Federal Republic of Yugoslavia

Environmental Sector Review

ANNEXES

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World Bank
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ANNEX 1: TRENDS IN THE QUALITY OF THE ENVIRONMENT AND NATURAL RESOURCES, TRANSBOUNDARY ENVIRONMENTAL PROBLEMS

1. This annex provides a brief overview of the main environmental issues and trends in Serbia and Montenegro, including air quality, water quality, forest management, biodiversity protection, and international waterways.

Geography and Population

2. FRY covers a total area of 102,173 km², out of which the Republic of Serbia covers 88,361 km² (87% of total) and the Republic of Montenegro 13,812 km² [7]. It is a Balkan, Mediterranean, as well as Danubian country. According to its geomorphological characteristics, the country can be divided into three macro-regions: the Pannonian Plain in the north, a hilly-mountainous region in the central part of the country and the Adriatic coast in Montenegro.

3. In 2000, the country’s total population was 10.6 million, which is only a slight increase when compared with the 1987 population of 10.3 million [7]. Serbia’s population is estimated at slightly below 10 million and Montenegro’s at about 650 thousand. The population is predominantly and increasingly urban (up from 67 percent in 1991 to 69 percent in 1999), with Belgrade, the capital, having a population of around 1.2 million and 5 other cities, Kraguyevac, Podgorica, Nis, Novi Sad and Subotica, having populations of more than 100,000.² The wars in the region brought 700,000 refugees into the FRY. From mid-1999 onwards more than 300,000 internally displaced people from Kosovo have found temporary homes in FRY. This has caused an increased demand for energy and water and resulted in a negative impact on the environment.

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¹ This annex does not discuss the state of forest resources and biodiversity as there are separate annexes on these topics.
² These population figures date from the 1991 population census. It is estimated that since the early 1990s, approximately 300,000 refugees and IDPs have migrated to Belgrade alone. Podgorica is also believed to have received a significant number of new inhabitants, relative to its size.
Air Quality

4. Air pollution is a localized problem, and can be severe with respect to some pollutants in selected industrialized cities, in Serbia and Montenegro. In the cities of Bor and Ivanjica in Serbia, annual average ambient SO$_2$ concentrations in 2000 were found to be at least three times in excess of national standard (50µg/m$^3$). The maximum allowable concentration (MAC) is exceeded at single measuring points 188 days in Bor, 63 days in Vranje and 22 days in Kikinda, and to a lesser extent in Leskovac, Sabac, Novi Sad, Kragujevac, Smederevo and Uzice. Average ambient particulate matter (PM) concentrations were 16 times the national standard (50µg/m$^3$) in Cacak, and between 6 and 8 times in Krusevac, Vranje, Leskovac, Uzice, and parts of Belgrade and Lucani. The MAC for soot is exceeded at single measuring points on 281 days in Uzice, 170 days in Smederevo, 141 days in Belgrade and Sabac, 118 days Leskovac and to a lesser extent in Nis, Cacak, Zrenjanin and Vranje. On the other hand, NO$_2$ levels recorded in the settlements were at or below the Serbian limit value of 40µg/m$^3$ in all Serbian cities with air quality monitoring networks (Table A1) [8].

5. In Montenegro, according to recent air quality reports (1998, 2000), the levels of pollution from SO$_2$ and PM are periodically above limit values in the vicinity of Niksic (ironworks plant), Plevlja (coal mine and power plant) and Podgorica (aluminum smelter).
### Table A1: Ambient air pollution concentrations in Serbian cities

<table>
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<th>Average annual concentration (µg/m³)</th>
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<th>NO₂</th>
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* Kragujevac: average value of PM for 10 measured places
** Soot is mainly elementary carbon, transformed during incomplete combustion processes and additional chemicals to particulate matter
∅ - no measurement above limits
PM: Particulate matter
6. Figures A1 and A2 indicate the trend in FRY emissions from 1990 to 1999. Air pollution emissions, in particular \( \text{SO}_2 \) and \( \text{NO}_2 \), declined slightly in the first two years of the 1990s. In subsequent years they rose again to surpass 1990 levels in 1998, but dropped substantially in 1999. Most of the drop was in energy related emissions and was caused by NATO bombings, which interrupted electricity production. Data on subsequent years are not available. As the tables indicate, the main sources of \( \text{SO}_2 \) and \( \text{NO}_2 \) emissions are energy generation plants (80-88%), and to a much lesser extent, industry (3-14%) and general consumption (9%). **Coal burning and inefficient technology are the most important factors leading to high emissions from energy plants.** The role of industry appears to have increased relative to general use in the 1990s for both pollutants. Public health impacts of air pollution are discussed under section “Poverty and Environment Linkages”.

7. Regarding global and transboundary aspects of air pollution, FRY ranks among those countries whose estimated yearly consumption of controlled ozone depleting substances is less than 0.3 kg per capita. With regard to “acid rain”, it has been estimated that in 1998, FRY imported 195,000 tons of sulfur and exported 109,000 tons. The majority of FRY’s \( \text{SO}_2 \) exports are to Romania, Bulgaria and Ukraine, while Bosnia and Herzegovina, Romania and Bulgaria are the main sources of “imported” \( \text{SO}_2 \). FRY’s nitrogen exports and imports in 1998 were estimated at 15,800 and 40,100 thousand tons, respectively. Transboundary nitrogen pollution is mainly imported from Italy and exported to Romania. In its research, the team did not come across evidence that acid rain may be resulting in significant damage to crops, forests, human or animal health. Further study into transboundary air pollution, and its causes and effects, is needed in FRY.

**Figure A1: SO\(_2\) Emissions by Category of Source**

Source: FRY Hydro-Meteorological Institute
8. The FRY has an annual per capita water flow of about 1,600 m$^3$ per capita, which classifies it among the water-poor areas of Europe. The country is poor in terms of internally renewable water resources, since about 84% of available water originates outside the territory of FRY [9]. Yearly groundwater reserves total about 244 m$^3$ per capita. Groundwater sources are extremely important especially for Serbia where they are estimated to supply 90% of domestic and industrial needs, and 70% of drinking water needs. In many areas of FRY, groundwater cannot be used for drinking purposes without prior treatment. This is particularly true in certain areas close to the Morava and Danube Rivers in the Vojvodina Region.

9. Water resources – Serbia. The quality of water resources, both surface and groundwater has experienced a continuous decline and is considered unsatisfactory. From 1994 onwards, water quality in most Serbian rivers deteriorated from second class (suitable for bathing and drinking purpose only after treatment) to third class quality (suitable for irrigation and industry) [9]. Some of the decline is attributed to higher levels of pollution in those water sources entering FRY. These tend to be contaminated with nutrients, oil, heavy metals, and organic components. Examples of very clean water - Class I and I/II - are very rare, and are situated in mountainous regions, for example along the Djetinja River in the Western part of Central Serbia. Organic pollution and nutrient enrichment have been recorded in the Danube River Basin, especially in the Vojvodina Region. Toxic pollution has been recorded in sediments downstream from the large industrial centers, such as Pancevo and Bor.

10. Water resources – Montenegro. The water quality of Montenegro’s most important rivers, namely the Moraca/Zeta, Lim, and the Tara/Piva, is generally within the required level during most of the year (Ministry of Environmental Protection and Physical Planning, 2002). The water quality of Lake Skadar also meets all standards for its category, with the exception of ammonia, particularly in the north and northwest of the lake. Eutrophication has also been documented in the North West part of the lake [1]. The most polluted water bodies in
Montenegro are two rivers, the Vezisnica and the Cehotina, in the vicinity of the industrial town of Pljevlja in northern Montenegro. Water quality in a stretch of the Ibar River near Bac also exceeds standards for BOD, ammonia, phosphates, nitrates, phenols, detergents, mineral oils, manganese, mercury and pathogens.

11. **Marine waters.** The quality of coastal marine waters off Montenegro is generally satisfactory, especially in open stretches. Nevertheless, more confined bays with human settlements are affected by wastewater discharges. Signs of eutrophication have been observed in Herceg-Novi, Kotor and Tivat, likely resulting from discharges of untreated wastewater. It is expected that the probable increase in tourists along the coast, particularly in the hot period of year, could result in higher wastewater discharges in the Adriatic Sea, impacting water quality. Increased phosphate discharges also originate from detergents. Significant algae blooms were observed over the few years in the interior part of Kotor Bay during the summer time [1]. Furthermore, fecal pollution is periodically a concern at almost all the beaches, especially near Sutomore, Bar and Ulcinj, where the number of coliform bacteria exceeds even the limits for Class II bathing waters. The quality of bathing water at the exclusive of location of Sveti Stefan is of greatest concern, where fecal pollution is the largest problem. Moreover, in Budva, Bijelea and Bar, increased pollution by ammonia and mineral oils has been observed.

**Transboundary Waters**

12. **Danube River Basin.** The Danube River Basin occupies 87% of FRY’s territory, representing 11% of the Basin’s area. The Danube crosses and borders FRY’s territory for 588 km, and its Drava, Sava and Tisa Rivers, the Danube’s largest tributaries, drain large parts of the Basin area located in FRY. A significant contributor to nutrient pollution in the Danube River and hence the Black Sea, are FRY’s discharges into the Danube of nitrogen (N) and phosphorous (P). The Danube Water Quality Model developed in support of the Transboundary Diagnostic Analysis (TDA) for the Danube River, estimated FRY’s annual discharges as 72,000 N t/y and 7,000 P t/y, representing 13% and 14% of total loads, respectively [3]. These values place FRY third in N discharges and second in P discharges among 13 countries in the Danube Basin. The TDA identified untreated municipal and industrial wastewaters and leakages of highly concentrated manure from large-scale pig farms as primary sources of nutrient pollution in the FRY portion of the Danube [3]. Nutrient pollution has adverse impacts not only on globally treasured biodiversity in the Danube and the Black Sea, but also on the local economy, affecting public health, fisheries and tourism.

**Land and Mineral Resources**

13. Around 36% of Yugoslavia’s territory is arable land and 13%, pastures [4]. Due to very intensive agriculture, about 20,000 km² or 20% of FRY’s territory can be classified as degraded, mostly due to water erosion, except in Vojvodina where the main cause of land degradation is wind erosion. The rate of soil erosion is 3 to 4 times the “natural” level. Erosion, not all related to agriculture, is reported to be moderate to extreme for 26% of Serbia. Among other causes of land degradation are open pit mining activities and unregulated waste disposal. Of the total degraded area, some 96% is in Serbia, and only 4%
in Montenegro, which is mountainous and less industrially developed. Large areas of land around many industrial complexes have been severely polluted by different heavy metals and POPs, and are now classified as environmental “hotspots”. Irrigation is used on only 40,000 ha in the Sava and Danube Basins. Problems of waterlogging and salinity have not been reported.

14. The economic dislocation of the 1990s led to a marked fall in the use of chemical fertilizers and pesticides to about one-third of their 1985 levels and consequently in the threat that they pose to the environment, in the form of toxicity to workers and ecosystems, deterioration of water quality, and eutrophication of lakes, bays and the Black Sea. However, it may be expected that this trend will be reversed as the economy recovers3, especially with the introduction of world market prices, which will tend to limit inefficient use. The biggest environmental challenge in this sector is from intensive livestock production, especially at large, former state farms. In the FRY portion of the Danube Basin, there are about 100 farms with an average of 1,000 cattle and 130 pig farms with a total of 1.2 m animals. Very few of these farms have any advanced form of waste collection and treatment – simple lagoons are common. The resulting runoff of nutrients (Nitrogen and Phosphorus) into the Danube and, eventually, into the Black Sea, contributes to the eutrophication of this international water body and to declines in fish production and biodiversity.

15. FRY is rich in various mineral resources: copper, lead, zinc, nickel, bauxite, gold, silver, various decorative stones, lignite, coal, oil, natural gas, as well as about 500 registered mineral and thermal-mineral water springs. Energy reserves consist mainly of solid fuels (72%), where the share of low-grade coal (lignite) is more than 65%. In the past few decades, the diverse mineral reserves of Eastern Serbia, Central Serbia, and Northern Montenegro, have been increasingly extracted, causing environmental damage, especially where open cast lignite mining (in the Kolubara, Kostolac and Kosovo basins), and open cast copper mining (Majdanpek) are practiced [5]. Open cast mines and mining waste dumps have also resulted in landscape degradation, groundwater contamination, and soil degradation.

Industrial and War Related Environmental Hotspots

16. In both Serbia and Montenegro, there are several environmental hotspots that pose a serious risk to public health and the surrounding ecosystem. In Serbia, the main hotspots are in the cities of Bor, Kragujevac, Pancevo, Sâbac, and several other industrial centers [6]. A UNEP/UNHCS report identified a number of additional environmental hotspots that were created in Serbia as a result of NATO bombing, most notably in the cities of Bor, Kragujevac, Novi Sad, and Pancevo.4 The following are some of the most severe industrial and war related environmental hotspots in Serbia:

• Pancevo’s industrial complex, including nitrogen processing, petrochemical plants, and a refinery, were damaged during NATO bombing. Approximately 1.2 tonnes of dichloroethane (EDC), which is an extremely toxic material to both terrestrial and aquatic fauna and flora, were released into soil and water from the bombing. High concentrations of EDC, as well as of mercury from

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3 Recent donor funding of fertilizers may prove to be a mixed blessing.
4 For more information see the UNEP/BTF Feasibility Studies, which can be found at the following website: http://www.grid.unep.ch/btf/reports/feasibility/index.html
previous, industrial pollution, have been detected in soil, groundwater and the city’s wastewater canal.

- An ore smelting complex in Bor is polluting the air. Sulfur dioxide and PCB oils from damaged equipment pose the greatest problems.

- Novi Sad has an oil refinery, which was bombed during NATO’s air raids. Large amounts of crude oil and petroleum products leaked into the soil, groundwater and Danube River. The polluted water poses a threat to the infiltration ponds of the Novi Sad water and wastewater plant.

- The city of Kragujevac faces environmental pollution from both a car factory as well as from NATO bombing. The level of PCB, nickel, chromium, and dioxin contamination in soil and groundwater is very high. The car factory is located on the banks of Lepenica River, a small tributary of the Morava River. PCB contamination of the river sediments and water represents a major threat to aquatic life, and possibly to groundwater resources in the area.

- The Kolubara – Obrenovac corridor consists of lignite-fired power plants and related ash pits and the lignite mines. Pollution in the 26-mile corridor is having a major impact on air quality, and has resulted in a high level of respiratory problems in the region.

17. Montenegro does not face Serbia’s problem of war related environmental hotspots, but it does have a number of areas that are severely polluted as a result of industrial activities [1]:

- The Plevlja Region is an area where coal mining and a power plant cause serious pollution. Energy production is based on mined lignite coal without any filtering or purification of gas emissions. Due to the location of the power plant in a closed valley with virtually no wind for two-thirds of the year, severe air pollution events occur frequently, especially during the heating season. The frequency of respiratory diseases in the area is much higher than the average.

- Aluminium Kombinat in Podgorica. The air in the area of this kombinat is periodically polluted from an anode backing plant and the electrolytic process (fluoride, phenols, SO$_2$, perfluorcarbons). Groundwater is polluted by different pollutants, notably PCBs and fluorides, coming from the plant’s “red mud”, which represents a waste from the production of aluminum.

- Niksic zone. The ironworks plant “Boris Kidric” in the city produces a variety of steel products from scrap iron. The electrical furnaces and the internal power plant operate without any filters or scrubbers and emit a range of heavy metals, noxious gases, and particulates. The pollution level in the air in the vicinity of the plant exceeds permissible levels.
Millennium Development Goals and the Environment

18. Ensuring environmental sustainability is one of the eight UN Millennium Development Goals (MDG) that were adopted at the Millennium Summit in September 2000. The seventh MDG aims to “integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources; halve, by 2015, the proportion of people without sustainable access to safe drinking water; and significantly improve the lives of at least 100 million slum dwellers by 2020.” Indicators related to this target include forest coverage, biodiversity protection, per capita energy use, CO₂ emissions, access to water, access to sanitation and security of tenure (Box A1). The fourth MDG, which aims to reduce the under-5 mortality rate and the infant mortality rate, is also related to the environment given the strong relationship between child health and availability of clean drinking water and sanitation.

<table>
<thead>
<tr>
<th>Targets</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources</td>
<td>• Change in land area covered by forest</td>
</tr>
<tr>
<td></td>
<td>• Land area protected to maintain biological diversity</td>
</tr>
<tr>
<td></td>
<td>• GDP per unit of energy use</td>
</tr>
<tr>
<td></td>
<td>• Carbon dioxide emissions (per capita)</td>
</tr>
<tr>
<td>Halve, by 2015, the proportion of people without sustainable access to safe drinking water</td>
<td>• Proportion of population with sustainable access to an improved water source</td>
</tr>
<tr>
<td>Have achieved, by 2020, a significant improvement in the lives of at least 100 million slum dwellers</td>
<td>• Proportion of population with access to improved sanitation</td>
</tr>
<tr>
<td></td>
<td>• Proportion of population with access to secure tenure [Urban/rural disaggregation of several of the above indicators may be relevant for monitoring improvement in the lives of slum dwellers]</td>
</tr>
</tbody>
</table>

Source: http://www.worldbank.org/data/mdg/About_the_goals.htm

19. While statistics indicate a very large part of the FRY population had access to safe drinking water in 2000, there are unsatisfactory trends in both quality and coverage and service, especially to rural areas and urban slums. Similarly, 99.6% of the FRY population is reported to live in a household with sanitation services of some kind, however the majority of rural households have septic tanks, many of which have been found to be improperly designed and situated. Urban slums, mainly populated by refugees, Roma and IDPs, do not have access to safe sanitation facilities. Problems in access to safe drinking water and sanitation endanger threaten to reverse the positive trend in decreasing child mortality rates.
since 1990s. The deficiencies in service are mainly caused by poor financing and management of public utilities, which need to be reformed.

20. GDP per unit of energy used, a reverse of the usual energy intensity ratio, declined from US$ 1.85/koe in 1990 to US $1.28/koe in 1999 showing a higher energy intensity. This compares poorly with the ECA average of US$ 2.4/koe and underlines the need for improved energy efficiency and reduced demand through the elimination of energy price subsidies. FRY’s CO₂ emissions of 4.6 mt of per capita were less than the ECA average in 2000. However, these emissions appear to have increased since the early 1990s. Hence there is room for improvement.

21. Forests cover 28% of FRY’s land area. This percentage is lower than the ECA region average of 40% and there has been a slight decline in forest coverage of 0.4% annually during the past ten years, mainly due to fires, pest infestation, illegal logging, reduced afforestation and overharvesting. While the annual reduction is not very dramatic, it does underline a need for more sustainable forest management to reach a positive trend. Of FRY’s total land area, 3.3% is protection for biodiversity conservation. This is the same as the ECA average and there is no indication of a negative trend. There is still, however, a need for better management of FRY’s globally significant biodiversity (Table A2).

### Table A 2: FRY and Millennium Development Goals

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Reduce child mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 5 mortality rate</td>
<td>26.0</td>
<td>19.0</td>
<td>16.0</td>
<td>NA</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>23.0</td>
<td>13.1</td>
<td>13.6</td>
<td>12.8</td>
</tr>
<tr>
<td>Ensure environmental sustainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest area (million ha)</td>
<td>2.995*</td>
<td>2.934*</td>
<td>NA</td>
<td>2.887**</td>
</tr>
<tr>
<td>National protected area (% of total land area)</td>
<td>NA</td>
<td>3.34</td>
<td>NA</td>
<td>3.33***</td>
</tr>
<tr>
<td>GDP per unit of energy use (US$ / koe)</td>
<td>1.85</td>
<td>1.28</td>
<td>1.28</td>
<td>NA</td>
</tr>
<tr>
<td>CO₂ emissions (mt per capita)</td>
<td>3.6^^</td>
<td>2.9</td>
<td>NA</td>
<td>4.6***</td>
</tr>
</tbody>
</table>

Notes:

1 1991 statistic

Sources:

^^ Chapter 12, “Breaking with the Past: The Path to Stability and Growth”, 2001
** FAO Global Resources Assessment, 2001
*** The Little Green Data Book, 2001

### Poverty and Environment Linkages

22. In this section we discuss linkages between the environment and poverty using a broader definition of which extends beyond income or consumption to include health and vulnerability. A number of important poverty – environment linkages exist in this context: a) health and environment; b) vulnerable social groups and environmental degradation; c) poverty and natural resource degradation; and d) poverty and vulnerability to natural disasters. Boxes A2 and A3 provide summary information on the state of poverty in Serbia and Montenegro, respectively.
Box A2: Poverty in Serbia

Poverty in Serbia has increased dramatically in the last ten years. The middle class has disappeared, the number of poor has increased two and a half times and there are an increasing number of people living just above the poverty line.

Available statistics for 2000 indicate that approximately one third of the Serbian population, 2.8 million, lives in poverty, defined according to national criteria, with an income of less than US $30 per month, and about 18%, 1.8 million, live in absolute poverty with monthly income less than US $20\(^5\). Additionally, a considerable group lives close to the poverty line and can easily fall below it in the absence of well targeted measures.

The urban population has suffered more from the fall in living standards and the spread of poverty than the rural population. There is a considerable difference in poverty incidence between these two categories of population (39.7 percent versus 29.4 percent).

Serbia’s three regions, Vojvodina, Central Serbia and Southern Serbia differ in terms of level of development: Vojvodina is the wealthiest region and fewer than 10 percent of its municipalities are classified as underdeveloped according to the UN Human Development Index (HDI). In the central region, GDP/capita is slightly lower than in the Vojvodina, and there is a higher proportion (21 percent) of municipalities classified as underdeveloped according to the HDI. But severe rural poverty is not widely observed. Southern Serbia is the largest of the three regions, and also the poorest, least developed region. 58 percent of municipalities are underdeveloped according to HDI. A substantial proportion (19 percent) of all municipalities are classified as severely underdeveloped. Widespread rural poverty has been a major determinant of the net out-migration recorded for Central Serbia and Southern Serbia during the period 1995-1999.

The results of empirical research show that the main survival strategies of households in Serbia in the year 2000 were the reduction of needs, subsistence economy, a decrease in savings or sale of property, as well as an increase in grey economy activities.\(^6\)

Source: I-PRSP

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\(^5\) “Poverty in Serbia and reform of Governmental Support for the poor”, B. Bogicevic, G. Krstic and B. Mijatovic, Center for Liberal-Democratic Studies, 2002. The study is based on pre-reform data from the first half of 2000 and does not take into consideration the approximately 600,000 refugees and internally displaced persons currently accommodated in Serbia.

\(^6\) According to the grey economy survey of 2000, at least 30% of the economically active population was involved in activities of the grey economy, with monthly incomes that were higher than the ones in the regular economy.
Box A3: Poverty in Montenegro

Poverty has increased in Montenegro during the past decade. A survey carried out in 2000 indicates that, depending on the assumption on poverty line, between 20 – 30 percent of the Montenegrin population can be considered poor. Unemployment rate stands at 86 percent, taking into account all types of employment (formal, informal and multiple). It should be noted however, that those engaged in informal activities may not hold full-time positions. Regional differences are also very strong. Northern inhabitants have a higher probability of living below the poverty line.

The negative socioeconomic trends experienced during the past decade in Montenegro have been, to a greater or lesser extent, offset by a number of coping mechanisms. As mentioned before, family support and income from informal activities (i.e. grey economy) played an important role in preventing an even larger share of population falling below the poverty line.

Source: UNDP, “Employment, Labor Market and Standard of Living in Montenegro”

Health and environment

23. The main issues under this heading are water and sanitation, air pollution and waste management. These are discussed below.

24. Water and sanitation. Health status data indicate that in FRY water related diseases are not a significant contributor to the burden of chronic or acute disease (WHO, 2000; UNICEF, 2001). Mortality among infants and children under five, a common indicator of water supply and sanitation conditions, has declined by one half during the 1990s and is associated with improved household sanitation and improved treatment for diarrhea and acute respiratory disease. The under-five mortality rate for diarrhea disease declined by 38.2% during the 1990-97 period (UNICEF, 2001). On the other hand, some epidemiological studies on health and environment have found linkages between living conditions, drinking water quality and health (Mihajlovic-Vukmirovic, et al, 2001). The deteriorating water quality of drinking water may well reverse the positive trend in under five mortality rate. The situation is particularly acute for urban slums, populated by refugees, Roma and IDPs, as discussed under “vulnerable populations” below.

25. The FRY public health sector utilizes a risk factor and exposure approach to environmental health, and it is from this perspective that, given the information on FRY water quality in terms of specific contaminants whose health impact is well known (e.g. arsenic, nitrates, carcinogens, pathogens) experts in FRY draw conclusions regarding impacts of water on health. These conclusions are credible but we recommend that the public health sector be strengthened in terms of environmental health capacity building and training in epidemiological methods for environmental health studies. Public health institutes are keen to receive training, equipment, and technical assistance.

26. Air pollution. High ambient concentrations of pollutants have been associated by international epidemiological studies with various negative health impacts. These are summarized in Box A4. SO\textsubscript{2} concentrations in some Serbian industrial settlements are within the critical range that has been associated with negative health impacts. The same is true for
exposure to high PM and soot concentrations likely leading to higher mortality and morbidity in several Serbian cities.

**Box A4: Health impacts of air pollution**

SO₂. Exposure to sulfur dioxide in the ambient air has been associated with reduced lung function, increased incidence of respiratory symptoms and diseases, irritation of the eyes, nose, and throat, and premature mortality. Children, the elderly, and those already suffering from respiratory ailments, such as asthmatics, are especially at risk. Health impacts appear to be linked especially to brief exposures to ambient concentrations above 1,000 µg/m³ (acute exposures measured over 10 minutes). Some epidemiological studies, however, have shown an association between relatively low annual mean levels and excess mortality.

PM. Several clinical, epidemiological, and toxicological studies have found statistically significant relationships between high short-term ambient particulate concentrations and excess mortality in different parts of the world. For example, using 14-to-16-year studies in six U.S. cities, and controlling for individual risk factors, including age, sex, smoking, body-mass index, and occupational exposure, Dockery et al. (1993) found a significant connection between particulate air pollution and excess mortality at average annual PM_{10} concentrations as low as 18 µg/m³, well below the current U.S. ambient standard of 50 µg/m³. Studies on the effect of particulates on human health summarized by Ostro (1994) suggest an increase in human mortality rates ranging from 0.3% to 1.6% for each 10 µg/m³ increase in average annual PM_{10} concentrations. A study conducted on over a half million people in 151 U.S. metropolitan areas during 1982–89 by Pope et al. (1995) found that death rates in the areas most polluted with fine particulates were 17% higher than in the least polluted areas, as a result of a 31% higher rate of death from heart and lung disease, even when most cities complied with the U.S. federal standards for particulate pollution. Cities with average pollution that complied with federal standards still had about a 5% higher death rate than the cleanest cities. In addition, relationships between morbidity and short- and long-term exposure to particulate matter have been found in a number of studies. Schwartz et al. (1993) found a significant increase in emergency room visits among people under the age of 65 in areas with daily average PM_{10} concentrations that were less than 70% of the U.S. air quality standard of 150 µg/m³.

NO₂. Epidemiologic studies have rarely detected effects on children or adults from exposure to outdoor nitrogen dioxide. Available data from animal toxicological experiments indicate effects on pulmonary function of acute exposure to nitrogen dioxide concentrations above 3,760 µg/m³ (WHO 1987). Studies with animals have found that several weeks to months of exposure to nitrogen dioxide concentrations less than 1,880 µg/m³ causes both reversible and irreversible lung effects and biochemical changes. Animals exposed to nitrogen dioxide levels as low as 940 µg/m³ for six months may experience destruction of cilia, alveolar tissue their affinity for certain dyes.

Source: Adapted from “Pollution Prevention and Abatement Handbook 1998”, World Bank

27. Anecdotal evidence is available on the impact of air pollution on human health in Serbia and Montenegro. It has been reported that, “bad air quality causes some health problems, such as increased bronchial and laryngeal diseases, especially in the industrial regions of Bor and Pancevo” of Serbia [9, page 24]. Similarly, when the study team visited the Kolubara-Obrenovac corridor, which consists of about 3,100 MW of lignite-fired power plants as well as related ash pits and the Kolubara lignite mines and is located in a small, 26-mile corridor, local officials reported that high levels of respiratory problems were the primary problem in this region. In Montenegro, Ministry of Environmental and Physical Planning’s (MEPP) Environmental Status Report (2000) states that in the area of Pljevlia, the site of a thermal plant and located in an enclosed valley with humid weather and, an absence
of wind two-thirds of the year, the frequency of respiratory diseases is markedly above the average for the Republic.

28. Lack of proper *waste management* creates public health hazards for the poor in a number of ways. First, as described in the section on waste management, hazardous waste is not sorted out, but dumped without any prior processing on regular, mostly illegal, waste dumps. Urban poor, notably Roma, who make a living by scavenging on waste dumps without any kind of protection or training on the handling of waste, are exposed to risks of injury and infection from sharp material. Second, leakage from waste dumps can contaminate groundwater which constitutes the drinking water source for poor communities living nearby. Third, inadequate incineration or incineration of unsuitable materials can result in the release of pollutants in the air and constitute a health hazard to nearby Roma, refugee or IDP communities.

*Vulnerable social groups and environment degradation*

29. Roma, refugees and IDPs residing in special camps and / or waste dumps in urban areas are among the most vulnerable social groups in FRY. Rural poor in the resource poor Southern Serbia also deserve attention.

30. In Serbia, there are an estimated 600,000 refugees and displaced persons who are among the most vulnerable with inadequate housing and much higher unemployment rate than the local population. Around 20,114 refugees and 11,486 IDPs are accommodated in collective centres clearly represent the most vulnerable part of this group. An estimated 25% of the IDPs and refugees are below the WFP poverty line. Among this extremely poor section of the population, living, hygienic and sanitary conditions are the worst and economic and social cases (the unemployed, the elderly, single parents, orphans and those who are unable to care for themselves) are concentrated.

31. The Roma minority is a key priority poverty risk group in FRY. There are thought to be 400,000 – 500,000 Roma in FRY concentrated mainly in southern Serbia, around Belgrade, Vojvodina and Montenegro. Within Roma settlements, access to utility and public services are nonexistent or limited and the most serious problems are lack of access to electricity, water, sewage, and garbage collection. The prevalence of communicable disease associated with poor living conditions such as hepatitis and trachoma was confirmed in discussions with public health officials in both Serbia and Montenegro. An international NGO, Oxfam, conducted a study on the health status and living conditions of Roma settlements in Belgrade and Kragujevac in 2001 (Oxfam 2001). The results clearly point to inadequate basic services and the consequent health impacts:

- 19,000 Roma people live in 64 “unhygienic” (meaning no piped water in the house or yard) settlements, usually in shacks, in Belgrade;
- Health was identified by the Romas as one of their major problems;
- Life expectancies are short (only 1.4% were older than 60) and living conditions are one of the contributors to early mortality;

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7 UNHCR and ICRC data, 2001
63.6% of households access water from public fountains; 
- More than half have outdoor latrines and a third have no latrines at all. In the majority of settlements there are no sewage system connections or septic tanks; 
- 30% of Roma children below 6 had diarrhea during the two weeks immediately prior to the survey, a figure three times greater than the general population; 
- 45% of Roma children are malnourished; and 
- More than 50% of children between 7-19 do not attend school.

32. While poverty is less widespread in rural areas than in urban areas mainly thanks to the resilience of agricultural production, there are significant regional differences in Serbia (Box A2). Although figures on poverty incidence and depth are not available for Southern Serbia, it is the poorest region in Serbia. Much of the area is mountainous, with 37 percent of the total area classified as forest and only 54.9 percent classified as agricultural land. Moreover, only 55% of the agricultural land is arable, further reducing the per capita availability of cultivable land to 0.28ha/capita. This scarcity of arable land and the harsh climatic conditions in many areas limit the potential for agriculture. Agriculture is dominated by livestock production, particularly cattle and sheep. Production is largely subsistence. Rural communities tend to be located around small pockets of arable land, and are small and highly dispersed, largely isolated from markets and each other. Household incomes are very low, particularly in isolated areas, a consequence of the low potential for agriculture, poor access, and lack of opportunities for non-farm employment. The resulting poverty levels have been exacerbated by the out-migration of the last 50 years, which has left a predominance of older people in rural areas. Many villages have been abandoned entirely, and others face the same prospect.

33. Analyses on the vulnerability of rural poor in Southern Serbia (and other regions of Serbia and Montenegro) to environmental degradation, such as land degradation, worsening of water quality, and to natural disasters, such as floods, are not available. This is an area that should be studied in more detail in order to inform policy decisions on regional environmental and natural resources policy. Once areas are identified where the rural poor are highly vulnerable to natural resource degradation and where poverty and lack of knowledge on sustainable resource management are identified, the government may consider promoting income generating activities that are environmentally friendly and use natural resources sustainably. Examples of such activities include eco-tourism, growing high value crops, fruits and vegetables, manure management. Regional successful experiences in achieving sustainable resource management while reducing rural poverty, such as in Turkey, may be considered for replication (Box A5).

Poverty and natural resource degradation

34. The rural poor whose livelihoods depend on limited natural resources, such as land and drinking water, can be very vulnerable to their degradation. As discussed above, rural poor in Southern Serbia, and those living in mountainous parts of Montenegro are highly dependent on the quality of natural resources. Land degradation as a result of overgrazing and deforestation are likely to be significant issues in mountainous regions and need to be studied. In particular, the reliance of rural poor on fuelwood for heating may increase in the face of increasing electricity prices as they are not serviced by district heating or natural gas.
networks. This may lead to increased uncontrolled wood cutting, exacerbating land degradation. Fisheries is another area where poverty can exacerbate resource degradation through overfishing leading to a spiral of lower yields and increasing poverty. As discussed in the section on Biodiversity and Protected Areas Management, there is evidence of overfishing and resulting decreases in fish stock in the Lake Skadar area which is among the poorest regions of Montenegro. Finally, as discussed in the section on Water Supply, pollution of groundwater which is a significant source of drinking water in rural Serbia and Montenegro, is common. The impact of this on the poor is high as they lack the resources to purchase other sources of drinking water, such as bottled water.

**Box A5: Turkey - Eastern Anatolia Watershed Rehabilitation Project**

The project, approved in 1993 with a loan of US$77 million, aimed to restore sustainable land-use management to degraded watersheds in Elazig, Malatya, and Adiyaman provinces, and to increase the incomes of populations living in these areas, among the poorest in Turkey.

The project included improved management and cultivation of fodder, improved range management, reforestation and oak coppice rehabilitation for fodder and fuelwood, soil conservation, improved crop farming and fruit farming, bee-keeping construction of ponds for supplementary irrigation, and gully protection. It also offered alternative income-generating opportunities such as the production of horticultural crops, forages to support stall feeding, aromatic and medicinal plants with export opportunities, bee-keeping, and vegetable production.

The success of the Eastern Anatolia Watershed Management Project hinged on a participatory approach that fostered unprecedented cooperation, organizationally and technically. Government agencies and local communities jointly planned, implemented, and continually fine-tuned agricultural productivity activities within a program of local forestry and soil conservation.

Communities then chose from a "menu" of options developed by project staff, but based on community knowledge, comprised of various treatments. These treatments coupled long-term benefits—such as forestry, range, and conservation activities—with short- and medium-term benefits related to irrigated crops, fallow reduction, horticultural crops, medicinal and aromatic crops, and forages. Communities continued to be involved by helping with the implementation and contributing to the costs of their plan.

Project monitoring and evaluation data indicate that range management has been successful, as measured by the reduction in the number of grazing animals, a substantial increase in fodder trees, increased adaptation of dryland and irrigated forages, and a shift to stall feeding. Indicative of the project’s success in improving family incomes is that out-migration has declined in several villages, and some family members are returning from the cities to project areas.

**Poverty and vulnerability to natural disasters**

35. Serbia and Montenegro are severely exposed to earthquakes and floods risks. The most severe earthquake was in Montenegro in 1979 when 131 persons were killed, 1,000 persons were injured, and 100,000 homes were destroyed. Its damage was estimated at US$ 2.7 billion. During the 1990s, more than 200,000 ha were affected by floods, which resulted in significant economic, social and environmental losses. The poor are particularly exposed to flood and earthquake risks notably due to the location of settlements on riverbanks and poor quality housing constructions. The country lacks a comprehensive strategy, which includes preparedness, mitigation, recovery and reconstruction.
References

2. “Assessment of Nutrient Emissions and Loads Discharged into the Black Sea”, Annex 6, Danube Regional Project / Project Brief submitted to the GEF in May 2001
3. FRY Statistical Yearbook, 2001
7. Statistical Yearbook of Yugoslavia, 2001
ANNEX 2: MACROECONOMICS AND ENVIRONMENT IN SERBIA AND MONTENEGRO

This chapter discusses the links between the environment and macroeconomic trends and projected reforms.

Structure And Trends of the Economy And Trade

36. Pre-1990s. The Former Socialist Federal Republic of Yugoslavia (SFRY), which comprised Serbia, Croatia, Slovenia, Bosnia and Herzegovina, Macedonia and Montenegro, followed an industrialization and economic development strategy that was based on import substitution and protectionism for domestic agriculture and industry, which necessarily relied heavily on natural resource exploitation. The state created a complex web of price and trade restrictions with the aim of providing food security to domestic consumers, and cheap raw materials and energy for the industry. Agriculture, mining, food processing and energy production contributed significantly to GDP. Internal trade among the Yugoslav Republics comprising the Federation played an important role in this economic system. Other partners were mainly Germany, Greece and other COMECON countries. Foodstuffs, non-ferrous metals, machinery and equipment, and chemicals constituted the main export products. The main imports were foodstuffs, machinery and transport equipment, chemicals, and petroleum products.

37. SFRY’s economy was characterized by large inefficiencies in raw material and energy use, which contributed to high dependence on foreign energy resources and foreign debt accumulation. Nevertheless, the Yugoslav economy was more decentralized; there was much larger room for private enterprises. Citizens of SFRY enjoyed higher living standards than those in most centrally-planned socialist countries. Per capita GDP in 1989 is estimated at US$ 2,941.

38. The 1990s. Major economic decline occurred in the 1990s starting with the break-up of SFRY in 1991-1992. The SFRY common market and input supply ties among the republics disintegrated. This, coupled with the effects of armed conflicts in the break away countries and the ensuing UN sanctions, resulted in severe economic stagnation and impoverishment of the population in the early 1990s (Figure A3). This was followed by a period of severe hyperinflation which peaked in 1994. A period of seeming economic recovery and reform attempts in the middle of the decade was cut short by the Kosovo crisis in 1999. The severe economic decline of the 1990s may be summarized by key macroeconomic indicators. In 2000, in both Serbia and Montenegro, recorded per capita GDP was only about 50% of its 1989 level. Exports in 2000 were just one third of their 1991 level. Imports were affected somewhat less dramatically; in 1999 imports were around 60 percent of their 1991 level8.

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8 Official indicators of economic activity are believed to underestimate economic activities given the large size of the gray economy and the scale of barter trade, which intensified during the 1990s.
39. The 1990s also altered the structure of the economy and trade from Serbia and Montenegro. Production of basic foodstuffs gained in significance while industrial production incurred heavy declines. Over the 1990s, exports of machinery, transport equipment and finished goods fell significantly, and consequently the relative importance of primary commodities rose. Imports of fuels, machinery and transport equipment also declined during this period because of low investment demand and general declines in economic activity. Agricultural output also fell, however to a lesser degree than industrial output, providing foodstuffs to the FRY population including large numbers of refugees from neighboring, former republics. Cereals were bartered for energy imports. The services sector increased in importance, and FRY enjoy a positive trade balance in services [3].

40. A look ahead. Taking the experience of other transition economies in the region as a guide, it may be expected that the recovery of heavy industry will be modest. Selected products, such as Serbia’s high quality steel products, may form an exception due to world demand. Similarly, Montenegrin aluminum exports will continue to grow based on increasing world demand for this product. Agriculture faces significant structural problems, including low productivity, low quality as well as a continued heavy state intervention in prices and quantities traded, making no-growth the most likely prospect for the short to medium run. On the other hand, the services sector will likely continue to grow significantly in the near to medium term. The Government of Montenegro also intends to significantly increase the share of tourism services in its economy for which it has an adequate basis in natural resources and cultural heritage.

Impact of Economic Activities on Environment And Natural Resources
41. Provision of cheap raw materials and energy sources to industry was, until recently, one of the pillars of the economic policy in FRY. This meant that prices for natural resources, including mineral resources as well as timber and water, were kept at very low levels that did not cover direct costs of their extraction and did not take into account environmental externalities, such as air, soil and water pollution, deforestation and soil erosion, and the opportunity cost of resource depletion to future generations. Industrial production was characterized by very high raw material and energy intensities. Similarly, in an attempt to increase agricultural output, chemical inputs, fertilizers and pesticides, were heavily subsidized, leading to their excessive use. Agricultural non-point source pollution of ground and surface waters was substantial. Very large, intensive livestock farms, lacking proper wastewater treatment facilities, constituted significant point sources of pollution. Underpricing of energy resulted in its excessive use, increasing the environmental costs associated with its generation and consumption. Overall, little attention was paid to the environmental impacts of policies designed to steer economic activities.

42. The 1990s witnessed a severe deterioration in physical capital basis and infrastructure as a result of lack of resources for maintenance and new investments. This is particularly true for water and sanitation and solid waste utilities in urban areas. Investments in cleaner technologies in industry were delayed or not carried out at all. Increased poverty made people, especially in rural areas, more dependent on natural resources for their livelihoods. In particular, it is claimed that use of wood for energy purposes and illegal woodcutting increased significantly [9].

43. Energy use intensity remained high in the 1990s - the average, 0.76 koe per unit of GDP, is nearly triple the OECD average. It increased from 0.56 koe per unit of GDP generated in 1991 to 0.78 koe in 1999. This suggests that while the economy shrank, the energy use by the remaining activities actually increased. This increase may in large part be explained by low energy prices that were not allowed to keep pace with inflation or international fuel prices after 1997. Hence, while in 1997 the electricity price was USc 3.7 / kWh, by October 31, 2000 the price merely USc 0.9/kWh which represented about one fifth of the economic price level. Similarly, the October 31, 2000 price for district heating in Belgrade for households, schools and hospitals (USc 5 / m2 / month) was equivalent to only one-eighth of the cost-recovery level. Subsidized energy prices led to higher energy demand, by households in particular. In Serbia, total annual demand for electricity increased by 21% during the 1990s, driven by a 52% increase of electricity consumption in households. In Montenegro, although industrial consumption declined by 17% during the 1990s, household energy more than doubled, as the under-pricing of electricity led to the widespread use of electric space heating.

44. Economic slowdown of the 1990s also benefited the environment in some ways. Most notably, financial difficulties experienced by farmers and the unavailability of agricultural chemicals severely limited their use. Average fertilizer consumption dropped from about 300 kg/ha to 100 kg/ha of arable land during the 1990s as a result of which non-point pollution became negligible [9]. This trend may reverse to some extent as the economy recovers.
45. *Genuine savings*, an integrated measure of economic and environmental performance, indicates that in 2000 the FRY economy was not on a sustainable path of growth. The indicator was $-13.50$ in 2000.\(^9\) In other words, the net addition to FRY’s assets that was passed on to future generations was negative. The large negative rate was caused mainly by already negative gross national savings, large consumption of fixed capital, and to a lesser extent by moderate levels of carbon dioxide damage, and energy and mineral depletion.\(^10\) Compared to other transition economies FRY’s negative genuine savings were similar to that of the Russian Federation, Kazakhstan and Georgia. In the former two, the low rate is a result of high energy depletion ratios, while in Georgia, as in FRY, *low genuine savings are mainly a result of negative savings and high consumption of fixed capital* (Table A 3).

| Table A3: Genuine Savings in FRY in 2000 (% of GDP) |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Gross National Savings | Consumption of fixed capital | Net national savings | Education expenditure | Energy depletion | Mineral depletion | Net forest depletion | Carbon dioxide damage | Genuine savings |
| -3.6 | 8.9 | -12.5 | 4.6 | 2.3 | 0.3 | 0 | 3 | -13.5 |


| Table A 4: Genuine Domestic Savings in other transition economies, 2000 (% of GDP) |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Belarus | 16.4 | Georgia | -6.1 | Moldova | 9.0 | Russian Fed. | -13.4 |
| Bulgaria | 0.5 | Hungary | 16.3 | Poland | 12.7 | Slovak Rep. | 18.8 |
| Czech Rep. | 17.0 | Kazakhstan | -29.6 | Romania | 2.8 | Slovenia | 17.2 |


**Macroeconomic Reform Policies and the Environment**

46. Macroeconomic reforms aim to restore economic stability and resume growth so that the country can return to higher welfare levels that the Yugoslav society was used to prior to 1990. As international experience suggests, higher income levels bring with them popular demands for better environmental quality. On the other hand, it would be naive to assume that economic growth would automatically generate better environmental conditions. This section attempts to identify the positive and negative effects of economic stabilization and restructuring measures on the environment and the natural resource base, and to propose possible interventions to counteract negative impacts.

\(^9\) “Genuine savings” is equal to net domestic savings, plus expenditure on education, and minus the value of energy depletion, mineral depletion, net forest depletion, and carbon dioxide damage over a one year period. *Net domestic savings* are equal to gross domestic savings less the value of consumption of fixed capital. *Education expenditure* refers to the current operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment. *Energy depletion* is equal to the product of unit resource rents and the physical quantities of energy extracted. It covers crude oil, natural gas, and coal. *Mineral depletion* is equal to the product of unit resource rents and the physical quantities of minerals extracted. It refers to bauxite, copper, iron, lead, nickel, phosphate, tin, gold, and silver. *Net forest depletion* is calculated as the product of unit resource rents and the excess of roundwood harvest over natural growth. *Carbon dioxide damage* is estimated to be $20$ per ton of carbon (the unit damage in 1995 U.S. dollars) times the number of tons of carbon emitted.

\(^{10}\) The contribution of carbon dioxide damage to the genuine savings rate would be reduced by half if carbon was valued at its current market value of roughly US$10 / ton of carbon emitted.
Stabilization Measures

47. In Montenegro, the stabilization measures started already in 1998 and aimed to reduce fiscal deficits and their monetary financing through the gradual introduction of first the Deutsche Mark and then the EURO as the sole legal tender as well as donor financing of the budget deficit. However, in 2000 the budget deficit actually increased as a result of raises in wages and social transfers. Consequently, Montenegro signed a stand-by agreement with the IMF in 2001. Serbia signed a stand-by agreement with the IMF also in the same year. Both agreements were based on a pledge to increase fiscal discipline, engage in more realistic budgeting, prioritize limited resources for pro-poor programs, and increase energy prices, which had been the main driving force behind quasi-fiscal deficits. The Serbian macroeconomic program also adopted non-inflationary financing of budget deficits, using privatization proceeds, exchange rate unification and current account convertibility.

Structural Reforms

Price and Trade Liberalization

48. By the end of 2000, the Governments of both Serbia and Montenegro had ceased fixing prices below market clearing levels for most commodities. Furthermore, the drastic trade reform that has been implemented at the federal level since late 2000 has included the reduction of tariff rates from 37% to 6%, removal of almost all foreign trade licenses and limitation of the use of quotas. FRY has also begun the longer-term process of accession to the WTO and the negotiation of an EU Stabilization Association Agreement. The Federal Government has also undertaken measures to reform customs and limit corruption and smuggling. The Government of Montenegro has gone farther in liberalizing its trade than FRY as a whole and has established a de facto customs territory. Environment related trade regulations are those of CITES, and licensing requirements related to medical and pharmaceutical products, and poisonous chemicals.

49. Energy Price Reform. Energy price increases are among the most important reform measures both from a macroeconomic and an environmental protection viewpoint. In 2001 and 2002, the governments of both Serbia and Montenegro increased electricity prices, in Serbia district-heating prices were also increased substantially. Further increases are needed and expected, for prices to enable financing of maintenance and new investments. Price increases will also provide the incentive to substantially reduce the inefficiencies in energy consumption by households and industry, which in turn will lead to reduced air pollution from energy production. As illustrated in Figures A1 and A2, energy production contributed significantly of SO₂ and NO₂ emissions in FRY. The other benefit for the environment of increased energy prices is higher rate of cost recovery in energy production is that it will allow power plants to have the funds to operate in an environmentally less damaging way, such as through emissions controls.

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11 In Serbia, Government continues to fix grain prices below market levels in an attempt to ensure the provision of consumers with basic foodstuffs at affordable levels.
50. In terms of macroeconomic benefits, energy price increases has also already reduced about half of the quasi-fiscal deficit (QFD) due to energy subsidies, which was estimated at US$1.1 billion, or roughly 10% of GDP in January 2001. Reduction of the QFD will help keep the inflation at low levels, which in turn helps the poor and fosters an investment friendly environment. Finally, lower demand for energy will reduce the country’s need to import energy sources, reducing foreign exchange outlays.

51. Further increases in energy prices may be difficult to implement due to problems of affordability by the poor. In Belgrade, the WB funded Energy Efficiency and District Heating Project has been designed to reduce this negative welfare effect by reducing the cost of energy to households. In other less densely populated cities, and particularly, in rural areas, energy price increases may make poor sections of society more dependent on coal and fuelwood and hence increase illegal wood cuts which are currently estimated at 10% of all wood harvests. Such shifts in energy use may also cause health damages through higher levels of indoor air pollution. A coordinated effort of cost reduction measures, an expanded energy efficiency program, and a targeted safety net for the poor should be developed to fully realize the win-win results of energy price increases for the environment and the macroeconomy.

52. Price Increases in Water Utilities. Water supply and sanitation has deteriorated significantly in recent years. This is mainly a result of low revenues. The revenue system was based on cross-subsidization of households and social institutions, such as hospitals and schools, by industry. In addition to capital deterioration leading to significant physical losses in the order of 50% or more and limitations in water treatment and sewerage, the system is plagued by high per capita water consumption (reaching 300 lpc/d whereas the average in Europe is 180 – 200 lpc/d), collection rates falling below 50%, lack of demand management and misuse of water supply for non-household activities, such as irrigation in peripheral areas. As discussed in chapter 6, the quality of water supplied as well as coverage of water supply and sewerage is unsatisfactory in both republics. In Montenegro, water supply and wastewater treatment are not sufficient to meet summer time needs when tourists more than double the area’s population to over 500,000.12 As a result of the low level of revenues, which do not cover operating costs, utilities have become a drain on municipalities’ budgets. For example, Novi Sad Water Company had a budgeted contribution from the municipality of US$3 million for 2001, against a projected revenue from billing of US$5.4 million.13 [Chapter 9 of 3].

53. In Podgorica, Montenegro, charges for water supply, waste and wastewater collection were raised significantly. This should be replicated in other Montenegrin cities and in Serbia. Increased tariffs has several benefits for the environment. First, it 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 as well as sewerage leakages. Increased revenues will also decrease the need for subsidies and make funds available for expanding services to underserviced sections of the society, such as the urban and rural poor. Increased drinking water quality and improved

12 The problems of the water sector are discussed in detail in chapter 6.
13 YUD 206 million and YUD 360 million, respectively. Converted at the average exchange rate for 2001, YUD 66.7/US$. 
sanitation will reduce costs incurred by the society as a result of diseases associated with water. Funds saved from subsidies may also be channeled to extending services to areas with high tourism potential, notably the Adriatic coast of Montenegro, which is expected to contribute substantially to the Montenegrin economy.

54. **Reforms in Wood Pricing:** There is also a move towards making timber charges (stumpage fees) reflect market conditions – new draft forest codes in Serbia and the new forest code in Montenegro stipulate that these charges be established based on auctions. Provided proper administration, multiple bidders and absence of collusion, this method of price setting should provide higher revenues for the organization in charge of sustainable forest management.\(^{14}\)

55. **Agricultural Input and Output Prices:** Price and trade liberalization have been limited in the agriculture sector and there is much scope for reducing subsidies and making the sector more efficient, which in many cases is beneficial for the environment as well.\(^{15}\) Profitability of agriculture remains low mainly as a result of poor quality products, lack of modern capital and difficulties in marketing. FRY does not enjoy a comparative advantage *vis a vis* European markets in the products that are being protected by the Government. Thus intensification of production or expansion onto marginal lands or wild lands and related environmental problems are not expected in the short or medium terms. Input subsidies have been removed which will likely dampened any increase in agrochemical applications that may result from the modest recovery of the sector. In any case, soils have been so depleted as a result of underfertilization in the 1990s, that any increase in nutrient application would likely not lead to runoff but be retained in depleted soils. On the other hand, low profitability of farming continues to fuel migration, especially by young people, to the cities. Increased urbanization without accompanying improvement in municipal services exacerbates waste and wastewater problems. In the long run, as liberalization proceeds, it is expected that FRY will have to open up its markets to foreign agricultural products and will start producing crops in which it has comparative advantage. At that time, the Government and civil society will have to be concerned with the environmental consequences of possible, renewed intensification and expansion of agricultural production.

56. Increased integration with world markets provides an opportunity for Serbia and Montenegro to promote its organic farming and other certified natural resource production to capture niche markets. Their closeness to European markets where demand for organic foodstuffs is ever increasing and the fact that in many areas cultivation has been de facto without any chemical inputs for nearly a decade provides a very advantageous starting point

\(^{14}\) For more information on forest management and its financing the reader is referred to Section 2.6. Forest Resources.

\(^{15}\) In Serbia, import quotas as well as licenses for imports or exports have been abolished and maximum tariff and levy rates have also been significantly reduced. However, export quotas continue to apply to 31 tariff lines of basic agricultural goods, including wheat, corn, flour, live animals, edible oil, soybeans, sugar, sunflower products and leather products. Furthermore, effective rates of import protection remain high, and variable levies are used as a means to protect nonviable enterprises and production activities. Current budget support, in the form of producer subsidies for milk, tobacco and sugarbeets, results in producer prices well above import parity for milk and sugarbeets and above export parity for tobacco. Further incentives are paid to farmers to retain heifers and sheep of improved genetic quality.
for these republics. Certification of timber and timber products is another area that holds promise for increased trade revenues from environmentally sustainable practices.

57. **Foreign Direct Investment.** Liberalization measures will likely encourage foreign investment in FRY. Many investors, particularly multinationals based in countries with high environmental sensitivity, are attracted to investments associated with good environmental performance so that they can maintain their reputation and market share. As such there is pressure for them to introduce modern technology that enhances raw material and energy efficiency and reduces harmful emissions into the environment. In the event that investors are not environmentally cautious however, that FRY’s environmental policy, including regulations and economic instruments, be designed and strictly enforced to discourage business ventures whose pollution levels are above acceptable levels set by the law.

**Privatization**

58. The Governments of the Republics of Serbia and Montenegro have embarked on an ambitious program of privatization. In Serbia, the Privatization Agency plans to privatize 1120 enterprises (120 through tender, 1000 by auctioning)\(^16\). Enterprises slated for privatization include agro-combinats, including large feedlots, and industries dealing with chemicals production, wood and agro-processing (tobacco, fruits, vegetables, sugarbeet, meat, grain), textile, mineral (aluminum, iron) processing. Most these companies have had little if any investments in upgrade in recent years. There are also initiatives to privatize the operation of utility services, such as waste management in Belgrade, that have past and ongoing environmental liability issues. In addition to its economic advantages, privatization offers an opportunity for improved environmental performance. International experience suggests that this is because of (i) more efficient use of resources as a result of greater attention paid by private companies to waste reduction and increased productivity of assets; (ii) improved access to capital, especially in the case of foreign direct investment, which promotes increased investment in new, more efficient and cleaner technologies; (iii) exposure to international management practices (e.g. environmental management systems such as ISO 14000) and market requirements as a result of increased export competitiveness; (iv) separation of government and management of enterprises, or environmental regulators and the regulated enterprises, has been shown to promote better enforcement of regulations as pressures to protect inefficient industries are no longer in place [10].

59. However, there is no guarantee that the privatization will help the environment. Experience also suggests that often in the early years the operators may try and make what they can from the existing technology and not worry too much about the environment. To ensure that remediation takes place, there should be an adequate regulatory capacity in place to encourage enterprises to adopt more environmentally sustainable practices. Second environmental considerations need to be incorporated into privatization transactions. This entails setting clear environmental performance objectives and dealing with past environmental liabilities. A strong environmental policy and regulatory system needs to be

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\(^{16}\) Vecernje novosti. “Interview with Aleksandar Vlahovic”, Serbian Minister of Economy and Privatisation, June 29, 20002
in place to ensure compliance with agreed targets and requirements, and to establish incentives for continued environmental improvement.

60. At present, there is no clear regulatory framework in Serbia or Montenegro for incorporating environmental concerns into the privatization process. Early experience in the privatization process in Serbia has shown that potential, foreign investors have demanded, prior to sale, an assessment of the environmental liabilities associated with enterprises and the World Bank loan for technical assistance on privatization also require environmental due diligence in transactions. However, the legal framework regarding past liabilities is not in place, which may reduce the number of bidders in sensitive cases. It may be advisable for Government to explicitly assume acceptance of responsibility for past environmental damage so as to reduce risks for potential buyers. Recent experience in Bulgaria indicates that this can produce win – win situations by accelerating privatization and attracting environmentally conscious, strategic international investors to the country. (See Box A6 below).

Financial Sector/Banking Reform

61. In the Republic of Serbia, reforms are under way to establish a strong banking system. A viable financial system will help environmental protection as it will help industrial enterprises access capital needed to invest in more energy and raw material efficient technology as well as in emissions control technology. A working banking system will also provide consumer credits, which may be used to acquire energy efficient heating systems and better cars. Agricultural productivity also depends upon a sound banking system that provides working capital for farmers. Property rights and land reform are key to the provision of collateral.

Fiscal and Public Sector Management Reform

Despite the overall fiscal benefits, reducing government expenditures has led to reduced resources for environmental agencies that monitor environmental quality and enforce environmental regulations. For example, in the Republic of Serbia, the expenditures of the Department Environmental Protection (DEP) declined from about US$1.5 million in 1998 to US$0.7 million in 2001, with the lowest level, US$0.45 million being reached in 2000. In 2000, DEP was allocated US$645 thousand as opposed to US$ 810 thousand, planned earlier. To some extent, the reductions reflect the changing role of Government in a market economy and the movement of responsibility for some environmental expenditures to the private sector municipal utilities or individuals. At the same time, the reductions significantly lowered DEP’s capacity to implement planned activities and to carry out emergency measure to mitigate environmental damages resulting from industrial accidents. With respect to the latter, these are measures that should shift to the private owners of these industries. Thus, to ensure the DEP is adequately funded, there is a need to better define the roles of the DEP and the cost of meeting them.
Box A6: Benefits of Incorporating Environment into the Privatization Process

Contrary to a common misperception, addressing environmental considerations during privatization does not impede the process. On the contrary, it reduces investment risks and uncertainties about potential future costs. Foreign investors, in particular, are concerned about possible unfair treatment regarding liability for past damages and about unexpected environmental requirements. In addition, international financial institutions increasingly require, as a condition for providing loans, environmental disclosure and a financial accounting for environmental liabilities in corporate financial records.

While environmental issues typically represent only a small part of all investment risks and costs, they become deal breakers if there are uncertainties about potential environmental liabilities, especially if the risks are large compared with the value of the enterprise (below). Of particular interest from the environmental point of view are privatization transactions in such sectors as mining, ferrous and nonferrous metallurgy, petroleum refining, chemicals, and power. From the privatizing government’s perspective, including clear environmental requirements in the privatization transaction can facilitate privatization, generate higher revenues, and avoid delays and future disputes.

Environmental Concerns as a Deal Breaker: Peru’s 1992 Mining Privatization

In 1992, the government of Peru embarked on the privatization of its biggest mining company, Centromin Peru. First Boston Bank and a local company, Macroconsult, prepared the company for privatization, setting a base price of $340 million and seeking commitments for an additional $240 million in investments over a three-to-five-year period following privatization. The enormous productive potential of the company generated high interest: 28 companies from several countries, including Canada, China, Japan, and the United Kingdom, signed up for the auction. A couple of days before the auction, however, reports appeared in the domestic and international media about possible large environmental damages. None of the investors submitted proposals during the first call for bids in April 1994. The company was restructured and was later sold, after environmental problems had been thoroughly addressed.

Source: Adapted from “Environmental Implications of Privatization”, Pollution Management In Focus, No.5, 1999

62. On the other hand, the Government of Serbia intends to reduce corruption with a combination of measures, including legal reforms, simpler and more transparent trade and tax regimes, and customs reform. This is clearly a positive development for environmental protection, as the reduction of corruption and the gray economy are one of the preconditions for enforcement of environmental regulations and the successful implementation of economic instruments for environmental protection.

References

1. Mileusnic-Vucic V., Chapter 14: Yugoslavia in “Sourcebook on Economic Instruments for Environmental Policy”,
4. Agricultural Sector Review, Draft Concept Note
5. Author??, year??, “Economic Instruments for Solid Waste Management in Serbia” in Designing Waste Management Strategic Policy Framework, ??
15. WHO, 2000
ANNEX 3: ENVIRONMENTAL EXPENDITURES AND FINANCING

Public Environmental Expenditures and Financing

63. The principles of environmental financing in Serbia and Montenegro were laid out by the 1991 and 1996 Laws on Environmental Protection, respectively. Both laws advocate the “polluter pays” principle. Enterprises or individuals that are the source of air, soil, and water pollution, or cause damage to natural resources, are under obligation to adjust their activities by adopting appropriate technology or by taking remediation measures so that their environmental impact is limited to permissible levels set forth by regulations. All these activities are to be financed from the enterprises’ own resources. Both laws also define in broad terms the types of activities that may be funded using public resources (Box A7).

64. As Box A7 indicates, both laws stipulate public funding of activities that are not in line with the “Polluter Pays” principle. In particular, “creating co-financing of investments capable of substantially reducing environmental pollution” should be mentioned. Rather, what is needed is an effective environmental management system in which polluting industries are induced to take remediation and mitigation measures. The role of a strong public environmental agency should be to monitor and enforce environmental regulations.

65. Both Laws also specify the sources of revenues for these activities. In Serbia these include: i) pollution taxes; ii) budgetary funds originating from turnover taxes on pesticides, detergents, plastic packaging and cigarettes at a tax rate of five percent, as well as from turnover taxes on coal, oil and oil derivatives, and on motor vehicles at the tax rate of one percent; iii) one percent of total estimated investment for legally required impact assessments on new plants in the industry, mining, energy and transport sectors; iv) interest on loans extended by the government environment institution for environmental protection projects; v) environmental fines; and v) other sources. 17

66. In Montenegro, the 1996 Environment Law lists the following sources of financing for environmental protection activities: i) budgetary funds; ii) eco-charges; iii) funds from the collection of environment related fines prescribed by the Law; iv) funds from particular sources as prescribed by local authorities, subject to the approval of Government; and v) funds from other sources. 18 Eco-charges are defined as a) charges on investments (2% of the investment value in the area of a national park, unless the project is in direct functional relation to the protection of natural resources; and 1% of the investment value for the investment projects for which an EIA is required by Law); and b) charges on pollution of the environment (emission of air polluting substances, consumption of fossil fuels; use of ozone depleting substances; use of lubricant oils; production and disposal of hazardous waste; and use of motor vehicles, aircrafts and vessels).

17 Article 88.
18 Article 35
Box A7: Activities to be funded with public resources as stipulated by current Laws

Republic of Serbia\textsuperscript{19}:
\begin{itemize}
  \item Monitoring the state of the environment;
  \item Co-financing equipment for technical and scientific institutions that are in charge of specialized work for the needs of the Republic in the area of environmental protection;
  \item Co-financing of specialized training of personnel in technical, scientific, business and administrative organizations dealing with environmental protection of an interest to the republic;
  \item Creating of investments capable of substantially reducing environmental pollution;
  \item Incentives for developing preliminary designs, applied scientific research projects, studies, surveys, contracting projects;
  \item Financing of programmes for the protection and development of natural resources under protection;
  \item Financing of organized efforts aimed at the prevention and rehabilitation in the area of environmental protection (Nature Conservation Club, Young Researchers of Serbia, Fishermen’s Federation, Hunters' Federation, Inventors’ Federation, the Red Cross, and the like); and
  \item Co-financing of publications, magazines and propaganda drives in the area of environmental protection.
\end{itemize}

Republic of Montenegro\textsuperscript{20}:
\begin{itemize}
  \item Realization of the Ecological Program;
  \item Co-financing of programs for natural resources protection and development;
  \item Financing the development and implementation of the rehabilitation program in case of an unknown polluter;
  \item Co-financing measures of intervention in cases of emergency related to pollution of the environment;
  \item Co-financing of other investment programs which contribute to significant reduction of environmental pollution;
  \item Providing funds for case studies, relevant scientific projects, studies, plans\textsuperscript{21} and construction projects;
  \item Co-financing of professional training of staff in professional, scientific, industrial and public institutions related to the field of environment of Republican interest;
  \item Co-financing of organized pollution prevention and environmental rehabilitation activities that are carried out by ecological NGOs; and
  \item Co-financing of publications, magazines, professional and scientific gatherings and information/promotional activities in the field of environmental protection and amelioration.
\end{itemize}

67. The Serbian Law stipulates that the Ministry would allocate these financial means on the basis of a medium term program adopted by the Government and its annual plan. The Law does not specify specific criteria, such as public good nature of investments, or benefit-

\textsuperscript{19} Article 89 of Environmental Law (1991).
\textsuperscript{20} Article 41 of the Environment Law (1996).
\textsuperscript{21} Law says “elaborates” (Article 41)
cost or cost effectiveness to guide investments. Rather, it states that the “Ministry shall set out the criteria and more specific conditions for the channeling and allocation of funds.” 22
The Montenegrin Law does not provide any guidelines on the allocation of these resources by the Ministry.

68. In reality, in both republics the “polluter pays” principle is rarely implemented and although data could not be collected by the study team, the expenditures incurred by industry, whether private, socially owned or state-owned, is believed to be very limited. The reasons for this are various and include the existence of a large gray or untaxed economy, estimated by some at 40% of the entire economy, inability of a number of fined companies to pay these fines due to their financial insolvency, and lack of a well functioning financial intermediation system, which among other things, would also facilitate access to investment capital for environmental pollution control. Furthermore, legislative loopholes regarding the enforcement of delayed payments, organizational weaknesses in the collection of charges, limited power for inspectorates to issue sanctions in case of non-payment, and lack of political will to enforce prevent effective enforcement of economic instruments designed to protect the environment. Finally, environmental inspectorates lack modern measuring equipment and have to rely on the enterprises’ self-assessment in assessing their compliance level with set standards [1].

69. *It should also be noted that environmental taxes and levies are rarely used as policy tools but are often seen as sources of revenues. A striking example is the “environment tax” on investments that are subject to and pass the EIA procedure. As this tax is not tied to environmental performance, and it does not serve as an incentive to improve and protect environment, but may actually constitute instead a disincentive for investments. Such a fee is only justified if it covers no more than the administrative costs of reviewing the EIA of an investment proposal.*

70. The majority of expenditures to control, monitor and prevent environmental damage is incurred by the public sector, in particular, the republic level environmental agencies DEP (Serbia) and MEPP (Montenegro), the city government of Belgrade, and the Federal level Environment Directorate (FED). In 2001, DEP’s and MEPP’s expenditures were US$ 660 thousand and US$ 740 thousand respectively. DEP’s expenditures have more than halved since 1998, while those of MEPP have actually increased (Tables A5 and A6). Like DEP, federal level expenditures also declined over the same period (Table A7). Data available for the City of Belgrade indicate that in 2001, it spent approximately US$950 thousand on environmental pollution and public health control measures. A breakdown of these expenditures is provided in Annex 1.

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22 Article 90
Table A5: Serbia DEP expenditures (US$ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>MOE / DEP Expenditures</th>
<th>National Income</th>
<th>Share in GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1.51</td>
<td>9,723</td>
<td>0.016%</td>
</tr>
<tr>
<td>1999</td>
<td>1.00</td>
<td>6,639</td>
<td>0.015%</td>
</tr>
<tr>
<td>2000</td>
<td>0.45</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2001</td>
<td>0.66</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>


Table A6: Montenegro environment related expenditures by MEPP (US$ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>MEPP environment expenditures</th>
<th>GDP</th>
<th>Share in GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>0.52</td>
<td>724.22</td>
<td>0.072%</td>
</tr>
<tr>
<td>1999</td>
<td>0.47</td>
<td>679.01</td>
<td>0.070%</td>
</tr>
<tr>
<td>2000</td>
<td>0.63</td>
<td>591.55</td>
<td>0.106%</td>
</tr>
<tr>
<td>2001</td>
<td>0.74</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: MEPP

Table A7: Overall and environment-related federal expenditures (US$ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total expenditures</th>
<th>Environmental expenditures</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>923.14</td>
<td>0.11</td>
<td>0.012%</td>
</tr>
<tr>
<td>1999</td>
<td>834.11</td>
<td>0.16</td>
<td>0.020%</td>
</tr>
<tr>
<td>2000</td>
<td>507.25</td>
<td>0.19</td>
<td>0.038%</td>
</tr>
<tr>
<td>2001</td>
<td>687.76</td>
<td>0.24</td>
<td>0.035%</td>
</tr>
</tbody>
</table>

Source: Federal Government of FRY

71. Time series data on annual capital and operations and maintenance expenditures by public utility companies for water, wastewater and waste management related services could not be collected by the study team. Nevertheless, accounts by relevant agencies contacted and background studies suggest that investment and maintenance expenditures were minimal in the 1990s leading to a dilapidation of the existing infrastructure [Chapter 9 of 3]. As discussed above, due to low tariff revenues, bare operating expenses could not be covered by the utility companies without subsidization from municipalities. During the past few years, following FRY’s reintegration with the global community, donor funding has become available for selected investments. These are discussed in Annex 6.

72. Table A8 indicates the breakdown of expenditures by DEP. The largest expenditure items relate to remediation of hazardous waste and to industrial accident response, both of which have been identified by DEP as two of the most pressing problems [9]. Support to industrial enterprises to study and document their environmental impact was accounted for

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15% of DEP expenditures in 2001. While this may seem to contradict the polluter pays principle, it is not uncommon in the region to provide such seed funding to polluting industries as an incentive for follow-up investments in cleaner technology. Expenditures towards increasing DEP’s inspection capacity and for monitoring and pollution assessment also made up significant parts of the total expenditure. These areas of expenditure appear to be in line with the public institutions’ mandate as defined in the 1991 Law, as well as with the pressing problems the sector and the institution face [9].

Table A8: Breakdown of DEP expenditures in 2001 (US$)*

<table>
<thead>
<tr>
<th>Expenditure item</th>
<th>US$</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality monitoring</td>
<td>30,003</td>
<td>5%</td>
</tr>
<tr>
<td>Environmental protection report</td>
<td>4,500</td>
<td>1%</td>
</tr>
<tr>
<td>Danube River water quality protection</td>
<td>19,502</td>
<td>3%</td>
</tr>
<tr>
<td>Acquisition of equipment for industrial accident response</td>
<td>90,008</td>
<td>14%</td>
</tr>
<tr>
<td>Acquisition of equipment for database</td>
<td>19,502</td>
<td>3%</td>
</tr>
<tr>
<td>Training of staff</td>
<td>15,001</td>
<td>2%</td>
</tr>
<tr>
<td>Investment in assessment of environmental pollution</td>
<td>60,006</td>
<td>9%</td>
</tr>
<tr>
<td>Projects about hazardous waste</td>
<td>105,010</td>
<td>16%</td>
</tr>
<tr>
<td>PCB in “Prva Iskra-Baric”</td>
<td>10,501</td>
<td>2%</td>
</tr>
<tr>
<td>Experts in Directorate Commission</td>
<td>10,501</td>
<td>2%</td>
</tr>
<tr>
<td>Assistance to NGOs</td>
<td>30,003</td>
<td>5%</td>
</tr>
<tr>
<td>Establishment of special nature reserves</td>
<td>22,502</td>
<td>3%</td>
</tr>
<tr>
<td>Acquisition of inspection equipment</td>
<td>45,004</td>
<td>7%</td>
</tr>
<tr>
<td>Training of inspectors</td>
<td>22,502</td>
<td>3%</td>
</tr>
<tr>
<td>Publications</td>
<td>15,001</td>
<td>2%</td>
</tr>
<tr>
<td>Subsidies to industrial enterprises for the study and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>documentation of environmental impact</td>
<td>97,509</td>
<td>15%</td>
</tr>
<tr>
<td>Documents for international cooperation</td>
<td>30,003</td>
<td>5%</td>
</tr>
<tr>
<td>Experts commission for legislation</td>
<td>18,002</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>645,059</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: DEP, *: Amounts were converted from YUD using average exchange rate YUD 66.7/US$.

73. Funding for public expenditures is allocated directly from the budget. Earmarking was abolished in both Serbia and Montenegro as part of the fiscal reforms that these economies have undergone in recent years. This will allow greater budgetary flexibility for macroeconomic policy makers. Before this policy change, public environmental expenditures were funded in part through budgetary transfers and in part through earmarked revenue sources. Although Serbia’s 1991 Law specified several revenue sources for earmarking (see above), in reality only two were earmarked. These were “environment taxes” on investments and taxes on commercially collected rare flora and fauna species. Revenues collected from these sources and their rate of coverage of DEP expenditures varied across years (Table A9). Revenues from other environment related taxes and fines have not been estimated, but are likely to be large.

24 No financial support was provided for actual investments.
Table A9: Planned and realized revenues and expenditures (US$ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total planned expenditures</th>
<th>Projected revenues from earmarked charges</th>
<th>Budget allocation requested from MOF</th>
<th>Realized expenditures</th>
<th>Revenues from earmarked charges actually collected</th>
<th>Realized central budget allocation</th>
<th>Realized expenditures / planned expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>2.51</td>
<td>0.33</td>
<td>2.17</td>
<td>1.51</td>
<td>0.06</td>
<td>1.45</td>
<td>60%</td>
</tr>
<tr>
<td>1999</td>
<td>1.25</td>
<td>0.68</td>
<td>0.57</td>
<td>1.00</td>
<td>0.67</td>
<td>0.33</td>
<td>80%</td>
</tr>
<tr>
<td>2000</td>
<td>0.65</td>
<td>0.33</td>
<td>0.33</td>
<td>0.45</td>
<td>0.19</td>
<td>0.26</td>
<td>68%</td>
</tr>
<tr>
<td>2001*</td>
<td>0.81</td>
<td>0.37</td>
<td>0.81</td>
<td>0.66</td>
<td>NA</td>
<td>0.66</td>
<td>81%</td>
</tr>
</tbody>
</table>

Source: DEP
* In 2001, earmarked revenues were transferred to the central budget, with central budget allocation becoming the only source of revenue for the MPE.

74. In recent years, the Serbian government environment institution, like other government agencies, has been affected by tight budgetary measures. Budget allocations to the DEP, excluding earmarked revenues, decreased from US$ 1.45 million in 1998 to US$ 0.26 million in 2000 (Table A13). In 2001, including revenues derived from formerly earmarked sources, the transfers amounted to US$ 0.66 million. This amount was less than the original budget allocation for 2001, US$ 0.81 million. DEP claims that this significantly lowered its capacity to deal with pressing environmental issues, notably industrial accidents, and hurt its credibility with contractors as it could not honor its commitments [9]. Tight budgetary discipline will continue in the years to come. While the Ministry of Finance will continue to project budget allocations at the beginning of the fiscal year, funds will be transferred periodically contingent upon the availability of funds in the central budget and the institutions’s successful justification of the funding requested.

75. In the past, there appeared to be concerns about transparency and justifiability of resource allocations from the special environment account supplied by earmarked revenues. Recently efforts have been made by DEP to introduce transparency and more efficiency to public fund allocations. In 2001, nearly 80% of the DEP budget was allocated to activities that were determined through a public competition. Projects were solicited according to the activity categories listed as eligible for public funding under Article 88 in the 1991 Law. Proposals had to include a description of the current environmental situation, specific results to be achieved, and estimated costs. The announcement further stated that “projects and contractors will be selected on the basis of the criterion of contribution to the establishment of the system of environmental protection in Serbia. At this point, the possibility of fast implementation with visible results achieved within budget resources available will be considered an advantage. Scientific and research projects will not be included in the competition.” While the “criterion of contribution to the establishment of the system of environmental protection” is not very clear, the competitive allocation of resources according to pre-set criteria is a step in the right direction. There is a sense of prioritization, consideration of cost effectiveness, and some measurement of benefits to be achieved. Both ministries of environment need to build capacity to quantitatively assess the benefits of project proposals for the society move against their costs.
As the rest of the public sector, environmental agencies have to adhere to budgetary discipline and principles of sound public finance. Efficiency, prioritization of objectives and selection of activities based on economic benefit cost analysis, and where this is not possible, on cost effectiveness is called for. Furthermore, tight fiscal conditions more than ever necessitate a clearer division of labor in terms of environmental investments between the public sector and the private sector. Limited public funds should be spent on activities that have a clear public good nature, such as environmental monitoring, protection of biodiversity and natural resources, and prevention of irreversible environmental impacts. Given their benefit to the public as a whole, these areas are likely to be properly funded only through public bodies. The private sector should undertake investments that will yield mostly private benefits. The government’s role has to create a regulatory environment that is conducive to such investments. Economic incentives are important policy tools in this regard.

### Economic Instruments

A number of economic instruments are employed as environmental policy tools in Serbia and Montenegro. In fact the number of economic instruments that are in force in FRY does not compare unfavorably with those in other Central and Eastern European countries. In 1998 Montenegro was one of two countries to implement air emission charges and a CO$_2$ tax, surpassing all more advanced transition economies, such as the Czech Republic, Hungary and Poland.

Both republics have in place non-compliance fees for air emissions, wastewater discharges, and waste. These are issued to industries when their emission and effluent levels exceed the levels specified in their permits. Furthermore, in both republics there are user charges for communal water supply, sewage and waste collection services. User fees also exist for natural resources, including natural park visitor fees and resource extraction fees for water, sand and gravel, and timber. In both Serbia and Montenegro, annual licenses are issued for recreational fishing and hunting in return for a fee. In Serbia, a non-tradable permit system is also in place for grazing on public pastures and for the collection of valuable and rare animal and plant species, such as snails and mushrooms. It is reported that an informal market has emerged for trading these permits [1]. In Montenegro charges for grazing or for the collection of valuable species do not exist. Furthermore, both republics have deposit refund systems for beverage containers. Moreover, in both republics there are tax allowances in the form of exemption from wholesale sales, import taxes and accelerated depreciation for investments in technology for environmental protection.

There are several problems with the current state of economic instruments in FRY. First, as discussed above, charges are too low to cover production, operating and maintenance costs in case of energy and utilities and sustainable management costs in case of natural resources, let alone taking into account negative externalities their production and consumption generate. The implications of this are discussed above. Second, the current levels of non-compliance fees are too low to provide a clear incentive to undertake environmental protection activities. Fees have eroded as a result of inflation and, as such, do not provide any real incentive for compliance. In fact, one of the reasons for the lack of compliance is that they do not even cover the enforcement costs. It is reported that some companies prefer to regularly pay the fines, than to invest in technology that would reduce...
their effluent levels. Third, environmental taxes and levies are rarely used as policy tools but are often seen as sources of revenues. A striking example is the “environment tax” on investments that are subject to and pass the EIA procedure. As this tax is not tied to environmental performance, and it does not serve as an incentive to improve and protect environment, but may actually constitute instead a disincentive for investments.

80. There is room for making greater and better use of economic instruments in environmental policy making, since in some areas their implementation may be more cost effective than solely relying on regulations. The primary area of focus should be reduction of subsidies to energy and utility tariffs. Environmental fees should be abolished where their sole purpose is revenue generation and they constitute a disincentive for business investments without providing an incentive for better environmental protection. Compliance fees should be adjusted to for inflation. Finally, the governments are advised to be most judicious when considering the introduction of new taxes. Administration of a complex tax system is very costly which recent fiscal reforms aimed to avoid.
### Table A10: Belgrade city environmental expenditures in 2001 (US$)*

<table>
<thead>
<tr>
<th>Activities</th>
<th>Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analysis and quality control of city environment</strong></td>
<td></td>
</tr>
<tr>
<td>CITY PUBLIC HEALTH INSTITUTE (Control of surface waters; measurement of public noise level; testing of agricultural soil, testing of water from public wells, analyses on request of Directorate)</td>
<td>46,512</td>
</tr>
<tr>
<td><strong>Public zoohygiene</strong></td>
<td></td>
</tr>
<tr>
<td>VETERINARY STATION “BEOGRAD” (Regular activity of catching and exterminating stray dogs and cats; expenses of food, drugs, disinfections devices; Drago product; Republic geodesist institute; Hidroproject – High building; Beopetrol; Faculty of civil Engineering; Quality control)</td>
<td>45,990</td>
</tr>
<tr>
<td><strong>Protection from ionized radiation</strong></td>
<td></td>
</tr>
<tr>
<td>INSTITUTE “Dr. D. KARAOVICO” (Examination of radioactivity)</td>
<td>3,251</td>
</tr>
<tr>
<td><strong>Funds for protected natural areas</strong></td>
<td>??</td>
</tr>
<tr>
<td><strong>Protection and advancement of environment</strong></td>
<td>842,219</td>
</tr>
<tr>
<td>CITY PUBLIC -HEALTH INSTITUTE (Systematic control of basic and specific polluting substances in air from stationary sources; control of Savsko lake and bathing beach Lido)</td>
<td></td>
</tr>
<tr>
<td>REPUBLIC OF SERBIA PUBLIC –HEALTH INSTITUTE (Systematic control of specific polluting substances in air from motor vehicle exhaust gases)</td>
<td></td>
</tr>
<tr>
<td>SKILLED TEAM FOR ERADICATION OF MOSQUITOES</td>
<td></td>
</tr>
<tr>
<td>SKILLED TEAM FOR ERADICATION OF TICKS</td>
<td></td>
</tr>
<tr>
<td>SKILLED TEAM FOR EXTERMINATION OF RODENTS</td>
<td></td>
</tr>
<tr>
<td>VISAN (Purchase of preparations for mosquitoes, purchase of preparations for ticks)</td>
<td></td>
</tr>
<tr>
<td>NORDCHEMI (Purchase of larva killing preparations)</td>
<td></td>
</tr>
<tr>
<td>INSTITUTE ‘SRBIJA”</td>
<td></td>
</tr>
<tr>
<td>FACULTY OF AGRICULTURAL SCIENCE</td>
<td></td>
</tr>
<tr>
<td>EKOSAN (Larva killings and home versions)</td>
<td></td>
</tr>
<tr>
<td>YUGOSLAV AIRLINES (Airplane treatment)</td>
<td></td>
</tr>
<tr>
<td>MOSQUITOES TREATMENT FROM GROUND (Biosan, Ekosan, Institute for disinfections, extermination of insects and rodents)</td>
<td></td>
</tr>
<tr>
<td>AVIATION UNION (Usage of Airports, Protection of storage)</td>
<td></td>
</tr>
<tr>
<td>TREATMENT OF TICKS (The command of 50. institute)</td>
<td></td>
</tr>
<tr>
<td>SYSTEMATICAL EXTERMINATION (Visan, Ekosan, DDD Promet, Institute for disinfections, extermination of insects and rodents)</td>
<td></td>
</tr>
<tr>
<td>PAYMENTS BASED ON NEEDS (Young explorers, Beopetrol, Cicero print, Ekosan)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>937,972</td>
</tr>
</tbody>
</table>

Source: Belgrade City Administration, Secretariat for Environmental Protection  
* Amounts converted from YUD using average exchange rate YUD 66.7/US$.  


References

1. Mileusnic-Vucic V., Chapter 14: Yugoslavia in “Sourcebook on Economic Instruments for Environmental Policy”,
4. Agricultural Sector Review, Draft Concept Note
5. Author??, year??, “Economic Instruments for Solid Waste Management in Serbia” in Designing Waste Management Strategic Policy Framework, ??
15. WHO, 2000
ANNEX 4: INSTITUTIONS, POLICIES AND LAWS

Introduction

81. Environmental protection is regulated by a large number of federal, republic and municipal laws and by-laws. Responsibilities for environmental protection are split between the federal (Department of Environment within the Federal Secretariat for Health and Social Policy) and the Serbian (Ministry of Environment and Natural Resources) and Montenegrin (Ministry of Environmental Protection and Physical Planning) levels. Institutions in charge of the environment also exist in larger municipalities in both Republics. The federal level as well as Serbia and Montenegro have designated specific institutions for dealing with environment matters. In addition, several other line ministries and institutions at the federal and republic levels, such as those responsible for Agriculture, Forestry and Water, Construction and Urban Planning, and Energy and Mining, have competencies in the environment sector and are designated to play a role in the environmental permitting process.

Environmental Policies

82. The fundamentals of environmental policy in FRY are laid down in the Constitutions of FRY and its Republics. The Constitutions of the FRY and of the Republic of Serbia (not Montenegro) stipulate the right of citizens to a healthy environment as well as the duty of citizens to protect and improve the environment according to the law. They establish the government’s responsibility to ensure the functioning of the system for environmental protection. The Constitution of the Republic of Montenegro (1994), declares in Article 1 that Montenegro is a democratic, social and ecological state. Serbia’s reform agenda contains key directions for the republic, including needed reforms in the environment sector. The Government of Serbia is committed to promoting environmental policy reforms and to strengthening environmental institutions.

83. Overall, the FRY has a number of well developed environmental strategies and action plans at the federal and republic levels. However, implementation is hampered due to their largely declarative nature, lack of harmonization with sectoral policies, and unclear role of stakeholders in environmental protection. In addition, the Governments have not yet developed sectoral strategies such as for forestry, biodiversity conservation or climate change mitigation.

Priority Policies Identified by the Serbian Government

84. In June 2001 the Government of the Republic of Serbia and later in September 2001, the National Assembly adopted a Report on the Status of the Environment Including Priorities for 2001. The Report contains not only the main features of the state of environment but also provides a synopsis of current environmental policy and its main priorities. Activities of the national environmental authorities should be oriented towards the
implementation of the development action programs, approved by the Government of the Republic of Serbia and particularly focus on the following:

- Return of Yugoslavia and Serbia to the international scene;
- Complement and adapt legislation in view of required harmonization with EU environmental legislation;
- Contribute to the program of economic growth with step-by-step integration of ecological principles;
- Participate in the program of remediation of ecological hotspots;
- Introduce new and cleaner technologies into the Serbian economy;
- Foster environmental management capacity in industry with the aim of improving compliance; and
- Create a Ministry for Natural Resources and Environmental Protection in line with recent Civil Service reforms.

The Report also highlights several priority environmental areas:

- Institutional and legislative capacity building, including the organization of training courses and improvement of efficiency of inspection and monitoring services;
- Establishment of a chemical accident response system;
- Remediation and technical development of ecological hotspots, as a precondition for agricultural development and sustainable economic growth;
- Waste management, wastewater management and hazardous waste management;
- Management of protected areas, protection of biodiversity and nature; and
- Environmental education; environmental awareness campaigns and accessibility of information.

Priority Policies Identified by Montenegrin Government

In 1991, the Parliament of the Republic of Montenegro adopted the "Declaration on the Ecological State of Montenegro". Last year, in March 2001, the Government of Montenegro expanded on the Declaration by adopting a document entitled “Directions for Development of the Ecological State of Montenegro”. This document:

- emphasizes the need to build on positive linkages between market reform, economic development and the environment;
- recommends policies that tackle the underlying causes rather than the symptoms of environmental problems;
- urges the use of cost-effectiveness as a criterion in allocating domestic and external financial resources; and

It should be noted that these priorities have not been broadly discussed and agreed upon with other sectoral ministries, civil society, and the private sector.
concentrates on short-term actions (like improvements in water supply, sanitation and waste management), which are consistent with the country’s long-term economic, social and environmental objectives.

87. In Montenegro’s Economic Reforms and Recovery Strategy, environmental issues are reflected in a special program for infrastructure development, highlighting the need to develop/improve water supply and waste water treatment, solid waste management as well as the urgency of an Integrated Coastal Zone Management Strategy, in order to steer the development of tourism in the Republic.

Institutional Framework

Federal Level Institutional Framework

88. At the federal level, the Department of Environment within the Federal Secretariat for Health and Social Policy cooperates with other federal ministries (Ministry of Economy, Ministry of Agriculture) and institutes (Federal Hydro-Meteorological Institute, Federal Institute for the Improvement and Protection of Health etc). Accentuated by the de jure and de facto shift of competencies from the federal level to the Republics, the responsibilities of the Department have diminished. As such, it continues to play an important role in international matters, such as the negotiation and ratification of environmental conventions and agreements, as well as obligations emanating from them, such as monitoring of transboundary air and water pollution, and permitting of transboundary movement of hazardous waste.

89. Environment is not mentioned as a common function for Serbia and Montenegro in the “Belgrade Agreement”, signed in March 2002. Thus it will be mainly a responsibility of the two Republics. However, the existing legal framework concerning environmental protection, which consists of more than 150 laws, over 100 by-laws enacted at all levels (federal, republic and local) and more than 50 international agreements, remains relevant until promulgation of a new Constitutional Charter.

Serbia - Institutional Framework

90. The newly created Ministry of Environment and Natural Resources (MENR) is the main institution in Serbia responsible for environmental issues. It was created in June 2002 through the upgrading of the Directorate of Environmental Protection which was as an administrative body within the Ministry of Health and Environmental Protection. MENR is inter alia responsible for the protection against noise and vibration, hazardous and toxic material, air pollution, ionic and non-ionic radiation, nature protection, and international cooperation. The Ministry is organized in five departments and has a total staff of 65, of which 33 are engaged outside headquarters in inspection departments in Novi Sad, Sabac, Uzice, Kragujevac, Nis and Pristina.

91. The Ministry of Agriculture, Forestry and Water (MAFW) is responsible for soil protection, and the management of water resources and forests. The management competencies have been delegated to a large extent to the three Public Enterprises for Water Resources\(^{27}\) and to Srbija Sume, the public enterprise for the management of forests and forestland belonging to the Republic. In addition, a number of institutes play a special role in the environment sector: the Institute for Nature Protection is responsible for nature parks and for the protection of wild fauna and flora; the Institute for Public Health monitors air, noise and water quality; and the Hydro-Meteorological Institute monitors water quantity. The draft new Law provides the legal basis for overcoming some of the institutional shortcomings, which so far have hampered the effective implementation of environmental policy. It is expected that the new regulations regarding the competencies of MENR 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, enhanced environmental information, and stricter inspections and enforcement.

92. Municipalities are in part responsible for assuring compliance with environmental law. To that end, there are some 200 environmental inspectors at the municipal level in Serbia. Their responsibilities and in particular the modalities of cooperation with the republican institutions are not regulated with adequate clarity. For example, according to the Report on the State of the Environment for 2000, it is common that municipal environmental inspectors issue permits or licenses for certain activities without ensuring that an EIA is undertaken or that mitigation measures included in the EIA/Environmental Management Plan are properly implemented. Consequently, a large number of works or installations are being built or start operating without proper permit.

Montenegro - Institutional Framework

93. MEPP, which has been operating since 1992, has been entrusted with supervising the implementation of the Environment Law and associated by-laws. The environment department has a staff of 20 and is divided in two units: one for environmental quality, which includes the ecological inspectors, and one for environmental policy, economics and information systems. Another Department in MEPP is responsible for physical planning, public utilities, and waste management. Other ministries with responsibilities in the environment sector are: the Ministry of Agriculture, Forestry and Water Resources (water and soil protection, water resources management) and the Ministry of Industry, Energy and Mining (mineral resources exploitation and power supply). Hence, issues that are central to environmental protection, such as air pollution, water management and solid waste, are within the competence of three different ministries. This rather complicated institutional setup is not alleviated by formalized inter-ministerial bodies charged with coordination of policies and actions. However, the modest size of the central administration of Montenegro compensates to some extent for this, since it seems to enable informal cooperation. Only the larger municipalities have staff in charge of environment\(^{28}\). However, there are no municipal

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\(^{27}\) JVP Dunav in Novi Sad, JVP Sava in Belgrade, and JVP Morava in Nis.

\(^{28}\) The city of Podgorica for example has an Ecology Department of 4 persons.
environmental inspectors, except for the municipal enterprises in the larger municipalities. Cooperation between MEPP and municipalities is not very developed and mainly informal in nature.

**Environmental Laws and Regulations**

94. In 1998, the Federal Assembly adopted the Law on Principles of Environmental Protection. The law contains the basic principles of environmental protection, as well as measures to be undertaken by different state institutions responsible for natural resource use and environmental protection, as well as by economic entities and citizens. The law also encompasses related issues including environmental monitoring, environmental management, and penalties in the cases of violation of existing legislation. Special laws regulate certain areas of environmental protection, including: national and international waterways, national hydro-meteorological issues; transport of hazardous materials; trade in explosives and poisons, pesticides; protection against ionizing radiation. Most of these laws were adopted in the late 1980s and early 1990s and many are outdated and need to be reviewed in the context of the transition to a market economy. The influence of federal institutions dealing with environmental matters is likely to diminish. This includes the development of policies and strategies to ensure the implementation of environmental legislation (domestic and international). As such, the Governments of Serbia and Montenegro, must adapt their regulatory framework to keep up with these trends.

**Serbia - Environmental Regulations**

95. On May 16, 2002, the Government of Serbia accepted a proposed new Law on Environmental Protection System and forwarded it to the Parliament for debate. The Law is comprehensive and ambitious. Its objectives are to develop a consistent and modern legal and institutional system for environmental protection, which is harmonized with the EU’s framework, and will improve horizontal and vertical cooperation and raise responsibility and efficiency. The new Law will replace the Environmental Law of 1991, which regulates the protection of air, water, soil, forests and natural goods, and control of noise, ionizing radiation, hazardous waste control, financing of protection and inspection, and environmental protection in planning and construction. Bilateral and multilateral donors are supporting efforts to develop a comprehensive, coherent and EU compatible legal framework for environmental protection in Serbia, which will be followed by similar efforts in Montenegro and at the federal level.

96. New, consistent environmental legislation may lead to an improvement in the level of compliance and enforcement, which are currently weak. According to information received from the Directorate for Environmental Protection, 70-80% of all big factories are operating without any environmental permit, and an even higher percentage are operating in breach of environmental standards. Although the Directorate carries out regular inspections (around 4000 in 2001) which may lead to administrative or legal charges, the relatively low risk of being caught, combined with the modest amount of standard fines and their low collection...
rate, are not a sufficient incentive for enterprises to comply with the law given the difficult financial situation of many enterprises.29

**Montenegro - Environmental Regulations**

97. The concise and modern Environment Law of 1996 covers a wide range of environmental protection issues in Montenegro: conservation of natural resources; preservation of biological diversity; reduction of environmental risks; environmental impact assessment; substitution of harmful substances; reuse and recycling; polluter/user pays principle; mandatory pollution insurance; and access to environmental information and public participation. The Law also contains general provisions regarding environmental monitoring, liability for environmental pollution, environmental financing, and compliance and enforcement, including penalties. Only a few by-laws pertaining to the Environment Law have been issued, such as the Regulation on Environmental Impact Assessments (1997). The other major laws under the Ministry of Environment, that is the Air Protection Law, and the Nature Protection Law, date back to 1980 and 1989. In addition, a number of laws under the authority of other ministries are also relevant, particularly regulations on quality of soil and agricultural land, water quality and wastewater. According to the Ministry of Environment and Physical Planning (MEPP), all recently issued laws and by-laws are compatible with respective EU legislation.

**Problem of the Legal and Institutional Framework**

98. Compliance and enforcement of environmental law and regulations are weak. The reasons for that are manifold, and include:

- A fragmented and in many parts inconsistent and outdated legal framework;
- Insufficient staffing and lack of modern equipment in inspection departments30;
- Complicated institutional structure inherited from the SFRY where the demarcation of competencies vertically between the federal level and the two Republics (and to a lesser extent between the republic level and the municipalities) and horizontally between different government institutions is often unclear31;
- Rather low levels of fees and fines combined with a low collection rate and lengthy court procedures;

29 For details and examples of administrative and criminal charges by the Directorate, see Performance Report for 2001, p. 8-12.
30 For Example: The Ministry of Environment of Montenegro has only 4 inspectors; and some of the Regional Environmental Inspection Departments in Serbia have offices with no telephone lines.

31 The shift regarding the locus of political decision making - de jure as well as de facto – since the elections in September and December 2000, has yet to lead to a clearer demarcation. The “Belgrade Agreement” between Serbia and Montenegro from 14 March 2002 to replace the defunct Federal Republic of Yugoslavia provides few details on how the new union of “Serbia and Montenegro” should function.
• Difficult economic situation and non-existent or incomplete emissions data from enterprises.

99. Unclear institutional demarcation is not only costly to the government, but it can lead in many cases to the undermining of some designated institutional functions. Institutional structures could be strengthened through clearer demarcations between the spheres of environmental regulation and policy making, environmental management and utilization of resources, and enforcement of regulations. Clearer demarcations also help to build public trust in the action of various agencies as they carry out their functions. The importance of clearly defined individual institutional roles and responsibilities cannot be overemphasized. But it is also important to note the importance of developing a system with good cross-sectoral communication channels for information sharing and joint decision shaping. However, neither Serbia’s recent legislation nor Montenegro’s contains such regulations.

100. An example may illustrate the weak compliance and enforcement practice: Although the Environment Law of Montenegro (articles 22 and 31) stipulates the obligation of industrial enterprises to monitor their emissions and to draw up and carry out reclamation programs, very few actually do monitor their emissions, and only one has developed a reclamation program. Small infractions of for example air emissions standards are tolerated by the Ministry, while fines are imposed for major cases, which are often brought to the attention of the Inspectorate by complaints of affected citizens. However, the maximum fines (about US$12,000) are very seldom issued, thus there seems to be insufficient incentives in place encouraging compliance with the law. Court cases concerning environmental protection are rare. The very few cases brought by MEPP were rejected on the grounds of lack of evidence.

101. The objective of FRY is to harmonize environmental legislation with EU environmental law. This will provide FRY an opportunity to overcome the fragmented and unsystematic legal framework and develop a modern and coherent environmental law corpus, including economic instruments, which so far only play a very modest role. However, there seems to be little, real appreciation of what the process requires in terms knowledge of the Community acquis and ability to formulate policy and draft legislation which are EU-compatible, and which consider monitoring, costs and enforcement capacity.

102. The municipal level largely lacks adequate institutional capacity, sufficient knowledge base or equipment to undertake compliance of environmental legislation. Local governments cannot independently adopt their own laws or regulations, as environmental

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32 REC, Doors to Democracy – Yugoslavia - Montenegro
33 This is the declared main objective of the Serbian Directorate for Environmental Protection (see Performance Report for 2001), but was also stressed by all interlocutors (government agencies at the federal and republic level, NGOs, business associations).
34 The task of incorporating the approximately 150 EU environment directives is a huge one and will require a very selective approach as well as a strong sense of what can be realistically implemented. For example, the “Development of Environmental Legislation Project”, which is supported by the Government of Finland with 1.5 million Euro and started in 2002, will deal with the EU directives on Environmental Impact Assessment, IPPC, and Access to Environmental Information.
protection is under jurisdiction of the Republics. However, communities can regulate some local issues, such as local programs for environmental protection, but always in accordance with Republic legislation.

103. Decentralization in government is a common theme across many sectors and the environment is no exception. The constraint is the existence of weak capacity in modern environmental regulation methods at the local level. In this context, the government should also seek to move towards increasing its use of market-based instruments, especially for the regulation of the use and exploitation of natural resources. This will require extensive capacity building activities.

Environmental Impact Assessments

104. One of the most important tools for mainstreaming environmental issues are environmental impact assessments (EIA). Federal legislation includes provisions for EIA, and the Environmental Laws of Serbia and of Montenegro set out the procedures in detail. There are however evident shortcomings, mainly due to an overly general list, which stipulates activities subject to mandatory EIA procedures, with no cost or size thresholds, or distinction based on type of enterprise, or considerations of magnitude or scale of impact. In addition, the capacity of environmental authorities to screen projects or review EIAs is very weak due to staff shortages and lack of funds.

Serbia – EIA

105. EIAs, including mitigation/remediation measures, are mandatory for facilities and works that can have a large impact on the environment (Articles 4 and 16 of the Law on Environmental Protection). Regulations on EIAs for Facilities and Works determine the types of facilities and works, which require EIA and regulate the details such as content, methods, and procedure. Because the list is very general, the number of EIAs is very high and EIA requirements also apply to small-scale works. While in the mid-1990s there were on average 50 to 60 EIAs per year, their number rose to about 600 in 2000 and more than 1,300 in 2001. Given the low number of staff dealing with EIA in the Environment Directorate (increased from 3 in 1995 to 6 in 2000) authorities in charge of EIA do not have the necessary capacity to screen projects, review and approve EIA, and to stipulate and enforce conditionalities and mitigation plans. In addition, local authorities often issue permits despite missing or incomplete EIAs, with the effect that a large number of objects start operating before putting in place adequate mitigation measures. The procedures (on paper) are therefore too demanding, unrealistic, and impractical to implement when applied to small-scale investments. In addition, they do not contain provisions regarding disclosure of environmental information, public participation or access to justice, all instruments that contribute to a higher rate of compliance.

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37 Interview with Mr. Aleksandar Vesic, Environment Directorate, EIA Department.
106. In the current set up, there are considerable fiscal interests in the EIA procedure, since the EIA regulation requires the payment of a fee of 1% of the total investment costs of a project. In 2001 this generated revenues of around US$183,000 for the Budget of the Republic of Serbia and is thus an important source of revenue, which poses the risk that environmental authorities might be held captive to a sub-optimal or dysfunctional system. If the fee is a charge for the administrative services related to the processing of the EIA of an investment then it is justified, otherwise it should be scaled down. Shortening the list of facilities and works for which an EIA is required to those with considerable potential environmental impact, would help make the EIA system implementable. Proposals for new policies and programs are not the subject of strategic EAs. Given their often considerable potential environmental impact and the underdeveloped inter-ministerial coordination procedures, provisions to make strategic EA mandatory for new policies and programs with considerable potential environmental impact should be developed.

Montenegro – EIA

107. Despite the Declaration on the Ecological State of Montenegro, environment is insufficiently taken into consideration in economic or political decision-making. Although an EIA system is in place, the situation regarding EIA in Montenegro is comparable to the one in Serbia; inter alia because of lacking thresholds, there is such a high number of EIA that the very few staff working on the matter are overstrained. Consequently, construction work is often started without proper EIAs and permits, and the number of finished activities/projects without permits is high and increasing.

Environmental Monitoring, Access to Information and Public Participation

108. The right to environmental information is stipulated in the Yugoslav Federal Constitution (article 52) as well as the Constitution of the Republic of Montenegro (article 19). There is no explicit provision in Serbia’s Constitution or Environmental Law. In Serbia, the Government submits annual reports on the status of the environment to parliament, and releases annual emissions data.

109. The federal level, as well as Serbia and Montenegro, have systems to monitor air, water, soil, hazardous substances, biodiversity and radioactivity. In Montenegro, air, soil, surface and groundwater, radioactivity and biodiversity are covered by an environmental monitoring system, which is managed, by the Eco-toxicological Institute, the Republic Hydro-meteorological Institute, and the Institute for Nature Protection.

110. However, due to blurred competencies, insufficient and sometimes worn down instruments and other equipment, and general economic difficulties, monitoring is not
systematic and has taken place at a reduced level since the early 1990s. In addition, environmental data from enterprises regarding air emissions or hazardous substances are often either incomplete or not provided at all\(^42\). Hence, there is a need to put in place more systematic environmental monitoring capacity. In recent years, monitoring of the environment has improved, but is still not systematic; with emissions data are missing or incomplete. There is also too widespread a monitoring of pollutants with the result that efforts are spread too thinly. It is advisable that the current list of pollutants that are monitored be shortened and/or monitoring be limited to areas where those pollutants are critical.

111. The practice of environmental reporting – a potentially important tool for creating greater environmental awareness – is not in line with the law (article 25 ss), since the Ministry of Environment and the Ministry of Health do not regularly publish the environmental data available. The collected data are submitted to the Ministry of Environment and serve as a base for preparing the annual reports on the state of environment which have been criticized though for being selective (that is ignoring the most negative results), and for interpreting certain figures in a too positive a way.

112. In both Republics, the Governments are planning to broaden and deepen environmental monitoring\(^43\) and to improve access to environmental information through the use of electronic means (internet). Despite these efforts, much more work needs to be done on increasing the public’s awareness of its rights and expanding available information channels. Increased transparency of institutions by building more effective partnerships with civil society and businesses is needed. The government, through its institutions at the republican and local levels should take a more proactive position in providing properly formatted, digestible environmental information to the population. For this task, the potential of the mass media should be better employed, and NGOs asked to provide assistance in information dissemination. Measures to foster public participation in environmental decision-making should be further improved and developed.

Role of Civil Society

113. The rights of citizens’ organizations and individuals to voice their views on development proposals, plans and policies are essential elements of a democratic society. There are about 140 environmental NGOs in Serbia and Montenegro. Most of them were established during the 1990s, have a local focus and unite local nature amateurs. All but a few define their financial status as very poor compared to the CEE average. Domestic sources of financing are scarce\(^44\) and foreign aid has just recently started.

\(\textit{NGO Involvement}\)

\(^{42}\) See Serbian Directorate for Environmental Protection, Report on the State of the Environment for 2000, and Republic of Montenegro, Ministry of Environmental Protection, Environmental Status Report; for example, the PRTR stipulated in the 1996 Environment Law of Montenegro is still not existing.

\(^{43}\) In Serbia work has begun on the introduction of a comprehensive GIS/Environmental Information System.

\(^{44}\) The Directorate for Environmental Protection of Serbia provides limited assistance to environmental NGOs for specific awareness raising and educational activities (Report on the State of the Environment for 2000).
114. With the exception of a few NGOs involved in legal aid—almost all NGOs focus on non-partisan, non-confrontational activities such as awareness raising, environmental education and information dissemination. In some cases though, nature protection NGOs play a role in bringing illegal activities to the attention of environmental inspectors, by reporting on poaching incidents, illegal logging or water pollution. Large international environmental NGOs, such as WWF or Greenpeace, have so far not been active in Yugoslavia. One of the strongest NGOs in Yugoslavia is the country office of the Regional Environmental Center (REC) for Central and Eastern Europe. The REC started working in Yugoslavia in May 1998 in Belgrade and has recently opened a project office in Podgorica. For several years it was the main supporter of NGO activities in Yugoslavia and it is continuing this support through its small grants program. The REC is implementing a project funded by the Government of the Netherlands assisting in the development of Local Environmental Action Plans (LEAPs) in 5 – 10 municipalities.

Private Sector Involvement

115. Within the business sector, environmental issues are not high on the agenda, and environmental business associations or committees are just beginning to be established. Private sector involvement, particularly in sectors such as waste management, water supply and sanitation in large cities, and forestry and national parks activities, is far from being utilized to its potential. The Government should further encourage private sector participation. A strengthened dialogue between government entities responsible for environmental protection and the business sector, for example in the context of privatization and environmental liabilities, as well as plans of some enterprises to obtain ISO 14000 certification, provide opportunities to further encourage private sector participation, raise environmental awareness and foster the development of environmental business associations.

International Environmental Law and Policy

116. Throughout the second part of the 1990s Yugoslavia’s international environmental cooperation virtually came to a halt. Since the elections in October 2000, Yugoslavia and Serbia and Montenegro, have engaged in efforts to reenter the international environmental arena, through the preparation of the ratification of multilateral environmental agreements (MEAs), and participation in policy fora, such as the UNECE Committee for Environmental Policy, the Task Force for the Implementation of the Environmental Action Program for Central and Eastern Europe, and aid assistance coordination bodies, such as the Task Force for the Regional Environmental Reconstruction Program (REReP). As representatives of the sovereign State, the competent federal authorities play a decisive role, although the Republics have the main responsibility for implementing obligations emanating

45 For examples and cases see REC, Doors to Democracy, Yugoslavia – Serbia.
46 For example the Council on Ecology within the Yugoslav Chamber of Commerce’s Agriculture Association which was established at the end of 2001.
47 In 2001 the FRY has ratified three important MEAs, namely the FCCC, CITES, and the CBD and has launched the process of acceding to the Bern and the Bonn Conventions.
from MEAs, and are also the drivers for developing project proposals for which international assistance is being sought.\(^{48}\)

117. Yugoslavia is party to a number of MEAs, and both the federal administration and the constituent Republics are fully committed to meeting the requirements stipulated in these agreements. The current federal administration tasked with overseeing the international environmental agreements are in the process of being restructured, but it is expected that a joint Ministry of Foreign Affairs with the same responsibilities will remain. However, implementation of the MEAs will continue to be a joint responsibility with a major role for the Republics. Regarding the UNFCCC, the FRY as non-annex I developing country, needs to do substantial work. So far, the activities related to climate change in the two constituents have been rather fragmented and unsystematic, and the preparation of the National Communication is taking precedence over all other activities. The existing legislative framework sets the basic principles for environmental protection and climate change related issues, but further work is necessary in the areas of environmental law and enforcement, and institutional capacity building in order to tackle the climate change and meet the international commitments. Also, it must be noted that climate change is not specifically addressed in any of the existing environmental policy documents.

118. The first step in the process of preparing the National Communication would be the inventory of greenhouse gas (GHG) emissions and removals, using the agreed IPCC methodologies. The national inventory would serve as a basis for formulating programs. Measures that would contribute to addressing the adverse impacts of climate change, including the abatement of increase in greenhouse gas emissions and enhancement of removals by sinks must be assessed. In addition, FRY needs to identify major vulnerabilities and adaptation strategies to global climate change. This project will assist the Governments of the Republic of Serbia, Republic of Montenegro, and FRY in meeting the reporting requirements envisaged under the UNFCCC.

**Problems With Implementing MEAs**

119. Effective shared Implementation of MEAs is often hampered by limited information sharing and inadequate cooperation in general between the different institutions involved at federal and republican level, including non-payment of dues. The main reasons are the unclear regulatory framework\(^{49}\) and the political and institutional changes, which occurred over the last few years. Yugoslavia has ratified 56 multilateral agreements that are directly or indirectly related to environmental protection, and is in the process of preparing ratification of a number of agreements. There is also a need to replace part of the old, domestic regulatory framework with bilateral and sub-regional, multilateral legal instruments in the environment sector, because the break-up of the former Yugoslavia has transformed formerly domestic matters into international ones. Work on some of the most urgent issues, like the

\(^{48}\) In 2001, the Serbian Directorate for Environmental Protection prepared over 140 project proposals in the area of international cooperation; see Directorate for Environmental Protection, Performance Report for 2001, p.41-43.

\(^{49}\) Obligations emanating from MEAs are often regulated in federal as well as republican laws. In addition, almost all ratification acts before 1978 for international agreements do not specify the institution responsible for their implementation.
The development of an international legal regime for the Sava River Basin is under way with international assistance. Experience gained in this work as well as in other sub-regional cooperation mechanisms, such as the REReP, may help build trust and knowledge on the best ways to promoting coordinated efforts.

References

4. Serbia Reform Agenda, 2001, Brussels
15. OSCE Mission to the FRY, Unofficial English Translation of the Draft Law on the System of Environmental Protection in Serbia, Belgrade, June 2002

50 Under the Stability Pact for South Eastern Europe, two working groups - International Sava Basin Commission Treaty Working Group and International Sava Basin Commission Rehabilitation and Development Working Group - were formally established in March 2002 with the aim of regulating the international regime of navigation, promoting sustainable development by regulating utilization, and protecting and managing water resources in the Sava Basin.

Appendix 1 to Annex 4

Environmental Legislation in force on 1 January 2001 (Federal Level, Serbia, and Montenegro)

GENERAL REGULATIONS

FRY

2. Resolution on the environmental policy in FR Yugoslavia (Off. Jour. of FRY, No. 31/93)
4. Law on the grounds for environmental protection (Off. Jour. of FRY, No. 24/98, 24/99)
5. Regulations on the form for federal environmental inspector official ID (Off. Jour. of FRY, No. 69/99)
6. Decision on establishing the Committee for protection and advancement of the human environment (Off. Jour. of FRY, No. 48/86, 41/87)
7. Decree on establishing Yugoslav environmental protection standards (Off. Jour. of FRY, No. 11/98)

Serbia

2. Law on environmental protection (Off. Jour. of RS, No. 66/91, 83/92, 67/93, 48/94, 53/95)
3. Regulations on premises and works environmental impact assessment (Off. Jour. of RS, No. 61/92)
4. Decision on special compensation for protection and advancement of the environment (Off. Jour. of the town of Belgrade, No. 22/99)
5. Decree on establishing the Organizational Board of the "Belgrade-a healthy city" project (Off. Jour. of the town of Belgrade, No. 22/99)

Montenegro

2. Declaration on the Ecological State Montenegro (Off. Jour. of RM, No. 39/91)
3. Law on the environment (Off. Jour. of RM, No. 12/96, 55/00)
4. Regulations on environmental impact assessment of operations (Off. Jour. of RM, No. 14/97)
5. Regulations on the level of compensations, calculation modalities and paying compensations for polluting the environment (Off. Jour. of RM, No. 26/97, 9/00, 52/00)
6. Regulations on contents of environmental inspectors record on inspection monitoring (Off. Jour. of RM, No. 19/96)
7. Regulations on awarding prizes for contribution in protection and development of national parks - The Eco Award (Off. Jour. of RM, No. 26/96)
8. Decision on establishing the Public Institute "The Center for eco-toxicological investigations of Montenegro (Off. Jour. of RM, No. 40/96)
9. Guidelines for keeping records of inspecting procedures of environmental inspectors (Off. Jour. of RM, No. 19/96)
10. Guidelines on contents of environmental impact assessment study for operations in the environment (Off. Jour. of RM, No. 21/97)
11. Decree on establishing the Council for environmental protection (Off. Jour. of RM, No. 56/00)

AIR PROTECTION

FRY

1. Law on Hydro-meteorological affairs of interest for the whole country (Off. Jour. of SFRY, No. 18/88, 63/90)
2. Regulations on establishing networks and work programs of meteorological stations of interest for the whole country (Off. Jour. of SFRY, No. 50/90)

Serbia

1. Law on prohibiting smoking in closed rooms (Off. Jour. of RS, No. 16/95)
2. Regulations on determining the Program of air quality control in years 2000 and 2001 (Off. Jour. of RS, No. 19/00)
3. Regulations on limit values, emission measuring methods, selection of sample spots criteria and data collecting (Off. Jour. of RS, No. 54/92, 30/99)
4. Regulations on the shape and contents of the "non-smoking" sign (Off. Jour. of RS, No. 30/95)
5. Regulations on emission limit values, methods and timeframe for measuring and data noting (Off. Jour. of RS, No. 30/97, 35/97)
6. Decree on determining organizations for measuring air quality and measuring air emission of harmful substances (Off. Jour. of SRS, No. 27/73, 14/74, 47/74, 24/78, 52/80)
7. The Program of air quality control in years 2000 and 2001 in the town of Belgrade (Off. Jour. of the town of Belgrade, No. 3/00)

Montenegro

1. Law on pollution protection of air (Off. Jour. of SRM, No. 14/80, 16/50)
2. Regulations on permitted concentrations of harmful substances in the air (Off. Jour. of SRM, No. 4/82, 8/82)
3. Regulations on analyses methodology, timeframe and forms for informing on results of monitoring and detecting harmful substances in the air on the sources of pollution (Off. Jour. of SRM, No. 4/82, 8/82)
4. Decree on determining sampling spots for measuring, expert analyses and determining air pollution in Montenegro (Off. Jour. of SRM, No. 6/86)

WATER PROTECTION

FRY

2. Law on hydro-meteorological affairs of interest for the whole country (Off. Jour. of SFRY, No. 18/88, 65/90)
3. Law on sea and internal shipping (Off. Jour. of FRY, No. 12/98, 44/99, 74/99, 73/00)
4. Law on water regime (Off. Jour. of FRY, No. 59/98)
5. Regulations on classification of inter-republic water-flows, interstate waters and coastal sea waters of Yugoslavia (Off. Jour. of SFRY, No. 6/78)
6. Regulations on establishing networks of hydrological stations of interest for the whole country (Off. Jour. of SFRY, No. 50/90, 54/90)
7. Regulations of the sanitary quality of the drinking water (Off. Jour. of FRY, No. 42/98, 44/99)
8. Decision on maximal permitted concentrations of radionuclides and hazardous substances in inter-republic water-flows, interstate waters and coastal seawaters (Off. Jour. of SFRY, No. 8/87)

Serbia

2. Regulations on water classification (Off. Jour. of SRS, No. 5/68)
3. Regulations on categorization of watercourses (Off. Jour. of SRS, No. 5/68)
4. Regulations on systematic water quality monitoring in year 2000 (with the Program) (Off. Jour. of RS, No. 8/00)
5. Regulations on contents of technical documentation submitted in the process of applying for water resources compliance and water resources permit (Off. Jour. of SRS, No. 3/78)
6. Regulations on the method of determining and maintaining the zones and belts for sanitary protection of potable water supply facilities (Off. Jour. of SRS, No. 33/78)
7. Regulations on harmful substances in waters (Off. Jour. of SRS, No. 31/82)
8. Regulations on methods and minimum number of wastewater quality testing (Off. Jour. of SRS, No. 47/83, 13/84)
9. Regulations on conditions for enterprises and other legal persons for performing specific types of superficial and groundwater quality investigations, including wastewater quality investigations (Off. Jour. of SRS, No. 49/90)
10. Regulations on conditions and methods for potable water fluorizing (Off. Jour. of RS, No. 6/97)
11. Decree on determining enterprises and other legal persons that fulfill conditions for performing specific types of superficial, groundwater and wastewater quality investigations (Off. Jour. of RS, No. 16/91)
12. Plan on water pollution protection (Off. Jour. of RS, No. 6/91)
13. Plan for protection of waters from pollution (Off. Jour. of APV, No. 3/91)

Montenegro

1. Law on sea and internal shipping (Off. Jour. of SRM, No. 13/78, 8/79, 19/87, 36/89, 13/91)
2. Law on water supplying, removing of wastewater and depositing of solid waste in the territory of municipalities: Herceg Novi, Kotor, Tivat, Budva, Ulcinj and Cetinje (Off. Jour. of RM, No. 46/91)
3. Law on the sea good (Off. Jour. of RM, No. 14/92)
4. Law on waters (Off. Jour. of RM, No. 16/95, 22/95)
5. Regulations on classification and categorization of waters (Off. Jour. of RM, No. 14/95, 19/96, 15/97)
6. Regulations on measuring methods and monitoring of quality of sea water for bathing and recreation (Off. Jour. of RM, No. 9/91)
7. Regulations on contents of technical documentation necessary for issuing water resources compliance and water resources permit (Off. Jour. of RM, No. 4/96)
8. Regulations on keeping the water registry and superficial and groundwater cadastre, users and polluters of water, torrent flows and erosive areas and water production premises and facilities (Off. Jour. of RM, No. 5/96, 19/96)
9. Regulations on methods for determining and maintaining zones and belts of sanitary protection of potable water sources and restrictions in the related zones (Off. Jour. of RM, No. 8/97)
10. Regulations on wastewater quality and methods of their emission into the public sewerage system and natural recipient (Off. Jour. of RM, No. 10/97, 21/97)
11. Decisions on establishing the Public Enterprise for water supplying, treatment and removing of wastewater and depositing solid waste for areas of the Montenegro coast and Cetinje (Off. Jour. of RM, No. 50/91)
12. Decision on establishing public enterprise for managing the sea good (Off. Jour. of RM, No. 25/92)

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13. Decision on establishing public enterprise for water resources (Off. Jour. of RM, No. 39/92)
14. Decision on criteria, level and payment methods for compensation for water pollution protection, compensation for material extracted form pipeline system and compensation for utilization of water resources facilities (Off. Jour. of RM, No. 15/96, 19/96, 35/98)
15. Decision on starting the elaboration of the spatial plan for the sea good (Off. Jour. of RM, No. 16/97)
16. Program of systematic water quality investigations on water operations (the zone of sanitary protection) and public bathing beaches (Off. Jour. of RM, No. 13/00)

SOIL PROTECTION

FRY

1. Law on determining and classification of mineral raw materials and presenting results of geological investigations (Off. Jour. of FRY, No. 12/98, 13/98)

Serbia

1. Law on geological investigations (Off. Jour. of RS, No. 44/95)
2. Law on mining (Off. Jour. of RS, No. 44/95)
3. Law on construction grounds (Off. Jour. of RS, No. 44/95, 16/97)
4. Law on agricultural land (Off. Jour. of RS, No. 49/92, 53/93, 67/93, 48/94, 46/95, 54/96, 14/00)
5. Regulations on permitted amounts of hazardous and harmful substances in soil and water for irrigation and methods of their testing (Off. Jour. of RS, No. 23/94)

Montenegro

1. Law on agricultural land (Off. Jour. of RM, No. 15/92, 59/92)
2. Law on geological investigations (Off. Jour. of RM, No. 28/93, 42/94)
3. Law on construction grounds (Off. Jour. of RM, No. 55/00)
4. Law on mining (Off. Jour. of RM, No. 28/93)
5. Regulations on reimbursement and cutting trunks, measuring and stamping trunks and issuing certfications of origin of forest products (Off. Jour. of RM, No. 7/00)
6. Decision on establishing public enterprise for managing forests within the forest-economic areas (Off. Jour. of RM, No. 56/92)

FOREST PROTECTION

FRY

1. Law on protection of animals from contagious diseases endangering the whole country (Off. Jour. of SFRY, No. 43/86, 53/91, Off. Jour. of FRY, No. 24/94, 26/98)
2. Law on plant protection (Off. Jour. of FRY, No. 24/98, 26/98)
3. Regulations on performing forecast and reporting affaires in the scope of plant protection (Off. Jour. of FRY, No. 65/99)
4. Regulations on maximum amounts of harmful substances in the fodder (Off. Jour. of SFRY, No. 2/90, 27/90)
5. Regulations on conditions for performing disinfection, control of insects and rats in the scope of plant protection and protection of plant products (Off. Jour. of FRY, No. 12/99)
6. Regulations on providing services in the scope of plant protection (Off. Jour. of FRY, No. 42/99)

Serbia

2. Law on animal health protection (Off. Jour. of RS, No. 37/91, 50/92, 33/93, 52/93, 53/93, 67/93, 48/94, 43/94, 52/96, 25/00)
3. Law on seed material and planting material (Off. Jour. of RS, No. 54/93, 35/94, 43/94)
4. Regulations on reimbursement for eradication of plant diseases, pests and weed (Off. Jour. of RS, No. 52/97)
5. Regulations on keeping record of issued and prolonged certifications on animal health conditions, their transportation, including forms for keeping record (Off. Jour. of RS, No. 44/94)
6. Regulations on conditions and measures for humane collecting and removing stray dogs and cats (Off. Jour. of RS, No. 29/94)
7. Regulations on protecting animals from torturing when performing health protection measures, performing experiments on animals and performing other procedures with animals, on measures for preventing mistreating animals, including determining substances that can be used for humane extermination of animals (Off. Jour. of RS, No. 44/94)
8. Decision on protecting animal species as natural rarities (Off. Jour. of RS, No. 11/90, 49/91)
9. Decision on protecting plant species as natural rarities (Off. Jour. of RS, No. 11/90, 49/91)
10. Decision on determining level of compensation for destroyed specimen of protected animal and plant species and game species during hunting closed seasons, including their nests, brood, eggs and young in the area of national parks of Montenegro (Off. Jour. of RM, No. 38/97)
12. Order on putting under monitoring utilization and circulation of wild plant and animal species (Off. Jour. of RS, No. 17/99)

Montenegro

1. Law on protection of plants from diseases and pests (Off. Jour. of RM, No. 4/92, 59/92)
2. Law on seed material and planting material (Off. Jour. of RM, No. 39/92, 59/92)
3. Law on animal health protection (Off. Jour. of RM, No. 39/92, 59/92)
4. Regulations on veterinary and sanitary conditions for constructing and equipment of facilities for production and keeping animals (Off. Jour. of RM, No. 39/95, 56/00)
5. Decree on protection of rare, reduced in number, endemic and endangered plant and animal species (Off. Jour. of RM, No. 36/82)

REGULATIONS ON HUNTING AND FISHERIES

Serbia

1. Law on hunting (Off. Jour. of RS, No. 39/93, 44/93, 60/93)
2. Law on fishery (Off. Jour. of RS, No. 35/94, 38/94)
3. Regulations on methods of marking borders of fishing areas, i.e. parts of the fishing area with prohibited or limited fishing (Off. Jour. of RS, No. 49/95)
4. Regulations on level of compensation for illegally caught or in any other way destroyed game (Off. Jour. of RS, No. 19/00, 29/00)
5. Order on game closed season (Off. Jour. of RS, No. 84/93, 5/98, 22/99, 32/99)
6. Order on establishing closed season for fishing of some fish species within a fishing area or parts of a fishing area and on prohibiting fishing species with not legislatively determined size (Off. Jour. of RS, No. 12/95)

Montenegro

2. Law on sea fishing (Off. Jour. of RM, No. 26/92, 59/92)
3. Law on hunting (Off. Jour. of RM, No. 47/99)
4. Order on determining fish spawn territories (Off. Jour. of RM, No. 18/99)
5. Order on fishing restrictions, limitations and measurements for protection of the fish fund (Off. Jour. of RM, No. 53/00)
6. Order on hunting and shortening the hunting season, i.e. hunting days (Off. Jour. of RM, No. 56/00)
7. Decision on prohibiting fishing in the waters of the Crno Jezero (Black Lake) and water courses in the National Park "Biogradska Gora" (Off. Jour. of RM, No. 28/00)

PROTECTION OF NATURAL GOODS

Serbia

1. Law on national parks (Off. Jour. of RS, No. 39/93, 44/93, 53/93, 67/93, 48/94)
2. Law on protection the Deliblatska Pescara sand pit (Off. Jour. of SRS, No. 6/65)
3. Law on declaring the Oplenac Park as a spatial-memorial natural monument (Off Jour. of SRS, No. 25/67)
4. Regulations on protection of natural rarities (Off. Jour. of RS, No. 50/63, 93/93)
5. Regulations on protection of a special nature reserve "Stari Begej-Carska Bara Swamp" (Off. Jour. of RS, No. 56/94)
6. Regulations on protection of special reserve "Ludasko jezero" (Off. Jour. of RS, No. 56/94)
7. Regulations on protection of special nature reserve "Obedska Bara swamp" (Off. Jour. of RS, No. 56/94)
8. Regulations on protection of general nature reserve "Vitanovaca" (Off. Jour. of RS, No. 9/95)
9. Regulations on protection of special nature reserve "Jelasnicka klisure gorge" (Off. Jour. of RS, No. 9/95)
10. Regulations on protection of natural monument "Homoljska Potajnica" (Off. Jour. of RS, No. 9/95)
11. Regulations on protection of natural monument "Risovaca" (Off. Jour. of RS, No. 9/95)
12. Regulations on protection of natural monument "Vrelo Mlave" (Off. Jour. of RS, No. 9/95)
13. Regulations on protection of natural monument "Resavska pecina cave" (Off. Jour. of RS, No. 9/95)
14. Regulations on protection of natural monument "Krupajsko vrelo" (Off. Jour. of RS, No. 9/95)
15. Regulations on protection of natural monument "Lisine" (Off. Jour. of RS, No. 9/95)
16. Regulations on protection of natural monument "Djavolja Varos" (Off. Jour. of RS, No. 9/95)
17. Regulations on protection of natural monument "Botanical Garden "Jevremovac" (Off. Jour. of RS, No. 23/95)
18. Regulations on protection of special nature reserve "River Tresnjica gorge" (Off. Jour. of RS, No. 50/95)
19. Regulations on protection of special nature reserve "River Uvac gorge" (Off. Jour. of RS, No. 50/95)
20. Regulations on protection of landscapes of exceptional characteristics of Pcinja River valley (Off. Jour. of RS, No. 50/96)
21. Regulations on protection of nature park "Stara planina" (Off. Jour. of RS, No. 19/97)
22. Regulations on protection of special nature reserve "Zasavica" (Off. Jour. of RS, No. 19/97)
23. Regulations on protection of special nature reserve "Kardajordjevo" (Off. Jour. of RS, No. 37/97)
24. Regulations on protection of special nature reserve "Pustures of the great bustard" (Off. Jour. of RS, No. 37/97)
25. Regulations on protection of special nature reserve "Selevenjske pustare" (Off. Jour. of RS, No. 37/97)
26. Regulations on protection of natural monument "Cerjanska cave" (Off. Jour. of RS, No. 5/98)
27. Regulations on protection of landscapes of exceptional characteristics of Mirusa (Off. Jour. of RS, No. 5/98)
28. Regulations on protection of natural monument "Mermerna cave" (Off. Jour. of RS, No. 25/98)
29. Regulations on protection of natural monument "Danube park" (Off. Jour. of RS, No. 5/98)
30. Regulations on protection of special nature reserve "Koviljsko-petrovaradinski swamp" (Off. Jour. of RS, No. 27/98)
31. Regulations on protection of natural monument "Klokocevac" (Off. Jour. of RS, No. 1/00)
32. Regulations on protection of nature park "Sicevacka gorge" (Off. Jour. of RS, No. 16/00)
33. Regulations on protection of landscapes of exceptional characteristics of "Ovcarsko-kablariska gorge" (Off. Jour. of RS, No. 16/00)
34. Regulations on protection of natural monument "Lazarev canyon" (Off. Jour. of RS, No. 16/00)
35. Regulations on contents of protection and development plan for Deliblato sand pit (Off. Jour. of SRS, No. 40/65)
36. Regulations on contents and methods of keeping registries of protected parts of nature (Off. Jour. of SAPV, No. 25/75)
37. Regulations on contents and methods of keeping registries of protected objects of nature (Off. Jour. of SAPK, No. 18/82)
38. Regulations of categorization of natural goods (Off. Jour. of RS, No. 30/92)
40. Regulations on the registry of protected areas (Off. Jour. of RS, No. 30/92)
41. Regulations on the form for national park supervisor official ID (Off. Jour. of RS, No. 70/94)
42. Decision on determining borders of the Deliblato sandpit (Off. Jour. of SAPV, No. 10/78)
43. Decision on establishing the organization for protection of natural goods (Off. Jour. of RS, No. 88/92)
44. Decision on compensations for utilization of National Park "Fruska Gora mountain" (Off. Jour. of RS, No. 47/95, 42/98)
45. Decision on compensations for utilization of National Park "Djerdap" (Off. Jour. of RS, No. 51/95)
46. Decision on compensations for utilization of National Park "Kopaonik Mountain" (Off. Jour. of RS, No. 51/95)
47. Decision on compensations for utilization of National Park "Sara Mountain" (Off. Jour. of RS, No. 8/96, 5/99)
48. Decree on previous protection of the natural good "Zasavica" (Off. Jour. of RS, No. 51/95)
49. Decree on protecting the natural good "English Oak-Melnice" (Off. Jour. of the town of Belgrade, No. 1/96)
50. Decree on protecting the natural good "Group of English oak trees near Jojica hut" (Off. Jour. of the town of Belgrade, No. 1/96)
51. Decree on previous protection of the natural good "Taorska vrela" (Off. Jour. of RS, No. 41/96)
52. Decree on previous protection of the natural good "Begecka pit" (Off. Jour. of RS, No. 53/96)
53. Decree on previous protection of the natural good "Veliko ratno island" (Off. Jour. of RS, No.14/97)
54. Decree on previous protection of the natural good "Radujevac" (Off. Jour. of RS, No. 44/97)
55. Decree on previous protection of the complex "Buljanka Lake" (Off. Jour. of RS, No. 55/97)
56. Decree on protecting the natural good "Magnolia tree" (Off. Jour. of the town of Belgrade, No. 16/98)
57. Decree on previous protection of the natural good "Tulips tree" (Off. Jour. of the town of Belgrade, No. 16/98)
58. Decree on previous protection of the natural good "Natural spawning area of huchen" (Off. Jour. of RS, No. 21/98)
59. Decree on previous protection of the natural good "Vlasinsko Lake" (Off. Jour. of RS, No. 42/99)
60. Decree on previous protection of the natural good "Rusanda Lake" (Off. Jour. of RS, No. 13/00)
61. Spatial plan of National Park "Tara mountain" (Off. Jour. of SRS, No. 3/89)
62. Spatial plan of National Park "Kopaonik mountain" (Off. Jour. of SRS, No. 4/89)
63. Spatial plan of National Park "Djerdap" (Off. Jour. of SRS, No. 34/89)
64. Statute of the Institute for the protection of nature of Republic of Serbia (Off. Jour. of RS, No. 59/93, 22/95)

Montenegro
1. Law on environmental protection (Off. Jour. of RS, No. 66/91, 83/92, 67/93, 48/94, 53/95)
2. Law on national parks (Off. Jour. of SRM, No. 47/91)


3. Decision on establishing public enterprise for national parks (Off. Jour. of RM, No. 39/92)
4. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Lovcen" (Off. Jour. of RM, No. 47/92)
5. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Skadarsko Lake" (Off. Jour. of RM, No. 47/92)
6. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Biogradska Gora" (Off. Jour. of RM, No. 47/92)
7. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Durmitor Mountain" (Off. Jour. of RM, No. 47/92)
8. Decision on establishing the Public Institute "Natural History Museum of Montenegro" (Off. Jour. of RM, No. 12/95)
9. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Lovcen" (Off. Jour. of RM, No. 19/97)
10. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Durmitor Mountain" (Off. Jour. of RM, No. 20/97)
11. Decision on determining level of compensation for destroyed specimen of protected animal and plant species and game species during hunting closed seasons, including their nests, brood, eggs and young in the area of national parks of Montenegro (Off. Jour. of RM, No. 38/97)
12. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Biogradska Gora Mountain" (Off. Jour. of RM, No. 44/98)
13. Decision on the level and methods of payment of compensations for utilization of national park goods, performing activities and providing services in them (Off. Jour. of RM, No. 23/99)
14. Decision on prohibiting fishing in waters of the Crno Lake and watercourses in the National Park "Biogradska Gora" (Off. Jour. of RM, No. 28/00)
15. Decree on protection of rare, reduced in number, endemic and endangered plant and animal species (Off. Jour. of SRM, No. 36/82)
16. Decree on appointing the Managing Board of the "Natural History Museum of Montenegro"
17. Decree on registration with Central registry of protected objects of nature for Republic Montenegro (Off. Jour. of RM, No. 20/95)
18. Spatial plan for the area of special purpose of National Park "Biogradska Gora Mountain" (Off. Jour. of RM, No. 44/98)

**Noise Protection**

**Serbia**

1. Regulations on permitted noise level in the environment (Off. Jour. of RS, No. 54/92)
2. Decree on determining organizations that fulfill conditions for measuring noise in the human environment (Off. Jour. of SRS, No. 1/84, 44/84, 44/87, 51/91)

**Montenegro**

1. Regulations on noise protection (Off. Jour. of RM, No. 24/95, 42/00, 49/00)

**Protection from Ionizing Radiation and Radioactive Substances**

**FRY**

1. Law on protection from ionizing radiation (Off. Jour. of SFRY, No. 46/96)
2. Law on prohibiting construction nuclear power plants in FRY (Off. Jour. of FRY, No. 12/95)
3. Regulations on limit values of irradiation for population and persons working with sources of ionizing radiation, on measuring levels of exposure to ionizing radiation of persons working with sources of these radiation and on testing contamination of working environment. (Off. Jour. of FRY, No. 31/89, 63/89)
4. Regulations on methods of application of sources of ionizing radiation in medicine (Off. Jour. of FRY, No. 32/98, 33/98)
5. Regulations on conditions to be fulfilled by legal persons for performing systematic investigations of radio-nuclide contents in the environment (Off. Jour. of FRY, No. 32/98)
7. Regulations on limit values for exposure to ionizing radiation (Off. Jour. of FRY, No. 32/98)
8. Regulations on conditions for putting in circulation food supplies and objects of general use that are preserved by ionizing radiation (Off. Jour. of FRY, No. 42/98)
9. Regulation on limit values of radioactive contamination of the environment and on method of performing decontamination (Off. Jour. of FRY, No. 9/99)
10. Regulations on methods and conditions of collecting, preserving, recording, storing, treating and depositing of radioactive waste materials (Off. Jour. of FRY, No. 9/99)
11. Regulations on conditions to be fulfilled by legal persons for performing decontamination (Off. Jour. of FRY, No. 9/99)
12. Decision on establishing the Committee for nuclear energy (Off. Jour. of FRY, No. 16/96)
13. Decision on conditions for location, constructing, and test work, starting the work, utilization and permanent closure of nuclear facilities (Off. Jour. of FRY, No. 42/97)
14. Decision on producing and contents of the report on nuclear safety and other documentation necessary for determining meeting the measure of nuclear safety (Off. Jour. of FRY, No. 42/97)
15. Decision on methods and conditions for systematic investigations of radionuclide presence in the environment in the vicinity of a nuclear facility (Off. Jour. of FRY, No. 42/97)
16. Decision on conditions for circulation and utilization of nuclear materials and methods for keeping record of nuclear materials according to the zones of material balances (Off. Jour. of FRY, No. 42/97)
17. Decision on qualifications and health conditions of persons working with sources of ionizing radiation (Off. Jour. of FRY, No. 45/97)

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18. Decision on keeping the record of sources of ionizing radiation and irradiation of population, patients and persons exposed to effects of ionizing radiation at work (Off. Jour. of FRY, No. 45/97)
19. Decision on systematic investigations of radionuclide contents in the environment (Off. Jour. of FRY, No. 45/97)
20. Decision on conditions to be fulfilled by legal persons for performing measuring for assessing the level of exposure to ionizing radiation of persons working with radiation sources, patients and population (Off. Jour. of FRY, No. 45/97)
22. Decision on conditions to be fulfilled by persons working on tasks and activities of managing production process in a nuclear facility and tasks and activities of monitoring such process (Off. Jour. of FRY, No. 2/98)

**Serbia**

1. Decree on determining expert institutions for performing sampling, measuring and investigation of radionuclide contents in construction materials (Off. Jour. of RS, No. 33/95)

**Montenegro**

1. Law on determining organs for performing tasks in the scope of protection from ionizing radiation (Off. Jour. of RM, No. 13/89)

**PROTECTION FROM WASTE AND HARMFUL SUBSTANCES**

**FRY**

2. Law on transportation of harmful substances (Off. Jour. of SFRY, No. 27/90, 45/90, Off. Jour. of FRY, No. 24/94, 28/96, 21/99)
3. Law on production and circulation of poisonous substances (Off. Jour. of FRY, No. 15/95, 28/96)
4. Regulations on destroying unused poisons and package used for packaging poisons and on withdrawal of poisons from circulation (Off. Jour. of SFRY, No. 7/83)
5. Regulations on criteria for classification of poisons into groups and on methods for determining levels of toxicity for certain poison (Off. Jour. of SFRY, No. 79/91)
6. Regulations on documentation submitted in the procedure for granting waste import export and transit permits (Off. Jour. of FRY, No. 69/99)
7. Decision on marking poisons in circulation (Off. Jour. of FRY, No. 38/97)
8. List of poisons with prohibited production, circulation and utilization (Off. Jour. of FRY, No. 12/00)
9. List of poisons classified into groups (Off. Jour. of FRY, No. 12/00)

**Serbia**

1. Law on explosive substances, inflammable liquids and gases (Off. Jour. of SRS, No. 44/77, 45/85, 18/89, Off. Jour. of RS, No. 53/93, 67/93, 48/94)
2. Law on waste substances handling (Off. Jour. of RS, No. 25/96, 26/96)
3. Regulations on criteria for determining location and disposition of waste materials deposit sites (Off. Jour. of RS, No. 54/92)
4. Regulations on permitted amounts of hazardous and harmful substances in soil and water for irrigation and methods of their testing (Off. Jour. of RS, No. 23/94)
5. Regulations on methodology for chemical accident risk and environmental pollution assessment preparatory measures and measures for remediation consequences (Off. Jour. of RS, No. 60/94)
6. Regulations on handling waste products of hazardous nature (Off. Jour. of RS, No. 12/95)
7. Decision on establishing the coordination team for chemical accidents of a larger scale (Off. Jour. of RS, No. 47/97)

**Montenegro**

1. Law on cleaning, collecting and utilization of waste products (Off. Jour. of SRM, No. 20/81, 36/81, 2/89, 19/89)
2. Law on water supplying, removing of wastewater and depositing of solid waste in the territory of municipalities: Herceg Novi, Kotor, Tivat, Budva, Ulcinj and Cetinje (Off. Jour. of RM, No. 46/91)
3. Regulations on sanitary-technical conditions to be fulfilled by waste deposits and locations for discharging communal waste, forms of spatial organization and waste deposit sites maintenance and locations for discharging communal waste and on methods for destroying waste and communal waste (Off. Jour. of SRM, No. 20/83)
4. Regulations on criteria for selection of localities, methods and procedures for depositing waste materials (Off. Jour. of RM, No. 56/00)
5. Decision on establishing the Public Enterprise for water supplying, treatment and removing of wastewaters and depositing solid waste for areas of the Montenegro coast and Cetinje (Off. Jour. of RM, No. 50/91)

**REGULATIONS ON SPATIAL ORGANIZATION AND CONSTRUCTION**

**Serbia**

1. Law on Planning and Disposition of Space and Settlements (Off. Jour. of RS, No. 44/95, 23/96, 16/97, 46/98)
2. Law on construction of facilities (Off. Jour. of RS, No. 44/95, 24/96, 16/97)
3. Law on spatial plan of Republic of Serbia (Off. Jour. of RS, No. 13/96)
4. Law on special conditions for granting building permits and utilization permits for certain facilities (Off. Jour. of RS, No. 16/97)
5. Regulations on spatial plan for basin of water accumulation "Begovina" (Off. Jour. of RS, No. 43/99)
6. Regulations on premises and works environmental impact assessment (Off. Jour. of RS, No 61/92)
7. Regulations on contents and elaboration of urban plan (Off. Jour. of RS, No. 33/99)
8. Decision on elaboration of spatial plan for source area for regional water supply subsystem "Rzav" (Off. Jour. of RS, No. 42/99)
9. Decision on elaboration of spatial plan for basin of water accumulation "Selova" (Off. Jour. of RS, No. 42/99)
10. Decision on elaboration of spatial plan of Kolubara lignite basin (Off. Jour. of RS, No. 11/00)

**Montenegro**

1. Law on planning and spatial organization (Off. Jour. of RM, No. 16/95, 22/95, 10/00)
2. Law on constructing facilities (Off. Jour. of RM, No. 55/00)
3. Law on urban and construction inspection (Off. Jour. of RM, No. 56/92, 16/95, 23/95)
4. Regulations on environmental impact assessment study for operations in the environment (Off. Jour. of RM, No. 14/97)
5. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Lovcen" (Off. Jour. of RM, No. 47/92)
6. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Skadarsko Lake" (Off. Jour. of RM, No. 47/92)
7. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Biogradska Gora Mountain" (Off. Jour. of RM, No. 47/92)
8. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Durmitor Mountain" (Off. Jour. of RM, No. 47/92)
9. Decision on starting the elaboration of changes and additions to the spatial plan of the Republic of Montenegro (Off. Jour. of RM, No. 43/94)
10. Decision on starting the elaboration of the spatial plan for the sea good (Off. Jour. of RM, No. 16/97)
11. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Lovcen" (Off. Jour. of RM, No. 19/97)
12. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Durmitor Mountain" (Off. Jour. of RM, No. 20/97)
13. Decision on starting the elaboration of the spatial plan for the area of special purpose of National Park "Biogradska Gora Mountain" (Off. Jour. of RM, No. 44/98)
15. Spatial plan of the SR Montenegro to 2000 (Off. Jour. of RM, No. 17/97)

**Fry**

1. Law on the customs service (Off. Jour. of FRY, No. 45/92, 16/93, 50/93, 24/94, 28/96, 29/97, 59/98, 17/99)
3. Law on foreign investments (Off. Jour. of FRY, No. 79/94, 15/96, 29/96)
4. Law on free zones (Off. Jour. of FRY, No. 81/94, 28/96)
5. Law on enterprises (Off. Jour. of FRY, No. 29/96, 33/96, 29/97, 59/98, 74/99)
7. Law on standardization (Off. Jour. of FRY, No. 30/96, 59/98)
9. Law on protection of population from contagious diseases endangering the whole country (Off. Jour. of FRY, No. 46/96, 12/98)
10. Law on records in the scope of public health (Off. Jour. of FRY, No. 12/98)

**Serbia**

2. Law on communal activities (Off. Jour. of SRS, No. 16/97, 42/98)
5. Law on sanitary monitoring (Off. Jour. of RS, No. 34/94)
7. Law on spas (Off. Jour. of RS, No. 80/92)

**OTHE REGULATIONS IN RELEVANCE TO THE ENVIRONMENTAL PROTECTION**

**Montenegro**

2. Law on communal activities (Off. Jour. of RM, No. 12/95)
3. Law on the protection at work (Off. Jour. of RM, No. 35/98)
5. Law on protection from elementary natural disasters (Off. Jour. of RM, No. 57/92)
6. Law on tourism and hotel management (Off. Jour. of RM, No. 16/95, 22/95)
8. Law on corporate profit tax (Off. Jour. of RM, No. 3/92, 17/92, 30/93, 3/94, 42/94, 1/95, 20/95, 40/95, 13/96, 45/98)
Appendix 2 to Annex 4: Multilateral Environmental Agreements

MULTILATERAL ENVIRONMENTAL AGREEMENTS RATIFIED BY YUGOSLAVIA

1. Convention Concerning the Use of the White Lead in Painting, Geneva, 1921
   Entry into force 1923
   Entry into force by Kingdom of Yugoslavia 1929

2. Agreement for the Establishment of a General Fisheries Council for the Mediterranean (as amended), Rome, 1949
   Entry into force 1952
   Acceptance by FPR Yugoslavia 1951

   Entry into force 1963
   Entry into force by SFR Yugoslavia 1973

   Entry into force 1953
   Entry into force by FPR Yugoslavia 1953

5. International Plant Protection Convention, Rome, 1951
   Entry into force 1952
   Ratified by FPR Yugoslavia 1955

   Enter into the force 1962
   Ratified by FPR of Yugoslavia 1956

   Entry into force 1958
   Entry into force by SFR Yugoslavia 1974

   Not yet in force
   Acceptance by SFR Yugoslavia 1976

   Entry into force 1958
   Entry into force SFR Yugoslavia 1958

    Entry into force 1962
    Ratified by SFR Yugoslavia 1966

    Entry into force 1966
    Ratified by SFR Yugoslavia 1966

    Enter into the force 1962
    Ratified by SFR Yugoslavia 1958

    Entry into force 1964
    Ratified by SFR Yugoslavia 1966

    Enter into the force 1965
    Ratified by SFR Yugoslavia 1964

    Entry into the force 1977
    Entry into force by SFR Yugoslavia 1977

    Entry into force - Ratified by SFR Yugoslavia 1970

    Entry into force 1971
    Ratified by SFR Yugoslavia 1992

    Entry into force 1970
    Ratified by SFR Yugoslavia 1990

19. International Convention on Civil Liability for Oil Pollution Damage (as amended), Brussels, 1969
    Entry into force 1975
    Entry into force by SFR Yugoslavia 1976

    Entry into force 1975
    Entry into force by SFR Yugoslavia 1976

21. Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 1971
    Entry into force 1975
    Entry into force by SFR Yugoslavia 1977

    Entry into force 1972
    Ratified by SFR Yugoslavia 1973

23. Convention Concerning Protection Against Hazards of Poisoning Arising from Benzene, Geneva, 1971
    Entry into force 1973
    Ratified by SFR Yugoslavia 1975

    Entry into force 1978
    Entry into force by SFR Yugoslavia 1978

    Entry into force 1977
    Ratified by SFR Yugoslavia 1975

    Entry into force 1975
    Ratified by SFR Yugoslavia 1975

    Entry into force 1975
    Accession by SFR Yugoslavia 1976

28. Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances Other Than Oil (as amended), London, 1973
    Entry into force 1983
    Entry into force by SFR Yugoslavia 1983

    Not in force
    Accession by SFR Yugoslavia 1980
Entry into force 1975  Ratified by FR Yugoslavia 2001
Entry into force 1976  Ratified by SFR Yugoslavia 1977
Entry into force 1978  Entry into force 2001
33. Convention for the Protection of the Mediterranean Sea Against Pollution, Barcelona, 1976
Entry into force 1978  Entry into force by SFR Yugoslavia 1978
34. Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Air-crafts, Barcelona, 1976
Entry into force 1978  Ratified by SFR Yugoslavia 1978
35. Protocol Concerning Co-operation in Combating Pollution of Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, Barcelona, 1976
Entry into force 1978  Ratified by SFR Yugoslavia 1978
Entry into force 1979  Ratified by SFR Yugoslavia 1982
Entry into force 1983  Entry into force by SFR Yugoslavia 1983
Entry into force 1983  Ratified by SFR of Yugoslavia 1987
Entry into force 1987  Entry into force by SFR of Yugoslavia 1987
40. Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, Athens, 1980
Entry into force 1983  Accession by SFR Yugoslavia 1990
Entry into force 1983  Ratified by SFR Yugoslavia 1987
42. Protocol Concerning Mediterranean Specially Protected Areas, Geneva, 1982
Entry into force 1986  Ratified by SFR Yugoslavia 1986
Entry into force 1994  Ratified by SFR Yugoslavia 1986
Entry into the force 1988  Accession by SFR of Yugoslavia 1987
Entry into force 1985  Accession by SFR Yugoslavia 1990

Entry into force 1987  Ratified by SFR of Yugoslavia 1991
47. Treaty on Pollution Protection of the Tisza River Waters and Tributaries 1986
Entry into force -  Ratified by SFR of Yugoslavia 1990
Entry into force 1989  Ratified by SFR Yugoslavia 1989
49. Convention on Early Notification of a Nuclear Accident, Vienna, 1986
Entry into force 1986  Entry into force by SFR Yugoslavia 1989
50. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Vienna, 1986
Entry into force 1987  Entry into force by SFR Yugoslavia 1991
51. Montreal Protocol on Substances that deplete the Ozone Layer, Montreal, 1987
Entry into force 1989  Accession by SFR Yugoslavia 1991
Entry into force 1992  Ratified by SFR of Yugoslavia 1999
Entry into force 1993  Ratified by SR Yugoslavia 2001
Entry into force 1994  Ratified by SFR of Yugoslavia 1997; by FRY 2001
Entry into force 1997  Ratified by SR Yugoslavia 2001
Entry into force 1996  Bound under simplified procedure 1995

MULTILATERAL ENVIRONMENTAL AGREEMENTS, IN THE PROCESS OF RATIFICATION BY YUGOSLAVIA

Adopted 1979
2. Convention on the Conservation of European Wildlife and Their Natural Habitats, Bern 1979
Adopted 1979
Adopted 1992
4. Convention on the Trans-boundary Effects of Industrial Accidents
Adopted 1992
5. Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes
Adopted 1992
6. Convention on Co-operation for the Protection and Sustainable Use of the Danube River (Danube River Protection Convention)
Adopted 1994

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ANNEX 5: ENERGY, TRANSPORT AND ENVIRONMENT IN FRY

Serbia – Background on Energy Sector

120. In Serbia, the energy sector accounts for more than 5% of GDP and is one of the largest sectors of the economy. It comprises electric power, coal production, district heating, oil and gas production and imports.

121. In FRY, domestic primary energy production in 2000 consisted of 265 PJ of coal (98% of which is lignite); 40 PJ of oil; 24 PJ of natural gas; 43 PJ of hydropower and 36 PJ of biomass, mainly wood, which is usually not reported in the energy balance. These are not sufficient to satisfy energy demand of the economy as such, the Republic imports 12 PJ of hard coal and coke; 90 PJ of oil; and 60 PJ of natural gas.

122. The centralized electricity production system is comprised of hydro and thermal power plants (about 7,100 MW capacity, of which 2,800 MW or roughly 40% are hydropower plants) and is managed by the Electric Power Industry of Serbia (EPS). It must be noted that EPS is also responsible for the transmission and distribution of electricity to consumers. In Serbia, the energy consumption is increasing. Of the average annual electricity consumption, up to 30 TWh is covered by domestic production, and an additional 2.5 TWh of electricity is imported per year.

123. Coal, extracted locally, is the principle fuel for electricity generation in the country. International assistance has been provided to support open pit coal mines with spare parts, vehicles, cables and various materials. However, major required activities have not been accomplished such as: land acquisition, necessary overburden removal, internal roads and drainage improvements. The delays in sufficient land acquisition are having a significant impact on coal output.

124. There are two refineries in Serbia, the Novi Sad of 1 M.t capacity and the Pancevo of 3.5 M.t capacity, and also pipeline system for transporting oil, which is about 420 km long. The 1,500 km of gas pipeline is used for the transportation and distribution of domestic gas production (in Vojvodina) and imported natural gas within Serbia. In Serbia, for the year 2000/2001, approximately 2/3 of the population depended on electricity for heat.

125. As mentioned above, the energy consumption in Serbia continues to increase. Electricity consumption during last ten years has been gradually shifting to the household sector, with its share increasing from 42% in 1990 to almost to 58% in the year 2000, while the share of industrial sector dropped from 51% in 1990 to 31% in 2000, reflecting the increased use of electricity for heating and the decline in economic activity. Three industrial branches, namely iron and steel metallurgy, basic chemical products and industry of construction materials, consume approximately 50% of total energy used in industrial sector, even though the share of GDP from these branches is below 15%.

126. With regard to heating, municipal district heating systems are used for heat production primarily with heat only boilers - that have a capacity of about 6,300 MJ/s. In Serbia, the decentralized energy production sources in the industrial enterprises, mainly comprise of boilers with a capacity of 5,000 MJ/s for heat production and about 50 PJ per year.
Trends and Main Environmental Concerns

127. Serbia’s energy sector traditionally produced enough electricity to meet domestic demand also exported surplus. However the sector now faces severe problems related to the consequences of the past few years of conflict: sanctions that limited imports of equipment and fuel, NATO destruction of energy infrastructure, fiscal deficit, outdated and insufficient maintained energy facilities and the impossibility of implementation of modern regulation and legislation. Electricity reform is therefore of paramount importance.

128. The primary environmental concerns in the energy sector focus on two areas: the unsustainably high level of energy consumption, which contributes to fiscal deficit and results in unnecessarily high GHG emissions and the critical impact of lignite-fired power plants (and associated mines) on air pollution.

Inefficient Energy Consumption And Macroeconomic Implications

129. Long periods of low energy prices, have left the energy sector unbalanced and skewed; subsidized prices have led to a major increase in the use of electricity particularly for households. The low revenues also have led to severe neglect of maintenance and investment in the energy sector. In spite of a significant slow–down in economic activities and thus industrial energy demand, power consumption actually increased since 1990 by about 6,000 GWh to 33,600 GWh. As might otherwise be expected, the decline in GDP was not accompanied by a decline in energy consumption. Energy use intensity per unit of GDP increased by 60% during the 1990s from 0.54 kg of oil equivalent per unit of GDP (koe/GDP) in 1990 to 0.78 koe/GDP in 1999. It is estimated that energy subsidies resulted in a quasi-fiscal deficit of US$1.1 billion in 2000 and has made maintenance and new investments financially impossible to pursue. Raising energy prices to economic levels, as the government has begun to do so, will spur energy efficient investments by industries and households, reducing demands, emissions and also improving the fiscal condition of the economy.

130. Another problem is that energy consumption is so inefficient particularly in regard to District heating (DH) systems, which operate in 43 towns in Serbia and are mainly based on heat–only, boiler energy sources. The principal problem in this area relates to the poor financial situation of DH companies due to inadequate tariff levels and considerable heat and hot water losses. At 2000 prices, DH companies managed to recover funds sufficient only to pay less than 20 % of the cost of gas. These DH systems are oversized, particularly as they operate only part of year and there is great potential for increasing energy efficiency and reducing operational losses.

Lignite Fired Power Plants and Mines

131. Air pollution from energy-sector activities is particularly severe in the Kolubara-Obrenovac corridor, where are located about 3,000 MW of lignite-fired power plants as well as related ash pits, and Kolubara lignite mines. Hence, there is severe air pollution related to the burning of low quality lignite coal in power plants. These power plants all lie in a 26-mile corridor and hence the impact on air quality has severe human health and ecosystem implications. Higher than average incidence of respiratory problems have been reported in this region.
132. Along with this, ash handling is a particularly acute problem as 4-5 million tons of ash per year is sent to ash ponds. Although, the ash content of 15-20% is reasonable, the ash burden increases because the low heat content of lignite requires significantly higher volumes be used per-unit of electricity output. Since, the volume of lignite required per unit of electricity produced is nearly double that of high heat content coal and the power plants are essentially lacking in desulphurization equipment, the result is higher SO\textsubscript{2} emissions than would normally be expected (particularly true of the Kostalac power plant east in Belgrade).

133. Apart from the inefficient use of natural resources, there are other environmental problems related to ash handling including arsenic contamination that is reported to pose a threat to groundwater. There have been various measures to reduce contamination of ground water. Wells surrounding the ash pits are designed to control pollution. Along with this, EPS is experimenting with new technologies and alternative uses of ash to mitigate this problem.

**Technical Barriers to Environmental Protection in Lignite Power Plants**

134. Serbian lignite-fired power plants do not have equipment to measure emissions on a continuous basis. Samples are taken periodically, however, this is sub-optimal both in terms of quality of information and manpower costs. Other problems include the poor quality of electrostatic precipitators in some of the older units, which need to be upgraded, as well as drifting particulates from the coal mine and the ash ponds. The precipitators at the newer units at Nikola Tesla Plant B have been rebuilt to meet EU standards. However, the 32-year old 200 MW unit at Nikola Tesla A remains a serious problem.

135. This issue needs to be addressed either by retiring the unit once the emergency energy supply shortfall has been met, or by upgrading the equipment. Given the continued problems with supply shortfalls, upgrading the electrostatic precipitator appears to be the preferred alternative. Fines provide some incentive to deal with these problems, but the fines are so small that these investments are not a priority for EPS.

136. Both the Nikola Tesla and Kostalac power plants use cooling systems (Kolubara uses cooling towers), which increase the cooling water temperature by 8-9 degrees Celcius and river temperatures by roughly 3 degrees Celcius. The Government has imposed an upper limit on Sava River water temperatures of 28 degrees Celcius, which is periodically exceeded in the summer.

**Financial Barriers to Environmental Protection in Lignite Power Plants**

137. The lignite mines have not had adequate funding to enable satisfactory land reclamation since 1992. Prior to 1991, about 1,800 hectares were reclaimed indicating the will to address the problem should funds be available. Limited reclamation has taken place at Kolubara Field D and current plans are for 200 hectares of reclamation in 2002. This financing problem of lignite mines primarily stems again from low electricity prices which do not even cover the operational costs. KfW is expected to assist with funding to address the problem of lignite field management and lignite quality.

138. In summary, EPS estimates that 500 million Euros are needed to address environmental problems associated with the lignite-fired plants. With the low electricity
prices, no immediate solution to this problem is expected other than the donor support for equipment upgrading and energy efficiency measures to decrease consumption.

Availability and Feasibility of Clean Energy Alternatives

139. Hydroelectric plants: Although hydroelectricity may be another option to meet supply and demand side economics of energy use, Serbian hydroelectric power plants suffer from two significant environmental problems: siltation of reservoirs and increased variation in river flows. Siltation of the Iron Gates Reservoir is of particular concern with an estimated addition of 20 million cubic meters of sediment each year. Channels have been dredged in the reservoir but these have not been well maintained due to funding constraints. The river flows have slowed roughly 400 km upstream because of the choking effect of the sedimentation. In some areas, islands of high quality soil have appeared.

140. Alternative technologies. Several alternative technologies are being considered to increase the supply electricity and reduce the impact of electricity production on the environment, including: coal bed methane; coal gasification; biogas boilers; and wind turbines. Renewable resources also play an important part in the Government’s energy strategy with particular focus on hydroelectric plants, biogas, solar and wind energy. A recent study identified that small hydro-plants could have a considerable impact in meeting longer-term energy needs. However, all of these options and priorities have to be examined in greater detail before development can be considered.

Institutions and Policies

141. The energy sector’s problems and the environmental degradation over the past decade have been compounded by factors mentioned above. Against this backdrop the new government that came into power in late 2000 had an imposing task.

142. In the past, environmental aspects of the energy sector were assigned a relatively low priority, except where the investments assisted the economic agenda. However, the Ministry of Mining and Energy is in the process of addressing medium to long-term problems through the development of an energy strategy, which also includes assessing and tackling the impacts of the energy sector on the environment.

143. Persistently low electricity prices during the 1990s allowed customers to increase consumption to levels which exceed norms relative to income levels. To tackle the problem of a quasi budget deficit from the energy subsidies, the Government’s energy strategy commits to increasing prices to reflect the cost of supply by 2005. The severity of energy supply shortage has necessitated that the government adopt a two-pronged effort of increasing supply capacity as well as reducing demand. Demand reduction has additional benefits, helping the fiscal and current account deficit, as well as reducing the impact on the environment.

144. Price adjustments will provide an incentive for reduction in energy consumption levels and prudent inter-fuel substitution. The price increases will need to be complemented by an information dissemination campaign that the Government initiated in 2001. In addition, a mechanism will need to be established to enable households to invest in technologies to decrease energy consumption. The Government has established the Serbian Energy Efficiency
Agency (SEEA) to implement this program. Both the European Agency for Reconstruction (EAR) and the World Bank are working with the Government to build SEEA’s institutional capacity and to establish systems and procedures with assistance from USAID-funded consultants.

145. An important component of the energy efficiency program is improved use of district heating where it is economically viable. The donor community is providing assistance to upgrade district heating systems in the major cities, with particular focus on Belgrade. There is considerable scope for reducing the cost of supply and increasing the efficiency of primary fuel use by utilizing waste heat from power plants. Effective extensions of the network in urban areas will also enable a decrease in air pollution.

146. In the early 1990s, many lignite fired boilers in the city center were replaced by district heating but the program was curtailed due to a lack of funding. The energy pricing reforms, including price increases as well as changes to the structure of district heating prices needs to be addressed to provide incentives for consumers to be more environmentally and prudent and energy efficient. Price increases will address the financial viability issues of district heating, enabling this program will be restarted. Air quality, as a result of more efficient systems, should particularly improve during winter months.

147. Serbia’s refineries also are in need of considerable investment to improve their operations due to the impact of NATO bombing, limited maintenance and the need to upgrade technologies to improve the product mix. The Government plans to address this issue in two phases. During the first phase, repairs to the plants aim to improve operating capacity and to bring output back to what it was when the plants were originally designed. This phase will focus on improved gasoline and diesel output as well as sulphur removal from petroleum products. Phase two is expected to be funded by the private sector, following divestiture of Government ownership in the refineries. This phase is expected to not only improve the product mix, but also to enable products to meet EU standards by 2005. This would probably mean that Serbia would be in a position to ban leaded gasoline at this time. Although, the plan is well focused, it must be noted that the timetable is extremely ambitious.

Montenegro – Background on Energy Sector

148. Montenegro’s energy sector comprises mainly of electricity production, coal export and the distribution of oil products from the petroleum sector. The consumption of electricity per year in Montenegro is currently 4.3 TWh. Of this production, the coal fired thermal plant in Pljevlja produces 1.0 TWh, the hydropower stations produce another 2.0 TWh and the remainder of 1.3 TWh per year is imported. Electricity generation and transmission is managed by the state-owned company Elektroprivreda Crne Gore (EPCG).

149. In Montenegro, the geological coal reserves are estimated at above 400 million tones, and the Republic is a (modest) net exporter of coal. Approximately, 80% of the coal production comes from the open pit Pljevlja Mines (reserves estimated at 70 million tones).

150. The petroleum sector in Montenegro is mainly limited to the oil products distribution through the state-owned oil product retailer Yugopetrol Kotor. It consists of some offshore oil
and gas exploration. Gas reserves of around 600 billion m$^3$ have reportedly been located in the southern part of the Adriatic Sea, but the economic viability is not proven.

151. In Montenegro, the main electricity consumer is the Aluminum Plant, accounting for nearly half of demand. Household consumption is the second largest in the economy, mostly due to the electric heating. There are no district heating systems in Montenegro.

**Trends and Main Environmental Concerns**

152. Montenegro shares a similar history of macroeconomic trends and environmental concerns as Serbia. Drastically low electricity prices during the 1990s led to increased energy consumption and limited the proper maintenance of the facilities and creating environmental problems at the lignite mine and the power plant.

**Energy Inefficiency**

153. The level of energy consumption in Montenegro is excessive given the size of the economy and income levels. Although, the statistics are skewed given the impact of KAP and Niksic Steel Mill (which are both energy intensive industries and exist as an overwhelming component in the economy), energy consumption levels are above sustainable levels. Sustained, low electricity prices have been part of the problem, but the Government has made considerable efforts to correct this, as electricity prices in Montenegro are roughly 67% higher than in Serbia as of May 2002.

154. There is however a social consideration to these hikes in energy price as much as they may be necessary. The need to increase electricity prices is constrained by affordability concerns where electricity is used for household heating. However, for much of the population (in Podgorica and along the coast), the heating season is short and temperatures moderate. The more sparsely populated, mountainous region needs to address their specific problems, with due regard to affordability and environmental degradation from the use of firewood. The Pljevlja Power Plant offers a unique opportunity to connect the heating problem in the nearby town by using the waste heat from the power plant to heat homes. A feasibility study is being upgraded to address this proposed district heating investment. Preliminary estimates by the Government put the cost at $20 million to serve the town population of 20,000.

**Lignite Power Plants.**

155. Emissions at the lignite power plants are reported to be 2-3 times the standard while ambient air quality exceeds limits by roughly 20%. Air pollution problems are accompanied with groundwater contamination. In Montenegro, the electrostatic precipitators are expected to be upgraded in 2002/3 which should have a considerable impact on particulates emission levels.

156. Among the three primary environmentally problematic locations (KAP, Niksic Steel Mill and the Pljevlja Lignite Plant), the Pljevlja town is often referred to as the black hole of
Montenegro. Each day, 5,500 tons of lignite is used at Pljevlja, generating roughly 300,000 to 350,000 tons of ash that leads to being stored each year. Ash handling is increasingly becoming a problem as existing dykes are inadequate. During rainy periods, ash spills over the dykes and contaminates the river. During the dry periods, ash is carried away to the surrounding districts. A plan is under preparation to improve the ash handling problem.

**Policy and Government Action**

157. Given the problems in Montenegro, there is a need for the government to establish a similar energy efficiency program as the one which is underway in Serbia. This would include the removing energy subsidies, increasing energy efficiency and getting a district heating system in order. It is important that information dissemination is coupled with a mechanism to enable households to invest in energy saving measures. The problem in Montenegro is expected to worsen considerably in the medium- to long-term once investments in air conditioning accelerate. As such, these must be kept in mind while formulating policies. It will be important to maintain the Government’s program of price reform to ensure that incentives to conserve energy are maintained.

**Serbia and Montenegro – Transport-related Pollution**

158. In Serbia and Montenegro, detailed data on transportation is not yet readily available, however, road vehicles are considered a major contributor to air pollution, especially in larger cities. The Montenegrin coast in particular suffers from a high level of traffic in the summer and high demands from tourists for a clean environment. Experience in neighboring countries suggests that this source of energy-related pollution is likely to become more prominent in the future, as power and industrial sector pollution problems are cleaned up and traffic volumes increase. Vehicle exhaust emissions contribute to \( \text{SO}_2, \text{NO}_x, \text{O}_3 \), particulates, and lead to the atmosphere. The sulphur and lead pollution is particularly problematic in FRY because of poor quality fuels, that is high sulphur diesel and leaded petrol. Lead emissions are particularly dangerous, as even low concentrations can retard mental development in children.

**Policies and Strategy for the Transportation Sector**

Given the high, potential environmental, health and tourism benefits associated with conversion to unleaded fuel, a more detailed examination of transport fuel alternatives is critical. The most effective measure that the government could take in the short-term is to eliminate fuel subsidies to reflect real gas prices, and open the gas distribution network to foreign competition. These policy actions would help to bring unleaded fuel to FRY very quickly. In the longer term, once conversion is complete, the focus can then move to reducing emissions of other transport-related pollutants through the introduction of government policies to upgrade the vehicle stock by setting minimum standards for new cars (including catalytic converters), and inspection and upgrades for the existing stock. A gradual adoption of EU standards for fuel, and monitoring programs for fuel quality, will also help reduce vehicle emissions levels and protect human health and the environment. Other transition countries in

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51 The lignite has an ash content of 15-30%, sulphur content of 1% and moisture content of 34%. The heat content of the lignite is 9.2 KJ/kg.
the region experienced similar problems in the 1990s. Relevant experience from Slovakia in phasing out leaded gasoline is presented in Box A8.

Box A8. Phaseout of leaded gasoline in the Slovak Republic

Lead was heavily used in Slovakia (part of former Czechoslovakia) until the 1980s. The lead content of gasoline was gradually reduced from over 0.7g/l to 0.4g/l in 1983; to 0.25g/l in 1985; and 0.15g/l in 1989, followed by the total phaseout by the end of 1994. The market share of unleaded gasoline increased from 6 percent in 1992 to 100 percent in 1995.

Besides health considerations about the impacts of lead, another —mainly supply-driven— factor contributed to the drastic change in the lead use in gasoline. As a result of a technical upgrade undertaken in response to increasing quality requirements of its export markets, Slovnaft, the only refinery of the Slovak Republic, developed an overcapacity in the production of high-octane gasoline components by the early 1990s. About 70 percent of the vehicle fleet in the country, however, consisted of cars designed to use leaded gasoline, manufactured with soft engine valve seats, and vehicle turnover was very slow. In order to resolve the disparity between supply and demand, Slovnaft developed a fuel additive that enabled all motorists to use unleaded gasoline by providing the necessary lubrication to the soft engine valves in old cars. The additive has been marketed, under the trade name ANABEX-99, as a universal fuel additive, which can be used in cars with or without catalytic converters.

The total cost of phasing out lead from gasoline production, including the annualized investment cost of the new isomerization and lubricant production units, the development of new additive, and the increased operation cost of unleaded gasoline was estimated at US$0.02 per liter of gasoline.

Slovnaft used its control over the gasoline distribution network to market the new gasoline brands. A differentiated pricing policy in favor of unleaded gasoline and a strong public information campaign contributed to the success of the total lead phaseout program and the acceptance of new gasoline by consumers.

Key factors of success in eliminating lead from gasoline in the Slovak Republic were
- The commitment to environmental improvement in Slovakia by all interested parties;
- Tax incentives for the production and consumption of unleaded gas;
- General advancement in environmental understanding and changes in consumers’ values and mind set;
- A long-term strategy for the modernization of gasoline production technologies;
- Participation of a highly qualified, expert team in the Research Center of Slovnaft Refinery;
- Highly motivated management teams in the Slovnaft and Benzinol companies;
- Relatively centralized and easily controlled gasoline distribution network.

ANNEX 6. WATER SUPPLY AND SANITATION

FRY Water

164. The water supply and sanitation sector was well developed in former Yugoslavia and even today coverage, in urban areas reflects this legacy. In 2000, 98% of the FRY population had access to safe drinking water using the commonly accepted definition of “access to improved water sources” as meaning sourced from a pipe, a public tap, borehole/tube well, protected well, protected spring or rainwater (UNICEF, 2000). Around 84% of the population receives a piped water supply to the home or yard. Coverage data disaggregated by country region (Table A10), however, paints a clearer picture. For instance, in Serbia, 93% of the population in the Belgrade area has water piped into their dwelling or yard, while the proportion for the rest of Central Serbia is only 77%.

Table A10: Percentage of the population with water supply of different service levels

<table>
<thead>
<tr>
<th>Territory</th>
<th>Piped into dwelling</th>
<th>Piped into yard or plot</th>
<th>Public tap</th>
<th>Tubewell /Borehole with pump</th>
<th>Protected dug well</th>
<th>Unprotected dug well</th>
<th>Other</th>
<th>Missing / DK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRY excl. Kosovo</td>
<td>83.8</td>
<td>2.8</td>
<td>0.6</td>
<td>4.4</td>
<td>6.8</td>
<td>0.7</td>
<td>0.5</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td>Montenegro</td>
<td>85.1</td>
<td>6.0</td>
<td>1.0</td>
<td>1.1</td>
<td>3.0</td>
<td>0.4</td>
<td>2.2</td>
<td>1.2</td>
<td>100</td>
</tr>
<tr>
<td>Serbia excl. Kosovo</td>
<td>83.7</td>
<td>2.6</td>
<td>0.6</td>
<td>4.6</td>
<td>7.0</td>
<td>0.8</td>
<td>0.4</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td>Central Serbia</td>
<td>81.3</td>
<td>2.6</td>
<td>0.6</td>
<td>4.4</td>
<td>9.6</td>
<td>1.0</td>
<td>0.3</td>
<td>0.2</td>
<td>100</td>
</tr>
<tr>
<td>C. Serbia excl. Bld</td>
<td>77.0</td>
<td>3.2</td>
<td>0.8</td>
<td>4.8</td>
<td>12.4</td>
<td>1.3</td>
<td>0.4</td>
<td>0.2</td>
<td>100</td>
</tr>
<tr>
<td>Belgrade</td>
<td>92.9</td>
<td>1.2</td>
<td>0.0</td>
<td>3.5</td>
<td>1.9</td>
<td>0.3</td>
<td>0.1</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>90.4</td>
<td>2.5</td>
<td>0.7</td>
<td>5.2</td>
<td>0.1</td>
<td>0.0</td>
<td>0.7</td>
<td>0.5</td>
<td>100</td>
</tr>
<tr>
<td>Urban</td>
<td>97.0</td>
<td>1.0</td>
<td>0.1</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>0.3</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td>Rural</td>
<td>68.0</td>
<td>4.8</td>
<td>1.3</td>
<td>9.1</td>
<td>14.1</td>
<td>1.6</td>
<td>0.8</td>
<td>0.3</td>
<td>100</td>
</tr>
</tbody>
</table>

165. These coverage figures (as all coverage figures in this report, are from the UNICEF Indicator Cluster Survey 2000) are misleading in other regards as well. Households appear to have reported what they have, not what is properly functioning. Many of the piped water supply systems are operating poorly, if at all, particularly in rural areas. The Republic Institutes of Public Health (IPH) have the responsibility of monitoring drinking water supplies and the authority to close systems, which do not produce water according to standards. In Serbia IPH has closed many systems, usually in small towns (5,000 – 10,000 population). The most common operational problem that leads to closure is lack of a functioning disinfection system – chlorination in the case of FRY. Either the equipment is broken or the chlorine is not available. NATO bombings in 1999 destroyed the two chlorine manufacturing plants in FRY.
and since then supplies have been erratic. The coverage figures also do not reflect service
interruptions, which are very common (Table A11). Again there are significant regional
differences with Vojvodina experiencing the most and longest interruptions in service.

Table A11: Percentage of the population with interruptions of water supply

<table>
<thead>
<tr>
<th>Territory</th>
<th>None</th>
<th>Yes, sporadic</th>
<th>Yes, on daily basis</th>
<th>Yes, during the summer season</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRY excl. Kosovo</td>
<td>51.7</td>
<td>28.4</td>
<td>5.0</td>
<td>15.0</td>
<td>5,730</td>
</tr>
<tr>
<td>Rep. of Montenegro</td>
<td>41.5</td>
<td>29.9</td>
<td>7.1</td>
<td>21.4</td>
<td>350</td>
</tr>
<tr>
<td>Rep. of Serbia excl. Kosovo</td>
<td>52.3</td>
<td>28.3</td>
<td>4.9</td>
<td>14.6</td>
<td>5,380</td>
</tr>
<tr>
<td>Central Serbia</td>
<td>57.4</td>
<td>23.5</td>
<td>5.8</td>
<td>13.4</td>
<td>3,849</td>
</tr>
<tr>
<td>Vojvodina Area</td>
<td>39.6</td>
<td>40.3</td>
<td>2.6</td>
<td>17.6</td>
<td>1,531</td>
</tr>
<tr>
<td>Urban</td>
<td>55.9</td>
<td>26.8</td>
<td>3.7</td>
<td>13.6</td>
<td>3,270</td>
</tr>
<tr>
<td>Rural</td>
<td>46.0</td>
<td>30.4</td>
<td>6.7</td>
<td>16.8</td>
<td>2,460</td>
</tr>
</tbody>
</table>

166. The FRY 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 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 (UNICEF, 2001). Medium size towns and rural areas have the most difficulty providing safe and adequate supplies of drinking water. There are significant regional differences in water quality with supplies in northern Vojvodina the worst and considered unsuitable for drinking water purposes without treatment.

167. Rural water supply systems are a combination of formal and regulated piped water supply systems owned and operated by the municipality; unregulated private piped systems the communities built (and operate) themselves; and private wells, which are also unregulated. Data is very scarce on rural water supply systems but some estimates indicate that about 50 percent of the rural population uses an unregulated supply (OCHA 2001). Unregulated drinking water supplies are not monitored by the IPH, as are regulated supplies, which may render rural communities and households particularly vulnerable to water quality problems. There is scattered evidence that the water quality of rural water systems can be expected to be even worse than the urban systems. The Serbian IPH, based on sporadic measurements, estimates that about 90 percent of the informal, unregulated rural water supply systems do not comply with bacteriological standards. A survey conducted by the Montenegro IPH in 2001 showed that out of 194 private wells that were analyzed in rural areas, 120 (62%) did not comply with bacteriological standards.

168. With the exception of the public/private Montenegro coastal water utility (discussed later), all water utilities are municipal, publicly-owned 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 wastewater services and sometimes solid waste management. They also may provide street lighting, parks, cemeteries, and green areas in the city. Although many are legally independent entities on
paper, generally, these enterprises have little autonomy and no control over crucial aspects of their business. Investment decisions have been taken until now usually at the municipal or national government level, with a strong bias towards new infrastructure, disregarding improved maintenance and rehabilitation of existing assets.

169. Operationally, the sector can be characterized as having huge physical losses in the order of 50% and more; no demand management; inadequate pricing policies; and fragmented institutional arrangements. Most areas have high per capita water consumption (figures in the order of 300 lpc/d are not uncommon – average in Western Europe is 180-200 lpd), well above the rates in comparable and more developed European neighboring countries. By international standards the utilities are overstaffed, fairly inefficient, and lacking in modern management and control systems and governance.

**Serbia Water**

170. In Serbia the coverage of drinking water supplies in homes or yards is 82% with an urban/rural breakdown of 98% and 63%, respectively. Regional differences are significant particularly in rural areas. Central Serbia has 71% of rural settlements receiving piped water, versus 87% in Vojvodina.

171. There are approximately 7,000 settlements and communities in Serbia the majority of which, 90%, have a population of fewer than 2,000 people. 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 total pollution load. There are very few large cities but they account for most of the population. Half of the Serbian population receives service from public water supply systems of which there are 153 serving 168 municipalities and their environs. 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 of which there are 72 serving municipalities of 10,000 to 100,000 population. Data on access to piped water supply and sewerage for selected municipalities can be found in Table A13.

<table>
<thead>
<tr>
<th>Municipal Water &amp; Wastewater Utility</th>
<th>Population Served**</th>
<th>Water Supply coverage, %</th>
<th>Sewerage coverage, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgrade</td>
<td>1,650,000</td>
<td>80</td>
<td>65</td>
</tr>
<tr>
<td>Nis</td>
<td>317,000</td>
<td>90</td>
<td>70</td>
</tr>
<tr>
<td>Kragujevac</td>
<td>175,000</td>
<td>85</td>
<td>65</td>
</tr>
<tr>
<td>Kraljeva</td>
<td>115,000</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Smederevo</td>
<td>110,000</td>
<td>98</td>
<td>65</td>
</tr>
<tr>
<td>Sremska Mitrovica</td>
<td>100,000</td>
<td>100 (city); 80 (muni)</td>
<td>80</td>
</tr>
<tr>
<td>Sombro</td>
<td>80,000</td>
<td>100</td>
<td>45</td>
</tr>
<tr>
<td>Sabac</td>
<td>75,000</td>
<td>65</td>
<td>50</td>
</tr>
<tr>
<td>Bujanovac</td>
<td>71,000</td>
<td>65</td>
<td>70</td>
</tr>
<tr>
<td>Pirot</td>
<td>55,000</td>
<td>95</td>
<td>80</td>
</tr>
</tbody>
</table>

* From “Breaking with the Past: Chapter 9.”; **Includes refugees
Approximately 50% of the population is considered "rural" in Serbia. While data varies, around 60 to 95% of the rural population uses private systems, often wells. It is estimated there are about 300,000 private wells but no confirmation of this figure is available. The rest of the rural population receives water through small, uncontrolled water supply systems. About 350,000 residents of Belgrade (mostly on the outskirts) are not connected to municipal water systems and rely on private wells. Drinking water quality is uniformly poor in terms of both bacteriological and physical/chemical standards, with 29% of water supply systems not meeting either (Table A14) (IPH 2001).

Table A14: Percentage of drinking water quality systems in Serbia not meeting water quality standards in 2001

<table>
<thead>
<tr>
<th>REGION</th>
<th>&gt;5% of samples do not meet bacteriological standards</th>
<th>&gt;20% of samples do not meet physical / chemical standards</th>
<th>Do not meet either bacteriological or physical/chemical standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serbia – total</td>
<td>49%</td>
<td>41%</td>
<td>29%</td>
</tr>
<tr>
<td>Central Serbia</td>
<td>41%</td>
<td>31%</td>
<td>17%</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>75%</td>
<td>75%</td>
<td>67%</td>
</tr>
</tbody>
</table>

*Institute of Public Health. Based on drinking water quality reports for 152 water supply systems in the Republic of Serbia, of which 116 are located in Central Serbia and 36 are from Vojvodina.

There are significant regional differences in water quality between Central Serbia and Vojvodina. The primary problems with physical chemical water quality parameters are turbidity, iron, manganese, nitrates and, in the case of Vojvodina, arsenic. Central Serbia’s main problem is bacteriological contamination with greater than 41% of samples not meeting standards. Vojvodina has severe problems with both physical/chemical and bacteriological standards; 67% of water samples do not meet standards. Children in the school setting appear to be particularly at risk since 90 schools in Vojvodina have no water supply facilities, and in 508 schools, the drinking water was found to be bacteriologically unsatisfactory (Mihajlovic-Vukmirovic, et al 2001). Only in Belgrade is the water quality generally adequate with greater than 90% of water samples falling within standards. The investment needs for 2002-07 for improved drinking water supply systems throughout the country have been estimated at US$ 900 million (Table A15).

Table A15: Serbia - Estimate of needed capital funds for water supply development from 2001-05 (five years)

<table>
<thead>
<tr>
<th>Development Activity</th>
<th>Capital Funds Needed (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of regional water supply systems</td>
<td>675</td>
</tr>
<tr>
<td>Multiple purpose reservoirs</td>
<td>225</td>
</tr>
<tr>
<td>TOTAL</td>
<td>900</td>
</tr>
</tbody>
</table>

The Ministry of Agriculture, Forestry and Water Management (MAFW), which is the agency responsible for construction of water supply systems, considers priority areas for investments to be Southern Serbia: ranje, Bujanova, and Presevo; Bor in eastern Serbia (for quantity issues); and Dojevac and Bojnik for quality problems.

Montenegro Water
175. There are 25 municipal water supply systems in Montenegro supplying 213 settlements (40 urban and 173 rural) and approximately 500,000 people. Over 90% of the population receives piped water to their house or yard. There are frequent interruptions in service noted, particularly in the summer. Only two water systems (Pljevlja and Nerceg Novi) utilize water from surface supplies. Almost all drinking water supplies come from groundwater resources, primarily springs (70%) which are of very high quality and deliver 109,403,000 m$^3$/annually (or 3.5 m$^3$/sec). Of this quantity produced, only 48% (1.7 m$^3$/sec) is delivered; 52% is unaccounted for. By system, losses range from 36-80%. Clearly elimination of these enormous water losses should be one of the top priorities in the sector.

176. 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 of water resources by municipal and industrial wastewater discharges. Deterioration of water supply networks and chlorination systems over the past ten years has impacted drinking water quality with 25% of samples in 2000 not meeting bacteriological standards. As in Serbia, the range of unacceptable water varies significantly regionally, with coastal cities generally faring the worst (Table A16).

<table>
<thead>
<tr>
<th>CITIES</th>
<th>Percentage of samples not meeting bacteriological standards</th>
<th>Percentage of samples not meeting chemical standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulcinj</td>
<td>25.0</td>
<td>47.6</td>
</tr>
<tr>
<td>Tivat</td>
<td>5.9</td>
<td>31.8</td>
</tr>
<tr>
<td>Andrijevica</td>
<td>25.0</td>
<td>22.9</td>
</tr>
<tr>
<td>Bar</td>
<td>11.7</td>
<td>21.2</td>
</tr>
<tr>
<td>Pluzine</td>
<td>25.0</td>
<td>20.4</td>
</tr>
<tr>
<td>Kotor</td>
<td>32.7</td>
<td>16.7</td>
</tr>
<tr>
<td>Mojkovac</td>
<td>14.3</td>
<td>16.6</td>
</tr>
<tr>
<td>Kolasin</td>
<td>7.3</td>
<td>15.6</td>
</tr>
<tr>
<td>Budva</td>
<td>1.2</td>
<td>9.5</td>
</tr>
<tr>
<td>Berane</td>
<td>12.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Danilovgrad</td>
<td>8.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Podgorica</td>
<td>11.2</td>
<td>2.8</td>
</tr>
</tbody>
</table>


177. Larger cities, for example Podgorica and Danilovgrad, are more likely to be able to afford disinfection of drinking water supplies, which is reflected in the higher water quality figures, with greater than 97% of samples meeting bacteriological standards. While many cities have seen improvements in their drinking water quality in terms of bacteriological standards since 1997 (Podgorica, Kotor, Berane), others have seen a sharp decline in water quality (Ulcinj, Tivat, Bar). Similarly with chemical standards, several municipalities stand out as having experienced sharp declines in quality since 1997 (Ulcinj, Tivat, Andrijevica). Podgorica has seen an overall improvement in drinking water quality in the past four years.

178. In Montenegro, all water sector infrastructure belongs to the Republic. The Republic delegates its use and responsibility for service provision to the municipalities, each of which
has its own water company. Water management problems are essentially the same as those noted for Serbia. While 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 (i) Aquaregia Public Company, created by merging water companies of Ulcinj, Bar, Budva, Tivat, Kotot, Herceg Novi, and Cetinje 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. Phase I of this program started on January 16, 2001, with financing from KfW and GTZ (approximately US$7.25 million) for technical assistance and urgent investments in rehabilitation and improved operation. Six of the seven coastal municipalities have signed letters of intent to participate in the program according to the concept of public/private ownership.

179. The investment for all town water supply networks and the Montenegrin Seaboard Regional Water Network up until 2020, as well as investment into facilities and works of priority importance for improvement of the current state of the sector and further development, is approximately US$ 175 million. Of this, 52% will be used for ongoing construction of the Montenegrin Seaboard Regional Water Network (approximately US$ 89 million). Around 45% would be allocated for all other town water networks, and 4% for rural water networks (approximately US$ 6.6 million). Investment into priority facilities and works that are needed to improve current water supply systems is approximately US$ 19 million.

FRY Wastewater

180. Most of the FRY population (99.6%) lives in a household with sanitation services of some kind (Table A17). In 1991, 66% of the population lived in a dwelling with either a sewage system or septic tank. By 1996, the figure was 77% and in 2000, 88% (57% linked to a sewage system, 31% to a septic tank) indicating improvements in sanitation coverage in the past 10 years.

Table A17: Percent Coverage to Sanitation Options

<table>
<thead>
<tr>
<th>Territory</th>
<th>Flush to sewage system</th>
<th>Flush to septic tank</th>
<th>Improved pit latrine</th>
<th>Traditional pit latrine</th>
<th>No facilities</th>
<th>Missing/ DK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRY excl. Kosovo</td>
<td>57.2</td>
<td>31.1</td>
<td>0.7</td>
<td>10.5</td>
<td>0.1</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td>Montenegro</td>
<td>60.6</td>
<td>28.2</td>
<td>0.6</td>
<td>8.4</td>
<td>0.7</td>
<td>1.5</td>
<td>100</td>
</tr>
<tr>
<td>Serbia excl. Kosovo</td>
<td>57.0</td>
<td>31.3</td>
<td>0.7</td>
<td>10.7</td>
<td>0.1</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td>Central Serbia</td>
<td>61.7</td>
<td>25.6</td>
<td>0.8</td>
<td>11.6</td>
<td>0.1</td>
<td>0.2</td>
<td>100</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>44.1</td>
<td>47.2</td>
<td>0.3</td>
<td>7.9</td>
<td>0.0</td>
<td>0.5</td>
<td>100</td>
</tr>
<tr>
<td>Belgrade</td>
<td>84.5</td>
<td>12.4</td>
<td>0.2</td>
<td>2.8</td>
<td>0.0</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>Urban</td>
<td>87.5</td>
<td>10.1</td>
<td>0.1</td>
<td>1.9</td>
<td>0.0</td>
<td>0.4</td>
<td>100</td>
</tr>
<tr>
<td>Rural</td>
<td>22.2</td>
<td>55.5</td>
<td>1.3</td>
<td>20.4</td>
<td>0.2</td>
<td>0.3</td>
<td>100</td>
</tr>
</tbody>
</table>

181. The rate of urban/rural sewage system coverage is 88 to 22%. Rural areas rely primarily on septic tanks for sanitation. Many septic tanks have been found to be improperly
designed and situated. Interventions in the rural sanitation sector should focus on assessment and improvements to septic systems, including both infrastructure upgrading and education.

**Serbia Wastewater**

182. Construction of municipal and industrial sewerage systems in Serbia during the past decades has lagged behind that of water supply development. There are distinct regional differences in sanitation coverage with 45% of Vojvodina connected to the public sewerage network versus 67% for Central Serbia (including Belgrade).

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

184. There are 37 central facilities for wastewater treatment in Serbia, of which 7 have mechanical (primary) treatment, and 30 have secondary, or biological treatment. Some of these facilities are over 30 years old (7) and others are not working at all (3). The municipalities of Arandjelovac, Bor, Becej, Vlasotince, Velika Plana, Vrsac, Gornji Milanovia, Dimitrovgrad, Aladovo, Kragujeva, Kikinda, Medvedja, Negotin, Paracin, Pozareva, Sombor, Surdulica, Soko Banja and Ruan have treatment plants. The efficiency of the existing plants for municipal and industrial wastewater treatment is low. **It is estimated that only 13% of the total number of treatment plants operate with satisfactory results.** Belgrade has no wastewater treatment plant. It discharges about 5 m$^3$/sec into the Danube, which has a velocity in the range of 3000 to 5000 m$^3$/sec. Thus the wastewater is diluted relatively quickly. **Overall, about 12% of municipal wastewater is treated in the republic.**

185. The result of inadequately treated wastewater discharges has been pollution of ambient and drinking water supplies. The Republican Institutes of Hydrometeorology conduct routine monitoring of surface inland water and groundwater quality. The Republic Institutes of Public Health monitor drinking water supplies. The most comprehensive ambient water quality data available is that for the Danube River Basin. There are about 160 gauging stations on rivers within the Danube river basin where both flow and water quality are measured on a regular basis. Water quality of the largest international rivers in the Danube watershed as well as water quality of the largest part of FRY national rivers is far from being satisfactory. This is particularly true for river stretches downstream of settlements as the result of untreated municipal and industrial discharges. Since the mid-1990s, water quality in many of the rivers has deteriorated from second class (suitable for bathing and drinking purpose only after treatment) to third class quality (suitable for irrigation and industry only). At the same time, drinking water quality has also deteriorated. The percentage of drinking water samples that do not meet the required standards is at the level of 50% in Serbia and around 15-20% in most Montenegrin cities. Unchecked industrial pollution, untreated wastewater discharges, and transboundary inputs are amongst the causes of deteriorating quality. Surface water quality monitoring has found bacteriological pollution in small rivers and channels where there is municipal and industrial wastewater discharge. The most threatened waterways, where water
quality is outside the bounds of the classification system are the Stari Begij, Lugmoir, Crnica, Lukavic, Veliki Lug, Pristevka Rivers. In the large rivers (the Danube, Save, Tisa and Moravo) increased bacteriological pollution is found downstream from the big cities (Novi Sad, Belgrade) along the river, but due to the great velocity rate, the pollution is relatively rapidly brought down within the allowed limits (State of the Environment 2001).

186. Non point source pollution contributes to more than 50% of total water pollution. These sources deliver 70% of total nitrogen, 50% of total phosphorus, and 90% of fecal and coliform bacteria. Proposed measures to mitigate non-point source pollution have focused on storm water retention, treatment and separation from common sewer systems. Additional measures, which could be taken to reduce non-point source pollution, include regulatory and incentive-based reforms to popularize non-phosphate based detergents and nutrient reduction programs for agricultural areas.

187. The investment costs for 2002-2007 for wastewater are estimated at approximately US$ 470 million (Jaroslva Cerni Design Institute, 2002). The sector has prioritized investments focusing on the sewer system and industrial pre-treatment plants (Table A18).

| Table A18: Investment needs in Serbia for improved wastewater treatment (US$ mn) |
|-------------------------------------------------|-------------|
| Investment                                      | Capital required |
| Construction of sewer systems (common, sanitary & storm) | 140 |
| Construction of industrial pre-treatment plants | 200 |
| Fix existing plants                             | 10 |
| Construction of new wastewater treatment plants in first priority settlements | 29 |
| Construction of 10 new treatment plants for settlements whose discharge is currently endangering water resources planned for water supply | 82 |
| Investments for protection of water supply reservoirs, the Morava and Danube Basin | 9 |
| Preparation of new laws and regulations, and establishment of an emergency clean-up team | 2.5 |
| TOTAL                                          | 472.5 |

188. In 2000, the MAFW financed construction of 33 wastewater related structures, 20 collector systems, 6 central wastewater treatment facilities, and 7 industrial pre-treatment systems for a total cost of approximately US$ 2.5 million.52

Montenegro Wastewater

189. Wastewater management is also considered a key environmental priority in Montenegro. Only 60% of residents 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 margins. The Podgorica wastewater treatment plant was designed for 55,000 people and is now servicing 150,000. This means a large percentage of the wastewater collected is discharged untreated. Outside Podgorica about 55% of the population is connected to sewerage systems.

52 YUD 112,750,000, converted to US$ using average exchange rate for 2000, YUD 44.36 /US$.
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 is fully covered by a sewerage system. The systems are uniformly dilapidated and out of date. In smaller towns and rural settlements, sewerage systems are non-existent. Around 28% of the population uses septic tanks and absorbing wells (wells previously used for drinking water converted to disposal sites) for wastewater disposal. Tanks, which collect wastewater and sludge from septic tanks, dump their contents into rivers or onto the ground.

190. An annual volume of at least 18 million m$^3$ of municipal wastewater is discharged 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 was available. A comprehensive report on the 2000 water quality monitoring program and its results can be found in the project files (MEPP 2001).

191. The Government has been making efforts to deal with wastewater problems. A number of projects, for which the Montenegrin Government provided funds, were developed through the Public Works Agency of the Republic of Montenegro, such as: the Tor – Tratište sewage system, the Zelenika – Kamenari sewage collector line, the Kolašin primary collector, the Žabljak primary collector and the Rožaje primary collector. For future investment needs, the sewerage system of each town was assessed with recommendations made for improvement or construction (Montenegro 2002). Some municipalities (Herceg Novi, Tivat, Kotor, Bar, Budva, Ulcinj, Podgorica, Cetinje, Niksis, Bijelo Polje, Berance, Andrijevic and Rozaje) have developed sewage system rehabilitation, reconstruction, expansion and construction programs. The funds required to implement these programs are estimated at 103 million DM.

Institutions, Legal Basis and Financial Situation

192. The Serbian Law on Waters covers protection of waters, utilization and management of waters, goods of general interest, conditions and methods for performing water-related activities, organization and financing of such activities, and supervision and monitoring for enforcement. The enforcement of the Law refers to surface and groundwater, including drinking water, thermal and mineral waters, border and trans-boundary water flows, and inter-Republic water bodies within the boundaries of the Republic of Serbia.

193. Surface and groundwater monitoring are covered under the Law on Waters, Regulations on Hazardous Substances in Waters, the Official Bulletin of SRS (No. 31/82), Regulations on Methods and Sampling for the Assessment of Wastewater Quality, and the Official Bulletin of SRS (No. 47/83) governing surface and groundwater quality monitoring. Water quality monitoring is conducted by Serbia’s Hydrometeorological Institute, which is responsible for measuring and recording quantities of wastewater discharged, and submitting the data to the relevant public agency. Monitoring also includes tracking the performance of wastewater treatment facilities.

194. The drinking water quality standards used are based on WHO drinking water quality guidelines and the EU directives for drinking water; whichever is more stringent, per standard. Drinking water quality monitoring control is the responsibility of the Institute of Public Health, and is based on several regulations.
195. Wastewater is regulated by the following two documents: (i) Regulations on Hazardous Substances in Waters, (Official Register of the Republic of Serbia, No. 31/82); and (ii) Regulations on Methods and Minimal Number of Wastewater Quality Assessments (Official Register of the Republic of Serbia, No. 47/83, Correction 13/84).

196. The tariff system in FRY is based on the cost-plus scheme with cross subsidies for the population coming from industries. This scheme keeps profit to a minimum for utilities. The economic crisis resulted in substantial reduction in industrial water consumption. The 20/80 revenue ratio (population vs. industry) in 1990 turned into 50/50 in the mid-1990s and fell even further below this level later on. In addition, population poverty and industrial decline reduced collection rates below 50% despite existing low tariffs. Economic decline made cross-subsidies impossible. Currently, the revenues of water utilities do not cover operational costs. Infrastructure is slowly deteriorating from age and lack of maintenance, resulting in increasingly lower quality water and wastewater services. Even though the tariffs were raised in October 2000, they still remain below production costs. In addition electricity costs are only 25 percent of the economic costs and are expected to rise soon. This will make it even more difficult for the water utilities to cover their operation and maintenance costs. In sum, municipal water and sanitation services are in deep financial and technical trouble, preventing utilities from initiating the rehabilitation of works that are urgently needed to diminish the possibility of a collapse of water supply, wastewater, and solid waste services.
Box A9. IFI and donor activities in FRY’s water sector

- EBRD and Serbia concluded negotiations in November 2001 for 240 million Euros in loans for infrastructure repairs and to support domestic export programs. Financial support will go to Belgrade, Novi Sad and Nis to upgrade water supply systems. In January 2002, EBRD announced a 6 million Euro loan to Nis to develop the city’s sewage system over the 2002 to 2004 period.

- USAID is financing a $200 million, five year, community development project in Serbia, which includes financing of small town and rural area water supply and sanitation services.

- The German government is financing to rehabilitate the Belgrade and Nis wastewater supply systems (5.1 million Euros) and to revitalize water supply, municipal heating and wastewater systems, and develop small and medium enterprises in other cities (37.3 million Euros). In 2000-2001, Germany invested 65 million Euros to develop the economic, social and management sectors of water supply, wastewater and district heating systems.

- The French government provided approximately US$ 250,000 in grants in 2001 for the construction of drinking water treatment plants and the local water supply grid in the village of Ivanovo. In 2002, an approximately US$ 165,000 grant will finance small, rural water supply systems in Ruma, Vrnjakc, Banja, and Lipovica.

The International Committee of the Red Cross, Oxfam, and Medecins San Frontieres have completed about 60 small water supply and sanitation projects since 2000. UNICEF and WHO have provided local water supplies and support for water quality monitoring, respectively. WHO has assisted public health institutes in monitoring and investigating water-related diseases and water borne disease outbreaks. Oxfam has worked with vulnerable groups including rural people in the most remote locations where people rely on contaminated wells for drinking water supplies. Oxfam completed about 40 individual projects to improve water supply systems, including the installation of pumps and pipelines, rehabilitation of 150 wells, and provision of chlorine. Water supply systems to schools and kindergartens were also repaired.

197. In the past two years, IFIs and donors have initiated projects in the water supply and wastewater sector, in large and medium-sized cities and rural areas (Box A9).

198. The FRY has a long history of experience with World Bank operations in the water sector. Before 1992, the Bank had several water projects in Serbia/Montenegro, the most notable of which was the Yugoslavia - Morava Region Development Project: Water Supply, Sewerage and Water Resource (1976). The Montenegro Water/Coastal Management Project was also under preparation in the early 1990s, but was halted due to the barring of FRY from Bank operations in 1993. In 2001 the Bank approved the “Coastal Emergency Municipal Environmental Infrastructure Project (P074618), a $2 million grant for improvements in water supply, wastewater and solid waste management in Montenegro’s coastal region and the Zeta valley. The Project will also provide a small amount of financing for technical assistance for the assessment of medium size water utilities and water rural systems in FRY.
ANNEX 7. WASTE MANAGEMENT

Serbia

199. Table A19 provides an overview of solid waste management practices in FRY. In the past year significant sector work has been done in Serbia on solid waste management. Most notably, a comprehensive report on the sector, financed by the Japan Special Fund, has just been completed (April 2002). The “Waste Management Strategic Policy Framework”, which can be found at www.recyu.org/eng/projects/Aamaspo, is the source of the following information and provides detailed information on the sector. In addition the Ministry of Environmental Protection (MEP) commissioned studies on medical waste in Belgrade (Ilic, 2001), an inventory and assessment of landfills in Serbia (Ilic, 2000), and a register of hazardous materials (MEP 2002). These studies are the basis for the following information and should be referred to for details on the sector, including legal, institutional, and policy issues, economic instruments, and recommendations for future action.

Table A19: Serbia: Percentage of households using different solid waste disposal methods

<table>
<thead>
<tr>
<th>Territory</th>
<th>Taken away by public utility</th>
<th>Disposed of at a public dump</th>
<th>Left at an illegal dump</th>
<th>Burned</th>
<th>Buried</th>
<th>Dumped near the house</th>
<th>Thrown at the river</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRY excl. Kosovo</td>
<td>54.7</td>
<td>25.3</td>
<td>6.4</td>
<td>6.3</td>
<td>0.3</td>
<td>5.4</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Montenegro</td>
<td>41.7</td>
<td>38.1</td>
<td>6.2</td>
<td>4.9</td>
<td>0.1</td>
<td>0.9</td>
<td>5.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Serbia excl. Kosovo</td>
<td>55.6</td>
<td>24.4</td>
<td>6.4</td>
<td>6.4</td>
<td>0.3</td>
<td>5.7</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Central Serbia</td>
<td>49.7</td>
<td>25.4</td>
<td>8.2</td>
<td>8.2</td>
<td>0.3</td>
<td>6.8</td>
<td>1.1</td>
<td>0.3</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>70.4</td>
<td>22.1</td>
<td>1.9</td>
<td>1.9</td>
<td>0.2</td>
<td>3.0</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Urban</td>
<td>79.6</td>
<td>18.3</td>
<td>0.5</td>
<td>0.3</td>
<td>0.0</td>
<td>0.9</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>Rural</td>
<td>21.9</td>
<td>34.4</td>
<td>14.2</td>
<td>14.3</td>
<td>0.6</td>
<td>11.3</td>
<td>0.7</td>
<td>0.7</td>
</tr>
</tbody>
</table>

200. It is estimated that about 50% of solid waste is collected in Serbia. Of the waste collected, about 63% is from households and 20% from industry. Of industrial waste, most is from the processing industries, primarily the food (33%) and chemical (20%) industries. Waste is not collected in rural regions. Rural communities either burn their waste or dispose of it in official or unofficial landfills themselves. About 3.5 million m³ of municipal waste is collected annually in Serbia. The amount of generated waste per person per day is about 0.65-0.85 kg, which is slightly less than other Central and Eastern Europe countries (1 kg/person/day). In Serbia’s 168 municipalities, there are 170 official landfills. There are hundreds of illegal landfills of varying sizes. The city of Belgrade includes 16 municipalities and 6 disposal sites. Eleven municipalities dispose of waste at the biggest landfill in Serbia, Vinca (1000 – 1200 tons/day), while 5 others have their own sites. Except for Belgrade, it is rare that two municipalities share the same landfill.

201. Solid waste collection and disposal is the responsibility of local public utility companies which face many problems, the main ones being: collection problems; excessive number of landfills; inadequate vehicle supply; unresolved issues connected with hazardous
waste; lack of appropriate equipment at landfills; improper disposal of materials, (medical and slaughterhouse waste); and lack of recycling programs.

202. Hazardous waste management is a significant problem in Serbia. About 260,000 tons of hazardous waste is generated per year. Of the hazardous waste produced, 9,600 tons of bio-hazardous waste are produced annually with about 50% coming from hospitals. Health care facilities typically do not segregate these types of wastes streams although there are exceptions where hospitals on their own initiative have developed low cost, appropriate waste management systems for themselves. Used needles, syringes, dressing, etc. are mixed with originally communal waste. These materials are placed in plastic bags and disposed of as regular waste.

203. There is no permanent storage facility for hazardous wastes and no hazardous waste landfill so enterprises resort to either storing the material on site, or illegally dumping it in municipal landfills. Lack of proper regulation for hazardous waste transportation frequently leads to accidents threatening public health. Recently (2002), Serbia and UNEP agreed on exporting hazardous waste from the Prva Iskra-Namenska factory in Barac to a country with technology for hazardous waste disposal. Negotiations on a country targeted for waste export are still under way. This is a part of the UNEP program for cleaning up “hotspots” of Kragujeva, Pancevo, Novi Sad and Bor. Currently, the Serbian Ministry of Natural Resources and Environmental Protection considers as high priority establishing a properly managed central landfill for hazardous waste site and putting in place modern regulations concerning hazardous waste transportation.

Montenegro

204. In Montenegro, 42% of solid waste is collected. There are about 20 registered landfills for municipal solid waste but none are properly constructed or operated. The amount of waste disposed of at the registered dumps is approximately 35,000 m$^3$/month. The largest landfills are those in Podgorica and Niksic. The Podgorica landfill receives 8-9,000 m$^3$/month of waste from Podgorica and Danilovgrad, and the Niksic landfill about 7,000 m$^3$/month. Other large landfills are those serving Herceg Novi, Tivat and Budva. None of the landfills meet sanitary standards: most do not have tarmac access roads; there is no running water; no electricity; no fences; and no guard service. Waste is mainly treated by burning and covering with a layer of soil. None of the landfills are designed with controls for gas emission or leachate collection. The per capita waste generation rate in Montenegro is estimated at 1kg/person/day.

205. Solid waste management has not been analyzed in Montenegro so there is limited information about the sector, particularly in comparison with Serbia. Montenegro is also lacking a national solid waste management strategy. It is known that there are a number of industries which use or produce hazardous substances and which have inadequate treatment/disposal practices. These include: the Aluminum Kombinat (red silt, cathode carbon waste, mineral oils, polychlorinated biphenyls, dissolvers); the Niksic Ironworks (dross, mineral oils, fats); a detergent factory, Rivijera, in Kotor (fats and fatty acids), the Pljevlja thermal power station (ash dump, the Potrlica coal mine); the Kristal factory in Rozaje (glass processing waste); the Polimak tannery in Berane (cyanides, chromium, cadmium, arsenic); and the Obod factory in Cetinje (heavy metals, polychlorinated biphenyl, polymeric substances, oil and grease).
206. Organizationally, each municipality, through its public cleansing enterprise, is responsible for the collection and disposal of its solid waste. Each of these enterprises is organized to provide collection and disposal services according to guidelines set by the republic government. Beyond this, there is no regulation on solid waste management, including waste disposal, from the federal or republican levels of government.

207. Montenegro is taking steps to address solid waste management issues. In December 2001, the Public Utility Company in Podgorica proposed an average 53% increase in the tariff for garbage collection for ten types of users, which will serve to ensure that the sector is financially self-sustaining. This signals a real interest in improving sector performance. Podgorica is further supporting innovative ideas in solid waste management while endeavoring to improve the livelihoods of the local Roma population. Podgorica is working with local NGOs to employ Romas, already informally scavenging at the Podgorica landfill, for recycling activities. The city pays salaries and the NGOs provide equipment and a facility. Despite these encouraging signals, development of the solid waste sector in Montenegro will continue to be fragmented as long as there is no strategic solid waste management plan.

**Institutional and Regulatory Framework**

208. Generally, the institutional system in the solid waste sector is characterized by an unclear division of responsibilities between the federal, republics and local levels of government, and low enforcement of national and international agreements in that area. The services in the sector suffer from similar problems as those of the water companies. Each municipality is allowed to size and operate its disposal systems as it wishes. There is no organizational emphasis on long range planning or rationalization of operations. Revenues available for each public waste management enterprise are obtained from three sources: (i) municipal waste management service fees; (ii) general revenues in communal funds; and (iii) direct user charges based on household surface area.

209. In Serbia there are numerous laws and regulations regarding solid waste management. The starting point is the Law on Environmental Protection (“Official Register of the Republic of Serbia” no. 66/91, 83/92, 53/93, 67/93, 48/94, 53/95), which establishes the framework for solid and hazardous waste management. The new Law on Environmental Protection is under preparation. A special Law on Waste Handling (“Official Register of the Republic of Serbia” no. 25/96) discusses wastes that can be used as secondary raw materials. An institutional framework has also been established by setting up the Recycling Agency, but most of the by-laws (see Annex x) for enforcing the law have not been enacted.

210. Economic instruments for waste management are lacking in FRY. There is no special tax on land used for waste disposal. Collection and disposal of communal waste is paid for by user fees. New fees were established in February 2002, with household fees varying from 0.0067 EUR/m$^2$ to 0.020 EUR/m$^2$ (less that 1% of household expenditures per month). Fees are collected once, monthly. Collection rates vary from one municipality to another, ranging from 15-70%. The collection rate for businesses is similar. Fines for violating waste laws exist but are not high enough to ensure compliance with the law. The fines do not even cover the cost of enforcement. Packaging deposit refunds for glass containers exist. Serbia’s new solid waste strategy proposes several new economic instruments. Priority actions include:
increasing fines; improving the system of fines; further developing the packaging refund system; establishing a system of extended manufacturer liability; and restructuring public utility companies. In the longer term (2007-2015), the strategy proposes the introduction of a transferable license system for hazardous waste management and the privatization of solid waste management systems. An important component of any strategy would exploit economies of scale and this is best done taking a regional approach, which promotes fewer landfills, that serve a wider region and that can be better monitored and controlled. (See Box A10).

Box A10: A regional approach to solid waste management in Bosnia and Herzegovina

The World Bank has recently approved a credit in the amount of $14.3 million for improving solid waste management for several localities (Tuzla, Banja Luka and Mostar) in Bosnia and Herzegovina (BiH). The main idea of the project is to consolidate waste disposal on a few regional landfills instead of a large number of smaller-scale waste disposal sites.

Past practice of waste management in the country was to create a waste landfill for each locality. However, municipalities with limited financial capacities were not in a position to build and maintain waste disposal sites at levels dictated by technical, environmental and sanitary requirements. As an alternative, the project will create regional landfills that can serve several municipalities. It was clear that formation of such landfills through cooperation between different numerous municipalities for BiH is necessary in order to afford improved sanitary landfill standards. The approach takes advantage of economies of scale: The cost of maintaining a regional landfill is lower than the sum of the costs of maintaining individual smaller landfills at the same standards. It was estimated that landfills are affordable and allow cost-recovery only when daily waste input rate is in excess of 200-300 tons per day. Lower costs are likely to induce more budget-constrained municipalities to invest in upgrading solid waste management which is a acute problem in BiH and in the Balkans, in general.

References

2. City Institute for Public Health “initial basis for carrying out a study about managing medical waste in the Belgrade area”, August 1995
5. Ilic, M.: "Assessment and categorization of dump sites in Serbia according to EU standards", Ministry of Environmental Protection of Serbia, 2000, Belgrade
11 Ministry of Spatial Development Republic of Montenegro, “Information on the state and possibility of investment into rehabilitation and construction of sewage systems in the Republic”, Podgorica, 2000
15. UNEP “Clean-up of Environmental Hotspots Progress Report” January 2002
17. UNICEF. “Multiple Indicator Cluster Survey II: FRY”, 2000
22. ?? National Report on Follow-up to the World Summit for Children: The FRY. February 2001
ANNEX 8. COASTAL ZONE MANAGEMENT IN MONTENEGRO

Trends and Main Environmental Concerns

211. Montenegro is blessed with one of the most scenic coastlines in the world and certainly in the Mediterranean – with rugged mountains plunging down to a transparent sea, adorned with occasional medieval towns and sandy beaches. The spectacular, almost enclosed Kotor Bay epitomizes these features. Due to the relative isolation of the Montenegrin coast and strict land use planning during the socialist period, its environmental values are still largely intact, though increasingly threatened by market pressures for illegal construction and further tourism development and suffering from already overburdened municipal services, like water supply, wastewater and solid waste collection and disposal.

212. Though it has not yet formally articulated a Coastal Zone Management (CZM) policy, Montenegro is heading in this direction through its policies on environment, land use planning and tourism. Though many definitions of CZM are possible, this report will use the following: Coastal Zone Management is a set of policies, procedures and institutional structures which facilitates the sustainable economic development of the coastal zone, while at the same time preserving essential environmental values. For this purpose, the coastal zone may be defined as that area which depends for its economic well being on coastal resources, such as beach tourism and ports. For Montenegro, it is typically a strip 20 to 50 km wide.

213. Montenegro is heir to the Yugoslav tradition of a strong emphasis on physical planning to guide the spatial aspects of development in all sectors. The existing Physical Plan for Montenegro (PPM) dates from the socialist period and is now considerably outdated. Work has started on a new PPM, which will stress the importance of agriculture and tourism. When drafted, it will be subject to public comment and final approval by Parliament. There will be a hierarchy of plans beneath the PPM: regional plans (for example, for the coastal zone, for national parks, and for other areas of public interest); obstina plans; and town plans (zoning maps). The planners recognize that enforcing adherence to a PPM is complicated in a democratic, market-oriented society, and even more so during the period of transition. “Planning” has developed a bad name. Business interests want to make investment location decisions based on access to raw materials and markets, rather than the areas reserved for them in the PPM. The tourism industry would like to build facilities in the most scenic and pristine areas of the coast. Even public sector project planners are more likely to disregard physical planning decisions of the previous regime.

214. Finally, citizens with resources now feel free to build where they want, especially along the coast. Although no accurate figures are available, estimates are that 30,000 housing units (the number of buildings would be less) have been built illegally in the coastal zone over the last 10 years. Not known is the proportion of these houses built in areas with the appropriate zoning but without payment of the necessary fees and taxes, and the number improperly sited and which may be causing harm to the environment. Addressing this problem will require first a reliable census of such structures.

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53 A prime example is the development of part of a highly scenic island opposite Budva.
215. Apart from the port of Bar and its associated infrastructure, tourism is the dominant industry in the coastal zone and its importance is likely to grow steadily in the future. Although some traditional agriculture and grazing persists, the steep, rocky, semi-arid slopes offer little comparative advantage and it may be expected that such farming will continue to decline into insignificance with the growth of market forces. The tourism industry receives strong government support, through the Ministry of Tourism, which undertakes considerable planning, both physical and economic. The goal for 2020 is 22 million visitor-nights, or four times the current level. However, only 20% of visitors are foreign (mostly from other Eastern European countries) and only 20% of beds are in hotels – a legacy both of the previous political and present economic difficulties in the region and the former Yugoslav strategy of targeting low-income tourists. This will gradually change, as fully built areas such as Kotor Bay are re-developed for high income tourism and new resorts are built in the south, such as the proposed 35,000 bed development at Velika Ulcinj. The Ministry of Tourism gives considerable stress to environmental protection and appears ready to balance commercial gain with the need to preserve the very scenic coastal environment.

216. Policies, Strategies and Plans. Montenegro has an enviable heritage of such planning documents, and updates are underway in the environmental, physical planning, and tourism areas. It will be important that these plans are consistent and mutually reinforcing and that the government has the tools to ensure that developers follow them. To achieve this, preparation of a Coastal Zone Management Policy, to integrate these sectoral plans, is needed. Coordinated planning for infrastructure (roads, airports and so on) and municipal services (including creative thinking on how to pay for such services) will also be needed to realize the desired pattern of development.

217. Institutional Coordination. Improved sharing of information and coordination of actions is needed, both horizontally (between national Ministries and agencies) and vertically (between the national, obstina and town levels). This can be achieved by reviewing and revising procedures for planning and permitting of development, to allow wider consultation, and expanding the role of public participation in decision-making. Training of staff in all concerned agencies will be another basic step. The potential for Coastal Zone Management Committees at the national and obstina levels could be explored, as well as the appointment of CZM Focal Points in each local government body. The role of the existing Coastal Zone Management Agency (a public enterprise under the Ministry of Marine Affairs) could be expanded beyond its present functions, which relate mainly to leasing of beach space, to become the main body responsible for concrete actions under a broader CZM program, taking advantage of its skilled staff and knowledge base. Specific institutional arrangements for counteracting illegal construction may be called for, as well as legal instruments.

218. Public Awareness. As in other areas of environmental protection, sustained action to establish a CZM system will not happen unless it is demanded by a concerned and well informed public. Thus, urgent attention should be given to a publicity program to inform the public about the state of the coastal environment, threats facing it, and the steps needed to ensure environmentally sustainable development of the coastal zone. In addition to programs targeted towards the general public, through the mass media, special programs for legislators and for schools may be needed.
ANNEX 9. FORESTRY

Forest Resources

219. Forest ecosystems cover about 2.86 million hectares (Table A20). The forest cover of Montenegro with 39% is considerably higher than in Serbia, where only 27% of the land is covered with forests. The per capita area under forests in FRY is 0.31 ha. In Montenegro (0.93 ha) it is nearly four times greater than in Serbia (0.25 ha).

Table A20: Forest cover in Serbia & Montenegro

<table>
<thead>
<tr>
<th></th>
<th>Total (000 ha)</th>
<th>Forests area (1000 ha)</th>
<th>(%)</th>
<th>per inhabitant (ha)</th>
<th>Forest density (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montenegro</td>
<td>1,381</td>
<td>543</td>
<td>23.5</td>
<td>0.93</td>
<td>39.3</td>
</tr>
<tr>
<td>Serbia</td>
<td>8,836</td>
<td>2,313</td>
<td>76.5</td>
<td>0.25</td>
<td>26.2</td>
</tr>
<tr>
<td>Central</td>
<td>5,597</td>
<td>1,781</td>
<td>58.9</td>
<td>0.31</td>
<td>31.8</td>
</tr>
<tr>
<td>Vojvodina</td>
<td>2,151</td>
<td>103</td>
<td>3.4</td>
<td>0.05</td>
<td>4.8</td>
</tr>
<tr>
<td>Kosovo</td>
<td>1,089</td>
<td>429</td>
<td>14.2</td>
<td>0.27</td>
<td>39.4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>10,217</strong></td>
<td><strong>2,856</strong></td>
<td><strong>100.0</strong></td>
<td>0.31</td>
<td><strong>28.0</strong></td>
</tr>
</tbody>
</table>


220. Of all forest types the broadleaved types are dominant with about 87%, while the share of the predominantly coniferous types is 7%. These latter forests are mainly concentrated in the Mediterranean region. The remaining 6% are mixed forest types. In the Serbian forests, beech is most common species (37% of forest area), followed by oak (35%), other deciduous species (20%) and coniferous ones (8%, among which the pines prevails). In Montenegro, the share of coniferous species in the total forest area is 25% (spruce is most comment) and that of deciduous species, 75% (beech 32%, oak 15% and others 28%). In the forests of Serbia, beech is best represented (37% of forest area), followed by oak (35%), other deciduous species (20%) and coniferous ones (8%, among which the pines prevails).

221. The standing volume is about 307 million m³ (Serbia about 235 million m³; Montenegro about 72 million. m³). The average standing volume is 107.4 m³/ha (Serbia 101.6 m³/ha; Montenegro 132 m³/ha). The average annual increment is 2.70 m³/ha (Serbia 2.70 m³/ha; Montenegro 2.60 m³/ha) and total annual increment 7.62 million m³ (Serbia 6.18 million m³; Montenegro 1.44 million m³).

222. The quality and extension of forests has declined widely during the past decade due to a combination of different factors. Especially during the UN sanctions (1992-2000) intensified timber cutting for domestic consumption (heating, construction etc.) led to poor stand conditions in accessible areas. Although statistics suggest that the estimated annual increment of the growing stock (2.7 m³/ha) exceeds the annual cut (1.2 m³/ha) by more than 100%, this does not necessarily imply a sustainable management on all forest sites. The fact is that due to a relatively low forest road density (about 5 meters/ha) over-harvesting took place in accessible areas takes, while in other areas harvesting is being done with very low intensity. These inaccessible areas have been more prone to forest fires and insect infestations as a result of
relatively frequent draught occurrence during the past decade. In addition the reduced funding for the “public” functions of forests due to growing economic difficulties during the 1990s has led to deficiencies in the forest monitoring and control. The latter is also one of the reasons for the increase of illegal logging activities over the last years. Furthermore air pollution – although declining – is still a cause of deterioration of forests. Finally, despite the absence of hard statistical data, illegal wood cutting is regarded as a significant problem, especially in protected areas.

223. A similar situation exists for Montenegro. Sustainable management on these small and highly fragmented forests is even more obstinate, as the forest owners are rarely organized. It is very difficult to provide effective extension services and training for the owners to enable them to manage their forests in a way that is sustainable and helps improve their livelihoods and economic base, while also protecting the environment.

Forest Management

224. More than half of the forests (58.5%) in FRY are owned publicly. Public ownership accounts for 56% in Serbia, while in Montenegro this figure exceeds 75%. there are about 500,000 private forest owners in Serbia holding some 5 million parcels in 7,500 registered municipalities. The average size of a private forest is about 0.5 ha and can often be as small as 0.2-0.3 ha. Due to their small size and low productivity, owners cannot afford to pay for professional management of their forests. The timber produced is used mainly for fuel-wood.

225. There is no forest policy approved at the Federal or the republic level. One group of national forestry experts recommend the following items to be included in a National Forest Policy:54

- Precise definition and structuring of the objectives of forest policy at the federal level (Federal Forest Law), in keeping with the principles of viable development, ecological and economic needs and bio-technical and economic peculiarities of the forest sector;
- Financial support to the development of the forest sector (mainly from sources outside the sector);
- Increase of the forest road network density;
- Creation of conditions for dealing with the issue of forest ownership;
- Creation of conditions for starting up a selective process of privatization in the forest production segment;
- Settlement of the issue of control over and management of the private sector forests (establishment of a network of test estates and monitoring of their performance, establishment of the associations of owners of private forests, etc.);
- Insistence on the development of the concept of viable eco-agri-forestry; and
- Strengthening of the material basis for science research in the forest sector, including the acquisition of equipment necessary for monitoring changes in the forest ecosystems, and the development of information system.

54 Yugoslav Survey – A Record of Facts and Information, Vol. XLI No. 3, 2000
226. The management of the state owned forests outside protected areas in FRY is responsibility of the Republics of Serbia and Montenegro within their respective territories. Until recently the management structure was similar in both republics. In order to separate administrative and control from economic functions, public enterprises for forest management were established (Srbija Šume and Crna Gora Šume) in 1991. Tasks of the Šumes include commercial, protection and recreational services, these include forest management (preparation of management plans, harvesting, regeneration, etc.), marketing of forest products, maintenance of infrastructure for commercial and recreational use as well as game management. Public enterprises are also entrusted under the forest law with the performance of professional and technical operations and advisory services in private forests.

227. The organization is set up at three levels – head office, forest districts and forest management units. The Ministry for Agriculture, Forestry and Water Resources with its Department for Forestry and Hunting is responsible for Monitoring and Supervision and therefore for the Forest Inspection Service. As is common in most states of ex-Yugoslavia, forest operations were initially mainly managed under the responsibility of the public forest enterprises. However, outsourcing/privatization of these activities (harvesting, wood transport etc.) has been taking place over the last few years. In Serbia 20% of the logging is carried out by Srbija Sume, 60% is contracted out for delivery at the road side and 20% of harvesting operations are sold through open auctions of standing timber. In Montenegro the privatization is at a even more advanced stage with the implementation of a new Forest Law (see below).

228. The above-described organization – still valid for Serbia - was changed in Montenegro with the adoption of a new forest law passed 2000. As of January 1, 2002, Crna Gora Šume was divided into a Directorate as state institution responsible for planning, protection, silviculture and inspection, and 14 private (shareholder) companies for forest exploitation. Also starting in 2002, forest harvesting is done on a concession-based contract for the period of one year. Basis for the concessions are annual operational plans derived from 10-year management plans. The first concessions were awarded at the end of February 2002. Although the system seems to be very progressive in terms of privatizing the economic functions, it has to prove whether it can ensure sustainable forest management in the long run. The concessionaire will not have an incentive to invest in the forest (e.g. infrastructure) or care for the remaining stand, since his interest in the forest is only limited for one year. The success of such a system will depend mainly on the strengthening of the forest inspection service. The service needs to have a clear mandate to supervise and control the compliance with the law and to impose performance bonds and sanctions in case a concessionaire fails the obligations defined in the contract.

229. The current Serbian forest law has no provisions on how the state should be recompensated by Srbija Sume for the use of the Serbian state owned forests. The only obligation Srbija Sume has is a flat 3% tax on its sales to the Ministry of Finance. This requirement applies to all forest users. Three percent of the total collected from all public funds (water, forests, roads, raw minerals, agricultural lands, and other natural resources) is then earmarked for forest operations (afforestation, silviculture, etc). In 2001 revenues from timber sales totaled US$1.01 million while the amount earmarked for forest related operations from the consolidated revenues of public funds was US$1.28. The current across-the-board practice means that much of the forest exploitation related rent is not captured by the government. In addition to the 3% there should be a differentiated tax schedule introduced to eliminate these
distortions. Those changes are necessary in order to assist the government to capture the real rents from forest exploitation and eliminate the de facto subsidy that is encouraging inefficient management of state forests.

230. While forest and land restitution is not identified as an urgent issue officially, as in other parts of Eastern Europe ideas to “de-nationalize” forests are being discussed in Serbia and Montenegro. Taking into account that the restitution process usually leads a significantly reduced average size of forest compartments (management units) as the most immediate consequence of the restitution process and subsequently to an increase in the economic and ecological risks. This effect is felt even more strongly, as forest management units over the past 50 years reflected both in size and shape the requirements of large-scale forest management, carried out by state agencies. Fifty years – roughly half an average rotation cycle, depending on the tree species – have in most cases been enough to determine lasting the spatial distribution of stand types, age-classes, and similar silvicultural parameters. Breaking this structure up into very small, individually managed allotments, might very well increase economic risks like windfall, wildfires, and the like. However, the intensity of fragmentation in Eastern and South-Eastern European Countries – probably the most familiar, and visible structural disadvantage of private forest ownership – varies greatly.

Forest Utilization, Wood Processing Industry, Marketing, Taxes and Pricing

Timber harvesting

231. The annual volume of timber felled for commercial purposes is 4 million cubic meters, of which 2.5 million m$^3$ is extracted from the State forests and the remainder from private forests. There are no accurate records of timber coming out of private forests. Of the annual harvested timber, about 13% of volume is coniferous (spruce (6%), pines (4%) and fir (2.5%)), and 87% broadleaf timber, of which beech (44%) has highest share, followed by oak with 21%. Of the annual timber harvest 39% of the volume is industrial and technical roundwood (saw logs, veneer logs, pulpwood), fuelwood account for 49% of the total annual timber harvest. The remaining volume is identified as waste.

232. Tractors and skidders carry out extraction to roadside of industrial timber, and draught animals (horses and oxen). The use of the cable system that reduces the impact of logging in mountainous areas is not very common.

233. In general, productivity of harvesting operations is low: average extraction and terrain transport distances are long as a result of an inadequate road network (road density averages about 5 meters/ha). Many areas with inadequate access have been severely affected by drought and in many cases are dying out (this is especially the case for young plantations). Machinery used and working practices are inefficient in many cases. Due to the lack of investments in the

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55 See “Restitution and Certification in ECA - Implications for land restitution for achieving World Bank/WWF Alliance targets in the ECA Region”, INDUFOR/ECO-Consult, 2001

56 In this context an interesting proposal is being discussed in Montenegro. Aware of the possible risks it is proposed to only restitute the revenues of the forest through a joint stock company in which the forest owner and the state are shareholders. The state remains in charge of the management, while the forest owner has a right to receive a dividend.
sector, the existing equipment is old and worn out. Harvesting volumes per hectare are low. The state intends to privatize in the long term.

**Non-timber Forest Products and Hunting**

234. Non-wood products of the forests are important both in terms of traditional cultural values and as income sources. These products include snails, frogs, herbs and spices, mushrooms, wild fruits, game meat, and Christmas trees planted in forest openings and firebreaks. Harvesting for commercial use of these NTFPs is organized through a permit system and monitored in Serbia by the independent Institute for the Protection of Nature, while in Montenegro Institute for Nature Protection is the responsible entity.

235. In FRY, hunting is understood as the production, rearing, protection and rational use of game. Game animals and birds make up the basis of the hunting industry, as a natural resource. Europe. Hunting areas are divided in hunting districts. In Serbia, there are eight hunting districts in Vojvodina, three in Central Serbia and three in Kosovo, and there are four in Montenegro. These districts include 347 hunting grounds, of which 321 are in Serbia and 26 in Montenegro. In Serbia, 227 hunting grounds are managed by hunters’ societies totalling about 7,909,000 ha in area and the remaining 94, totalling 925,000 ha in area, are managed by public enterprises, stock companies, agribusinesses, the Yugoslav army, and the Faculty of Forestry. In Serbia, there 18 fenced-in hunting grounds in which red deer, fallow deer, wild boar and mouflon are reared. A project of introducing deer in the hilly and mountainous hunting grounds of central and southern Serbia is under way.

236. The rearing and survival of game species is threatened by poaching, as a reaction to which protective regulations have been instituted. Official statistics indicate that the most valuable game species are being shot in highly decreasing numbers (red deer from 1,265 shootings in 1988 to 644 in 1997, roe deer from 9,253 to 3,667, wild boar from 4,109 to 2,642, pheasant from approximately 325,000 to 125,000). This decrease results from poaching, which in turn results from the socio-economic conditions and shortage of funds towards replenishing the population of the reared game species. Under the game laws, all species of wild mammals and birds are divided into three groups: those permanently protected (permanent prohibition of hunting), those protected on the basis of closed season (hunting prohibited in certain periods) and those enjoying no protection (game exempt from protection). Hunting tourists (foreign and domestic) may shoot game by arrangement with enterprises or agencies duly authorised and court-registered for the provision of tourist services and having contracts with the hunting-ground management. The shot game and parts thereof (trophy, meat) are payable for according to the market price lists set by the hunting-ground management for each hunting season.

**Wood Processing Industries and Marketing of Products**

237. Compared with other sectors, the woodworking industry in FRY has a number of comparative advantages, among which the one relating to raw material sources, on which its output is based stands out. However, the industry can be characterized as highly fractured. There are 3,970 wood processors, 43% of these companies are working in primary wood processing (sawmills) mainly operating in Serbia (79%), the rest are panel, veneer, particle and cellulose mills (of which over 90% are located in Serbia).
238. Of the total number of wood industry enterprises, 95% are private, 4% are cooperatives or 3.2% (122 in Serbia and 5 in Montenegro), the rest are in communal, state or mixed ownership. 12,800 people (% of the entire workforce). The wood processing industry as a whole employs currently about 37,100 people (4.9% of the entire industrial workforce). Most of the private enterprises are in the category of small enterprises with less than 50 employees.

239. The industry is characterized by the production of large number of different products: sawnwood, veneer, wood based boards, (plywood, particle board, fiber board), parquet, furniture, carpentry and wooden houses. The production capacity of the sector is said to be 3 – 5 times the log production capacity of the State and private forests. Sawmills utilize about 2 million m$^3$ of logs. Pulp mills are reported to be operating at 50% capacity. Panel and pulp mills utilize 1.5 million m$^3$ of round wood annually. Private sawmills use circular saws.

240. The woodworking industry in Serbia & Montenegro is an export-oriented branch. In 2000, its exports totaled about US$102 million or 6.1% of the total national exports. About US$60 million was accounted for by sawn timber and about US$42 million by finished products.$^{57}$ Prices of exported roundwood achieved US$92/m$^3$, while the price for a cubic meter of sawn hardwood (Beech & Oak) reached prices between US$200 and US$240 in 2000. In terms of output and exports in sawn hardwood, the country is ninth and sixth in Europe respectively. However, softwood sawn timber (mainly from conifers) is a rare product, since the output cannot meet the demand. Because of the high demand in the production finished wooden products and building construction and its low output, a large quantity of this timber has to be imported.

241. FRY is dependent on export markets to further develop its forest and wood industries. In this context the impact of FRY’s absence from the European and international markets over the last decade should not been underestimated. With the appearance of forest certification in the mid 1990s and the subsequent growth in demand from buyers and users for certified forest products, the ability to supply independently certified timber increases the chances to become an important trade partner to environmentally sensible markets in Western Europe. In this respect FRY has still some way to go, but it is encouraging that the need for an establishment of a National Working Group (NWG) for the development of standards for sustainable forest management and certification is currently under discussion within different stakeholder groups in Serbia and Montenegro.

References

1. The Regional Environmental Center (Country Office Yugoslavia), Strategic Environmental Analysis of FR Yugoslavia, pg. 15-16, Belgrade, 2001
2. Yugoslav Survey, Forests and Forestry, No. 3 2001
5. Jovic, D. and Stanisic, M., Data collection on forest management in Serbia, 2002

$^{57}$ http://www.yusurvey.co.yu/3_2001/ - _ftn2
6. Prokic, S., Management of Protected Areas in the Republic of Serbia, 2002
7. Prokic, S., Conservation and Promotion of Biological Diversity of Forest Ecosystems, 2002
ANNEX 10: BIODIVERSITY AND PROTECTED AREA MANAGEMENT

Characteristics of Biodiversity in FRY

242. Yugoslavia hosts a large variety of ecosystems ranging from Mediterranean-Sub-Mediterranean evergreen forests, various deciduous forests, and coniferous woods typical of the Euro-Siberian and North American regions, to freshwater bodies and marine ecosystems on the Adriatic. This makes FRY one of the six European centers of biological diversity, and is home to 39% of Europe's vascular plant species, 74% of its bird fauna, and 68% of its mammalian fauna [5]. The flora and fauna of Yugoslavia is characterized by a great diversity of species including more than 8,000 plant species, 15,500 animal species, 550 species of fungi, and about 400-500 species of lichen. The exceptional richness of plant and animal species and their communities is further illustrated by the existence of around 1,400 species of freshwater algae, 1,500 species of marine algae, 565 species of moss and 650 species of macro-mycete. Around 1,600 wild plant and animal species considered internationally significant inhabit the FRY.

243. The fauna of the Adriatic Sea has not been fully investigated but according to available data now available, among the better known groups of animals represented are some 300 species of Hydrozoas, some 700 species of Crustacea, 530 species of snails, about 300 shellfish species, 23 Cephalopoda species, 408 fish species, 3 species of marine turtles, 4 species of dolphins [2]. Several species of whales are also occasional visitors of the Adriatic.

244. A number of FRY’s nature areas have been recognized as internationally significant. Among these are the Obed Swamps and the Ludas Lake, Skadar Lake and Carska bara - Stari Begej (Ramsar Wetland of International Significance). The Durmitor-National Park with part of the Tara River Canyon and the Kotor-Risan-Bay (on the World Natural Heritage List) and the Tara River Canyon which has been included in the biosphere reserves grid of the UNESCO Man and Biosphere Programme. A certain number of plant species from the flora of the FRY are included in the Red Lists of European and World Flora, such as Ramonda serbica and R. nathaliae, rare living representatives of the Tertiary tropic-subtropic flora that inhabited the Mediterranean and Europe over 500,000 year ago. Among rich dendro-flora, there are three sorts of crab apples (Malus), four sorts of common pear tree (Pyrus), and seven sorts of cherry tree (Prunus), which represent important genetic resources in pomiculture. The richness and peculiarity of the fauna in many caves in the Karst region (Eastern Serbia, Montenegro) are to be seen not only in numerous endemic species, but also in endemic genera and families.

245. The country's biodiversity is further enhanced by endemic and relict varieties and ecosystems which are found in FRY lending them global significance. Close to 15% of the total flora is accounted for by endemic and subendemic plants, of which 2-3% are endemites to be found exclusively in the territory of FRY or whose ranges spill over slightly into the territories of the neighbouring states. About 60% (out of a total of 417 species) of endemic Balkan flora to be found in the territory of Serbia are endangered to a varying degree and by different causes [3]. Available data indicate that out of the total of some 5000 species of vascular flora, 800-1000 (or about 20%) are endangered and some varieties have become totally extinct.
The bio-geographic position of FRY on the main lines of migration of a large number of migratory animal species crossing from continental Europe to the Mediterranean and further towards Africa and Asia, means that for much of the year, these species, many of which are endangered or are species of international significance, are present in FRY.

**Threats to Biodiversity**

Negative impacts on ecosystems and biodiversity include: (i) unsustainable exploitation of forests, game and fish and use of improper and methods for fighting “pests”, such as application of pesticides and herbicides, poisoning of game; (ii) mining practices that are not friendly to nature, notably open-cast lignite and copper ore mines; (iii) expansion of agricultural lands to marginal lands, drainage of swamps and marshes; (iv) water, soil and air pollution; (v) urbanization, expansion of urban areas and tourism development in zones of particularly vulnerable ecosystems; (vi) infrastructure development (fragmentation of habitats), hydro melioration, construction of water accumulations in gorges (refuge habitats of relict and endemic species and communities); (vi) fires, floods, accidental spills and discharges of harmful substances by industry or during transportation.

**Table A21: National Parks in Montenegro and Serbia**

<table>
<thead>
<tr>
<th>Park</th>
<th>Municipalities</th>
<th>Area (ha)</th>
<th>Altitude range (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montenegro</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biogradska Gora</td>
<td>Berane, Kolasin i Mojkovac</td>
<td>5,400</td>
<td>832-2,116</td>
</tr>
<tr>
<td>Durmitor</td>
<td>Mojkovac, Pluzine, Pljevlja, Savnik i Zabljak</td>
<td>32,000</td>
<td>538-2,523</td>
</tr>
<tr>
<td>Lovcen</td>
<td>Cetinje, Budva</td>
<td>6,220</td>
<td>985-1,749</td>
</tr>
<tr>
<td>Lake Skadar</td>
<td>Podgorica, Bar i Cetinje</td>
<td>40,000</td>
<td>cryptode-depression</td>
</tr>
<tr>
<td>Serbia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Djerdap</td>
<td>Golubac, Kladovo i Majdanpek</td>
<td>64,000</td>
<td>70-806</td>
</tr>
<tr>
<td>Tara</td>
<td>Bajina Basta</td>
<td>19,200</td>
<td>1,000-1,591</td>
</tr>
<tr>
<td>Kopaonik</td>
<td>Raska i Brus</td>
<td>12,000</td>
<td>640-2,017</td>
</tr>
<tr>
<td>Fruska gora</td>
<td>Backa Palanka, Beocin, Indjija, Novi Sad, Sremska Mitrovica and Sid</td>
<td>25,500</td>
<td>100-539</td>
</tr>
<tr>
<td>Sara Mountain</td>
<td>Kacanik, Urosevac, Suva Reka, Prizren i Strpce</td>
<td>39,000</td>
<td>1,220-2,670</td>
</tr>
</tbody>
</table>

**Protected Areas and National Parks**

Nature conservation areas, including natural monuments, represent five percent of **Serbia’s territory** [5]. The Landscape Management Plan of the Republic of Serbia approved in 1996 aims to increase protected areas to 10% of the territory by the year 2010. Currently in Serbia there are five national parks (Fruska Gora, Kopaonik, Tara, Sarplanina, and Djerdap - Iron gate) (Table A21), 120 nature reserves, 20 nature parks and about 470 natural monuments.

In **Montenegro**, about 8% of the state is protected by the state and is made up of four national parks (Lake Skadar, Biogradska Gora, Durmitor and Lovcen) (Table A21), four nature reserves, 51 natural monuments and four forest parks or special nature areas. An
estimated 314 animal and 52 plant species designated, as natural rarities inhabit protected areas and are included in the republic’s Red Book.

**Institutional and Legal Framework for Biodiversity Protection**

250. Preservation of biological and landscape diversity of forest ecosystems in the country is supported by the general FRY “Resolution on the Policy of Preservation of Biodiversity”. In addition, a series of laws and legal acts exist in the Republics of Serbia and Montenegro, which foresee an important role for the National Parks (NPs) and other protected areas where the protection regime focuses on limiting use and through-traffic.

251. FRY is a signatory to the Convention on Biodiversity Conservation (1992) and of the Convention on Trade of endangered species of Wild Flora and Fauna (1973), ratified both in 2001. FRY has also signed and ratified the Convention on the World’s Cultural and Natural Heritage and the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Yugoslavia is also expected to ratify several other international treaties relevant to international waters and to biodiversity conservation, such as the Convention to Combat Desertification, the Convention on the Conservation of European Wildlife and Their Natural Habitats, the Convention on Co-operation for the Protection and Sustainable of the Danube River (Danube River Protection Convention), and the Convention on the Conservation of Migratory of Wild Animals.

252. At the Federal level there are several regulations and policy documents related to nature protection and international waters. They include the Resolution on Environmental Protection Policy (1993), the Resolution on Biodiversity Conservation Policy (1994), the Law on Trade of Substances for Plant Protection (1993), the Law on Principals for Environmental Protection (1998) and the Law on the Protection of Forests (1999). The Resolution on Biodiversity Conservation Policy of the FRY (1994) defines the base, goals and priorities in this area and was prepared in order to assure the “fulfillment of obligations under international agreements relevant to this field and conservation, protection, and sustainable use of biodiversity and biological resources”. It also contains a list of priority programs to be implemented.


254. At the Federal level, the Environment Department within the Secretariat for Health Protection and Social Policy, is responsible for cooperation with specialized international organizations in the field. At the republican level, the Ministries of Agriculture, Waters and Forests are responsible for forestry and forests biodiversity. They are also responsible for fauna protection and utilization, and for the enforcement of exiting legislation in these areas. Forest management it is carried out by forest enterprises (sume) whose responsibilities include the protection, and conservation of forests and their biodiversity. The strategic goal of the
enterprises is to promote an integrated and sustainable management of forests. The republican Ministries of Environmental Protection are responsible for supervising activities of public enterprises for National Parks.

Box A11: National Park Lake Skadar

Lake Skadar is the largest lake on the Balkan Peninsula, with a surface area of about 20,000 ha. Two thirds of the lake is located in Montenegro and the rest in Albania. The lake surface varies between 260ha and 440 ha. The lake is geographically and ecologically connected with other aquatic habitats (Buna River and Delta, Velipoja Reserve and Domni marshes, Veluni Lagoon), thus creating an ecological complex of wetlands. It was identified as one of the 24 transboundary wetland sites of international importance, known as “Ecological Bricks sites”[5]. The lake is also one of the 5 most important wintering sites of waterfowl in Europe, and a critical staging and wintering site for migratory birds, some of which are globally threatened.

The Skadar Lake has a unique and rich flora and diverse fauna that includes numerous endemic species. It is the richest part of the Balkans in flora and fauna, and is home to 176 bird species, 42 fish species and a huge diversity of plants, including a great number of endemic and protected species. Lake Skadar is also home for about 250,000 birds, and a sanctuary for 1.5 to 2.5 million birds from all over the world during the summer.

Lake Skadar plays an important role for local livelihoods. Notably fisheries are a significant source of income. The Lake, coupled with its beaches, varied landscapes that surround it and the presence of 20 monastery complexes, churches, villages, fortresses and sacral monuments in the Skadar area, has attracted local tourists.

During the past decades, Lake Skadar has experienced significant water pollution causing losses in aquatic biodiversity and posing a threat to fisheries, public health and tourism. This is due, in part, to eutrophication caused by excessive flows of nutrients from point sources (industrial and municipal wastewater) and non-point sources (agricultural), pollutants originating from waste disposal sites and transported by groundwater, and to sediment run-off as a result of deforestation and overgrazing in the catchment area. Overfishing has also been an important threat to the sustainability of fisheries, and excessive hunting has threatened birds.

The protection of the Lake will require coordinated action by the two littoral countries, Albania and Montenegro. A transboundary environmental analysis should be carried out on the basis of which a joint Lake Management Plan should be prepared. Actions should also include measures to reduce pollution from various point and non-point sources, afforestation works in deforested areas mainly in Albanian part, law enforcement against illegal bird hunting and fishing, and promotion of public awareness. Furthermore, environmentally friendly economic activities should be introduced to the poor local communities that would reduce the pressure on the natural resources of the lake and its surroundings. These may include ecological tourism, wood handicrafts, best agricultural practices, such as manure management and planting of high value fruit trees.

Public Enterprises on National Parks and Institutes for Nature Protection. Pursuant their respective Laws on National Parks of both republics, the administration and management of NPs is the responsibility of public enterprises which report to the respective Republican Ministries of Environmental Protection. The national parks are managed in accordance with special programs of protection based on the Republics’ Spatial Development Plans. In addition, in Serbia and Montenegro the independent Institutes for the Nature Protection fulfill a very crucial role, since they are in charge of the monitoring and capacity building of commercial users of natural resources (mainly “non–timber forest products”) from protected areas.

It may be concluded that both at the federal and republican levels, necessary institutional set up and legislation are in place. What is needed is strengthening of institutional capacity, integrate them in regional and global conservation networks and harmonize the laws
and regulations with international best practices and, where feasible from a cost effectiveness point of view, with EU legislation.

Problems in Protected Areas Management

257. Despite the fact that FRY’s NPs are generally in relatively good condition, most of them suffer from inadequate funding and have very weak institutional and human capacity. Park development depends in part on the receipt of public funding. However, this has been decreasing in the face of the Governments’ tight budgetary policies. For example in Montenegro, the NP public enterprise has experienced a budget cut of 33% in the last year. These difficulties have led a number of NP administrations to resort to revenue-generating activities that are not in line with existing legislation. In particular, in National parks that include forests, administrations engage in wood cutting and sales in the name of “sanitary cutting” and to regular small scale logging in zones with less restrictive protection regimes. Construction activities for tourism development are also reported to have reached unsustainable levels from a biodiversity protection point of view.

258. In the face of decreasing public resources that maybe used for biodiversity protection, there is a need for a comprehensive strategy and action plan which identifies priority problems, including species and eco-systems that require attention more immediately than others, and measures to be undertaken.

References

1. The Regional Environmental Center. Environmental analysis of FRY, Belgrade, 2001
2. FRY Resolution on Biodiversity Conservation, 1994
4. Statistical yearbook, 2001
<table>
<thead>
<tr>
<th>Republic</th>
<th>Donor</th>
<th>Main Activities</th>
<th>Funding</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental Hotspots</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>Switzerland, Austria, Norway, Russia, Denmark and several others</td>
<td>Implemented 15 of 27 projects in NATO bombing hotspots identified by Balkan Task Force (UNFCS &amp; UNEP) for a total of USD 37m</td>
<td>US$ 11.2m</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>EU</td>
<td>EU also would on exceptional basis procure equipment for pollution monitoring and support some works in sites where current ecological situation raises concern with respect to possible environmental damage. This may also involve dealing with ‘hot spots’ in areas such as Trepca, Pancevo and Novi Sad.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Institutional Capacity Building and Regulatory Reform</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>UNECE</td>
<td>Preparation of an Environmental Performance Review for the country at the request of the Yugoslav Government. This will be a comprehensive analysis of the current state of Environment and country’s environmental management system, containing also a list of policy recommendations for improving the situation in the sector. UNECE also cooperates with Yugoslavia through its regional environmental conventions.</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>UNEP / UNDP</td>
<td>International seminar on implementation of multilateral environmental agreements in Yugoslavia (Fall 2001).</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>UNEP</td>
<td>Capacity building workshop in parallel to hotspot clean-up activities.</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>EU</td>
<td>TA planned in three areas in 2002-2006: Drafting, adopting and implementing a well functioning legal, policy and institutional framework Supporting in maintaining and further development of a civil society network, Strengthening the municipal institutions responsible for solid waste and waste water management.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>Finland</td>
<td>Improvement and harmonization of environmental legislation with EU directives particularly in (i) public participation; (ii) environment impact assessment and (iii) integrated pollution prevention and control (2002 – 2004)</td>
<td>Euro 1.2m</td>
<td></td>
</tr>
<tr>
<td>Serbia</td>
<td>Switzerland and Norway through</td>
<td>Drafting of the Framework Law for Environmental Protection</td>
<td>???</td>
<td></td>
</tr>
</tbody>
</table>
### OSCE

| Both | REC | Co-implementation of several regional projects in Yugoslavia: (a) support for ratification and implementation of multilateral environmental agreements; (b) strengthening the capacities of the national environmental protection agencies and their inspectorates; (c) developing national information systems, networking environmental and finance specialists; (d) developing strategies for implementation of the Aarhus Convention, environmental legal advocacy and advisory centers. | REC acts as the Secretariat for the Regional Environmental Reconstruction Program (REReP) in the framework of the Stability Pact for South Eastern Europe |

| REReP through REC | “Promotion of networking and exchange of experience in countries of South-Eastern Europe”. Project has a special component on Lake Skadar to promote cross border exchange between local people, organizations and NGOs, technical networks in support of the selected transboundary sites, in implementing small scale demonstrational projects. |

| REC | Promotion of and support for the development of Local Environmental Action Plans in Bor, Kotor and other localities. |

### Energy and Air Pollution

| Serbia | EBRD | Considering a District Heating Project in Belgrade |
| Serbia | WB |  |

| Both | UNDP / GEF | Enabling activity for the preparation of “Yugoslavia First National Communication in Response to its Commitments to the UNFCCC” | US$ 0.35m |

| Both | UNDP / GEF | Biodiversity Strategy | TBD |

| Both | UNDP | Advisory services and capacity building activities on energy conservation and efficiency, and promotion of sector reform | NA |

### Water Supply, Sewerage and Wastewater Treatment

| Montenegro | EU through ERA | Has funded several feasibility studies on municipal infrastructure development and maintenance. Capital investment in sewerage and wastewater treatment in the coastal region and in Virpazar (small locality on the lake Skadar). **Time frame??** | NA | EU intends to act as catalyst for investment in WWT and aim for cost effective solutions. May Provide co-financing to IFI and municipality funds. |

| Serbia | EBRD | Loan to Nis to develop the city’s sewage system over the 2002to 2004 period Loans to the cities of Belgrade, Novi Sad and Nis to upgrade water supply systems. | Euro 6m |  |

| Serbia | Germany | Rehabilitation of the Belgrade and Nis wastewater supply systems Revitalization of water supply, municipal heating and wastewater systems, and development of small and medium enterprises in other cities | Euro 5.1m | Euro 37.3m |
### Serbia

| Country   | 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$ 0.25m | US$ 0.17m |

### Waste Management

<table>
<thead>
<tr>
<th>Country</th>
<th>IFC (WB)</th>
<th>IFC is offering advisory services on the privatization of the city’s main landfill and waste management operations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serbia</td>
<td>WB</td>
<td>Health Sector Loan at early stage of preparation will likely include a sub-component to improve disposal of medical waste</td>
<td>TBD</td>
</tr>
<tr>
<td>Montenegro</td>
<td>EBRD</td>
<td>Loan for Podgorica Waste management under preparation</td>
<td>NA</td>
</tr>
<tr>
<td>Montenegro</td>
<td>WB WB</td>
<td>Grant for solid waste management on Adriatic coast IDA credit for waste management project</td>
<td>US$ 2m</td>
</tr>
</tbody>
</table>

### Other Municipal Services

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>???</td>
<td>USAID</td>
<td>Municipal level infrastructure development and maintenance, and support to civil society development, NGO involvement in project implementation. Five year program.</td>
<td>US$ 200m</td>
<td></td>
</tr>
</tbody>
</table>

### Other

| Country   | Germany through KfW | Plans to invest in environment sector, specific areas to be determined | Euro 2.5m |  |

NA : Information not available, TBD: To be determined