

**A Study of Environmental
Conflicts and Issues in South-Eastern Europe: Possible
Collaboration
between CSOs and Ecological Economists**



A report for the CEECEC project

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June 2009



Executive Summary

This report, funded by the European Commission under the Seventh Framework (FP7) Science in Society programme, creates a unique environmental snapshot of South Eastern Europe (SEE), based on an overview of recent international and national research and structured around current concerns of civil society organisations (CSOs) working on environmental conflicts in the region. This 'snapshot' goes on to provide the foundation for a discussion of possible opportunities for collaboration between ecological economists and CSOs in SEE. As the objective of the CEECEC project (www.ceecec.net) is learning and teaching Ecological Economics with and for CSOs, this report aims to provide a resource for ecological economists in the South Eastern European (SEE) region and to examine ecological economics applications that might benefit research and campaign work of environmental CSOs in the region.

Following the introduction, Part 2 prepares the ground by depicting the regional and individual national contexts within which CSOs are carrying out their work on environmental conflicts. This includes a brief profiling of the geographies, demographics and economies of the 6 countries that are the focus of the report: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Former Yugoslav Republic of (FYR) Macedonia and Serbia. This profiling is followed by a summary of international and national research on the state of the environment, providing an overview of the state of air, water and soil across the region. The regional political and economic context is then discussed in terms of the influences and pressures of EU integration processes, economic drivers and trends, and economic externalities on the environment. The section finishes with a look at the regional institutional and legislative context, outlining existing environmental policy, strategy, and related instruments and international agreements.

With the various contexts laid out, Part 3 then explores possible areas of collaboration between CSOs working on environmental conflicts and ecological economists. Here the framework of topics is defined by actual cases of conflict submitted by over 65 CSOs active in the region through surveys distributed exclusively for the purposes of this report. The topics of waste and recycling, energy, mining and mineral processing, management of protected areas and agriculture are first examined at the regional level. They are then explored in greater depth at the national level for each country. It is within these national level discussions that over 30 CSO case studies are embedded.

The report culminates in Part 4, a discussion of how specific concepts, tools and methods of ecological economics might be applied to CSO work on environmental conflicts in SEE. Focusing on specific issues and CSO case studies from Part 3, this section outlines opportunities for collaborative research. Examples include the impacts of depopulation on agriculture, whereby in contrast to Malthusian doctrine and related predictions of lower Human Appropriation of Net Primary Product (HANPP), depopulation and migration processes are actually increasing environmental pressures on agricultural production through increased soil erosion and invasions by pests and weeds. Another example, is an exploration of how the Polluter Pays principle might be operationalised, particularly in the context of the

mining and industrial sectors. While abandonment of mines and industrial closures in recent decades could be viewed positively as a source of economic dematerialisation, environmental pressures may actually be increasing due to poor maintenance, and as the region is still rich in mineral resources, mitigation measures against future exploitation will be required to prevent further environmental damage. One final example of an area for future collaborative research is the potential for implementation of Payment for Environmental Services (PES) schemes in the region. Such schemes could be used for example to address pollution of watercourses so that downstream users such as fishermen pay those upstream to implement protective measures, or at the very least raise local awareness of the value of natural resources. PES schemes could also be conceptualized in the growing organic farming sector, through certification systems for organic products and for preservation of landscapes through entry fees to national parks.

Following Part 4 is a list of sources cited, as well as annexes containing the methodology used in conducting the surveys for the gathering of CSO case studies, a summary of environmental legislation in each country transposing the EU acquis, and contact details of all of the CSOs that participated in the making of this report.

Contributing Civil Society Organisations

Albania

- Albaforest
- Albanian Centre of Excellence (ACE) / Qendra Shqiptare e Ekselences (QSHE)
- Albanian Ecological Club Kruja (AEC) / Klubi Ekologjik Shqiptar Kruja (KESH)
- Association for Development of Environmental Policies — G & G Group / Shoqata për Zhvillim të Politikave Mjedisore— G & G group
- Association for Sustainable Rural Development / Per Nje Zhvillim Rural Te Gendrueshem
- Awareness for Progress / Shoqata Ndërgjegjësimit për Progres
- Environmental and Social Protection and Development (ILIRIA) / Shoqata Mbrojtja dhe Zhvillimi Mjedisor e Social (ILIRIA)
- Environmental Centre for Development, Education and Networking (EDEN) / Qendra EDEN
- Environmental Women's Association (AEWA) / Gruaja Ambjentaliste Shqiptare (GASH)
- For Progress and Civilization (FPC) / Për Progres dhe Civilizim (PPC)

Bosnia Herzegovina

- Association for Development, Improvement and Promotion of Ecological Agriculture, Tourism and Environment Protection (UG EKOPOT) / Udruzenje za Razvoj, Unapredjenje i Promociju Ekopoljoprivrede, Turizma i Zastitu Okoline (UG EKOPOT)
- Association for Tolerance Against Differences / Udruzenje Tolerancijom Proitiv Razlicitosti (ToPeer)
- Centre for Civil Cooperation (CCC) / Centar za Gradjansku Suradnju (CGS)
- Centre for Environmentally Sustainable Development (CESD) / Centar za Okolisno Odrzivi Razvoj, (COOR)
- Eko Put Ecological Association / Ekolosko Udruzenje Eko Put
- Fondeko - Association for Stimulation of Sustainable Development and Quality of Life / Fondeko Udruzenje za Podsticanje Uravnotezenog Razvoja i Kvaliteta Zivota
- Local Development Initiative (LDI) / Lokalna Inicijativa Razvoja (LIR)
- Women's Nature Association / Udruzenje Zena Priroda

Bulgaria

- Bulgarian Biodiversity Foundation
- Ecocentre for Chamber of Commerce and Industry
- Green Varna Association
- Greener Bourgas Foundation
- Kalimok
- Moderna Vratsa
- Partnership for New Europe Association / Partnyorstvo za Nova Evropa
- Terra Ecological Club
- Zlatishka Kotlovina Ecological Society

Croatia

- Argonauta Ecological Society / Ekoloska Udruga Argonauta
- Association for Nature, Environment and Sustainable Development (SUNCE) / Udruga za Prirodu, Okolis i Odrzivi Razvoj Sunce (SUNCE)
- Divina Natura Ecological Society / Ekoloska Udruga Divina Natura
- Eko-Eko Komin Ecological Organisations / Ekoloska Udruga Eko-Eko Komin
- Eko Zadar Association for Organic Farming and Environment Protection / Eko Zadar - Udruga za Promicanje Ekoloske Proizvodnje Hrane i Zastitu Okolisa (EKO ZADAR)
- Green Action Ecological Association / Ekoloska Udruga Zelena Akcija
- Green Istria Association / Udruga Zelena Istra
- Green Osijek Ecological Society / Ekolosko Drustvo Zelene Osijek

- Nobilis Ecological Organisation / Zastitarsko Ekoloska Organizacija Nobilis

FYR Macedonia

- Biosfera -Centre for Education and Protection of the Environment and Nature / Biosfera - Centar za Edukacija Zastita na Zivotna Sredina i Priroda
- Centre for Local Development / Centar za Lokalen Razvoj (CELOR)
- Centre for Regional Research and Cooperation- Studiorum (CRPRC) / Centar za Regionalni Istrazivanja i Sorabotka-Studiorum (CRIS)
- Citizens' Committee for Development Probistip (CCD Probistip) / Građanski Komitet za Razvoj Probistip (GKR-PROBISTIP)
- EcoAction Ecological Society / Ekolosko Drustvo EcoAction
- Ednakvi za Site Union of Citizens / Zdruzenie na Gragani Ednakvi za Site
- Green Power Ecological Group / Ekoloska Grupacija Green Power
- Ekumena Union of Citizens / Zdruzenie na Gragani Ekumena
- FLORA Ecological Society / Ekolosko Drustvo FLORA
- Florozon Association for Protection of Natural Environment and Sustainable Economic Development / Florozon Zdruzenie za Zastita na Prirodnata Sredina I Odrziv Ekonomski Razvoj (Florozon Skopje)
- Grasnica Ecological Society / Ekolosko Drustvo Grasnica
- IZVOR Union for Protection of Environment, Cultural and Historical Landmarks and Human Health / Zdruzenie za Zastita na Zivotnata Sredina Kulturno - Istoriskite Znamenitosti I Covekovot Zdravje IZVOR
- Kalinka Ecological Society / Ekolosko Drustvo Kalinka
- Macedonian Green Centre - Union of Citizens Lobbying for Promotion and Research of Environmental Issues / Makedonski Zelen Centar- Zdruzenie na Gragani za Lobiranje, Zastapuvanje i Istrazuvanje na Orashanjata od Oblasta na Zivotnata Sredina
- Municipal Centre for Rock Art (MCRA) / Opstinski Centar za Karpesta Umetnost (OCKU)
- National Council of Women of the Republic of Macedonia Skopje / Nacionalen Sovet na Zheni na RM (NSZM-SOZM)
- NATYRA Ecological Society / Ekolosko Drustvo NATYRA
- NETOP Union for Protection of Natural and Cultural Heritage of Mariovo / Zdruzenie za Zastita na Prirodnoto i Kulturnoto Nasledstvo na Mariovo NETOP
- ORT Training for Sustainable Development / ORT Obuka za Odrziv Razvoj
- Proaktiva Association of Citizens / Zdruzenie na Gragani Proaktiva
- Society for Academic Education / Drustvo za Edukacija Akademik
- Women's Organisation of Mavrovi Anovi (WOMA) / Organizacija na Zeni na Opstina Mavrovi Anovi (OZMA)

Serbia

- Association of Young Researchers of Bor / Drustvo Mladih Istrazivaca Bora
- Centre for Ecology and Sustainable Development (CESD) / Centar za Ekologiju i Odrzivi Razvoj (CEKOR)
- Ecolibri Bionet-Centre for Biodiversity Conservation and Sustainable Development / Ecolibri Bionet - Centar za Cuvanje Biodiverziteta i Odrzivi Razvoj /
- Eko Ibar Environmental Movement / Ekoloski Pokret Eko Ibar
- Endemit Ecological Society / Ekolosko Drustvo Endemit
- Non-Smokers Educational Centre-RP / Nepusacki Edukativni Centar –RP
- Stara Planina Society for Environmental Protection / Drustvo za Zastitu Zivotne Sredine Stara Planina
- TERRAS Organic Food Association / Udruzenje za Organsku Hranu TERRAS
- Young Researchers of Serbia (YRS) / Mladi Istrazivaci Srbije (MIS)

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1. Introduction

This report is one of the final products of work carried out under the CEECEC project. The objective of this report is to survey the state of environmental conflicts and assess the potential for civil society organizations (CSO)/ ecological economics collaboration in the Balkans in order to strategise for future research initiatives between locally-based CSOs and ecological economists. The CEECEC project is based on learning and teaching Ecological Economics with and for CSOs. This report therefore aims to provide a resource for ecological economists in the South Eastern European (SEE) region as well as examine possible ecological economics applications that can be useful to environmental NGOs in the region. The analysis presented here is based on data compiled from reports and a survey devised by Endemit, a CEECEC partner and Serbian civil society organisation. The survey was completed by local environmental CSOs in each country and compiled by the National Focal Point Organisations (FPOs) appointed to assist in its distribution throughout the region.

With the Balkan region as the focus of this study, the SEE countries of Albania, Bosnia and Herzegovina, Bulgaria (the only country that is already a member of the European Union), Croatia, the Former Yugoslav Republic (FYR) of Macedonia, and Serbia are covered. While the most common definition of the Balkans includes these nations as well as Greece and Montenegro, Greece was not included in the study due to its level of economic development compared to the rest of the region. Montenegro was initially included in the scope of the study but later removed due to lack of CSO interest there in participating. Unless specified otherwise, where SEE is used in this report, it refers only to the countries covered in this study. A detailed description of the methodology used in this research can be found in [Annex 1](#) of this report.



Central and Eastern Europe, no. 3877 Rev. 7 UNITED NATIONS September 2008

Following the introduction, the second section of the report provides insights on the political and economic context of the region as well as the regional and national institutional and legal settings. The third section contains a description of several categories of conflict across the region, with more detailed descriptions at the country level illustrated by specific case studies. It should be noted here that this is not meant to be a comprehensive survey of environmental conflict in the region, but a representation of issues highlighted by the CSOs involved in the survey distributed by FPOs (see [Annex 3](#)). The fourth section contains a discussion with recommendations of how some of the conflicts in the region could benefit from CSO / ecological economics collaborative research, and the fifth section contains appendices.

2. Context

2.1. General overview of countries studied in the region

The SEE region is highly diverse in terms of its ecosystems, ethnic groups, religions, cultures, economies and geographies, the latter of which includes four of Europe’s bio-geographical areas: Mediterranean, Central European, Alpine and Pannonic. Some basic characteristics of the countries in this study are set out below¹:



Albania, no. 3769 Rev. 6 UNITED NATIONS
June 2004

2.1.1. Albania

The Republic of Albania lies on the western seaboard of the Balkan Peninsula. One of the smallest countries in Europe, it has a total population of approximately 3.18 million, with a density estimated at 111 persons / km². Albanian territory covers an area of 28 750 km². Of this area 21.1% of the land is arable, 29% covered in forest and there is a coastline of 362 km. The Albanian capital is Tirana, with a population of about 523 thousand.² Albania is classified by the World Bank (WB) as a lower middle income country and has a gross domestic income (GDI) per capita of €2490. Its economic structure has shifted in recent years from agriculture and industry to services and construction.

¹ All data on national population, GDI and GNI per capita and economic structure / trends in the section below is drawn from the World Banks Country Brief 2008 Series. Population density was calculated by dividing the total area of each country from the World Banks' World Development Report (WDR) 2009 by national population figures from the Country Brief 2008 data. GDI and GNI per capita data is translated from US Dollars into Euro based on the average exchange rate in 2007 of 0.73, provided by <http://www.oanda.com/convert/fxhistory>.

² INSTAT 2001 http://www.instat.gov.al/repoba/zyra_shtypit/prel_eng.htm

Meanwhile, large scale migration has fueled the inflow of workers' remittances, which make up 13% of the gross domestic product (GDP).

2.1.2. Bosnia and Herzegovina

Bosnia and Herzegovina (B&H) lies in the western part of South East Europe between Croatia and Serbia, bordering the Adriatic Sea. It has a population of 3.77 million, with a density of 72 persons / km². It covers an area of 51 210 km² extending over 2 hydrological basins: the Sava River (Danube) and Adriatic Sea basins. Of the total area of B&H, roughly 75% lies within the Danube and 25% within the Adriatic Sea basin. Arable land accounts for 19.5% of the total land area, 42.7% is forested and there is 20km of coastline. The current governance structure established by the Dayton Peace Agreement which ended the war in Bosnia and Herzegovina in 1995 is comprised of a state level government and two entities that enjoy substantial autonomy, the Federation of Bosnia and Herzegovina (FBH) and the Republika Srpska (RS). An autonomous Brcko District was added to the structure in 1999. The capital city Sarajevo had a population of



Bosnia and Herzegovina, no. 3729 Rev. 6 UNITED NATIONS March 2007

421 289 in 2007.³ B&H is categorised by the WB as a middle-income country with a GNI per capita of 3577€. Approximately 67% of GDP is generated in the service sector, 22% in industry, and 10% in agriculture.

2.1.3. Bulgaria

Bulgaria borders the Black Sea, and is located between Romania and Turkey. It has a population of 7.64 million and a population density of 68 persons per km². Its total area covers 111 000 km². Of the total land area 29.2% is arable and 33.4% is forested. The Bulgarian coastline is 354 km long. The capital of Bulgaria is Sofia, with 256 511 citizens as of 2007.⁴ Bulgaria is an upper-middle-income country with a GNI per capita of 3351€ but it is one of the



Bulgaria no. 3877 Rev. 7 UNITED NATIONS September 2008

³ Federation of Bosnia and Herzegovina, Federal Office of Statistics 2008 <http://www.fzs.ba/Dem/ProcPrist/stalno.pdf>

⁴ Republic of Bulgaria, Ministry Of Economy and Energy and Invest Bulgaria Agency www.investbg.government.bg/upfs/58/Industrial%20Park%20Sofia%20East.pdf

poorest countries in the EU. The manufacturing, finance, and trade sectors have contributed most to GDP growth in recent years due to large foreign direct investment (FDI) inflows. Between 2004 and 2007, most new jobs generated in the private sector were in the construction and service industries.



Croatia, no. 3740 Rev. 5 UNITED NATIONS June 2004

2.1.4. Croatia

The Republic of Croatia lies on the northwestern seaboard of the Balkan Peninsula and has a population of 4.44 million, with a density of 78/km². Its territory of 56 540 km² includes over 1000 islands. Of the total land area, 19.8% is arable and 38.2% is forest. The coastline extends 1,777 km. In 2002 there were 780 thousand people living in the capital, Zagreb⁵. Croatia is an upper middle-income country, and as of October 2008, its per capita

income stood at about 8416€⁶, with approximately 56% of EU purchasing power standards. Industry, retail trade, and financial intermediation have been key contributors to recent GDP growth.



FYR Macedonia, no. 3789 Rev 5 UNITED NATIONS August 2007

2.1.5. Former Yugoslav Republic (FYR) of Macedonia

The FYR of Macedonia is a small country located in the centre of the Balkan Peninsula. It has a population of 2.04 million, with a density of approximately 78/km². Its territory covers 25 710 km², of which 22.3% is arable and 35.6% forest land. The capital city of FYR Macedonia is Skopje, with a population of 506 926 in 2002.⁷ With a GNI per capita of around 2533€ FYR Macedonia is a lower middle-

⁵ Zagreb Chamber of Economy, City Bureau for Development Planning and Environmental Protection Statistic Department http://www.zg.hgk.hr/english/novo_zagreb_figures_2007.pdf
⁶ Calculation based on exchange rates for 11500 US\$ (1 USD = 0.73 Euro) on 15 October 2008
⁷ City of Skopje, Official Portal of City of Skopje <http://www.skopje.gov.mk/EN/DesktopDefault.aspx?tabindex=0&tabid=33>

income country. It is located at the crossroads of important transport routes connecting Central and Eastern Europe with South and South East Europe and beyond. Services (primarily in trade and transport, and communications) accounted for 58% of GDP in 2007. An additional 30% was generated by industry, dominated by iron and steel, textiles, construction, and the exploitation of metals and minerals. Agriculture accounts for the remaining 12%.

2.1.6. Serbia



Serbia, no. 4268 Rev.1 UNITED NATIONS April 2007

The Republic of Serbia is located in the heart of the Balkan Peninsula. The country has a population of 7.39 million with a density of 78/km², and covers an area of 88 361 km². Within Serbia there are two autonomous provinces, Vojvodina (21 506 km²) in the north and Kosovo and Metohia (10 887 km²) in the south. Kosovo and Metohia is currently under provisional administration of the United Nations according to the UN Security Council Resolution 1244. The capital of Serbia is Belgrade with a population estimated at 1.5 million in the 2002 census.⁸ The nation's GDP per capita has more than doubled from 2002 – 2005, and currently stands at 3942€. It is endowed with a wealth of natural and mineral resources and fertile and arable agricultural land. It is also located at the crossroads of major road and rail routes in South-eastern Europe. Economic activity is divided into services (65% of GDP), industry (24%), and agriculture (11%).

2.2. State of the environment

Several factors have contributed to environmental degradation in the SEE region in the face of economic growth, industrial development and modern consumption patterns. These include socio-economic factors such as weak or recovering economies with limited budgets for addressing issues of environmental protection, insufficient environmental regulation or implementation, limited public participation and poverty. Limited access to cleaner technology and environmental information and political tensions have also contributed to environmental degradation in SEE, leading to the pollution of the soil, air and water in the region. On the other hand, low population density means that the region still has a wealth of natural spaces which remain relatively pristine.

⁸ City of Belgrade <http://www.beograd.org.yu/cms/view.php?id=201201>

2.2.1. Air

Despite considerable reductions in air pollutant emissions in much of the pan-European region, atmospheric pollution still poses a significant threat to human health and the environment. In SEE, the impacts of sustained growth in road transport and emissions from industry, power production and households all contribute to poor air quality in urban areas. Between 2000 and 2004, emissions of acidifying substances such as NO_x, SO₂ and NH₃ in the region increased (see **Table 1**), and eutrophying emissions grew by 3.8%.⁹ Despite continuing reductions in the emissions of atmospheric pollutants in West Central Europe (WCE) and in some SEE countries, exposures of urban populations across Europe have not improved significantly since the late 1990s. It is estimated that 30% of the population of WCE and Bulgaria is exposed to air pollution over limit values, with many urban areas in SEE experiencing daily average concentrations of primary particulates (PM₁₀) in excess of 50 µg/m³ on more than the permitted 35 days per year.¹⁰

Table 1: Percentage change in emissions, 2000 - 2004
(source: EEA 2007)

Pollutant	West Central Europe	South Eastern Europe
NOx	- 8.7 %	+ 5.7 %
SO2	- 19.6 %	+ 1.5 %
VOC	- 13.6 %	- 12.3 %
NH3	- 2.6 %	- 5.7 %
TOFP	- 11.3 %	- 2.1 %
PM10	- 9.7 %	+ 2.2 %

Tobacco smoke and domestic combustion of solid fuels such as coal and wood are the prevalent indoor air pollutants. The latter are a source of particulate matter and hazardous organic compounds such as polycyclic aromatic hydrocarbons (PAHs). Around 16 % of the household population in central and Eastern Europe relies on solid fuels, the use of which is linked to poverty. In Albania and Bosnia and Herzegovina, the rate of usage is over 50%.¹¹

Emissions of air pollutants in the region are projected to decline during the next two decades in line with national legal and institutional development and the introduction of EU accession-driven emission control legislation and structural changes in energy systems. The largest projected reductions are for energy-related emissions, especially SO₂, NO_x, VOCs, with lower reductions for emissions from agriculture¹². Bulgaria has already harmonised its air quality protection legislation with the EU, and in Croatia a local network for air quality measurements has been introduced with 108 measuring stations operating in 32

⁹ EEA Report No 1/2007

¹⁰ Ibid

¹¹ Ibid

¹² Ibid

towns or settlements, covering the largest towns, areas of high industrial activity and areas where possible trans-boundary pollution is expected.¹³

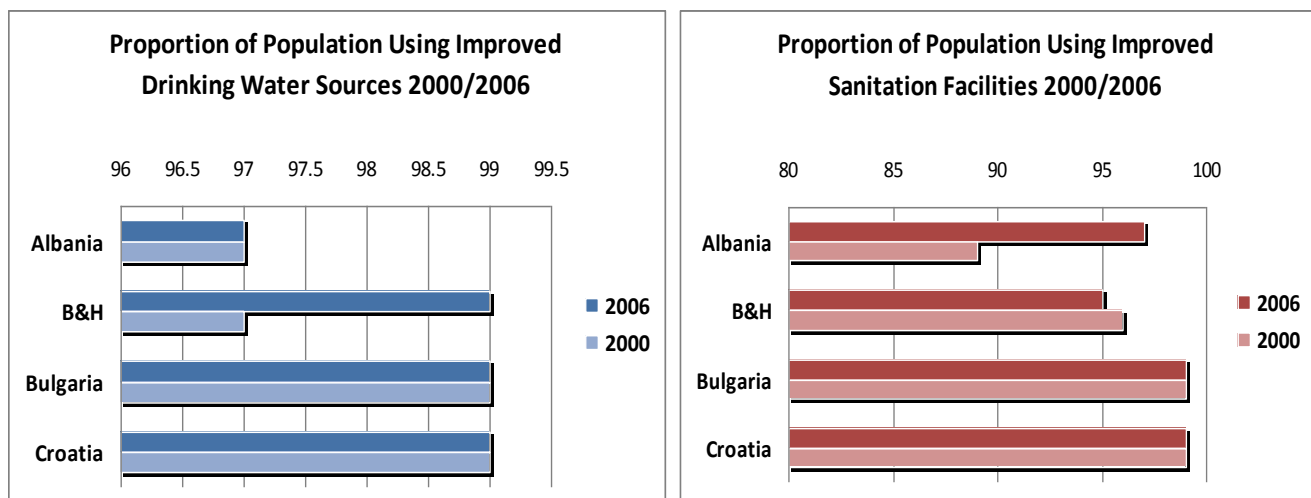
However, the challenges in achieving hoped for emissions declines are formidable. For example, continued deterioration of urban air quality is expected in Albania due the large number of imported diesel burning cars in use there. In FYR Macedonia the industrial sector (mainly the metallurgy and chemical sectors) is a major air polluter as a result of obsolete equipment and lack of modern technologies, with added pressure on air quality from combustion, energy production and mobile sources. Air pollution is also a serious environmental and public health problem in Serbia, where limit values for nitrogen dioxide, sulphur dioxide and soot are exceeded in many cities on a daily basis.¹⁴ Air quality analyses in Belgrade have shown the annual PM₁₀ concentrations to be significantly higher (77 µg/m³ annual mean) than those of most European cities. The main sources of suspended particles are traffic, power stations, local heating and dust re-suspension¹⁵.

2.2.2. Water

Although water quality is perceived as having improved across SEE, some large rivers and many smaller watercourses remain severely polluted. Many millions of people in the pan-European region still do not have access to safe drinking water and adequate sanitation (see **Figure 1**), and over the past decade the quality of water supply and sanitation services has steadily deteriorated.

Figure 1: Improved Access to Sanitation

(source: UN Statistics Division)



In SEE irrigation and energy production each account for around a third of total water abstraction while the manufacturing industry and public water supply

¹³ Republic of Croatia, MoEPPPC November 2007

¹⁴ EEA Report No 1/2007

¹⁵ Tasić et al. (2006) in EEA Report No 1/2007

account for 12% and 18% respectively.¹⁶ Despite the introduction of more efficient cooling technologies only a minor reduction in the use of water in energy generation has been achieved. Water abstraction resulting from intense industrial and agricultural activity has led to the lowering of groundwater levels, the drying-out of water courses and wetland areas, and to salt-water intrusion in aquifers along the Mediterranean coastline.

In terms of public water supply, 90–100% of the urban population of the region are connected to piped water¹⁷, but drinking water quality is low due to deteriorated infrastructure. In Albania urban water rarely has even preliminary treatment. Rural areas have much less connectivity to water and sanitation infrastructure, which in some countries is as low as one third of the rural population.¹⁸ With no piped water supply, rural householders dig their own wells, in some cases on the banks of heavily polluted rivers, the waters of which are unsuitable for human consumption. In Serbia, deterioration of water supply infrastructure including chlorination systems, is believed to have contributed to a decline in the quality of piped drinking water. In Bosnia and Herzegovina only 32 % of the urban population is supplied with treated drinking water and it is estimated that over 68% of the rural population is exposed to unsafe drinking water.¹⁹

Most urban housing in the SEE region is connected to sewage systems, but this does not mean that the wastewater is being treated before its discharge into open waters. Prior to 1990, large volumes of effluent were discharged into surface water bodies from municipal, industrial and agriculture sources, polluting both surface and groundwater sources. This diminished in the early 90s with the collapse of many industries and agricultural endeavors, nevertheless a number of polluting activities persist, notably those of the mining, metallurgical and chemical industries. Wastewater from these sources threatens human and environmental health across SEE, as does the direct discharge of sewage in many rural areas. Wastewater collection and treatment infrastructure in Albania for example, has neither been maintained nor developed quickly enough to cope with the increasing flow of pollution. Sewage systems are on the whole poorly maintained in B&H and in many cases only partially completed with a maximum of 10% coverage in rural areas.²⁰

The effective management of transboundary water bodies is also of particular importance in SEE since 90% of the territory falls within transboundary river basins and there are more than 12 large transboundary rivers and four transboundary lakes in the area.²¹ Exploitation of water resources by upstream parties can have negative impacts on water supply for downstream users and

¹⁶ EEA Report No 1/2007

¹⁷ Ibid

¹⁸ Ibid

¹⁹ Ibid

²⁰ Ibid

²¹ Ibid

affect the natural water cycle in wetlands and aquifers. Shared water bodies have been used as sinks for urban and industrial wastewater, with unsustainable agricultural practices further adding to the problem. Furthermore, rivers in the SEE region are subject to irregular flooding and it is likely that annual flood damage will increase, given prevailing unsustainable management practices at the national level and limited investment in flood mitigation. Climate change will only increase existing pressures as rising temperatures intensify hydrological cycles bringing unpredictable shifts in precipitation that further impact the availability of groundwater and increase the frequency and severity of flooding and droughts. Despite the importance of effective transboundary water management against these threats, Bosnia and Herzegovina, FYR Macedonia and Serbia have yet to ratify the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.²²

2.2.3. Soil

The main threats to soil quality are erosion, sealing and large-scale land movements, contamination, salinisation, and loss of organic matter, and declines in soil biodiversity. The pressures of urbanisation, tourism, transport, agriculture and industry were reduced to an extent in SEE, as conflict and economic crises of the 90s took over from a period of economic development (the 1960s to the late 1980s) that had been based on intense exploitation of natural resources. However, problems of soil degradation due to erosion and contamination have intensified due to deficits in national budgets, the inability to maintain physical and institutional infrastructures, and poverty, thus raising issues of environmental security.²³

Soil contamination (see **Figure 2**, overleaf) has contributed significantly to loss of livelihoods, resulting in unemployment and poverty, health problems, land abandonment and depopulation of rural areas.²⁴ As many of the perpetrators responsible for land degradation are insolvent, no longer exist, cannot be identified, or cannot be made liable, public money is needed to fund remediation activities. Contamination from local sources and air deposition of traffic and industrial effluents affect soil and groundwater quality throughout the pan-European region, affecting human health through direct contact and by the ingestion of contaminated soil, for example through drinking water from sources that flow through contaminated areas, through the food chain, and by children in playgrounds. Across WCE and some SEE countries, polluting activities are estimated to have occurred at nearly three million sites, necessitating investigation into whether remediation is required.²⁵ However in most SEE countries the real extent of contamination is unknown because systematic inventories do not exist or cover only specific sites or specific regions.

²² UNECE <http://www.unece.org/env/water/status/legal.htm>

²³ OECD 2005; UNEP 2003, 2005 in EEA Report No 1/2007

²⁴ EEA Report No 1/2007

²⁵ Ibid

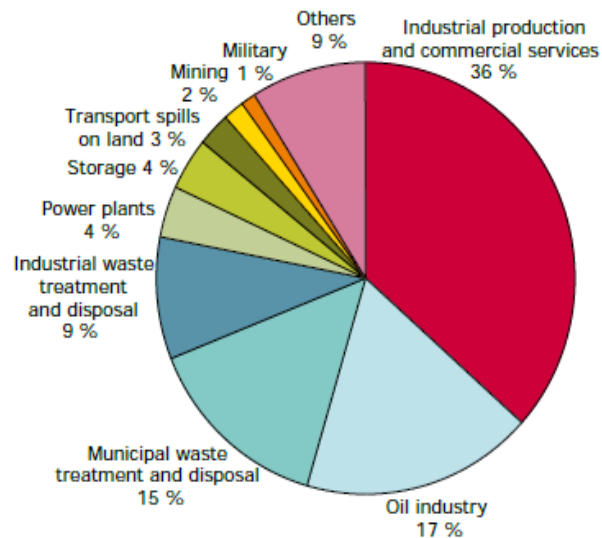


Figure 2 Overview of Economic Activities Causing Soil Contamination in Some WCE and SEE Countries
 (% of investigated sites)
 (source: EEA 2007)

Inadequate municipal and industrial waste disposal and treatment, and substandard storage of chemicals from industrial activities are the predominant sources of soil contamination in the region, and illegal disposal practices are widespread. In Albania for example, the construction of houses on abandoned industrial sites has exposed the population to hazardous residual substances in the soil. In Bulgaria, storage of obsolete chemicals poses significant challenges, while in the FYR Macedonia, mining sites are the source of 27% of soil contamination.²⁶ B&H faces historical contamination of a different variety to the above examples: land mines, and minefields are estimated to cover 1,755 km² or about 3.68% of its territory, rendering nearly 10 thousand hectares of agricultural land and 20% of forests inaccessible.²⁷

In urban and coastal areas in SEE, the sealing of soil, often without the necessary spatial planning permission, is also common. This is a result of rapid economic growth and the expansion of tourism. Soil erosion due to land abandonment and consequent lack of terrace maintenance in mountainous areas is also widespread in the region, affecting large swathes of territory across Albania, Bosnia and Herzegovina, Croatia and Serbia.²⁸ In the Croatian karstic region, the soil layer has completely disappeared, where structural changes in land ownership and increased farm sizes are expected to intensify the risk of further erosion.

²⁶ Ibid

²⁷ ICBL 2008

²⁸ SOVEUR 2000 in EEA Report No 1/2007

2.3. Regional political and economic context

The SEE countries in this study exhibit high levels of of cultural, ecological and geographical diversity but have in common a decade-long period of conflict and instability (1991 - 2001) that followed the dissolution of Yugoslavia and the collapse of socialism in the region. As a result, political and economic activity in the region has of late been focused on reconstruction and rehabilitation. Due to the complexity of these processes, the region today represents a geographical gap in the enlarged European Union (excluding Bulgaria which is a member), but has a clear European perspective that places a high priority on issues of environment and sustainable development.

2.3.1. EU Integration Processes

The process of integration into the EU is currently the main political driver for change in the region, structured around the Stabilisation and Association Process and in the cases of Croatia and FYR Macedonia, Accession Processes. These processes run on a country by country basis, depending on individual fulfilment of the Copenhagen Criteria for EU membership. Of the countries covered in this report, Albania signed the Stabilisation and Association Agreement (SAA) most recently in June 2006, and Croatia and FYR Macedonia are now formally candidates for EU membership.

2.3.2. Economic Drivers and Trends

The non-EU countries of SEE have declared accession to the EU to be a main strategic goal. However, the level of economic and social development in these countries is significantly behind the countries of the EU, with the exception of Croatia, whose GDP per capita is higher than that of Romania and Bulgaria.²⁹

The economies of the region have been largely built on agriculture, natural resources and industry. SEE possesses competitive advantages with regard to natural resources (minerals, coal, water, forests, biodiversity, scenic beauty) and human resources with a relatively high level of education. The natural resource and industrial sectors employ large numbers of people, but at the same time cause resource depletion and pollution. Many such related economic activities have collapsed since 1990, leading to improvement of some aspects of environmental quality but causing widespread unemployment, poverty and migration to large cities and abroad.

Medium-term efforts across the region are focused on the establishment and maintenance of macro-economic stability, acceleration of economic growth and improvement of living standards through inter alia, completing privatisation processes, attracting higher levels of FDI, and development of small and medium-sized enterprises.³⁰ In recent years the economies of the region have grown at rates exceeding the EU average. This is perceived as being the result of

²⁹ UNDP 2007/2008

³⁰ Stritih, Jernej et al. 2007

trade liberalisation, privatisation and restructuring of enterprises, financial investment from international donors through reconstruction and development projects, and remittances from abroad. Resource extraction industries for energy, minerals, and metals in particular have received the greatest share of foreign investment. These are currently among the most successful industries (even if they generate only a minor share of GDP) due to the relatively low cost of labour, proximity to EU markets, lack of adequate environmental enforcement and demand for energy and raw materials.³¹

2.3.3. Economic Externalities

Despite regional economic growth, unemployment is still high. Discrepancies in economic power and development among regions and citizens are growing, trade imbalances are significant and rising, external debt is high, and state intervention in the economy is significant and often counter-productive from a sustainability point of view, particularly where it involves costly subsidies to loss-making enterprises. There are also growing concerns that efforts to achieve rapid economic growth are contributing significantly to unsustainable development patterns across SEE. Although the state of the environment has improved in some regards due to the restructuring of industry in some countries, new problems have emerged across the region such as rural depopulation and pressures from uncontrolled urbanisation around coastal development.

2.4. Regional institutional and legislative context

2.4.1. Institutions

Over the past decade, the SEE Stability Pact countries have begun to bring their environmental institutional structures in line with EU harmonization requirements and have initiated legislative reforms. One of the main tasks has been to establish comprehensive environmental ministries at the national level. Institutional arrangements (see **Table 2** overleaf) include the division of environmental responsibilities among several Ministries, the combination of environmental with other portfolios (such as physical planning, sciences, tourism, water and culture) and the establishment of various national sub-bodies, institutes, inspectorates or agencies. Environmental agencies have been established in some countries to form counterparts to the European Environment Agency (EEA) in Copenhagen with the main functions of collecting and reporting on environmental data, and developing, harmonizing and managing national environmental information systems. Bulgaria and Albania have executive environmental agencies and Croatia and Serbia have established environmental agencies with mandates to manage environmental information. Mechanisms for policy integration with other state policies have also been developed, such as general decision-making procedures and the establishment of national councils for environmental protection and / or sustainable development.

³¹ Ibid

Table 2: Environmental institutions at the national level

(adapted from Stritih, Jernej et al. 2007 and Republic of Bulgaria, MoEW 2007)

Country / Territory	Responsible for Environment	Responsible for Water	Environmental Agency	Environmental Fund
Albania	Ministry of Environment, Forests and Water Administration	Ministry of Environment, Forests and Water Administration	Agency for Environment and Forests Regional environment agencies	Proposed
Bosnia and Herzegovina	Ministry of Foreign Trade and Economic Relations, Department for Environment Federal Ministry for Environment and Tourism Ministry for Spatial Planning, Civil Engineering and Ecology of Republika Srpska Brčko District, Department for Utilities Ten Canton-level ministries	Federal Ministry of Agriculture, Water and Forestry Ministry of Agriculture, Forestry and Water of Republika Srpska Brčko District, Department of Agriculture, Forestry and Water management	In preparation	Established
Bulgaria	Ministry of Regional Development and Public Works Ministry of Agriculture and Food Supply Ministry of Economy and Energy Ministry of Health	Ministry of Environment and Waters (MOEW)	Executive Environmental Agency (EEA) 15 Regional Inspectorates for Environment and Water (RIEW) 3 National Parks Directorates 4 River Basin Directorates (RBD)	Enterprise for Management of Environmental Protection Activities, National Trust Eco-Fund
Croatia	Ministry of Environmental Protection, Physical Planning and Construction Ministry of Agriculture, Forestry and Water Management Ministry of Culture Ministry of Economy, Labour and Entrepreneurship Ministry of Health and Social Welfare Ministry of Tourism Ministry of Sea, Transport and Infrastructure	Ministry of Agriculture, Forestry and Water Management Ministry of Health and Social Welfare Ministry of Environmental Protection, Physical Planning and Construction Ministry of Culture Ministry of the Sea, Tourism, Transport and Development	Croatian Environment Agency	Environmental Protection and Energy Efficiency Fund
FYR Macedonia	Ministry of Environment and Physical Planning Ministry of Agriculture, Forestry and Water Economy	Ministry of Agriculture, Forestry and Water Economy Ministry of Environment and Physical Planning Ministry of Economy Ministry of Health Ministry of Transport and Communications	MoEPP/ Administration of Environment	Replaced by budget programme in 2003
Serbia	Ministry of Environmental Protection	Ministry of Agriculture Water Management and Forestry Ministry of Health	Agency for Environmental Protection	Environmental Fund

Environmental protection funds have been established in Bosnia and Herzegovina, Croatia, FYR of Macedonia and Serbia with the main purpose of providing financing for environmental protection projects and programs, especially those related to infrastructure investments for waste and water management, air pollution and energy efficiency.

Institution-building and development of policy and legal frameworks has occurred (see [Annex 2](#)), mainly with international donor support. Unfortunately, the ministries, and other national agencies lack the necessary capacities required for full implementation of environmental policies. On the whole, clear policies and long term strategies for key environmental issues are lacking across the region, and legislation to the *acquis* is making slow progress. Furthermore, implementation and enforcement of existing environmental policy is lagging in

important areas. Bulgaria for example received two separate warning letters from the European Commission in 2007 over its failure to properly implement EC environmental laws.³²

2.4.2. Environmental policy, strategy, instruments and agreements

Policy Priorities

Sustainability has yet to be integrated into core economic and social development policies. Economic growth remains the predominant policy driver, with short-term economic gains taking precedence over longer-term benefits of improved integration of sustainability into policy making.

Other policy priorities include education, awareness raising and building capacities for both environmental protection and applying sustainable development principles at policy formulation and implementation levels. Horizontal and vertical communication between the relevant governmental institutions, namely in the field of environment and sustainable development, requires strengthening. This also applies to the building of local and regional public-private partnerships.³³

Strategies

All of the countries in this study have developed and adopted sustainable development strategies, or other forms of environmental strategies, including National and Local Environmental Action Plans (NEAPS and LEAPS – see **Table 3**), and poverty reduction strategies dealing with the environmental and social

Table 3 Local Environmental Action Plans (LEAPs)
(adapted from UNDP, 2007 and REC Bulgaria)

Country/ territory	LEAPs adopted	LEAPs under development
Albania	25	2
Bosnia and Herzogovina	26	5
Bulgaria	266 (1 per municipality)	
Croatia	30	
FYR Macedonia	24	11
Serbia	40+	Appr. 25

dimensions of sustainability. Significant responsibilities related to environmental protection and sustainable development have been devolved to regions and municipalities. While some countries, such as FYR Macedonia have developed a

³² The first letter was a final warning to Bulgaria over its failure to establish an adequate household waste management system in the capital city Sofia, and the other was a first written warning over Environmental Impact Assessments required under the wild birds directive
<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1826&format=HTML&aged=0&language=EN&guiLanguage=en>

³³ Stritih, Jernej et al. 2007

second generation of Environmental Protection Action Plans (the first was for 2004-2008, with the second developed in 2008), others, like Serbia and Albania still have difficulty implementing initial ones.³⁴

Regulatory Instruments

Different regulatory instruments for environmental protection are in place in all of the countries of this study, including Environmental Impact Assessment (EIA) guidelines / standards, Environmental Protection Standards, Environmental State Monitoring, the Environmental Pollution Cadastre, Environmental Protection Information Systems, provisions on liability for environmental pollution etc. However, administrative capacity and communication and co-ordination among ministries of government institutions is insufficient for implementation, and major weaknesses in enforcement capacity need to be addressed.

Economic Instruments

Although recent environmental legislation provides for them, economic instruments such as charges, tradable permits, subsidies and other instruments which aim to incite economic actors (such as households and industry) to shift to more environmentally beneficial behavior are not proving effective. There has been mixed success with collection and channeling of fees into environmental expenditure. Pollution charges are not sufficiently high to influence a polluters' behavior and the collection rate of pollution charges is low owing to lack of enforcement and limited inspection capacities to control payment of fees and penalties.³⁵ Accordingly there are high levels of public opposition to their increased implementation. Instead, when fees are implemented, they tend to be for the purpose of generating government revenue (as in the case of taxes on the import of motor vehicles) rather than for providing incentives for behavioral changes. Vehicle fuel tax (petrol and diesel) is an exception, with a clearly environmental motivation which favours unleaded over leaded petrol.

In the field of nature management, fees exist (e.g. User fees for beaches in Croatia), but are often poorly enforced. Environmental subsidies have been provided through environmental funds but these have been abolished in some countries and replaced by subsidy schemes administered by environmental ministries with limited skills and capacities for the development of economic instruments for environmental protection. This fact, combined with the reality that inter-ministerial collaboration is in general quite weak has meant that there are substantial obstacles to the accelerated use of economic instruments for environmental protection.

Multilateral Environmental Agreements (MEAs)

A number of key MEAs have been ratified or signed by the countries that are the focus of this study. These include:

- The Kyoto Protocol

³⁴ Ibid

³⁵ Ibid

- The Aarhus Convention
- The Protocol on Strategic Environmental Assessment
- The Convention on Long Range Transboundary Air Pollution
- The Convention on Biological Diversity
- The Convention on Control of Trans-border Transportation of Hazardous Waste and Disposal (The Basel Convention)
- The Convention on the Protection of Ozone layer
- The Convention on Climate Change (UNFCCC)
- The Convention of Wetlands of International Importance (The Ramsar Convention).

Although ratified, implementation / integration into national environmental legislation across the region is incomplete. Other relevant MEAs to the region remain to be ratified by concerned parties. These include:

- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes
- The Convention on Transboundary Effects of Industrial Accidents
- The Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters
- The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- The Convention on Protection and Sustainable use of Danube River, and
- The Convention for the Establishment of the European and Mediterranean Plant Protection Organisation

3. Areas for Collaboration

This part of the report presents an overview of negative environmental impacts caused by human economic activity as identified by CSOS working in the region. Based on information provided by participating CSOs via survey and web based research, issues and conflicts in the areas of waste and recycling, energy production, mining and mineral processing, management of protected areas and agricultural and livestock production are described at the regional and national levels, and illustrated by specific CSO case studies that could benefit from civil society / ecological economics collaboration.

3.1. Waste and recycling

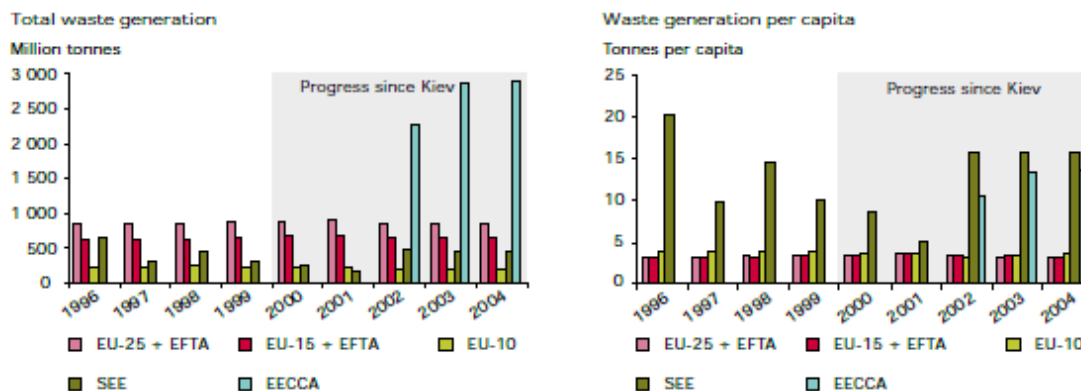
3.1.1. Regional description

The overall amount of waste generated in the region is growing due to increased economic growth (see **Figure 3** overleaf) which has proven a much stronger force than the range of prevention initiatives designed to curb the problem.³⁶ One

³⁶ EEA Report No 1/2007

Figure 3 Total Waste Generation and Waste Generation Per Capita

(source: EEA 2007)



of the most difficult challenges facing these countries is that of how to develop waste management systems that comply with EU legislation, and are at the same time affordable for consumers and businesses. Regional waste collection and disposal schemes have been developed and countries are in the process of constructing new waste management infrastructure that includes incinerators, landfills and composting facilities. Efforts are also underway to strengthen and improve management of waste service companies and public-private partnerships, to open the waste market to the private sector, to raise public awareness and to increase the use of economic instruments to minimise waste and stimulate recycling, particularly of packaging.

Despite these efforts, waste management services and infrastructure remain relatively underdeveloped in all of the SEE countries and generally lack advanced waste management practices such as separate waste collection. Under the European Waste Act (OG No.178/04 art.10) municipalities and cities have a key role in achieving sustainable waste management at the local level, with responsibility for management of municipal waste. In this role they are obliged by law to develop Waste Management Plans that outline waste streams, treatment options and measures for the prevention or reduction of waste production and recycling and specify measures for the separate collection of waste. However, few cities and municipalities are able to provide the necessary infrastructure (containers for separate collection of paper, metals, organic waste, etc) and additional systems for the collection and transportation of these materials has not been organized yet.

In terms of the quantity of waste, there has been an overall decrease in industrial sources owing to the decline of that sector, but resource intensive industry still produces relatively large quantities of industrial and hazardous waste. Growth in construction waste, packaging, and end of life vehicles is predicted to continue and the proper treatment of 'new' waste streams that are on the rise (electronic

equipment, computers and mobile phones) is posing new challenges to the region.³⁷

It is also predicted that the volume and composition of municipal waste in the region will become similar to that of the EU as economic growth continues. Some countries have begun to exhibit consumption patterns similar to those of highly industrialised countries yet currently almost all municipal waste ends up in landfills. An important obstacle to the implementation of alternative waste disposal schemes at this level is cost, as municipalities are mainly responsible for waste services. This is also an obstacle to increasing separate waste collection, which is limited to high value secondary raw materials and often performed informally by marginal social groups. In addition there are pressures resulting from the location of regional landfills in individual municipalities. While there has been a notable increase in the share of the population served by organised waste collection schemes, this has not been sufficient to prevent the unauthorised disposal of waste especially in rural areas. Illegal dumping and inadequate number and quality of disposal sites pose public health problems as they contaminate adjacent watercourses and soil.³⁸

One of the main environmental health hazards in the region, linked to the improper management of waste is wastewater. The number of wastewater treatment plants is insufficient and sewage networks are only developed in urban areas. Responsibility for the delivery of local public services such as water supply, sewerage and wastewater treatment (as with solid waste collection and disposal) rests with municipalities or regions. Typically, services are delivered by municipal companies (utilities) which operate as autonomous entities separated administratively and financially from the municipal governments, while decisions on tariff structures are subject to municipal approval. The financing of water supply and wastewater services is carried out through the collection of fees. However, the prices set by the municipalities and the companies cannot cover costs leaving the sector severely under-financed, and leading to further deterioration of the already poor infrastructure.³⁹

In general, the level of recycling in SEE is low, and although there is potential for the recycling of municipal waste, little progress has been made, largely due to the limited practice of separate waste collection. Any recycling that does take place is not the result of environmental regulation, but driven by economic forces, and tends to focus on industrial waste rather than municipal waste. Country descriptions

3.1.1.1. Albania

Waste management in Albania is severely underdeveloped and faces numerous challenges in collection and disposal. The actual level of annual per capita waste

³⁷ Stritih, Jernej et al. 2007

³⁸ EEA Report No 1/2007

³⁹ Ibid

generation in Albania is unknown but is estimated at 255 kg.⁴⁰ The per capita production of inert and solid waste averages 550 kg per year for urban areas and 170 kg annually for rural areas. The total production of urban waste for 2006 was 722 thousand tonnes (t).⁴¹

Less than 60% of Albania's population is covered by waste collection services, the responsibility for which falls on local authorities.⁴² The main method of waste disposal is landfill, and while there are systems for the collection of solid waste in most cities and towns, there are no properly engineered landfill sites meeting EU requirements in the country. Nor are there any systems of collection in small towns and rural areas and there is very little recycling of waste in the country.

Nor is there any system for the safe management of hazardous waste, of which it is estimated 2531 t/year is produced.⁴³ The storage of chemicals, pesticides, waste from copper and chromium mines, and from the extraction and refining of oil without adequate safeguards or monitoring systems poses particularly significant environmental threats.

With regard to wastewater, sewage systems in urban areas cover 67% and in rural areas only 1.4% of the population.⁴⁴ As of November 2008 there was only one wastewater treatment plant in the country that was not yet operational, and four others in construction.⁴⁵ Pollution of bathing waters remains a serious problem in some places due to direct discharges from sewage systems or from industry and uncollected waste and untreated wastewater pose an acute threat to Albania's southern coast.

3.1.1.2. Bosnia and Herzegovina

Public communal companies established in each municipality are responsible for the collection of solid waste in B&H. B&H produces 2-3 million t of all categories of solid waste annually, 452 kg of municipal waste per capita and 8636 t of hazardous waste.⁴⁶

Only 60% of urban areas are covered by waste collection services, with substantially less coverage in rural areas. B&H has one of the highest levels of per capita waste generation in the region. One CSO contributor to this report, The Centre for Environmentally Sustainable Development, indicated that even in the central municipality of Sarajevo with its embassies, residences and rich cultural and historical heritage, there are severe problems with waste treatment, with 27 illegal dumps and a daunting procedure for obtaining permission to build much needed waste disposal sites.⁴⁷

⁴⁰ Stritih, Jernej et al. 2007

⁴¹ IMF 2008

⁴² Stritih, Jernej et al. 2007

⁴³ Ibid

⁴⁴ Patozi 2008

⁴⁵ Commission of the European Communities November 2008a

⁴⁶ Stritih, Jernej et al. 2007

⁴⁷ CEECEC 2008b

There is no system for waste separation in B&H. Industrial waste is either disposed of together with municipal waste or stored at the industrial facilities where it is produced. The current rate of recycling in B&H is low except for the recycling of scrap ferrous and non-ferrous metals, the collection and recycling of which has increased suddenly (until 2008) due to increased prices for these on regional and world markets. Currently, the estimated recycling rate in Bosnia and Herzegovina is 50–70 % for iron, and over 60% for aluminium, rates which are comparable with some EU Member States.⁴⁸

At the outbreak of the civil war 1992-95, only seven municipal waste-water treatment plants were built and in operation. During the war, five of the seven plants were closed as a result of war damage, stripping of equipment and installations, lack of maintenance or shortage of electricity. After the war all the plants were put back into operation, except for the plants in Sarajevo and Trnovo, with one new plant built in Srebrenik. The percentage of population covered by sewage systems in urban areas is 56%. There are no waste water treatment plants in most of settlements, with the exception of Gradacac, Srebrenik, Trebinje, Ljubuski, Grude and Neum. The plants that are in operation are very small, and over 95% of municipal waste water is discharged directly into water bodies without any kind of treatment. Municipal and industrial wastewaters that are not treated but directly released in water flows mean that more than 2/3 of the water flows in B&H are polluted.⁴⁹ The European Investment Bank (EIB) is currently developing wastewater treatment plans and are considering a similar operation for the Republic of Srpska to improve outdated and poorly maintained water distribution and sewage systems.⁵⁰

3.1.1.3. Bulgaria

In Bulgaria the amount of municipal solid waste generated per capita in 2007 was 468kg⁵¹ and 3.6 million t in total.⁵² Just over 25% of settlements holding 84.2% of the population are served by organized waste collection. In urban areas organised waste collection covers almost 100% of the population, but in rural villages coverage decreases to less than 40%. Landfill remains the only method of treatment for municipal waste in the country and the main method for all other types of waste. In 2004, 86.5% of all waste was treated as landfill.⁵³

Bulgaria has a greater number and range of recycling facilities than other countries in the region, but these tend to operate below capacity. The total capacity for recycling of paper and cardboard waste in 2004 was estimated at 200 thousand tonnes, but in that year only 82 thousand tonnes of paper were recycled. The annual quantity of processed glass waste is around 15 thousand

⁴⁸ Bosna-S Consulting in EEA Report No 1/2007

⁴⁹ UNECE 2004

⁵⁰ European Investment Bank 2008

⁵¹ Eurostat <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdpc210>

⁵² Republic of Bulgaria, MoEW 2007

⁵³ Ibid

t/year, but the necessary infrastructure for sorting, separating and processing of glass waste does not exist, and only 23% of packaging was recycled in 2004.⁵⁴

In 2004, 526 thousand tonnes of hazardous waste and 10 million t of industrial waste were generated. Waste from thermal processes (71%), and construction and demolition waste (10%) made up the bulk, followed by the waste from inorganic processes (9%).⁵⁵

Case Study 1) Landfill for Solid Waste in the Zlatitsa Valley Zlatishka Kotlovina Ecological Society, Bulgaria

Location: The municipalities of Zlatitsa, Pirdop and Chelopech, Bulgaria.

Brief History: These municipalities have been united since 1987 on the issue of the construction of a regional landfill for solid domestic waste in Zlatitsa. Several months before its completion, the newly-elected Mayor of Zlatitsa expelled the company director of the landfill without explanation and refunded over 1 million leva (appr. 515 135 €) to the Government. An ecological catastrophe now threatens 18 thousand citizens as a result of this decision. Curiously, an illegal landfill was created in the town of Zlatitsa with the help of the same Mayor, which is now polluting the Pordopska and Topolnitsa Rivers.

Current Situation: The Ministry of Environment and Waters (MOEW) and the Regional Inspectorate of Environment and Water have been notified and an inspection is underway, but specific expertise is necessary to assess the actual condition of the air, water and soil.

Waste generated from the extraction and primary treatment of mineral resources has been on the decline due to the restructuring of the mining industry and the decommissioning of unprofitable operations. In 2004 the quantity generated from such activities was 71 million t, which was 5.2% lower than in 2003. The main share in 2004 came from ore and coal extraction.⁵⁶

Only 69.6% of the population was connected to sewerage networks as of 2007,⁵⁷ an increase of only 3.1% from the year 2000. Approximately 95% of towns had sewage networks, but only 9% of villages had sewage infrastructure in 2004.⁵⁸ According to the latest available data, only 42% of the population is connected to wastewater treatment plants⁵⁹, an increase of only 5.3% from 2000. In 2005 there were 68 urban wastewater treatment plants (UWWTP) in operation, 14 of them using mechanical treatment and the rest using biological treatment. The UWWTPs were unable to operate to the full potential of their design capacity (only 53% was achieved) owing to the incomplete state or absence of sewage systems.⁶⁰

⁵⁴ Ibid

⁵⁵ Ibid

⁵⁶ Ibid

⁵⁷ Bulgarian National Statistical Institute http://www.nsi.bg/Ecology_e/Ecology_e.htm

⁵⁸ Republic of Bulgaria, MoEW 2007

⁵⁹ Bulgarian National Statistical Institute http://www.nsi.bg/Ecology_e/Ecology_e.htm

⁶⁰ Republic of Bulgaria, MoEW 2007

3.1.1.4. Croatia

In 2004 the total amount of municipal waste generated in Croatia was 1.31 million t, with an annual per capita amount of 295 kg.⁶¹ The percentage of municipal waste covered by organized collection and disposal is 79 %, and by unorganized collection 18 %.⁶² Municipal waste production is on the rise and existing infrastructure for landfill and waste treatment does not meet EU standards. There are 283 landfills, of which only 23% are legal or in the process of legalization.⁶³ The new National Waste Management Plan envisages the construction of county and regional waste management centres but for now almost all municipal waste collected is deposited in landfills.

Case Study 2) Waste Management in Split, Dalmatia County Association for Nature, Environment and Sustainable Development (SUNCE), Croatia

Location: the city of Split, Dalmatia County, Croatia

Brief History: In Croatia landfill and waste treatment is insufficient for the country's needs and falls below standards required for EU accession, with most municipal waste ending up as landfill. Many such sites operate without permits and are used for municipal as well as hazardous waste.

Current Situation: The waste management situation in Split, Dalmatia county is critical as the biggest landfill, Karepovac, just outside the city (<http://wikimapia.org/1742346/Karepovac>) is nearly full. A county waste management centre is planned in the municipality of Lečevica-Kladnjice, 30 km from Split, and according to plans, the Karepovac landfill will be closed and remediated upon the county centre's opening. Residents of Lečevica (Split-Dalmatia County) and residents and local officials of Unešić, (Šibenik-Knin County) are strongly against the planned centres. The NIMBY effect is causing project delays (project preparation began in 2002, the EIA was done in 2005, and in 2009 building had not yet begun) and continued use of sub-standard existing landfills. Local people are said to be prepared to use any means possible to prevent the construction of the new centre, and at the same time, most local municipalities are not prepared to introduce primary waste collection due to cost. It is also important to stress that Lečevica sits at an altitude of 470 meters in a karst area beneath underground springs which are the source of water for most of the inhabitants of the County which mainly populate the shore. So even with the best available technology, an earthquake would mean certain contamination of the drinking water of over 350.000 inhabitants. For this reason and out of adherence to the precautionary principle, Association Sunce is also against the building of a waste management centre at this location.

In the context the impending waste management crisis of this region, the NGO Sunce is interested in conducting a recycling related cost benefit analysis (CBA), taking into account the cycle of materials across the primary waste collection system (waste collection costs, transport costs, etc.) and comparing the costs of recycling different materials with those of treatment by landfill or incineration. A CBA of the use of energy producing incinerators, would also be of interest, taking into account the volume of waste required for their proper functioning, and concerns that the use of such incinerators could impede efforts to reduce levels of waste generation. Such results would be useful for the development of recommendations for waste management programmes, as would practical examples from other cities around the world that have initiated sustainable waste management programs.

⁶¹ Republic of Croatia, MoEPPPC November 2007

⁶² Ibid

⁶³ Republic of Croatia, MoEPPPC July 2007

Separate waste collection is poorly developed in most Croatian cities despite the adoption of new regulations at the national level, with only 2% of solid waste separately collected and 1% treated by composting.⁶⁴ For example, packaging waste, specifically plastic, is increasing, amounting to 250 thousand t in 2004.⁶⁵ Yet despite the adoption of the Ordinance on Packaging and Packaging Waste in 2005, much less of this waste is being treated than there is installed capacity for.

The state of industrial, and particularly hazardous waste management has worsened since 2002, when the country's only hazardous waste incinerator, the PUTO mobile installation, was shut down. A major portion of hazardous waste is therefore exported. In 2004, this amounted to 12 805 tonnes, with additional amounts temporarily stored at the point of generation.⁶⁶

With regard to wastewater, only 20% from industrial sources is purified before discharge into natural water bodies, and only approximately 25% of municipal wastewater undergoes purification. Only 43% of the population is connected to sewage networks, mostly in larger towns. Of Croatia's 83 municipal wastewater treatment plants, only 34 carry out second stage wastewater treatment, and not a single plant carries out third stage treatment.⁶⁷ Instead, purification consists of mechanical treatment and the use of wastewater discharge pipes that extend a minimum of 500 metres from shore. The discharge of untreated or insufficiently purified municipal and industrial wastewater is affecting the quality of sea water in some areas.

Case Study 3) Waste in Protected Areas Argonauta Ecological Society, Croatia

Location: Kornati National Park, Kornati Archipelago, Croatia

Brief History: According to the Law on Waste, the Municipality of Murter-Kornati is responsible for the collection of communal waste within Park borders. Entrance fees to the park are meant to pay for the clean-up of tourist waste left in the benthonic sea and Park areas, but much waste in the park remains uncollected. As a result the local NGO Argonauta has been organizing and funding (through projects and donors) clean-up activities, not only to clean the Park but to raise public awareness. While the Municipality of Murter-Kornati is providing much of the funding for cleanup of the benthonic sea area, the Park administration has not taken much initiative or provided financial and logistical support to the NGOs working within the Park despite persistent NGO lobbying.

Current Situation: Argonauta is looking for a solution through a joint, long-term agreement that includes clear roles and duties and financial commitments between the municipality, the National Park, itself and other interested organizations.

⁶⁴ Republic of Croatia, MoEPPPC November 2007

⁶⁵ Ibid

⁶⁶ Ibid

⁶⁷ Ibid

3.1.1.5. FYR Macedonia

In the Republic of Macedonia landfill is the main method of disposal for all solid waste. Municipal solid waste is estimated at 570 thousand t/year⁶⁸, and 250 kg per capita. This is defined as household waste, street sweepings and park green waste, commercial institutional waste and waste generated by industry "of a household nature". All of this is deposited untreated, as landfill.⁶⁹

Around 70% of the population benefits from waste collection services, but in rural areas this decreases to 10%.⁷⁰ Most waste collection is performed by public communal enterprises that suffer from a lack of finance and obsolete waste collection equipment. Municipal waste that is not collected by official collection enterprises is disposed in "wild" (illegal) dumps, of which there are estimated to be approximately 1000 in rural municipalities.⁷¹ Separate collection of municipal waste does not take place, except for some bulky waste in Skopje and organic waste in the municipality of Zrnovci.

Case Study 4) Solid Waste and Biodiversity Grashnica Ecological Society, FYR Macedonia

Location: Ohrid Lake and its surrounding rivers

Brief History: Fish stocks in Ohrid Lake have declined, particularly those of Ohrid trout as a consequence of pollution discharged from the Velgoshka River (near the village of Grashnica) which flows through a communal dumpsite bringing solid waste with it. Eutrofication of the lake has expanded and accelerated due to increased levels of nitrogen and phosphorus. The annual fish catch decreased from 150 tonnes in 1985, to less than 10 tonnes in each of the last four years. Due to the deteriorating water quality in the lake the Ohrid Trout, an endemic species to Macedonia, is now approaching extinction.

Current Situation:

Macedonian and Albanian fishing concessionaires, inhabitants of the river bank the City of Ohrid and tourism stakeholders are cooperating to resolve the environmental problems of Lake Ohrid, but despite continuous cleaning efforts the level of ecological awareness of the inhabitants remains low. Increased cooperation is needed between Albanian environmental NGOs and Macedonian and Albanian authorities. The exchange of experience with foreign organizations dealing with similar issues is also desired.

Mineral excavation and ore processing, generates about 17.3 million tonnes of waste per year, a significant proportion of which is hazardous. Agricultural waste composed of "recyclable" animal excreta and plant waste makes up another 5.5 million t/year. There are no formal collection systems for construction and demolition waste which amounts to 500 thousand t/year. Used tyres, end-of-life vehicles and electrical/electronic waste contribute another 40 thousand t/year. Power plants, thermal metallurgical and inorganic chemical processes generate an additional category of non-hazardous waste amounting to approximately 2

⁶⁸ Republic of Macedonia, MoEPP 2008

⁶⁹ Stritih, Jernej et al. 2007

⁷⁰ Republic of Macedonia, MoEPP 2008

⁷¹ Ibid

million t/year, which is landfilled locally, and in the case of smaller generators, together with municipal waste.⁷²

Hazardous waste is mainly generated by metallurgical industrial facilities and amounts to approximately 77 500 t/year.⁷³ This is disposed of in industrial landfill sites that have been identified as environmental "hotspots" due to their negative impacts. The majority of hazardous waste oils generated in the production sector and in other activities are currently burned as fuels, and industrial emulsions are mainly discharged as wastewater. Hazardous medical waste originating from Skopje and Kumanovo is separately collected at source and incinerated, but all other medical hazardous and non – hazardous waste is disposed of at municipal landfills without the required pre-treatment.

Case Study 5) Urban Smelting Green Power Ecological Group, FYR Macedonia

Location: The city of Veles, central Macedonia,

Brief History: The city of Veles has been involved in a long-running conflict with one of the biggest polluters in the Balkans, a smelter for lead and zinc situated in the City centre that has aggravated the health of the citizens of Veles for more than 30 years. Although, the smelter has now been closed for more than 5 years, the soil and water are still highly contaminated and plans to reopen the smelter are underway in complete disregard to both environmental standards and the citizens' wishes.

Current Situation: The NGO Green Power was founded 6 years ago to represent the rights of the citizens of Veles with regard to the smelter. At the moment NGO Green Power is campaigning against the reopening of the facility, organizing numerous protests against the smelter with the support of thousands of citizens and initiating a judicial process against the State.

Recycling activities for municipal waste are limited and disorganised, and the majority of recycling is carried out by private companies that deal with scrap metal. There is some recycling of other metals, paper, plastics, car batteries and accumulators by the informal sector, but the recovery of many potentially recyclable materials is not seen as financially viable and markets are underdeveloped. Besides the obvious need for recycling and new modern multi-functional dump sites, reform of the public communal waste enterprises responsible for waste management operations is urgently needed.

3.1.1.6. Serbia

Although primary recycling of paper, glass and metal packaging is prescribed by Serbian law, in practice it does not take place, with the exception of a waste sorting facility in Novi Sad and recycling yards with designated containers for the collection of specific types of waste. The industrial processing capacity for recyclables and recovered materials is very limited.

⁷² Ibid

⁷³ Ibid

Case Study 6) Municipal Waste in Kraljevo Eko Ibar Environmental Movement, Serbia

Location: The Municipality of Kraljevo is in central Serbia in the District of Raska, which covers an area of 1529km².

Brief History: Waste management has not been dealt with appropriately in the Municipality of Kraljevo, as there is no integrated waste management system. Waste is disposed of by dumping, without any prior selection or treatment, and recycling is almost non-existent. This is harmful to both people's health and the environment and the disposal of the waste without utilization of the energy and materials' potential is seen as utterly irrational. The existing landfill will be closed soon due to saturation, leaving local residents, local self-government bodies, and citizens' associations desperate to find a solution.

Current Situation: The Municipal Assembly of Kraljevo has designed a Local Environmental Action Plan (LEAP) and a Local Waste Management Plan based on the National Strategy of Waste Management, but both are in need of implementation. Short-term objectives include capacity-building of local communities for waste management including separation of communal waste to reduce the amount sent to landfill, investment in equipment and introduction of new technologies, use of waste as secondary raw material, compost and energy, Projects aiming to stimulate the involvement of all participants and reduce the price of waste disposal if successful, will hopefully lead to the smooth operation of a regional sanitary landfill in the future, where the price of waste disposal would be determined according to its weight.

Case Study 7) Local Sustainability Actions – Changing Consumption Habits of the Residents of the New Belgrade Municipality Young Researchers of Serbia

Location: the New Belgrade Municipality, the largest municipality in Serbia covering an area of 4074 ha, with 236 000 residents.

Brief History: The global recycling sector is believed to achieve an annual turnover of 160 billion dollars. Each year, more than 600 million t of waste paper, plastics, ferrous and non-ferrous metals, rubber, glass and electronic waste are recycled and traded. According to data from the Serbian Association for Recycling, more than 200 thousand t of various plastic materials are discarded annually in Serbia, and only around 5% of collected plastic packaging material is recycled. The NGO Young Researchers of Serbia launched a project in 2006/7 with the support of the European Agency for Reconstruction with the aim of changing local waste disposal habits through education in schools, and cooperation with the media, municipalities, citizens and city authorities (through advisory counsels). Part of the project includes the provision of equipment for a recycling yard in New Belgrade, including 80 containers for polyethylene terephthalate (PET) bottles, paper and aluminium waste, 1 container for used batteries, 1 container for waste oils and 1 container for accumulators.

Current Situation: The Public Utility Company "Gradska cistoca", a project partner, was given the containers to distribute across various locations of New Belgrade for the collection of the recycling raw materials. However, after more than a year, the containers lie unused on the premises of the Public Utility Company. The representatives of the Public Utility Company "Gradska cistoca" have not been willing to cooperate and the situation remains unresolved. Expertise is needed in order to educate citizens, and prompt the relevant institutions and companies to take part in finding solutions to problems of waste.

Hazardous waste is not separately collected and dumped without treatment in municipal disposal sites. There is no reliable data on the volumes of hazardous waste generated but the most recent estimated is 460 thousand t/year of hazardous industrial and medical waste. This includes: waste motor oils (106 thousand t/year), mixed organics/water emulsions (257 thousand t/y), and other

Case Study 8) Waste Management in Subotica TERRAS Organic Food Association, Serbia

Location: Subotica is the most northern city of the Republic of Serbia, with a population of 100 thousand (2002 census), the 2nd largest in the Autonomous Province of Vojvodina. It is located about 10 km from the Hungarian border and is the administrative centre of the North Backa District and the Municipality of Subotica.

Brief History: In Serbia waste has always been a major problem, and Subotica is no exception in this respect. The city landfills include both uncontrolled and illegal dumps. People discard their waste in a non-selective way, i.e. secondary raw materials are not separated. The problem is also in the lack of ecological culture, so litter can be seen everywhere, in cities and rural areas. A particular problem in rural areas is packaging materials for chemicals and fertilizers. Instead of disposing of them appropriately, controlled 'wild dumps' are created.

Current Situation: Since last year, local CSOs, the public utility company "Cistoca i zelenilo", local communities, local self-government and educational institutions have been mobilizing to try to tackle the problem. However, current laws on waste management, packaging and packaging waste offer little hope for results. Action plans are needed at the local level that will involve civil society and other stakeholders including local self-government, public utility companies, and environmental experts. The experience of neighbouring countries, Hungary in particular as an EU member, and Croatia as a candidate, will also be relevant.

Case Study 9) Electronic Waste in Serbia Ecolibri Bionet Centre for Biodiversity Conservation and Sustainable Development, Serbia

Location: The Municipalities of Vracar and Prokuplje, Belgrade. Vracar is the least populated and smallest, covering an area of 292 ha, with a population of 60 thousand. Prokuplje is the seat of the Toplica District with a population of 80 thousand residents.

Brief History: The components of electronic devices contain toxic substances including lead, cadmium, mercury, beryllium and others which, if treated inadequately, release dangerous toxins into the environment. Serbia recycles only 5% of its electronic waste compared to EU countries which use as much as half of theirs as raw material. Currently there are no effective regulations to minimise the production of such waste and therefore little incentive for its recycling. Two companies in Serbia recycle their electronic waste by separating plastics, metal and rubber. The materials that cannot be recycled, such as hard discs and batteries, are sent to recycling centres in Europe. Although citizens and companies are able to dispose of this waste in this manner, they have so far shown little interest.

Current Situation: In theory, the Waste Treatment Law threatens severe penalties for companies disposing of waste inappropriately, although in practice no such fine has ever been paid. A project by ECOLIBRI has been prepared to devise a hazardous waste treatment strategy and cooperation has been established with the municipalities of Vracar and Prokuplje, including the Recycling Agency. Its aims include the dissemination of information regarding laws regulating waste disposal and publication of separate guidelines for different categories of waste.

hazardous wastes such as medical waste, organic and inorganic hazardous waste from industry, and Polychlorinated biphenyls (PCBs) (amounting to 97 thousand t/y).⁷⁴

The sewage system covers only about 57% of the country's population. In urban areas this ranges from 50-80%, but coverage is as low as 22% in semi-urban and rural areas. Only 28 towns in Serbia had wastewater treatment plants (WWTP) in 2005. Some of the existing WWTPs are abandoned, many only provide primary (mechanical) treatment and most are not fully operational, due to poor maintenance and lack of financial resources. Only 13% of municipal wastewater is treated, and the country's four largest cities, Belgrade, Novi Sad, Niš and Kragujevac lack WWTPs. Much of the sewage infrastructure has deteriorated over recent years due to lack of maintenance and upgrading, and sewage pumping stations are vulnerable to defects that can result in public health hazards when spillage occurs. Rural areas rely on inadequate septic tanks for sanitation.⁷⁵

Case Study 10) Remediation of Palic Lake Centre for Ecology and Sustainable Development (CESD), Serbia

Location: Palic Lake is situated 8 km from Subotica, near the town of Palic, Serbia.

Brief History: Palic Lake is a popular tourist destination, with 3 separate beaches covering 3,8km², and shallow waters averaging 1.9m in depth. It is situated in the midst of a mild continental climate and receives an average of 2100 hours of sunshine per year, with an average summer temperature of 20°C. As early as the end of the last century the Lake's vegetation had begun to increase and water levels to recede, affected by increased temperatures, changing wind patterns and the presence of waste water. By the summer of 1970, a shortage of oxygen caused by uncontrollable algal bloom resulted in the death of all living organisms in the Lake. By 1971 the lake had completely dried up. Its mud was removed, a waste-water purifier built and in 1976 the Lake was refilled with water and monitored carefully. In addition the Tisal Panic canal was installed in 1995, greatly improving the Lake's water quality.

Current Situation

Palic Lake is again under threat, as the result of communal and industrial wastewaters. Revenue generated from citizens' payment of increased water fees and the enlargement of the purifier have not been able to improve the situation significantly, and the Lake bottom is now covered in nearly 1m of mud.

The latest available data shows 152 industrial sites to have some effluent treatment installed, including 20 large industries. However, very few installed industrial wastewater treatment facilities (13%) operate effectively, and nearly 90% of industrial wastewater is discharged without treatment.⁷⁶

⁷⁴ Republic of Serbia, MSEP 2005

⁷⁵ Ibid

⁷⁶ Ibid

3.2. Energy

3.2.1. Regional description

The energy sector is the main source of greenhouse gas emissions (**Table 4**). It is also a source of air pollutants (acidifying substances, ozone precursors and particulates), oil spills, and nuclear waste. As one of the most polluting sectors of

Table 4: CO₂ Emissions from Fossil Fuels and Taxes
(source: EIA 2006 and Stritih, Jernej et al. 2007)

Country / Territory	CO ₂ emissions from fossil fuels in 2006 (Million Metric Tons)	CO ₂ Per Capita Emissions from Consumption and Flaring of Fossil Fuels in 2006 (Metric Tons)	CO ₂ Tax
Albania	4.69	1.31	CO ₂ tax applied to motor fuels
Bosnia and Herzegovina	17.41	3.87	No
Bulgaria	48.94	6.63	No
Croatia	21.43	4.47	CO ₂ emissions charge
FYR Macedonia	7.17	3.50	No
Serbia (and Montenegro)	52.15	N/A	No

the regional economy it is not surprisingly the source of much conflict.⁷⁷ The energy intensity of SEE is high with much of the energy used coming from coal (see **Table 5**). Following a decrease in the 1990s, coal consumption has been rising and is projected to do so further sparked by concerns over high oil and gas prices and security of sources, driving a return to coal-fired electricity generation across Europe.

Table 5: Coal Production, Consumption and Imports 2006

(source: Energy Information Administration 2006)

Country / Territory	Production (Million Short Tons)	Consumption (Million Short Tons)	Imports (Trillion Btu)
Albania	0.114	0.129	0.379
Bosnia and Herzegovina	10.054	10.057	0.092
Bulgaria	28.090	30.756	60.911
Croatia	N/A	1.009	22.402
FYR Macedonia	6.475	6.714	3.175
Serbia (and Montenegro)	0.114	0.129	0.379

⁷⁷ See Transparency International Bosnia and Herzegovina's "Billions for major new energy projects in the Balkans but why not a penny for renewables, demand NGOs" <http://www.ti-bih.org/Articles.aspx?ArticleId=54304fbc-6078-4b79-bf01-cb14bdb1b68d>

Most of the countries in the region are net importers of energy (see **Tables 5 and 6**). Demand in recent years for energy from oil and electricity in Europe has led to increased investment in export capacity. The main domestic sources of electricity generation in the region are lignite and hydropower. Lignite-fired power plants and the oil and oil derivatives industry are among the most severe polluters in the region. Hydropower plants transform the hydrology and ecology of the rivers on which they are located. Fuelwood remains an important heat source, and wood is used extensively as a furnace fuel, often in low efficiency stoves that release greenhouse gases and poly-aromatic hydrocarbons that create cancer risks.⁷⁸

Table 6: Oil and Gas Reserves, Production, Imports and Consumption

(source: Energy Information Administration)

Country / territory	Oil Reserves 2007 (Billion Barrels)	Oil Production 2007 (Thousand Barrels per Day)	Oil Imports 2007 (Thousand Barrels per Day)	Oil Consumption 2007 (Thousand Barrels per Day)	Gas Reserves 2006 (Billion Cubic Feet)	Gas Production 2006 (Billion Cubic Feet)	Gas Imports 2006 (Billion Cubic Feet)	Gas Consumption 2006 (Billion Cubic Feet)
Albania	0.198	6.4	25 ^F	32 ^F	30	1	N/A	1
Bosnia and Herzegovina	0	0	28 ^F	28 ^F	0	0	14.1	14
Bulgaria	0.015	3.36	118 ^F	121 ^F	210	0	N/A	118
Croatia	0.074	23.63	79 ^F	103 ^F	1000	54	N/A	95
FYR Macedonia	0	0	21 ^F	21 ^F	0	0	N/A	4
Serbia (and Montenegro)	0.078	0	91 ^F	91 ^F	1700	9	N/A	85

^F=Forecast

** Data for Serbia from 2001

Although the region holds important fossil fuel deposits (see Table 6) these are not significant on a world scale, and recent political and economic instability has discouraged any substantial foreign investment in the respective countries' energy sectors. Globally, the region is more important as a transit centre for Russian and Caspian Sea region oil exports to Western consumers. With total proven oil reserves of approximately 345 million barrels, a number of companies are active in the region and exploration is picking up (especially in Albania and

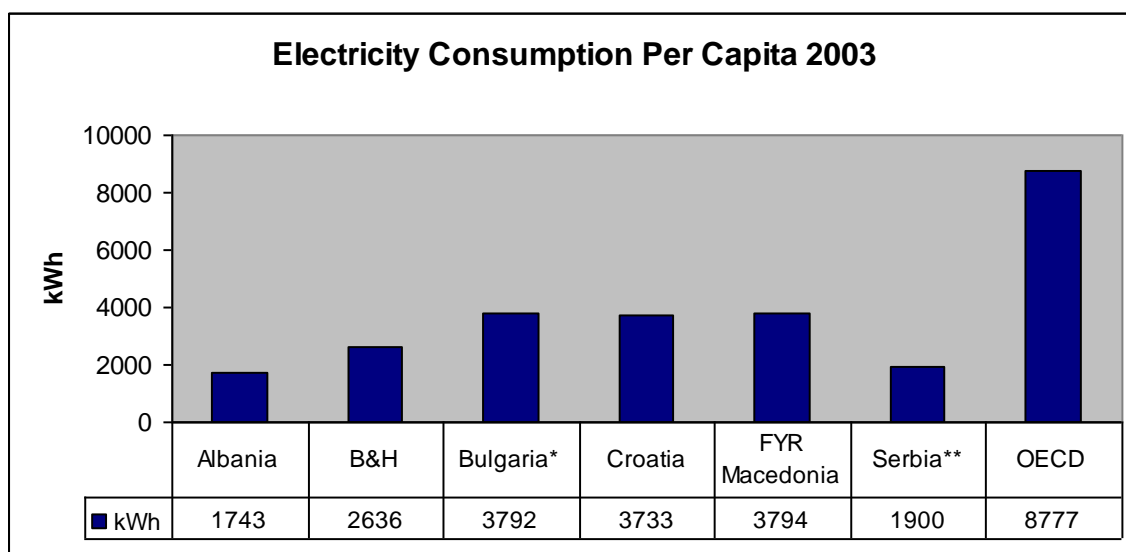
⁷⁸ Stritih, Jernej et al. 2007

offshore areas in the Adriatic Sea), but production overall remains low, in 2005 reaching only 41 thousand barrels per day (bbl/d). Estimates of regional oil consumption in the Balkans in 2005 indicate a total of 237 000 bbl/d, leaving it dependent on imports for roughly 80% of its needs which are well supplied via pipeline links with Russia and Greece, and port facilities on the Adriatic Sea. Proven natural gas reserves in the Balkan region total approximately 2.7 trillion cubic feet (Tcf) with most of the region's natural gas imports coming from Russia.

79

Figure 4: Electricity Consumption Per Capita 2003

(adapted from UNDP (2007) Environmental Policy in Southeastern Europe and EEDRB)



* Data for Bulgaria for 2002, from IAEA Energy and Environment Data Reference Bank (EEDRB)

Total energy consumption per capita in SEE is still two or three times lower than in Western and Central Europe (for electricity see **Figure 4**), with a share in global total energy consumption in 2004 of 2%. However, current policies and actions to increase the efficiency of energy production and consumption and switch to low or zero-carbon energy sources are being overwhelmed by growth in energy use. For example, energy consumption fell between 1991 and 1994 and between 1997 and 1999 but recovered from 2000 onwards, with total energy consumption (TEC) increasing between 2000 and 2004 (see **Table 7** overleaf) in the post-war period of greater stability. Although energy consumption per unit of GDP decreased over the period 1992 - 2004 by 16 % (showing some decoupling of energy consumption from economic growth), oil consumption mounted, as did that of natural gas, which increased by 18 % over the same period.⁸⁰

⁷⁹ EIA 2007 http://www.eoearth.org/article/Energy_profile_of_the_Balkans

⁸⁰ EEA Report No 1/2007

In 2004, energy-related greenhouse gas (GHG) emissions accounted for 80 % of total GHG emissions in the pan-European region.⁸¹ Although the energy intensity of the region is predicted to fall, concerns over energy security, adequate access to energy services (particularly in rural areas) and modernisation of energy infrastructure cast serious doubt over whether the SEE will be able to reduce its energy intensity in the near future. Moreover, in the coming years, growth in

Table 7: Energy Consumption in SEE

(source: European Environment Agency, 2007)

	Total Energy Consumption Per Capita (TOE/Capita)	Total Energy Consumption % Change	Renewable Share in Total Energy Consumption (%)	Final Energy Consumption Per Capita (TOE/Capita)	Electricity Consumption (Gwh)	Transport Energy Consumption Per Capita (TOE/Capita)	Transport Energy Consumption % Change
Year	2004	2000–2004	2004	2004	2004	2004	2000–2004
Albania	0.8	40	26	0.67	3 671	0.27	56
Bosnia & Herzegovina	1.2	17	15	0.81	7 177	0.19	24
Bulgaria	2.4	1	5	1.31	24 906	0.33	26
Croatia	2	13	11	1.57	13 669	0.42	20
FYR Macedonia	1.3	-1	12	0.80	5 764	0.17	-3
Serbia & Montenegro	2.1	30	11	1.28	27 755	0.27	162

energy consumption is projected to increase steadily.⁸² Energy efficiency is therefore of crucial importance to the environment of the region. However, obstacles to improvement include lack of investment in efficiency measures for power generation, transport, buildings, and industry, relatively low levels of awareness among consumers, vendors, and policy makers, and a lack of up-front capital to buy new energy-efficient equipment or undertake necessary retrofit measures.

Renewable energy sources (see **Table 7**) in the region include electricity from large hydro power plants, and heat from traditional biomass. So far however, such initiatives have mainly been carried out on a pilot level. Croatia has had some success with more efficient gas power plants, improved district heating systems, and small-mid sized applications of renewable energy sources in industry. Wind power plants are becoming profitable businesses and biofuel production is growing, but on the whole the share of wind and solar energy in electricity production is at present insignificant. Policy frameworks to promote renewable energy are in their infancy in SEE, and the main growth in electricity

⁸¹ Ibid

⁸² Ibid

production from renewable sources has come from the rehabilitation and construction of hydro plants.⁸³

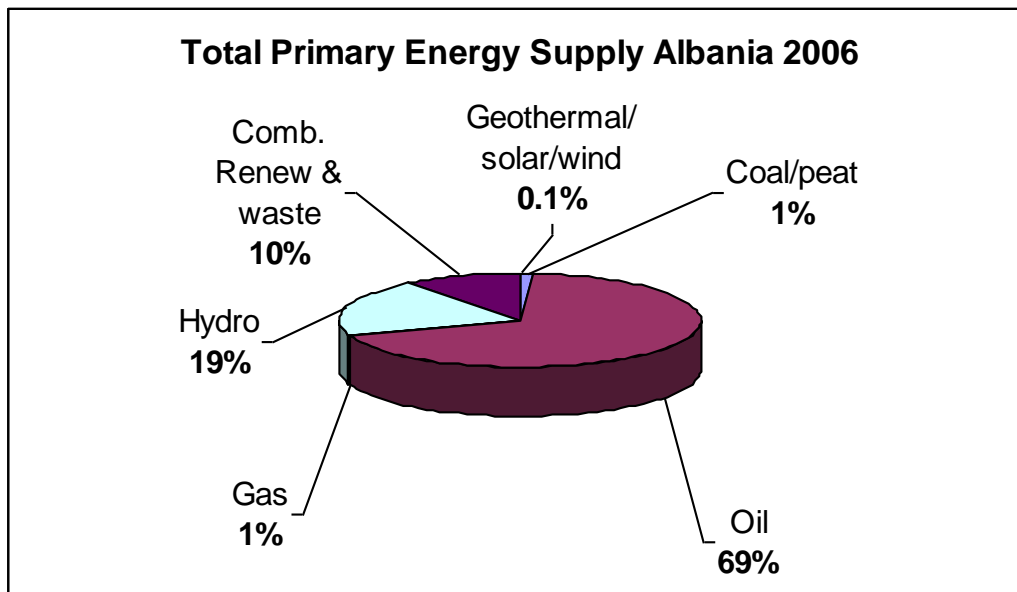
3.2.2. Country descriptions

3.2.2.1. Albania

Albania's energy sector faces several key challenges as outlined in its 2008 PRSP.⁸⁴ These include:

- insufficient electricity production for domestic demand resulting in ongoing cuts and rationing;
- inadequate interconnection lines to neighbouring countries for import of electric energy;
- Non-technical losses due to illegal connections, interventions on meters, and improper relations between consumers, meter inspectors and other sector staff; and,
- Lack of diversified fuel sources

Figure 5: Total Primary Energy Supply Albania 2006 (source: IEA 2008)



In terms of fossil fuels, the largest source of primary energy (see **Figure 5**), Albania has 198 million barrels of oil reserves (**Table 6**). Total oil production in 2007 was 6400 bbl/d, imports during same year were approximately 25 thousand bbl/d, and consumption for 2007 was forecast at 32 thousand bbl/d. Natural gas reserves are estimated at 30 billion cubic feet (Bcf), and apart from Croatia and Serbia, Albania is the only country in the region that produces natural gas. Its

⁸³ Ibid

⁸⁴ IMF 2008

output of about 1 billion Bcf fulfills domestic demand . In 2005 CO₂ emissions from fossil fuels amounted to 4.4 million metric tons (see **Table 4**), up 28% from 3.2 million metric tons in 2000.⁸⁵

Case Study 11) Coal Fired Thermal Power Plant in Porto Romano Environmental Centre for Development Education and Networking (EDEN) Albania

Location: The Porto Romano energy complex near Durres, the second largest city in Albania

Brief History: The complex includes a thermo power plant, marine facilities and distribution lines connecting the plant with Tirana and Italy. "Enel", an Italian company had planned to construct a 1600MW coal fired TPP with permission from the Ministry of Environment once the Environmental Impact Assessment (EIA) had been prepared and disclosed and public consultations had been organized. On January 27, 2009 the EIA was presented and should have been submitted to the public for debate, however the investor and the Ministry of Environment, Forestry and Water Administration refused to publicly release the EIA despite direct requests from Albanian environmental organisations for its disclosure. Enel was criticised for not disclosing detailed information on the tender process and conditions. The "Ekolevizja" coalition of Albanian environmental groups presented a position paper with preliminary comments on the EIA, demanding: the preparation of a Strategic Environmental Assessment by the Ministry of Economy, Trade and Energy for the whole energy and industrial park in Porto Romano; preparation of an alternative project EIA by independent experts; and the organisation of a referendum in the Durres region regarding the thermo power plant.

Curent Situation: EDEN is working very intensively in joint collaboration with partners CEE Bankwatch Network (BWN) to provide information and assistance to the Durres Municipality by providing an expert analysis of the present EIA and fundraising for an awareness raising campaign for members of the public regarding the health and environmental impacts as well as the economic benefits of the TPP.

Albania has a high potential for hydropower production due to its large water quantities and steep riverbanks. In 2005, electricity production was 5.32 billion kWh, 98.7% of which was from hydropower, and most of this from dams on the Drini. Other hydropower plants have been built along the Mati. In the rest of the country (central and southern) hydropower plants are driven by river-flow without dams. Dams originally built only for hydropower generation also play a role in river-flow regulation. Installed capacity for hydro electricity generation in this country is 1.45 GWe.⁸⁶

The amount of electricity provided by hydropower is set to increase as plans for the rehabilitation and construction of additional hydro dams are central to the Government's strategy for meeting demand for energy at minimal social and environmental cost. The diversification of the electrical energy system away from its almost total dependence on water sources is set to be achieved though the rehabilitation and construction of thermal power stations. Through these developments more than 8500 GWh of electric energy will be generated

⁸⁵ Energy Information Administration http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=AL#co2

⁸⁶ Energy Information Administration <http://www.eia.doe.gov/iea/elec.html>

domestically per year by 2013.⁸⁷ Albania's energy strategy also includes plans to improve the legal and institutional framework to promote the use of renewable energy, although no specific timeframe is mentioned in the PRSP.

Case Study 12) Wind Farm Installation in the Protected Area of Karaburuni Peninsula

Environmental Centre for Development Education and Networking (EDEN) Albania

Location: Karaburuni Peninsula – Albania

Brief History: In the beginning of 2008 the Albanian Government granted approval for the construction of a large (500 MW) wind farm installation in the protected area of Karaburuni Peninsula. A license for its construction was granted to Moncada Construzioni, an Italian firm, without the required prior public information process.

Current Situation: The Karaburuni peninsula presently has the status of Managed Nature Reserve (IUCN category IV) and it has been proposed to be upgraded to a National Park by many environmental policy documents, one of them the 2006 GEF MedWetCoast project. An NGO coalition led by the Ekolevizja Network opposes the decision of the Albanian government to open this protected area to development. The Albanian Government it points out, is openly disregarding without due explanation, all of its previous commitments to citizens and the donor community to protect this biodiversity hotspot and coastal landscape of outstanding natural beauty.

3.2.2.2. Bosnia & Herzegovina

The energy sector has been traditionally very important to B&H, which was once a producer of energy and raw materials for other parts of the former Yugoslavia. It is also one of the greatest sources of pollution in B&H, where power is primarily produced from hydro and thermal sources (see **Figure 6**). Despite considerable post-war investments in refurbishing, thermal facilities lack adequate air protection measures, creating cross-border environmental pressures.

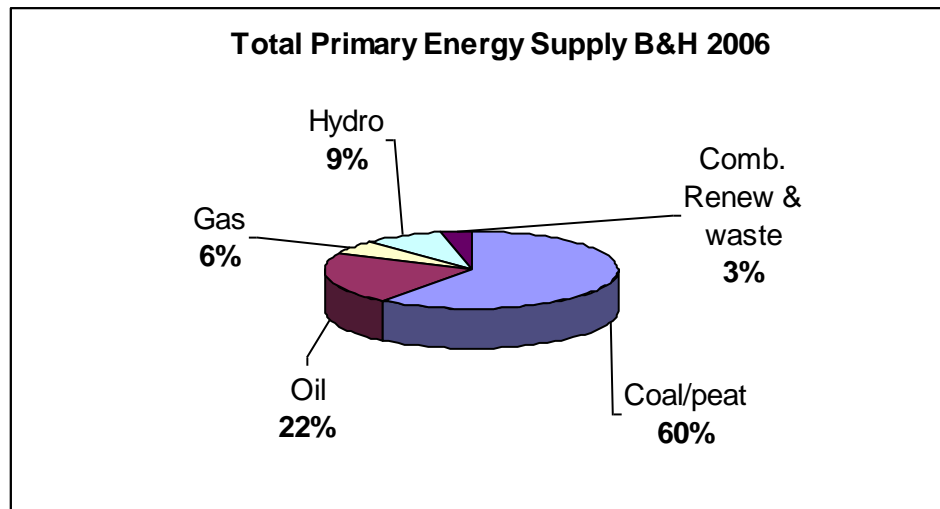


Figure 6: Total Primary Energy Supply B&H 2006 (source: IEA 2008)

⁸⁷ IMF 2008

The country has a surplus of generation capacity of both hydro and coal. There is considerable untapped hydro potential, estimated at 6100 MW but only 38.75% of which is utilised.⁸⁸ Of the hydro plants in use the environmental controls are seen as relatively good. Coal (lignite and brown coal) is mined in opencast and subsurface mines and is generally of a low heat content. Current production, approximately 50-60% of its pre-war level,⁸⁹ covers the needs of the power generation sector for the most part, with remaining coal production supplied to households and industry.

With no domestic gas or oil reserves, oil consumption in 2007 was about 28 thousand bbl/d. and natural gas in 2006 was 14.1 Bcf (see **Table 6**). Despite a high share of fossil fuels in the energy system, CO₂ emissions are relatively low thanks to low overall consumption of energy per capita. In 2005 CO₂ emissions from fossil fuels were 17.4 million metric tons (see **Table 4**), up 20 % from 13.9 million metric tons in 2000.⁹⁰

The estimated unexploited potential of biomass (residual wood and wood waste) is approximately 1 million m³ annually. There is also potential for wind, geothermal and especially solar energy utilization. B&H is counted as one of the more favourable locations for solar irradiation.⁹¹ In an effort to raise the profile of such alternatives, several NGOs have formed the 'Energy' network to influence the adoption of renewable energy strategy in B&H, advocating greater public participation and working to inform citizens about the current state of strategy preparation and their rights to direct participation in this process.

3.2.2.3. Bulgaria

Over 70% of Bulgaria's energy comes from imports.⁹² The country is at present almost entirely dependant on imports for natural gas and crude oil, most of which is sourced from the Russian Federation. Domestic gas is imported primarily from Russia at highly subsidized prices in exchange for Russia's use of Bulgaria as a transit country. Although it enjoys proximity to its sources, Bulgaria has only one storage facility for natural gas with limited capacity, making its supplies vulnerable to the restriction or interruption of these. Partnership and cooperation with its main suppliers, the main consumer countries and transiting countries have therefore been a high priority.

Until recently there were believed to be only very modest natural gas reserves in the country, and these were only of interest in terms of their potential to limit price increases for imported natural gas. At the end of 2008 however, a reserve of approximately 6.6 billion cubic metres was discovered in the north of the country near the village of Deventsi. It is expected to be able produce 500 million cubic

⁸⁸ Federation of Bosnia and Herzegovina Republika Srpska 2003

⁸⁹ UNECE 2004

⁹⁰ Energy Information Administration http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=BK#co2

⁹¹ Austrian Energy Agency <http://www.eva.ac.at/enercee/bih/supplybycarrier.htm>

⁹² Republic of Bulgaria, MoEE 2008

metres / year but in extraordinary situations like a gas supply crisis, the volume could be increased, making Bulgaria a source of stability for gas supply in the

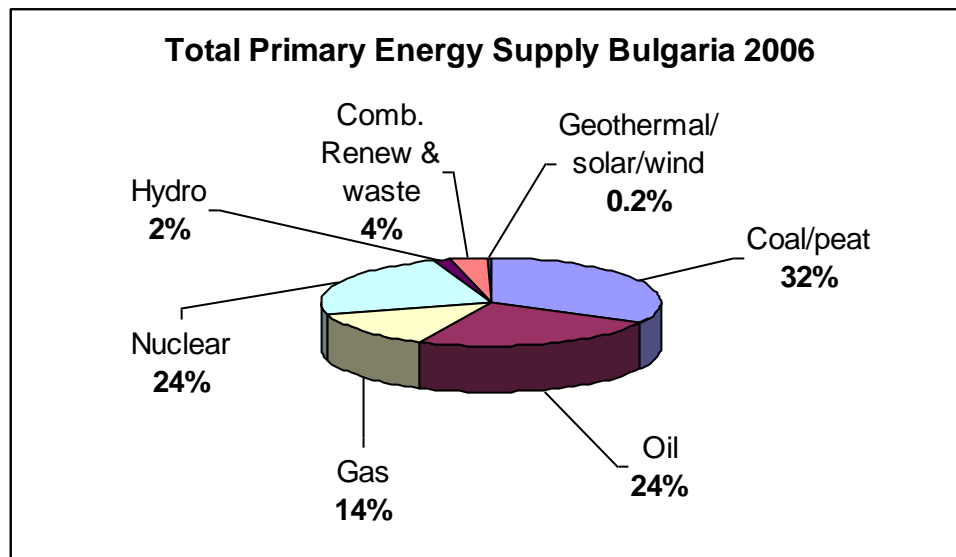


Figure 7: Total Primary Energy Supply Bulgaria 2006

(source: IEA 2008)

region.⁹³ Bulgaria is dependent on imports of crude oil, producing 3360 bbl/d and consuming an estimate of 121 thousand bbl/d in 2007 (see **Table 6**). There were 15 million barrels of proven oil reserves in 2007, with oil exploration occurring predominantly in the northern part of the country and the Black Sea. Its biggest oil refiner, Lukoil's Neftochim, has a capacity of 140 000 billion bbl/d.⁹⁴

In 2006 coal supplied the majority of fuel needed to generate electric power (**Figure 7**). Lignite coal deposits in the Maritsa Iztok basin (90% of local coal production) are estimated at 1200 million tons (proved reserves) and deposits are expected to last for 50– 55 years. The technology used is however obsolete and has low efficiency rates. Furthermore the coal has low calorific value, high sulfur and powder content, and is a main source of greenhouse gas emissions. Strict environmental limitations require large investments and increased production costs but coal production is seen as a source of energy independence and long-term employment for Bulgaria. Open-pit coal mining is a strong resource for electricity generation (over 95% of local coal was used for this in 2007.)⁹⁵ In 2005 Bulgaria produced 50.5 million metric tons of CO₂ emissions (see **Table 4**), an increase of 4% from 2000.⁹⁶

⁹³ Sofia News Agency 20 March 2009 http://www.novinite.com/view_news.php?id=102092

⁹⁴ EIA 2007

⁹⁵ Republic of Bulgaria, MoEE 2008

⁹⁶ EIA http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=BU#co2

Nuclear power accounted for 35% of the country's electrical power generation in 2007.⁹⁷ Two reactors still operate at the Kozloduy Nuclear Power Plant while four other Chernobyl-era reactors were shutdown as part of the country's EU (European Union) accession agreement. The construction of two new reactors at Belene is intended to replace the lost capacity caused by the Kozloduy shutdowns. The construction of the NP Belene is underway despite a controversial Environmental Impact Assessment and years of protests and disapproval from national and international NGOs, with Greenpeace being one of the main opponents.

Hydro potential of the country currently represents only 2% of total energy production. There are 87 hydro power plants with a combined capacity of 1980 MW, most of them in the southern and south-western mountainous parts of Bulgaria. The EBRD is helping to finance implementation of the Cascade Middle Iskar project that will build nine small hydroelectric stations with a total capacity of 25.7MW⁹⁸. A few other larger projects are also planned to increase hydroelectric output .

Currently power generation from renewable energy sources (RES) comes from HPPs (24%), energy from biomass (70%) and geothermal energy and others (6%).⁹⁹ However, Bulgaria has significant unused potential of renewable energy sources including hydro, wind, solar, geothermal energy and biomass.

3.2.2.4. Croatia

In 2007, the balance of primary energy supply in Croatia showed oil representing 50% and natural gas 25.6%.¹⁰⁰ Consumption of these fuels will grow in the future, while local oil and natural gas production will decrease as deposits become exhausted. Croatia is therefore facing serious challenges to the security of its energy supply. In 2007 Croatia produced approximately 23.63 thousand bbl/d, imported about 79 thousand bbl/d and consumed approximately 103 thousand bbl/d, with 74 million barrels of reserve oil. In 2006 it produced 54 Bcf of natural gas and consumed 95 Bcf, with reserves estimated at 1000 Bcf for that year (**Table 6**). Oil is furthermore set to remain the main source of energy (see **Figure 8** overleaf) under the nation's current energy strategy, although a decrease is foreseen in the share of oil in total energy consumption from the current 47% to 38% by 2020.¹⁰¹

⁹⁷ Ibid

⁹⁸ Resnicoff 2008

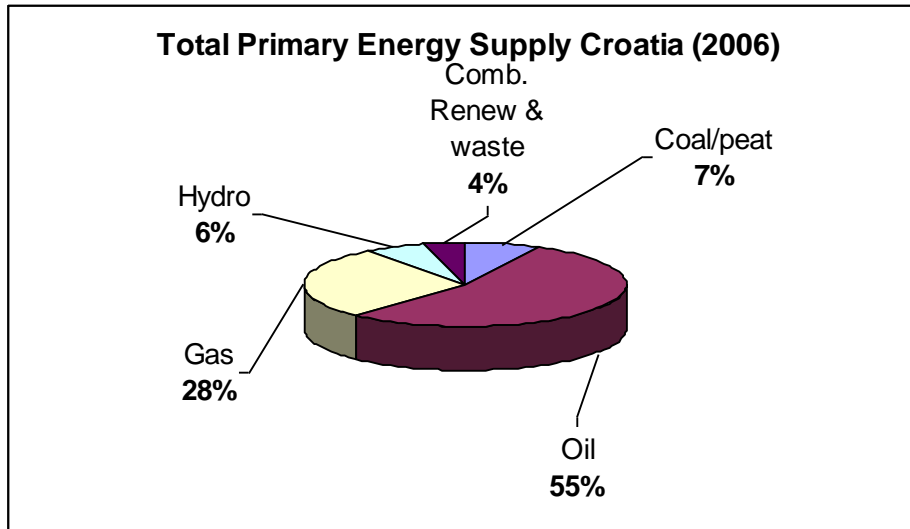
⁹⁹ Republic of Bulgaria, MoEE 2008

¹⁰⁰ Republic of Croatia Ministry of Economy, Labor and Entrepreneurship and UNDP 2008

¹⁰¹ Ibid

Figure 8: Total Primary Energy Supply Croatia 2006

(source: IEA 2008)



Consumption of natural gas has grown steadily over the past twenty with the exception of the war years in the nineties. Growth is foreseen in natural gas consumption by 4.2% in 2020.¹⁰² Croatia does not have any domestic coal reserves that it can utilize commercially. Imported coal is used in the cement industry and the Plomin thermal power plant.¹⁰³ CO₂ emissions amounted to 21.5 million metric tons in 2005 (**Table 4**), compared to 20 million metric tons in 2000, an increase of 7%.¹⁰⁴

There are currently no nuclear facilities or installations within the jurisdiction of the Republic of Croatia, but the Croatian utility HEP is co-owner with a 50% share of the Krško nuclear power plant in Slovenia.¹⁰⁵ The Croatian Government's Green Paper draft furthermore recommends the construction of a nuclear power plant of 1000 MW by 2020 to address climate change and security of supply.¹⁰⁶

The potential for RES is under-exploited in Croatia, except for large hydropower sources which accounted for 40% of electricity supplied in 2004. The technical potential for solar energy has been assessed at 777 TWh, mainly through low temperature heating applications with a goal of producing 80% of hot water from solar energy in coastal areas by 2020.

Regarding biomass and waste, there is significant potential (39 PJ) from agriculture and the wood industry and the aim is to obtain 15% of total energy consumed from biomass by 2030. Potential from geothermal energy is assessed

¹⁰² Ibid

¹⁰³ Ibid

¹⁰⁴ EIA http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=HR#co2

¹⁰⁵ Commission of the European Communities 2007

¹⁰⁶ Republic of Croatia, Ministry Of Economy, Labor And Entrepreneurship and UNDP 2008

Case Study 13) The Neretva River Divina Natura Ecological Society, Croatia

Location: The 225 km long River Neretva flows from the Dinaric Mountains in the Republic of Srpska (B&H) through Croatia, emptying into the Adriatic Sea.

Brief History: The government of the Republic of Srpska aims through the “Gornji Horizonti” (“Upper horizons”) project to construct Hydro Power Plants in the upper stream of the River using underground water supply, with investment from Great Britain. This would lead to the salinization of upstream water and reduce freshwater availability downstream. It is also predicted that the rerouting of underground streams would decrease water levels and negatively impact the ecosystem on the left bank of the Neretva River, in Croatia.

Current Situation: International conventions regarding transboundary watercourses have not been adhered to so far in this case. Divina Natura argues that adoption and implementation by the B&H Government of the European Sea Ports Organisation (ESPO) and Habitat Protection Conventions, as well as the European Water Directive are necessary to limit potential ecological catastrophe in South Dalmatia, Croatia.

at 839 MWth and 47.9 MWeI, mostly from existing boreholes used for oil and natural gas extraction. The greatest interest however is in the wind sector, which has been assessed at 1300 MW with 3 TWh annual production. There are already two operational wind power plants (5.95 MW + 11.2 MW), and several projects are in preparation along the Adriatic coast (an installed capacity of 300 MW is reckoned by the local authorities of Split-Dalmatian county).¹⁰⁷

3.2.2.5. FYR Macedonia

Domestic energy resources are scarce in Macedonia. The FYR Macedonia Energy Policy Paper published by the World Bank has projected that by 2019 the country would have to import as much as 90% of its power demands.¹⁰⁸ The main source of energy is coal (see **Figure 9** overleaf) – lignite, which accounts for almost 70% of total energy production in the country. Electricity production comes primarily from two thermal power plants “REK Bitola” and “TEC Oslomej”. Lignite reserves are only estimated to last until 2025.¹⁰⁹

The other fossil fuels with a relatively large share in energy consumption are oil and natural gas. In 2007 oil consumption was estimated at 21 thousand bbl/d and natural gas consumption was around 4 Bcf (see **Table 6**), all of which was imported. With only one oil pipeline transporting crude oil from Greece and recent hikes in global oil prices until July 2008, the state has had to make large expenditures for oil imports, leading to increases in the trade deficit, and the country’s trade volume with oil exporting countries such as Russia. In 2005, CO₂ emissions from fossil fuels were 8.1 million metric tons (**Table 4**), the same as for the previous year, and 2.5% less than the 8.3 million metric tons of 2000.¹¹⁰

¹⁰⁷ Rodik 2006

¹⁰⁸ World Bank 2004

¹⁰⁹ Analytica 2008

¹¹⁰ Energy Information Administration http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=MK#co2

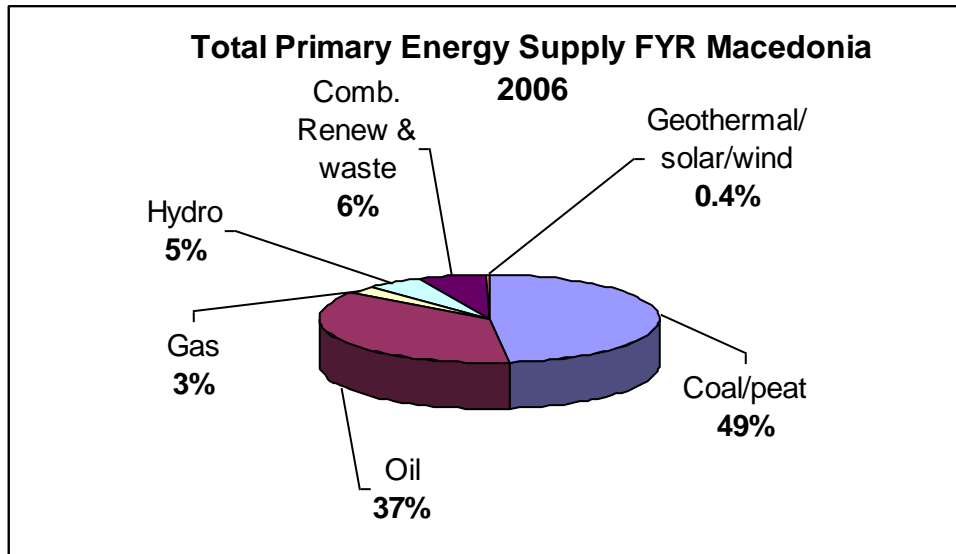


Figure 9: Total Primary Energy Supply FYR Macedonia 2006

(source: IEA 2008)

In addition to thermal sources, hydroelectric power provides for Macedonia's electricity needs. Eight large and 20 small hydropower plants have an installed capacity of 540MW.¹¹¹ There is also a 200MW oil-powered plant mostly used during peak periods. However, all of these sources cover only 70% of total annual consumption, and therefore cannot provide for the country's rising annual

Case Study 14) Bio-diesel Production in Macedonia Centre for Regional Research and Cooperation- Studiorum (CRPRC), FYR Macedonia

Location: Skopje, Macedonia

Brief History: "Studiorum" the NGO Centre for Regional Research and Cooperation is involved in an experimental bio-diesel production project in East Macedonia on agricultural land polluted by heavy industry. One of its main objectives is the promotion of the production and use of renewable energy in a way that decreases both negative environmental impacts and the cost of energy for inhabitants of the local community. The innovative aspect of the project lies in its simultaneous focus on environmental protection through decontamination and improvement of social welfare through the production of ecologically acceptable bio-fuel.

Current Situation: At this point turnip crops have been grown, the construction of a bio-fuel plant for turnip processing is underway and preparations for sending the first batches of bio-diesel for chemical and physical analysis have begun. Meanwhile soil samples will be analyzed for decontamination levels and an indicator-based economic analysis of the entire process is planned.

consumption, nor for the additional pressures from the (re)opening of some large industries and the resulting increase in demand, which grew from 8100 GWH in

¹¹¹ Energy Information Administration * <http://www.eia.doe.gov/iea/elec.html>

2005 to 9700 GWH in 2007. Unplanned electricity imports cost the state 80 million € in 2007 alone.¹¹²

There have been some embryonic initiatives concerning RES, with feasibility studies for wind energy and the use of solar energy, but the large scale exploitation of RES has not occurred and is not likely to in the near future. According to some studies FYR Macedonia has potential for the construction of 406 SHPP with an overall capacity of 258 MW. In 2007 around 90 SHPP construction projects were applied for to the government and concessions have been agreed for 41 locations.¹¹³ Macedonia has a history of using geothermal energy for heating purposes and currently there are more than 14 geothermal sites used for heating green houses. Further potential for geothermal energy production is estimated at 210 thousand MWh per year.¹¹⁴ Much more work is required to uncover the real potentials and feasibility of RES options in the country.

3.2.2.6. Serbia

Serbia imports half of its annual energy needs. This percentage has grown substantially over the past several years, mainly due to a rise in the consumption of oil derivatives and gas. There are an estimated 78 million barrels of oil reserves in Serbia and forecasted oil consumption for 2007 was 91 thousand bl/d (see **Table 6**). Gas consumption increased by 15% from 2004-2006 and Serbia now annually consumes about 2.2 Bcm of gas, imported from Russia by Srbijagas. Businesses are the largest consumers with seven companies covering about 47% of Serbia's total gas consumption.¹¹⁵

For the past several years, coal production has been half a million tons per year, of high-quality coal types, demand for which has been increasing. Solid fuel (coal and wood) consumption rose by 80% from 2004 to 2006 and estimates put demand for domestic coal at 1.3 million tons annually.¹¹⁶ In 2005, CO₂ emissions from fossil fuels totalled 52.6 million metric tons (see **Table 4**) in Serbia (and Montenegro), an increase of 19% from 42.6 million metric tons in 2000.¹¹⁷

Serbia's electricity production is dominated by the combustion of low-grade coal, and to a lesser extent, available hydroelectric potentials (see **Figure 10** overleaf). According to 2005 data, coal-fired plants accounted for 65.4% of electricity produced, with gas- or liquid-fuel-fired plants accounting for 1.6%, and hydroelectric plants for 33%.¹¹⁸

¹¹² Analytica 2008

¹¹³ Panovski, Sotir and Janevska, 2008

¹¹⁴ Colovic, Ana

¹¹⁵ Radosavljevic, Goran and Djokovic, Vuk 2007

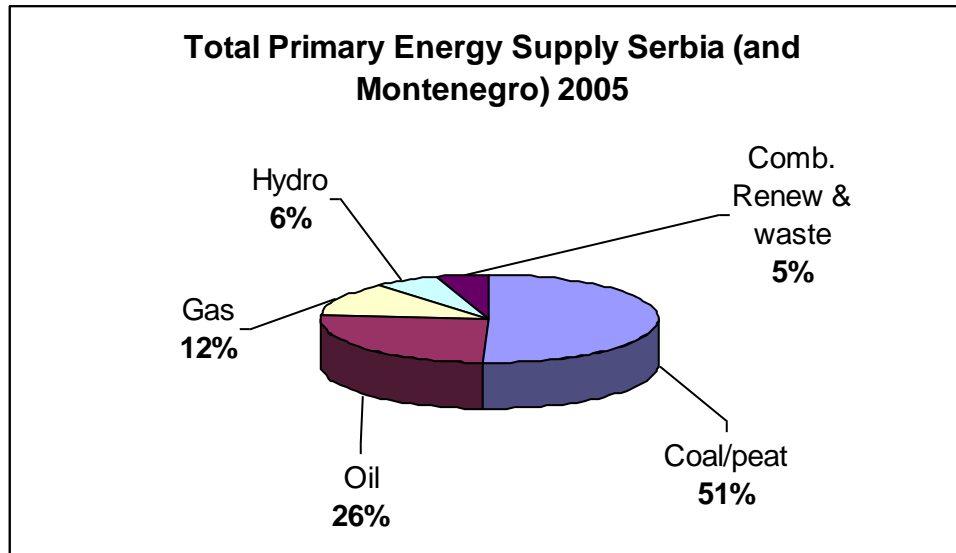
¹¹⁶ DMT et al, 2006 in Radosavljevic and Djokovic 2007

¹¹⁷ Energy Information Administration http://tonto.eia.doe.gov/country/country_time_series.cfm?fips=YR#co2

¹¹⁸ "Uskoro privatizacija rudnika Resavica i privatizacija NIS [Resavica mine and NIS to be privatized soon]", Danas, 30 May 2007, in Radosavljevic and Djokovic 2007

Figure 10: Total Primary Energy Supply Serbia (and Montenegro) 2006

(source: IEA 2008)



In terms of RES, Serbia currently uses only 18% of its potential, all of it concentrated in large hydro power plants. There are currently around 60 small hydro power plants in the country, but only half are in use, while 900 potential locations.¹¹⁹ A significant amount is also available through bio-mass (for space

Case Study 15) Pollution of the Ibar River from Energy Production Eko Ibar Environmental Movement, Serbia

Location: The Ibar River is 276 km long and originates in Montenegro (on the Hajla mountain near Rozaj), passing through Kosovo and flowing into the Zapadna Morava River near Kraljevo.

Brief History: Pollution in the Ibar River was identified as early as 1966 and by the 1970s water quality had deteriorated drastically due to the presence of heavy metals, phenol and organic pollutants. In 1983 a hazardous phenol spill, traced by a UN study to large quantities of concentrated phenol and phenol wastewaters stored at the gasification facilities of the Korporata Energjetike Kosovës (KEK) power plant¹²⁰, sent the concentration of pollutants far beyond permissible limits, contaminating the drinking water of the residents of Kraljevo, and several larger towns (of 30 to 50 thousand people) and nearby settlements (of 500-5000 residents each). The cause of pollution in the Ibar River was pinpointed as energy production (gas, electricity and dry coal) and the related mining and processing of lignite, used to fire the turbines of the power stations. Other sources of pollution identified include municipal wastewater (there are no systems for treatment of the municipal wastewaters) and solid waste from illegal dumps.

Current Situation: The situation is exacerbated by a lack of precise records on the history of pollution in the Ibar River. The River is an important resource for industry, agriculture, water supply and tourism in all the regions it flows through, therefore awareness-raising activities aimed at affirming the river's value, and cooperation and networking are vital if the River is to be preserved as a common good for all.

¹¹⁹ Beta 2008
¹²⁰ UNEP 2002

heating in households and buildings, co-firing in district heating plants, and electricity production - 2.40 Mtoe), solar power, geothermal power (for balneological purposes, sports and recreation), and wind power. Biodiesel is another option for development in central Serbia, where it is estimated that annual production of rapeseed could produce 200 thousand tones of biodiesel per year, or 10.5% of Serbian diesel fuel consumption.¹²¹

Although there are considerable institutional, financial and technical barriers in the increased uptake of RES, there has been some recent progress in Serbia, including plans for a feasibility study for the exploitation of unused hydro potential of Drina river and the signing of an agreement between the Governments of Serbia and Spain on cooperation in developing wind power. Amendments to the Energy Law have been drafted and are waiting for adoption by the Parliament, and a regulation defining what types of renewable energy producers qualify for subsidies is set to be adopted by July 1, 2009.¹²²

Case Study 16) Re-routing of the Toplodolska River into Lake Zavoj for Electric Power

Stara Planina Society for Environmental Protection, Serbia

Location: Lake Zavoj in South-Eastern Serbia is 17 km north of the town of Pirot. The lake is situated on Stara Planina, in the area known as Visok, midstream of the Visočica River. The tributaries to Lake Zavoj are the Visocica, Gostuska and Belska Rivers, with the only outflow from the Lake via the Visocica River.

Brief History: On February 24, 1963 a landfall on the right bank of the Visocica River divided the river, flooding the village of Zavoj. Ten days later, the villages of Mala and Velika Lukanja also flooded. After this natural catastrophe, settlements were never re-established due to a decision to build an artificial accumulation lake and dam for electricity generation. The villagers were resettled with the majority now living in Pirot. Despite strong opposition of the residents of the village Temska in 1990, the Visocica River was redirected via a tunnel, toward turbines and generators situated in the village of Berilovac. Immediately after the Zavoj power plant was put into operation, plans were made to re-direct a tributary, the Toplodolska River, to the Zavoj basin. In the 90s, construction of the tunnel for its redirection was initiated without the required construction permit or implementation of the appropriate decision-making mechanisms.

Current Situation: The re-routing of the Toplodolska River to the Zavoj power plant was supported by the Ministry for Energy and Mining and received approval by the Serbian Institute for Nature Conservation. However, strong resistance by the residents of the village Temska continues. They are supported by the local government, which has decided not to allow the re-direction of the River through their territory. Local political parties and environmental NGOs are against this project and Stara Planina has since been designated a Nature Park. In addressing this problem, the opinion of independent experts is needed, along with the creation of mechanisms for verification of their opinions and estimation.

¹²¹ Republic of Serbia, MoME 2008

¹²² Ibid

3.3. Mining and mineral processing

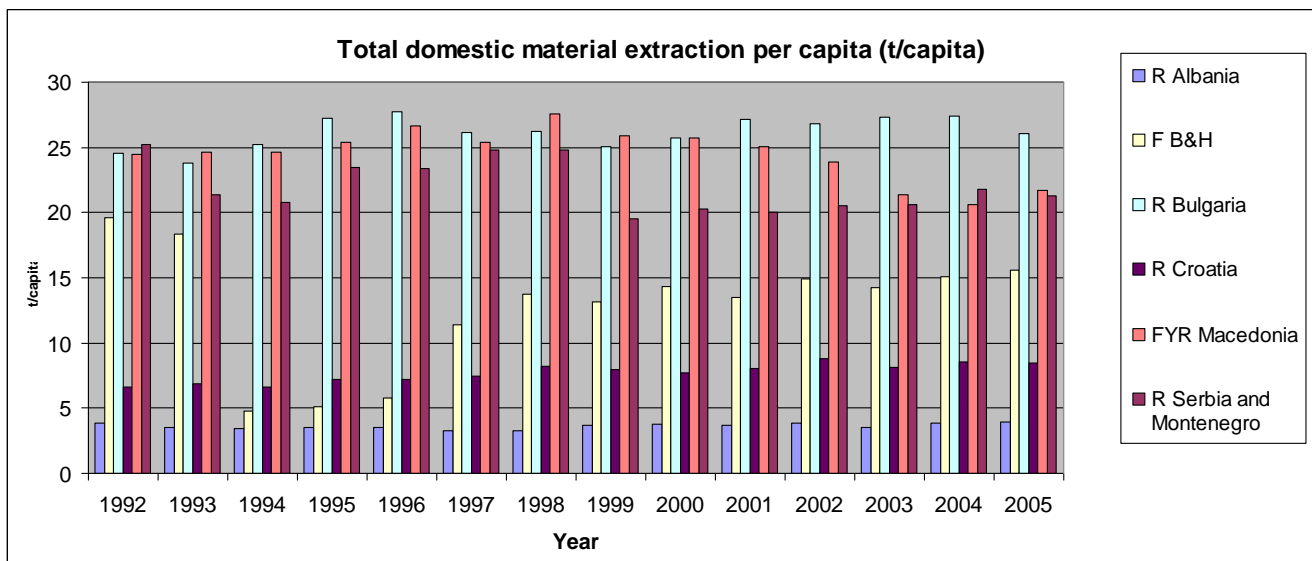
3.3.1. Regional description

The SEE region is part of the Mediterranean Alpine folded zone, which extends through the Dinarides of the former Yugoslavia (Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Montenegro, and Slovenia), the Albanides of Albania, and the Hellenides of Greece. Bulgaria is encompassed within this zone as well, which comprises the Carpatho-Balkan branch to the north and the Dinaric-Hellenic branch to the south.¹²³ Mining for base and precious metals is traceable through historical records to at least 5th century B.C. with evidence of early workings at the Bor copper deposit in Serbia suggesting prehistoric origins. Mining and metalworking history in the Bulgarian part of the Mediterranean Alpine folded zone were well-documented from Roman times when Bulgaria, then known as Thrace, was an important source of base and precious metals.¹²⁴

Until the early 1990s, the mining and processing of metals established the region as a major European source of copper, lead, and zinc and a major world producer of chromite. Political, social, and ethnic tensions and conflict destroyed or degraded much of the region's mineral industries and industrial infrastructure.¹²⁵ Following the war, total domestic material extraction rose across the region (apart from in Albania where it remained stable) from 1992-2005, with the greatest increase in extraction in B&H (see **Figure 11**). With regard to materials use, mining industries now account for a large share of materials input.

Figure 11: Material Extraction in SEE

(source: Sustainable Europe Research Institute, www.materialflows.net)



¹²³ Bogdanov 1982

¹²⁴ Steblez 2006

¹²⁵ Ibid

Extraction industries have left behind a legacy of contamination and degradation, with adequate policies and resources for clean-up lacking. Badly operated or abandoned mining sites have caused severe pollution, some with impacts spilling across national boundaries. Spills of heavy metals, cyanide and other toxic releases affect watercourses, the main vector for transboundary pollution. Smelters contribute to air pollution, with serious consequences for human health today and into the future.

SEE faces problems from abandoned sites with no liable legal ownership, where the necessary measures for site closure such as stabilization, water management, and replanting of vegetation, were never taken to minimize the risk of accidents and prevent environmental pollution.¹²⁶ Implementing these measures now is complicated by the large number of sites and high remediation costs. In most cases governments are responsible for carrying out remediation measures linked to historic pollution, but the huge financial liability attached to any systematic rehabilitation programme means that no substantial progress has been made.

3.3.2. Country descriptions

3.3.2.1. Albania

Albania was the world's third largest producer of chromium per capita and has the largest reserves of recoverable ore in Europe, estimated at more than 33 million metric tons (5% of the world's known deposits). Mining activity is now concentrated on chrome and copper, with enough reserves to support production until about 2025.¹²⁷ In recent years extraction has become more difficult because of a lack of ore suitable for opencast mining. Nevertheless, in 2006, the output of chromite rose by about 24% from 2005.¹²⁸ Most reserves lie in deep deposits in remote and mountainous areas of Albania's north and east, making exploitation expensive. Albania has small quantities of gold, silver, bauxite, magnesite and zinc, and is a well known producer of chromites, copper, ferrochromium, nickel and petroleum. All of Albania's existing mineral facilities remain under state ownership, however private companies, are conducting exploration programs for nickel.

Albania's overall mineral production declined from the early 1990s, stemming mainly from the country's transition from rigid central economic planning to a market economy¹²⁹ but significant danger is presented today by waste accumulated from previous activities. Six mining hot spots have been highlighted in a UNEP report on mining hot spots in SEE¹³⁰: the Elbasan ferrochromium, steel and nickel smelter complex; the Rubik copper mining area; the Pogradec chrome nickel crusher deposits/dump¹⁴; the Rehoval copper mines; the

¹²⁶ UNEP 2007

¹²⁷ Ibid

¹²⁸ U.S. Geological Survey 2006b

¹²⁹ UNECE 2002a

¹³⁰ UNEP August 2006

Kurbnesh copper mines and; the Kalimash/Kukes copper mines and smelter. In addition to impacts on soil, highly toxic waste water discharged without treatment from mining activities has polluted Albanian waters. The Fani River contains hexavalent chromium (the most toxic form of chromium), from the heaps of high chromium and copper sludge dumped along its riverbanks, and Lake Ohrid is polluted with iron and chromium that has leached from a nearby mining plant. There have been no regular measurements of pollution since 1995.¹³¹

3.3.2.2. Bosnia and Herzegovina

Bosnia and Herzegovina was a major industrial centre and mineral producing area in the former Yugoslavia. The metallurgical sector included steel and aluminum enterprises, with the latter providing feedstock for the former Yugoslavia's heavy industries. Major local mineral resources included bauxite, iron ore, and lead-zinc ore and coal, the latter of which is of a generally low quality. The dissolution of Yugoslavia in the early- to mid-1990s severed long-standing economic ties in the region, which partly accounted for a sharp reduction in mineral production. The production rate for processing has declined to about 33% of its pre-war level, with the production of coal and lignite decreasing by 40%, and production of other ores and stone reducing in 2003 to 23% of pre-war figures.¹³² However, in 2006 activity expanded and the total value of mine production rose by about 14% compared to that of 2005.¹³³

The development of mining and mining quarries have created many environmental problems in B&H. Underground exploration has created subsidence and problems of waste separation, agglomeration and disposal. Surface exploitation has resulted in losses of agricultural land and forests to strip mining, waste disposal and separation plants, and ore concentrations. Opencast mines alone are estimated to cover approximately 12 800 ha and waste from mining operations is estimated to have affected some 6 thousand ha of land, as well as polluting water bodies and threatening groundwater, due to the virtual non-existence of effluent treatment plants.¹³⁴ Eight mining hot spots were highlighted in the UNEP report on mining hot spots in SEE, among them: Vares, a historical centre of iron ore mining and iron smelting and lead/zinc mining; Srebrenica, a site of lead/zinc mining where about 90% of the communal area has reportedly been mined or affected by mining in the past; and Jajce, the site of a ferroalloy smelter with associated air, soil and water pollution problems and a high risk waste pond.¹³⁵

3.3.2.3. Bulgaria

Coal is the key mineral fuel in Bulgaria, and the Maritza Iztok coal basin accounts for 80% of the nation's coal production¹³⁶ Total coal extraction in 2007 was 25

¹³¹ Ibid

¹³² Federation of Bosnia and Herzegovina, Republika Srpska 2003

¹³³ Agency for the Statistics of Bosnia and Herzegovina 2006 in U.S. Geological Survey 2008b

¹³⁴ UNECE 2004

¹³⁵ UNEP August 2006

¹³⁶ Report Buyer, August 2008

http://www.reportbuyer.com/industry_manufacturing/mining/bulgaria_mining_report_2008.html

million t which is almost 4t per capita.¹³⁷ Bulgaria also mines ferrous and nonferrous metals. Copper deposits are mainly found in the Srednogore-Panagyurishte regions and the Alpine- Balkan-Carpathian-Dinaride belt. Asarel

Case Study 17) Gold-mining and Cyanide TERRA Ecological Club, Bulgaria

Location: Krumovgrad, East Rhodope Mountains and neighbouring Greek municipalities

Brief History: The East Rhodopi Mountains is a region in Bulgaria known for its landscapes, Mediterranean climate, abundant historical monuments and exceptional biological diversity. It is now threatened by Canada's Dundee Precious Metals' plans to develop an open-pit gold mine and use cyanide in the extraction of the precious metal. The planned mine is to be located only 800m from the hospital of the nearby town, Krumovgrad, and the tailings pond for the waste cyanide pulp is designed to be right above the water-source zone of the town. Stakeholders involved include local citizens, Bulgarian and Greek NGOs, local Bulgarian and Greek Authorities, Ministry of Environment and Waters in Bulgaria, Dundee Precious Metals owners.

Current Situation: Dundee Precious Metals in its plans to introduce cyanide technology failed to receive approval from the Bulgarian Ministry of Environment and Waters. The decision of the Supreme Environmental Expert Council of the Ministry has been postponed due to opposition from local communities and national environmental organisations from the "Cyanide-Free Bulgaria" coalition. However, this is a temporary decision and the problem is far from being solved. Expertise is now needed for collaboration with international organizations and authorities from Greece and the EU.

Medet and Elatsite Med are the two largest copper mining companies in Bulgaria. Lead and zinc are largely found in Plovdiv, in the Ossogovo Mountains, near the Thundza River, and in the Madan area close to Greece. The nation also has large manganese reserves. Production is geared toward meeting domestic needs and Bulgaria remains dependant on imports of copper ores, iron ore, lead and zinc ores, steel, and mineral fuels.¹³⁸

Bulgaria's environment has been seriously damaged by exploration, extraction and initial processing / flotation of ores and minerals. A serious problem is the generation of huge quantities of waste from prospecting, extracting and processing mineral resources, the treatment of which is limited by lack of technological capacity, consumer interest and economic regulation. The prevailing method for waste treatment is landfilling, operated by private enterprises. The total quantity of waste from coal mining alone amounted to 3.7 billion t by the end of 2003, and by the end of 2004 the total area of damaged terrain covered 22 thousand ha. In that year the Bulgarian government spent 4 million € (8.2 mln BGN) to technically decommission, recultivate 8 thousand ha of land affected by coal mining activities. Accumulated waste from ore mining amounted to 1.3 billion t by the end of 2004 and had damaged 629.7 ha, with 622 ha recultivated and 6 million € (13 mln BGN) spent.

¹³⁷ US Geological Survey 2008a

¹³⁸ US Geological Survey 2008a

The largest gold operation in Europe, the Chelopech Mine, is found in Bulgaria, with estimated deposits of 119.4 tonnes, along with 430 900 t of copper.¹³⁹ In 2006, gold production amounted to about 3.8 t.¹⁴⁰ Gold and nonferrous metals mined in this region remain attractive investment opportunities to foreign investors, but there are also conflict issues (see <http://www.cyanidefreerhodopi.org/index.php?language=en>) with the gold exploration companies involved, including Dundee (see **Case Study 16**), Cambridge Mineral Resources plc of the United Kingdom, and Euromax Resource Ltd. of Canada.

3.3.2.4. Croatia

Between 1989 and 1995 the volume of production of industrial and mineral excavation decreased drastically due to war. One of the sharpest decreases occurring between 1990 and 1994 was reflected in the manufacture of basic metals and metal products, which shrank by 83%.¹⁴¹ Petroleum extraction was the main sector of Croatia's mineral industry after the war, when most of Croatia's output of industrial minerals was consumed in the domestic market. The country remains reliant on imports of mineral products, petrochemicals, and base metals for its industrial needs, which constituted about 36% of the value of total imports, an increase of about 3% from 2005.¹⁴² Croatia stopped producing coal in 1999 and the country now covers its entire needs of hard coal, lignite and coke by imports from third countries.¹⁴³ Industrial production rose by 4.5% in 2006 from the previous year and the output of the mining and quarrying sector increased by about 10.3%.¹⁴⁴ In 2006, Croatia's imports of mineral products, petrochemicals, and base metals constituted 36% of the value of total Imports.

In Croatia today industrial and mineral excavation and quarrying of building stone, gravel, sand, clay and limestone for the needs of the construction industry, cement plants, lime factories and brick and ceramic factories threaten Croatian landscapes and soil. One source of such degradation in the past was the frequent illegal and profitable quarrying of gravel, and the illegal dumping of waste into the pits.¹⁴⁵ Major consumption increases of industrial minerals for the construction sector are predicted along with the reconstruction, expansion, and modernization of Croatia's infrastructure, and the production of steel and industrial minerals for construction is also predicted to increase with infrastructure development.¹⁴⁶ Visual landscape pollution and irretrievable landscape degradation are therefore predicted as likely to result from mineral and industrial excavation activities in Croatia.¹⁴⁷

¹³⁹ Report Buyer August 2008

http://www.reportbuyer.com/industry_manufacturing/mining/bulgaria_mining_report_2008.html

¹⁴⁰ US Geological Survey 2008a

¹⁴¹ Steblez 1994

¹⁴² Central Bureau of Statistics, Republic of Croatia 2007 in U.S. Geological Survey 2008b

¹⁴³ Commission of the European Communities 2007

¹⁴⁴ U.S. Geological Survey 2008b

¹⁴⁵ UNECE 1999

¹⁴⁶ U.S. Geological Survey 2008b

¹⁴⁷ Republic of Croatia, MoEPPPC November 2007

3.3.2.5. FYR Macedonia

Historically, about 45% of mineral feedstock here came from domestic lead and zinc mines (Sasa-Kamenica, Zletovo-Probistip, and Toranica-Kriva Planca). FYR Macedonia also has deposits of copper, iron, and precious metals such as silver and gold. In the second half of the 20th century, an extensive processing and fabricating infrastructure was established to allow the production of not only these metals and their alloys, but also ferroalloys such as ferrochromium, ferromanganese, ferronickel, and aluminium. The Bucim mine, the country's only source of copper ore, located near Radovis, has the capacity to produce 4 Mt/yr of ore, 50 thousand t/yr concentrates, 8 thousand t/yr copper cathode, and 3 thousand t/yr copper alloys.¹⁴⁸

In FYR Macedonia, the mining sector poses severe environmental threats, and is responsible for an estimated 27 % of all sources of soil contamination.¹⁴⁹ In 2003 production of lead-zinc ores was temporarily halted due to a combination of environmental concerns that lead to production stoppages and closures.¹⁵⁰ The Bucim mine represents one of the country's most environmentally dangerous hot spots. Another is the country's smelter and refinery for the production of lead, zinc and associated metals, located in Veles (MHK Zletovo-Veles). Other locations with high or medium environmental risk as a result of mining activities are those surrounding Sasa, a lead and zinc mine near Kamenica, the Zletovo lead and zinc mine at Probistip, and Lojane, a former chromium, arsenic, and antimony mine at Kumanovo.¹⁵¹

3.3.2.6. Serbia

Mining is a vital component of Serbia's economy with several mineral resources extracted there at approximately 180 mining sites.¹⁵² Primary minerals extracted in Serbia include copper; coal; lead-zinc with associated gold, silver, copper, bismuth and cadmium; red bauxite and modest quantities of oil and gas. Prior to the conflicts of the 1990s, the country represented a significant proportion of European capacity for refined aluminium, copper lead, silver and zinc. The most intensive mining activities relate to lignite, as electricity is predominantly produced by lignite fired thermal stations, extracted from the Kolubara and Kostolac open-cast mines. Reserves in these mines are deemed sufficient to last about 50 years, but this lignite has a low caloric value, with sulphur content varying from 0.5% to 1.3%. Intensive copper mining activities are concentrated in the Bor district. The average copper content in the open cast mines and in the underground mines reaches 0.35% and 0.7% respectively.¹⁵³ Apart from copper, silver, gold, platinum and palladium are recovered as well. The remaining economic reserves are substantial but require underground mining techniques.

¹⁴⁸ UNEP August 2006

¹⁴⁹ EEA Report No 1/2007

¹⁵⁰ U.S. Geological Survey 2008b

¹⁵¹ UNEP August 2006

¹⁵² Ibid

¹⁵³ UNECE 2007

The mining basins in Serbia have experienced many years of intensive exploitation. Apart from depleting non-renewable natural resources and polluting the water, air and soil, this has led to significant soil degradation, most of which has occurred through open cast mining of copper and coal. Huge areas are covered with tailings (in most cases, disposed of in inadequate dumpsites), affecting 40 thousand ha of soil of which less than 20 per has been covered by natural vegetation.¹⁵⁴ But the most frequent type of pollution in the vicinity of coal mines is air pollution resulting from higher level of dust caused by exploitation and transport in open cast mines, exhaust gases, spontaneous self-ignition of coal, etc.

Water pollution in mining basins most frequently results from erosion of uncontrolled tailings. On January 30, 2000 at 11 p.m., the dam of the Baia Mare treatment plant in Romania overflowed, releasing about 100 000 cubic meters of tailings water containing free cyanide and cyanide complexes into waterways which travelled via tributaries into the Somes, Tisza, Danube Rivers, before reaching the Black Sea, with transboundary affects on Hungary and the (then) Federal Republic of Yugoslavia (FRY).¹⁵⁵ The 8 mining hot spots in Serbia identified in the UNEP report were principally associated with antimony, lead and zinc mining, processing, and smelting, and with very large operations for the mining, processing, and smelting of copper. These included: the RBB copper mines in Bor; the Kolubara open pits of lignite coal; the Ljubovija lead and zinc mine; and the Zajaca antimony mine.¹⁵⁶

3.3.3. Building Materials in the Region¹⁵⁷

This region is rich in non-ore mineral resources including those mined in the largest quantities: barite, different types of clay (predominantly bentonite and kaolin), gypsum, limestone, mineral salt, quartz and silicates, sand, gravel and building and decorative rock materials. For example:

- **Gypsum**

The production of gypsum (**Figure 12**) in Southeastern Europe is modest and is chiefly of regional importance. As of 2005 demand for and consumption of natural gypsum was expected to decrease over the next few years on account of so-called 'synthetic' gypsum.

¹⁵⁴ Ibid

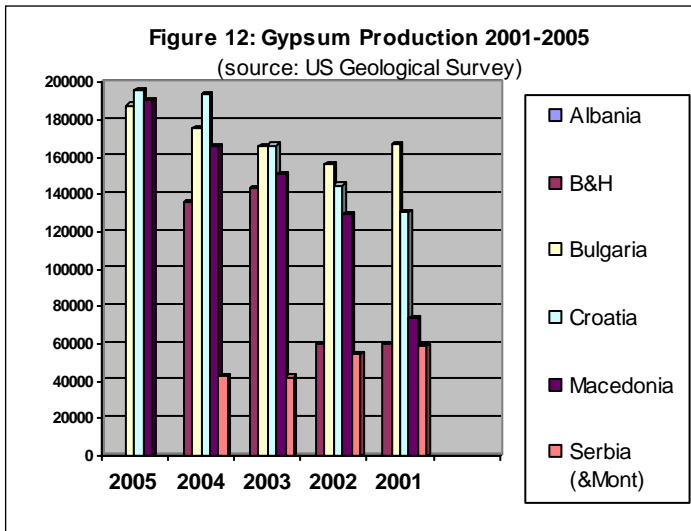
¹⁵⁵ UNEP 2000

¹⁵⁶ UNEP August 2006

¹⁵⁷ See News 28 September 2007 http://www.seenews.com/news/latestnews/seenewsresearch_profiles-extractionandminingindustryinsoutheasteurope-143903/

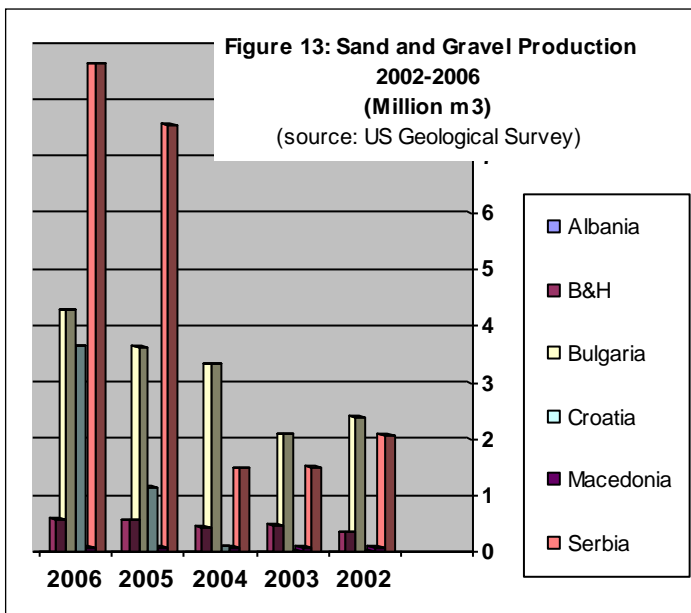
- **Kaolin**

With annual production of more than 180 thousand tonnes of kaolin, Bulgaria is a



although the country ranks far behind other countries from Eastern Europe. The other SEE countries produce little or no kaolin. The main foreign market of Bulgarian kaolin is Italy, with large quantities also exported to Turkey, Greece, Romania, Serbia and Macedonia. The sole producer of kaolin and silica sand in Bulgaria, Kaolin AD, produces and exports washed and enriched kaolin, which is more valuable compared to the raw

kaolin sold for instance in Ukraine and Turkey. In 2004 and 2005, Albania also ranked among the big producers of kaolin, with production in 2005 adding up to 310 thousand tonnes. Driven mainly by the ceramic, glass and paper industries, the annual demand for kaolin by these industries is expected to grow by an average 1% to 3% by 2010.



- **Sand, Gravel and Related Materials**

The biggest producers of sand and gravel (**Figure 13**) in the region are Croatia and Bulgaria. Since 1997 production of rubble and sand has increased in Croatia as a result of the intensification of building activities in the country (construction of roads, highways, buildings etc.) The illegal (but profitable) quarrying of gravel is also prevalent, and due to the ongoing construction activity in SEE, nearly all of the SEE

countries produce cement and lime. The leading producers of cement in 2006 were Croatia (3,6 million t) and Serbia (2.6 million t)¹⁵⁸, with Bulgaria producing a significant amount of lime – 1.4 million t in 2006¹⁵⁹

Case Study 18) Cement Plant Construction in Albania Environmental Centre for Development Education and Networking (EDEN), Albania

Location: The Kraste – Kruje region, Albania

Brief History: The Albanian parliament took the decision to remove the Kraste-Kruje parcels from the national forests' fund, in order build two huge cement plants (namely Antea Cement and Aguila Cement) in the area. In some areas of the country, particularly in the cities of Elbasan and Fushe-Kruje, cement plants cause heavy air pollution, discharging large amounts of particulate matter into the atmosphere.

Current Situation: Licences have been granted for the construction of the two plants without prior consultation on either project or the possible impacts on local populations or the affected public. Nor is the Albanian government considering a Strategic Environmental Assessment for these cement plants. It is instead said to be using the "salami method", providing only tiny slices of information at a time, for each individual project. Impacts on neither climate change nor carbon trading are being taken into account.

Case Study 19) Gravel and Sand Extraction from the Drina River Eko Put Ecological Association, Bosnia and Herzegovina

Location: The Drina River is 346 km long and originates in Bosnia and Herzegovina near the Montenegrin border. Much of its length (206 km) forms the border between Serbia and Bosnia and Herzegovina.

Brief History: The Drina River has been transformed as the result of extensive sand and gravel extraction. Fish stocks have decreased, the surrounding forest belt has been destroyed and access to the bank has become restricted due to the construction of illegal cottages along the shore, which has been fenced and illegally privatised. Furthermore, the holes left behind after the removal of gravel have been filled with waste.

Current Situation: The main issue confronting stakeholders (environmental NGOs, local fishermen, the Governments of B&H and Serbia, and gravel extractors) is the problem of undefined property rights on the banks of the River. Permits for exploitation are issued under very suspicious circumstances from both the Serbian and B&H Governments. There is also concern over the fact that while both local governments have authority to issue a small number of licenses, the majority of gravel extractors have licenses issued by one particular municipality (Bogatić/Badovinci) in Serbia. Unfortunately only environmental NGOs and fishermen are interested in solving the problem and they propose either completely halting extraction or at least regulating the exploiters' rights and obligations. Eko Put Bijeljina is advocating for the introduction of environmental taxes for each truck loaded with gravel, and has proposed that companies engaged in gravel extraction ought to be required to restore the fish stocks and revitalise the destroyed ecosystem.

¹⁵⁸ U.S. Geological Survey 2008b

¹⁵⁹ U.S. Geological Survey 2008a

Despite the great variety, these industrial minerals are of predominantly regional importance, meeting local consumption needs with negligible influence on world markets. Due to increased reconstruction activities in the Balkan countries however, the extraction of construction minerals is causing environmental problems and conflicts. The negative impacts of increased construction activity are evident in Croatia, where according to the NGO Sunce ¹⁶⁰ the Croatian coastline has become endangered as a result of growth in the tourist industry, which has involved the illegal construction of buildings and the use of non-traditional materials. In another example, gravel extraction in the Neretva River in B&H is posing serious problems downstream in Croatia according to the NGO Divina Natura ¹⁶¹, where decreased water levels all the way down to the estuary are increasing the salinity of the water there and affecting the water supply for agriculture.

3.4. Management of protected areas

3.4.1. Regional description

SEE is very rich in biodiversity, covering four different European bio-geographical regions (Mediterranean, Alpine, Continental and Pannonian) with numerous well preserved ecosystems. There are numerous threats to biodiversity however, including urbanisation, land abandonment, overexploitation of resources due to poverty, intensification of agricultural and forestry practices, changes in the water regime due to construction of dams and irrigation, pollution and others. Among the most threatened in the short term are coastal zones, rivers and wetlands but in the longer term the mountain meadow ecosystems are also considered vulnerable.

The number and size of protected areas (PA) in the region has been increasing, although the share of protected land is still low compared to EU targets for the Natura 2000 network. Of the countries covered in this report some protected areas have recently been established or are under preparation in a trans-boundary context, including: the Neretva River Delta, Skadar Lake, Ohrid Lake, Prespa Lake, the Prokletije mountains, Djerdap National Park, the Balkan and Tara Mountains, and the Danube River. International organisations including WWF, IUCN, UNESCO, FAO, UNDP, Council of Europe, UNEP, SNV and Euronatur have also joined forces in the Dinaric Arc Initiative (DAI) and proposed the Framework Convention on the Protection and Sustainable Development of South-Eastern Europe Mountain Regions, which aims at preserving the wealth and integrity of the Dinaric Arc and other mountain regions in SEE. ¹⁶²

All of the SEE countries have begun cooperating on conservation issues to some degree in accordance with various European and International Conventions and

¹⁶⁰ CEECEC 2008d

¹⁶¹ Ibid

¹⁶² Stritih, Jernej et al. 2007

Directives. Two widely known networks are the Emerald network, working under the Bern Convention and the Natura 2000 network working under the EU Birds and Habitats Directives. The DAI also aims to establish networks to take part in initiatives and other conservation activities, such as the WWF led 'Dinaric Arc Ecoregion – 2012 Protected Areas Programme, which includes the Durmitor, Tara and Prokletije Mountains' Green Belt Project.¹⁶³ The specific goal of this project is to create favourable conditions for the long-term conservation of biological diversity and the sustainable use of natural resources in these areas.

Despite these strides forward, the planning and management of protected areas (MPA) have a number of challenges to overcome. The systems and resources for efficient management of protected areas are still developing, and where they are insufficient, poor enforcement and negative trends can endanger the important biodiversity they are meant to preserve. Inadequate local participation in establishing protected areas, and insufficient or non-existing dialogue and lack of transparency in management are obstacles to coming to satisfactory management solutions and achieving successful transboundary cooperation.

3.4.2. Country descriptions

3.4.2.1. Albania

In Albania 2.4% of the total area is protected.¹⁶⁴ It has six national parks and 25 official World Conservation Union (IUCN) protected areas of environmental significance covering more than 76 thousand hectares.¹⁶⁵

The country boasts a rich spectrum of biodiversity, including approximately 3200 flora species and 756 fauna species. It also possesses a high diversity of ecosystems and habitats. Within the territory of Albania are maritime ecosystems, coastal zones, lakes, rivers, evergreen bushes, broadleaf bushes, broadleaf forests, pine forests, alpine and sub-alpine pastures and meadows, and high mountain ecosystems. There are 27 plant species found only in Albania and another 160 species endemic to Albania and adjacent countries.¹⁶⁶ Threats to biodiversity in Albania include unsustainable agricultural and forestry practices, industrial pollution and uncontrolled building.

The Ministry of Environment (MoE) was established in 2001 and initially shared responsibility for nature conservation policy with the Ministry of Agriculture and Food (specifically, the General Directorate for Forests and Pastures), which retained responsibility for management of protected areas. This was due to the institutional weakness and inadequate capacity of the MoE at the time to implement biodiversity legislation, management policies and strategic documents. Lack of stakeholder engagement was another apparent weakness of the MoE, for example through more inclusivity at the early stages of planning and

¹⁶³ see http://www.panda.org/about_wwf/where_we_work/project/projects/index.cfm?uProjectID=9E0727

¹⁶⁴ EEA Report No 1/2007

¹⁶⁵ Minkova, Yordanka (ed) 2006

¹⁶⁶ Ibid

decision-making. More recently, the European Commission's Albania 2008 Progress Report on enlargement¹⁶⁷ found that there had been some progress in nature protection with adoption of a law for for implementation of the CITES Convention and the transposition of the Habitats Directive. However, it also observed that additional training and adequate resources needed to be provided to the staff operating in these areas.

3.4.2.2. Bosnia and Herzegovina

Only 0.53%¹⁶⁸ of the total land area of B&H is protected although the 2003 NEAP identifies the enlargement of protected areas as a priority. Existing areas include: 3 strict natural preserves, 2 managed natural preserves, 2 national parks, 8 special preserves, 9 natural landscape preserves and 91 monuments of nature.¹⁶⁹

Case Study 20) Transport Corridor Vc - LOT 3 / Future National Park Prenj-Cvrsnica-Cabulja Fondoko Association for Stimulation of Sustainable Development and Quality of Life, Bosnia & Herzegovina

Location: The Motorway on the Corridor Vc is a part of the Trans-European ground corridor network connecting the central part of the Adriatic Sea coast with Budapest in Hungary.

Brief History: The Corridor, 330 km long, runs North-South through the heart of Bosnia & Herzegovina, passing through ecologically important areas such as the Bosna and Neretva River valleys. The potential environmental impacts of the proposed motorway have been assessed in four separate Environmental Impact Assessment reports over the full length of the route, which has been divided into four sections. Of particular concern to the NGO Fondoko are the possible impacts of the motorway in the 3rd section which runs from Sarajevo South (Tarcin) – to Mostar North. This section runs through a 6.4 km long tunnel under the Prenj Mountain, bordering on the future Prenj-Cvrsnica-Cabulja National Park, designated for preservation due to its extraordinary biological and geomorphologic diversity which includes an endemic sub-mountain forest of Bosnian pine (*Pinus heldeichii*).

Current Situation: Despite numerous attempts to point out the unsuitability of this motorway passing near the future national park, the attempts of NGO FONDEKO to propose an alternative route have been ignored by authorities. This NGO continues to use all varieties of media (radio, TV, journals) to point out the potential problem, but so far without success.

B&H is rich in biodiversity due to its location in three geological and climatic regions: Mediterranean, Euro Siberian-Boreo American and Alpine Nordic. The flora of BiH contains some 3572 plant species, subspecies, and varieties, 500 of which are endemic. About 19 percent of plant species are thought to be under significant threat from land conversion, unsustainable management, and exposure to pollutants. The vertebrate fauna of Bosnia and Herzegovina includes some 502 species, 29 of which are threatened.¹⁷⁰ B&H also has an extremely high level of habitat and landscape diversity, although many landscapes have been devastated, changed and degraded into lower forms of ecological

¹⁶⁷ Commission of the European Communities November 2008a

¹⁶⁸ EEA Report No 1/2007

¹⁶⁹ Federation of Bosnia and Herzegovina Republika Srpska 2003

¹⁷⁰ Minkova, Yordanka (ed) 2006

organization. The post-war socio-economic situation means that pressure on the country's natural heritage is increasing, with many fauna and flora endangered, and financing for their protection inadequate. Threats to biodiversity include: clear-cutting and excessive use of accessible forests, pollution of aquatic ecosystems from industry, mining, municipal waste water and agricultural runoff, and energy (particularly hydropower) production that leads to habitat degradation and conversion and watercourse fragmentation.

The management of protected areas in B&H faces many obstacles. The current protected area system is extremely complex, involving state-level, entity-level, district-level, canton-level and local levels of government, which requires many time-consuming steps for each procedure in the establishment and/or management of PAs. Post-conflict economics furthermore have resulted in: the forced mining of otherwise renewable natural resources; limited public awareness of mechanisms to improve resource conservation; lack of a coherent legislative framework and of substantial regulatory capacity; and policy and market failures that substantially undervalue environmental goods and services. The lack of evaluation of benefits provided by PAs prevents adequate integration of the PA system into B&H's overall developmental strategies and plans. Very few protected areas have adopted management plans, and where they have, these are regarded as insufficient (with the exception of the national parks and the new Hutovo Blato and Blidinje nature parks) to the needs of nature protection. Consequently NGO work is focused on increasing the proportion of protected areas in B&H and on creating the preconditions for their maintenance. One NGO for example, LIR, has identified the area of Bardača / Donja Dolina in the municipalities of Srbac and Bos, as having the potential for protected status, and is now lobbying, campaigning and building NGO/Citizens' coalitions to have it granted.

3.4.2.3. Bulgaria

Bulgaria has a long tradition of nature conservation. Its first protected area, the Silkosiya Nature Reserve was established on Strandzha Mountain in 1931. Three years later, in 1934, a "People's Park" was established in the Vitosha Mountains, becoming the first national nature park of its kind to be established on the Balkan

Case Study 21) Varna Bulgarian-Soviet Friendship Park Green Varna Association, Bulgaria

Location: On the periphery of the city of Varna, Bulgaria

Brief History: Due to its classification as forest stock the Spatial Planning Act permits construction on 40% of the Park's area. Many rare species of perennial trees across the massifs will be destroyed. The Municipal leaders refuse to pressure the Courts to revoke the Operative Detailed Site Development Plan and change the Park's status to that of "Green Areas for Public Use", because of the influence of a small group of people with vested interests who will benefit.

Current Situation: Zelena Varna is interested in collaboration to challenge the validity and soundness of the Detailed Site Development Plan in Court, under the Law on Territory Planning.

Peninsula. Today, Bulgaria's protected areas encompass 9.53%¹⁷¹ of the country's territory, comprising: national parks (3); nature parks (10); reserves (55); maintained reserves (35); natural landmarks (457); and protected localities (175).¹⁷² In relation to the protection of wild birds and habitats, 140 sites have been identified as meeting the requirements for being designated as specially protected areas and cover 12% of the national territory. Of these sites 30% have already been granted protected status, covering 4.5 % of the nation.¹⁷³ Two categories of protected areas (reserves and national parks) are exclusively state-owned. Other categories (nature monuments, maintained reserves, nature parks, and protected sites) may be municipally or privately owned.

Bulgaria is one of the richest countries in terms of biological diversity in Europe including around 3700 higher plant species, 5200 fungi, 1300 lower plant species, 709 lichens, 700 vertebrate species, more than 400 bird species, 94 mammals, and 27 thousand invertebrate species. Endemic plant species in Bulgaria constitute about 5% of the entire flora, and available information on invertebrates shows that 8.8% (excluding insects) are endemic. Known endemic vertebrates include 12 species of fresh water fish, 1 amphibian variety, 4 reptilian varieties and at least 4 mammal varieties. Appendix 3 to the Biodiversity Act in Bulgaria includes as protected 90 animal species, 331 bird species, and 594 plant species.¹⁷⁴ Among the numerous threats to Bulgaria's biodiversity listed are:

Case Study 22) The Malak Preslavets Swamp Kalimok, Bulgaria

Location: The Malak Preslavets Swamp is a protected locality situated 4km north of the village of Malak Preslavets, near the Danube.

Brief History: The Swamp is about 30 km from the Srebarna Reserve and is the feeding base for herons, ibis, fallow deer stag, cormorants and other birds nesting in the Reserve. The lakes and swamps are the habitat and source of important natural and biological resources such as fish, mussels, crabs, reed, healing mud, and salt, resources which favour the development of ecological tourism. The swamp is one of the biggest sources of water supply in Dobrudzha and has significant aesthetic value for the area of Lower Danube with its exotic and extraordinary landscape. It is also one of the very few preserved wetland areas on the Bulgarian bank of the Danube.

Current Situation: Contrary to the Ordinance for its establishment as a protected area, the entire North side of the Lake has been cemented and hosts a non-functional infrastructure. The Regional Inspectorate for environment and water is refusing to acknowledge the situation or take a stand on this issue.

the draining of wetlands especially along the banks of the Danube and in the Danubian plain; the introduction and settlement of invasive species and subspecies; agricultural intensification, pollution from heavy metals, oil, and

¹⁷¹ EEA Report No 1/2007

¹⁷² Parks.it <http://www.parks.it/world/BG/Eindex.html>

¹⁷³ Trichkova, Katya http://www.edinburgh.ceh.ac.uk/biota/bioplatform_archive/3393.htm

¹⁷⁴ Republic of Bulgaria, MoEW 2007

thermal sources; and construction and development works in disregard of environmental impacts. As an example of the latter concern, many municipalities, particularly those on the Black Sea coastline, are constructing new resorts without wastewater treatment plants, leading to toxic and other sources of pollution in the Black Sea Basin in the absence of incentives for investors and local authorities to mitigate environmental impacts.

With regard to the management of Bulgaria's protected areas, the process of designation of protected areas is slow, with the development and approval of management plans for national/natural parks and managed reserves proving challenging. It has also been noted that the existing network of protected areas is not completely representative of the level of protection in place across the entire PA territory, as highly protected areas represent only 2.1% of the country's territory.¹⁷⁵

Furthermore, although, commended for its refreshing, cultural value-based approach¹⁷⁶, MPA in Bulgaria has been the subject of some recent negative attention due to new projects planned or going ahead in a number of the country's most famous national and nature parks and Natura 2000 sites. The Bansko ski zone for example, which lies within the core zone of Pirin National Park, has been expanded. This expansion, like the original development within this UNESCO World Heritage Site, is in contravention of existing Bulgarian

Case Study 23) Rila Mountain and Ski Resort Bulgarian Biodiversity Foundation, Bulgaria

Location: Rila National Park in the Balkan Peninsula's Rila Mountains, which are in the EU's Natura 2000 network of specially protected areas

Brief History: One of Europe's largest national parks and virtually sheltered from human impact, Rila is home to some of the most secluded forest ecosystems. About 95% of these are natural forests averaging 90 years of age. Rila National Park is certified under the WWF-supported PAN (Protected Area Network) Parks initiative, but is coming under increasing pressure from developers who want to turn the area into a ski resort.

Current Situation: A proposal was made to the Ministry of Environment and Water for the construction of a cabine lift in the Bodrost-Kartala ski resort on Rila Mountain, bordering the Rila Nature Park borders. Although the Environment Impact Assessment procedure had not been completed, construction began in 2007. This criminal violation of Bulgarian and European legislation has caused irrevocable mutilation of the Mountain, and although the developers are in violation of multiple laws, the state institutions have been unwilling to take action because of strong pressure from business interests. A coalition of nature conservation organizations, including WWF, together with local citizen groups have organized several demonstrations in Sofia, as well as in the National Park, in an attempt to stop construction.

legislation. Furthermore, two further ski resorts have been proposed within the border of the national park by the park directorate itself. Most recently, plans have been unveiled for significantly expanding ski areas into Vitosha Nature

¹⁷⁵ Republic of Bulgaria, MoEW 2007

¹⁷⁶ see <http://www.archnetwork.eu/blog/archives/2008/9/10/3878180.html>

Park, located on the edge of Sofia and one of Bulgaria's most famous and popular protected areas.

Case Study 24) The Strandzha Nature Park Bulgarian Biodiversity Foundation, Bulgaria

Location: Near the village of Varvara, South-eastern Bulgaria

Brief History: The illegal construction in recent months by of a holiday development within the borders of the Strandzha Nature Park had featured violations including:

- illegal land use change for property development
- non concordance regulations and the Declaration of Strandzha Mountain as a nature park
- failure to carry out an environment impact assessment
- publication and use of inaccurate documents
- non compliance with the Black Sea Water Basin Directorate
- lack of coordination with the Strandzha Nature Park Directorate

Due to media and public interest in the case the Regional Inspectorate for Environment and Water issued an Order forbidding further construction. The company then brought the case before the Supreme Administrative Court which overturned the Order, arguing that there had been no adopted park management plan indicating whether the above mentioned properties were part of the park or not. This decision reflected the fact that the Court unfortunately had no knowledge that the borders of protected territories are defined through the Orders for Declaration and not through management plans.

Current Situation: Due to public outcry and the adoption of a special law by the Parliament against appeals, Strandzha Nature Park was restored. However in August 2008 the Minister of Regional Development and Public Works approved alterations in the General Development Plan of the municipality of Tsarevo permitting the concreting of an area of the Park on the South Black Sea Coast. The plan was approved despite multiple negative expert opinions. The findings of the Environmental Impact Assessment have not been made public as required by law, and there are suspicions that these have been concealed in order to prevent an appeal.

The plan is in direct conflict with the management plan for the protected area. In what can only be taken as a sign of high-level support and corruption, Bulgarian Prime Minister Sergey Stanishev actually presided over the opening of one of the illegally constructed ski lifts in the buffer zone of Rila National Park (see **Case Study 23**). The lift was built in area that is awaiting official protection under the EU's Natura 2000 network of specially protected sites before the completion of the mandatory Environmental Impact Assessment.¹⁷⁷

3.4.2.4. Croatia

Croatia has 8 national parks (96 315 hectares), 11 nature parks (424 215 hectares) 83 special reserves (85 334 hectares) along with numerous other categories of protected areas¹⁷⁸ totalling approximately 6.49%¹⁷⁹ of Croatia's total area. Parts of Croatia, due to its exceptional landscape and biodiversity, are protected under international legal protection. The Plitvice Lakes National Park is UNESCO listed, the Kopački Rit and Lonjsko Polje nature parks, and Crna Mlaka

¹⁷⁷ WWF 2008

¹⁷⁸ Republic of Croatia, Ministry of Culture 2007

¹⁷⁹ EEA Report No 1/2007

ornithological reserve fishponds and the lower part of the Neretva River valley are protected under the Ramsar Convention on Wetlands, and Velebit Mountain is part of the international network of biosphere reserves.

Croatia is one of the richest European countries in terms of biodiversity, even in the absence of a comprehensive inventory. Around 34 000 known taxa are present, of which 7523 are plant species, 24 087 are animal species, 1744 are fungi and 925 are lichens.¹⁸⁰ These figures represent half of the estimate of total Croatian species, with new species and subspecies being discovered each year. The most significant threats to biodiversity are habitat fragmentation / loss and degradation, primarily due to infrastructure construction, the expansion of built-up areas and agricultural intensification. Besides these threats, excessive exploitation through hunting, fishing and forestry, pollution of water, soil and air , and introduction of allochthonous species are of great concern.

Case Study 25) Nature Park Designation on the Neretva River Eko Eko Komin Ecological Organisation, Croatia

Location: Lower Neretva, Croatia

Brief History: Proposals for the designation of the area around the Neretva River as a nature park have met a mixed reaction. Part of the local population (politicians and most of the local people of the city of Metković) favour Nature Park designation while others, namely politicians and most of the local population of the city of Opuzen, are opposed to it on the grounds that it will be more difficult or even impossible to carry on illegal hunting with impunity, and to practice intensive agriculture based on chemical fertilization.

Current Situation: Eko Eko Komin is in favour of Nature Park Designation and argues that under such designation agricultural production would need to be strictly controlled.

Tourism is the main economic activity in Croatia's PAs. Although some progress was noted in the EU enlargement progress report on Croatia regarding its establishment of an ecological network, it was also noted that the designation of actual protected areas by the State Institute for Nature Protection had not taken place yet¹⁸¹ due to the relatively unexplored biodiversity and a lack of data on the distribution of Natura 2000 species and habitat types. New research has recently been financed and a Natura 2000 proposal drafted, and it is expected that Natura 2000 PAs will be designated in time for Croatia to enter the EU.¹⁸² Meanwhile, general impediments to effective PA management have been noted as: absence of appropriate tourism programs; poor control; overall lack of implementation of policies and regulations; and low penalty fees. Lack of monitoring of the status of habitats in PAs in particular means that only qualitative evidence of environmental degradation such as disappearance of moors, sands, fens, etc... can be cited. Even areas protected by law such as nature parks and national parks are exposed to heavy pressure from tourism,

¹⁸⁰ Minkova, Yordanka (ed) 2006

¹⁸¹ Commission of the European Communities 2008b

¹⁸² see <http://www.natura2000.hr/PageTemplates/PageContent.aspx?pagelD=38&langID=2>

especially during the summer months, particularly marine protected areas, the protection of which are disproportionately low compared to that of the mainland.

Lack of co-ordination among different institutions, and especially among ministries involved in tourism management has led to a situation where Croatia has no integrated policy on tourism development. Unsustainable patterns of tourism development have substantial impacts on biodiversity in coastal areas and nearby islands caused by construction (often illegal) of tourism facilities at biodiversity rich sites, and heavy consumption by tourists of water, energy, food and the related production of polluting waste. Misbehaviour by tourists also directly causes habitat degradation, waste and even forest fires, especially on islands.¹⁸³

3.4.2.5. FYR Macedonia

About 7.13% of Macedonian territory in total is protected¹⁸⁴, with 6.6 % of this under some form of protection under the Law on Natural Rarities Preservation. This includes three national parks (108 388 ha), three areas with special characteristics (2338 hectares), 14 special plant and animal reserves (2647 ha), and 47 natural monuments (58 084 ha). All three national parks, Pelister (12 500 ha), Galicica (22 750 ha) and Mavrovo (73 088 ha), are in forested areas.¹⁸⁵

Case Study 26) Water Buffalo Conservation Biosfera Centre for Education and Protection of the Environment and Nature, FYR Macedonia

Location: The village of Debreshte, Macedonia

Brief History: During field work on endangered species, Biosfera members discovered that only 13 female Water Buffalos were left in Macedonia, with no male. The females had not reproduced for 3 years and risked losing their ability to produce milk, so their breeders faced killing the animals for the meat or selling them. Biosfera succeeded in buying one male Water Buffalo male and donated it to the village, producing a new generation of Water Buffalo babies in 2007 and another in 2008. However now breeders are facing the problem of potential inbreeding with the male Water Buffalo and may have to import males from Bulgaria or Italy.

Current Situation: Official statistics include Water Buffalo as cattle so there are no official statistics about the status of the population. Working along with the breeders, Biosfera want to promote cultural and biological diversity as a model for rural sustainable development with Water Buffalos as the focus. The milk industry is interested in the buffalos' milk and mozzarella cheese production. Other stakeholders include the Municipality of Dolneni and the Mayor of Dolneni, the water buffalo breeders, the UN Global Environmental Facility Small Grants Program (GEF SGP), the Save Foundation from Sent Galen, Switzerland, the "Fejzi" Milk Factory, journalists from print and electronic media and the World Water Buffalo Federation. Expertise regarding biological diversity and the links between culture and biodiversity in rural sustainable development is needed in order to develop a strategy for rural sustainable development of the region and designate this region as a region of special value.

¹⁸³ Republic of Croatia, Environment Agency <http://www.azo.hr/Default.aspx?art=1001&sec=537>

¹⁸⁴ EEA Report No 1/2007

¹⁸⁵ Minkova, Yordanka (ed) 2006

Various climatic influences and relief forms on a relatively small territory result in an abundance and heterogeneity of species and ecosystems, which include which include more than 18 000 taxa of flora, fauna and fungi, of which over 900 are endemic. The former Yugoslav Republic of Macedonia contains a large number of threatened ecosystems and habitats on a European scale and a number of endemic plant species, some of them very rare. The main threats to biodiversity in FYR Macedonia include habitat loss, land-use modification and habitat fragmentation from agriculture, fishing, traffic and road infrastructure, and energy production.¹⁸⁶

Significant management issues in biodiversity protection in FYR Macedonia have to do with the lack of local community involvement in protected area management. Stronger engagement of environmental NGOs and the establishment of mechanisms for dialogue between municipalities and the central government have been called for, along with encouragement of the role of NGOs in public awareness raising and nature protection education, particularly in support of protected areas. Also an issue of management is the allocation of responsibility for national parks to the Ministry of Agriculture, Forestry and Water Economy, which leaves the Ministry of Environment and Physical Planning without the necessary authority or competence for nature conservation.

3.4.2.6. Serbia

About 6.5% of Serbia's total land area is protected. Apart from 5 national parks there are 98 nature reserves, 16 landscape protected areas, 296 nature monuments, and 24 nature parks.¹⁸⁷ There are also parts of Serbia that are protected under the UNESCO MAB program (the Golia and Stara Mountains) due to their exceptional landscape and biodiversity.

Balkan endemic species make up 8.06% of the flora (287 taxa), and local endemic species make up another 1.5% (59 species). The number and diversity of fauna is also very high. Serbia has 215 plant species and 429 fauna species which fall under the category of protected natural rarities. Another 600 flora species are endangered, while endangered fauna numbers approximately 500 species of mammals, birds, reptiles, amphibians and fish.¹⁸⁸ Among the threats to biodiversity are habitat / species loss due to agricultural expansion, illegal construction, unregulated tourism and water infrastructure (dams), illegal hunting and or poaching, excessive utilization of forests, alien invasive species and industrial pollution.

With regard to management issues in Serbia, the system of laws and bylaws addressing biodiversity and nature conservation is inconsistent and requires revision and approximation with the EU Directives. Nor does Serbia have a

¹⁸⁶ Ibid

¹⁸⁷ UNECE 2007

¹⁸⁸ Ibid

comprehensive National Biodiversity Strategy, or an inventory of endangered species and habitats upon which to base such a strategy. Furthermore, existing

Case Study 27) The Green Corridor Project Stara Planina Society for Environmental Protection, Serbia

Location: Stara Planina is the largest mountain in Serbia, stretching as far as the natural border to Bulgaria. The length of this mountain system is 53 km, and the highest peak is Midzor, at 2 169 m. The lowest point is the entrance of the Prilit brook, at 132 m.

Brief History: Stara Planina is an important natural treasure, yet there is no clearly specified authority for managing the Stara Planina Nature Park. Negligence and ignorance have deprived Stara Planina of nearly all of its inhabitants. The Park suffers from total passivity regarding conservation initiatives, while increased economic activity threatens to turn the mountain into a built-up area. There is no balance between development and preservation of the natural resources of this area.

Current Situation: The “Green Corridor” Project has facilitated and improved cooperation between the the “Stara Planina” Society and institutions at both the local and state level (for example, with the Institute for Protection of Cultural Monuments from Nis, and the Ponisavlje Museum), improving awareness of cultural and historical heritage and creating opportunities for the development of new projects. The long term objective is to merge the natural and cultural-historical values of the region into a unique green corridor which will provide an opportunity for eco-tourism and thus a new strategy for the areas development. To this end cooperation with the economic sector, local government and media will be sought. To achieve these objectives, the Environment Protection Association Stara Planina plans to:

- offer quality and innovative services to groups and individuals interested in applying the principles of sustainable development in practice,
- provide a neutral atmosphere for dialogue, networking and cooperation of interested groups and partners at the local, national and international level, and;
- maintain the independent status of organizations through a successful governance model.

Case Study 28) Preserving Wild Nature Areas in the Bor Region Association of Young Researchers of Bor, Serbia

Location: The Juzni Kucaj Mountain covers the territory of the six municipalities of Eastern Serbia: Bor, Boljevac, Paraćin, Despotovac, Svilajnac, Žagubica.

Brief History: The area of Juzni Kucaj was nominated for protection as a national park back in the 70s when the first national parks were proclaimed in Serbia, yet the status of much of this area remains unresolved despite the interventions of stakeholders including representatives of the municipalities, the public company “Srbija šume”, water management companies, tourist organizations, and local residents.

Current Situation: The initiative for the protection of this area is part of the Local Environmental Action Plan (LEAP). The Association of Young Researchers (AYR) and the Municipality of Bor have launched several initiatives including scientific research and a cleanup up the Zlot Canyon and Cave, currently the only protected parts of the Juzni Kucaj Mountain in the Bor Municipality. Protecting the mountain area of Stol, Veliki and Mali Krs and Deli Jovan, situated between Juzni Kucaj and Djerdap at the junction of the three municipalities of Bor, Majdanpek and Negotin is also a goal. The AYR and Municipality of Bor have undertaken analyses and sent findings and a proposal for protection of this area to the Institute for Nature Protection of Serbia.

management of protected areas is inadequate and suffers from unclear competencies, underdeveloped information systems, and ineffective supervision of economic activities within their borders.

Case Study 29) Livelihoods and Djerdap National Park Endemit Ecological Society, Serbia

Location: The valuable resources of the Park are spread all along its 100 km Danube coastline, from the City of Golubac up to the Village of Sip.

Brief History: Previously, agriculture was one of the most important economic activities in Djerdap territory until almost all fertile land was submerged upon completion of a huge dam in 1971. The elimination of this main source of income for a great number of people left the local population with few economic alternatives. Compounded by the negative national economic situation and lack of plans for management and sustainable use of resources, the results have included an increase in illegal logging, fishing and hunting activities as well as unregulated collection of products from forests and illegal construction of tourism facilities within the Park.

Current Situation: The beautiful landscape and natural richness of Serbia represents a solid basis for the development of sustainable tourism. While there is a long tradition of spa, mountain and rural tourism, these forms of tourism impact negatively on the environment. The tourism sector is considering the development of environmentally friendly tourist programs in destinations with high natural values, but current barriers to the development of eco-tourism include: low levels of international publicity, low accommodation capacities, underdeveloped leisure facilities (e.g. golf terrains, parks, recreation space etc.), and underdeveloped road infrastructure. Strategic development plans for sustainable tourism in specific areas based on the National Strategy for Sustainable Development, National Environmental Strategy, Tourism Development Strategy and Spatial and Urban Development Plans are needed. Such plans should also be in compliance with local environmental and sustainability action plans.

3.4.3. Invasive species in the Region

The European Environmental Agency has produced a list of the most threatening invasive alien species to European biological diversity.¹⁸⁹ Out of the total 163 “worst invasive alien species threatening biodiversity in Europe”, Albania has 21, Bosnia & Herzegovina has 28, Bulgaria 34, Croatia 34, FYR Macedonia 29 and Serbia 12.¹⁹⁰ Furthermore, the number of invasive species is constantly rising and it is estimated that for every year for the past 50 years at least one alien species has become established in Europe that will significantly impact biodiversity. There is no indication that this trend is set to change and thus there is minimal chance of progress towards halting biodiversity loss caused by invasive species. Rather, impacts on biodiversity are expected to increase because of the growing number of species involved, and the increasing vulnerability of ecosystems to such invasions due to fragmentation and climate change.

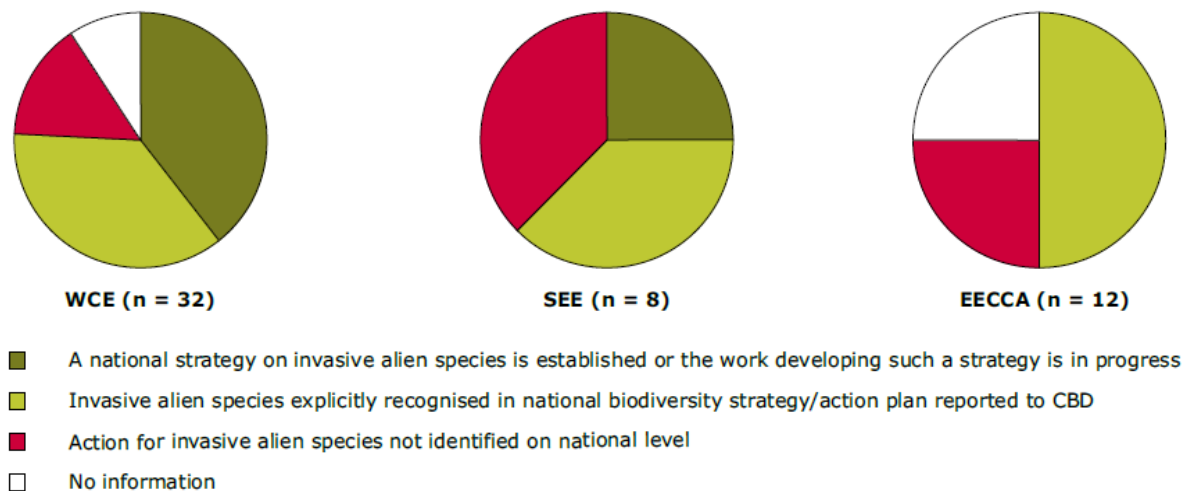
¹⁸⁹ see http://www.eea.europa.eu/publications/technical_report_2007_11/

¹⁹⁰ EEA Technical Report No 11/2007

The 2003 Kiev Resolution on Biodiversity¹⁹¹ urges European countries to implement the European Strategy on Invasive Alien Species as established under the Bern Convention and in accordance with the Guiding Principles for Invasive Alien Species under the Convention on Biological Diversity.¹⁹²

Figure 14 indicates how policy responses in SEE region are lagging behind. This is due to a lack of specialists in certain taxonomic groups, low environmental awareness, the inaccessibility of many areas, and a lack of funding for monitoring. Furthermore, the actions necessary to counter invasive alien species require measures for management and restoration which are usually both difficult and costly.

Figure14: Progress in developing national strategies for invasive alien species
(source: EEA 2007)



Note: A country is assigned to one category only, a specific national strategy for invasive alien species is given priority over general national biodiversity strategies/action plans. Information is lacking from the following countries: WCE: Monaco, San Marino and Andorra; EECCA: Turkmenistan, Uzbekistan and Belarus.

Sources: Council of Europe, 2004; EEA/SEBI 2010 Expert Group on trends in invasive alien species.

¹⁹¹ see <http://biodiversity-chm.eea.europa.eu/convention/F1117799202/F1122894118/1117807252>

¹⁹² see <http://www.cbd.int/decision/cop/?id=7197>

Case Study 30) Solving the Problem of Ambrosia TERRAS Organic Food Association, Serbia

Location: Subotica, Serbia

Brief History: Ambrosia (*ambrosia artemisiifolia*) is among the most dangerous invasive plants in the world. Ambrosia pollen causes an allergic reaction among 10% of the population, and is a major cause of pollen allergy (50-60% cases). Only 8-20 pollen grains in 1m³ of air can cause severe reactions with the most sensitive people, and one ambrosia plant is capable of producing up to 1-8 billion pollen grains. Among the leading sources of health problems in Subotica, and Vojvodina counties, ambrosia was first found in 1953 in Sremski Karlovci. According to data from 2006, 400 pollen grains per m³ were measured in Belgrade on certain days. Since 2006 monitoring and removal of the weed has been regularly carried out.

Current Situation: With the help of foreign donors, the government in Subotica has purchased a Burkard device for conducting pollen counts in order to inform the public of concentrations. Mowing machines have been purchased by local communities and are available for hire, and a decision on ambrosia eradication was adopted in the city assembly but unfortunately has not been applied in practice. The media asks citizens to take care of their yards, but the main problem lies in the fact that the railway authorities and road maintenance services aren't taking appropriate steps. A higher degree of cooperation is therefore needed amongst the Ministry of Agriculture's Administration for Plant Protection, local authorities, educational institutions and inspectorates to enable the implementation of regulations.

3.5. Agriculture

3.5.1. Regional description

Natural conditions provide for three distinct agricultural zones within SEE: intensive cereal and animal production in the continental part and valleys, extensive sheep and cattle production in the mountains, and intensive production of Mediterranean crops and horticulture production in the coastal regions. While the negative impacts of the food production sectors are of a lesser scale than those of the waste, energy and mining sectors, they do present significant environmental challenges.

Despite good natural conditions for farming and a high rate of unemployment, a significant portion of arable land is abandoned (see **Table 8** overleaf) and all countries in the region are currently net importers of food. Low incomes, hard working conditions and a lack of social services in many areas make farming an unattractive option for young people, contributing to land abandonment and increasing the proportion of the elderly among farmers. Even where abandonment is occurring, some countries still have large rural populations, but the average size of rural holdings is small (on average 2 ha).¹⁹³ In certain areas such as mountain pastures and coastal areas, land abandonment is causing biodiversity loss and loss of environmental capital such as terraces.

¹⁹³ Stritih, Jernej et al. 2007

Table 8: Agricultural Land in SEE

(source: EEA 2007)

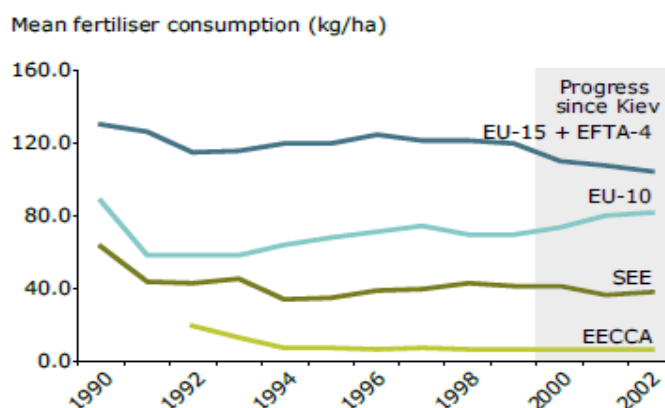
	% Agricultural Land	Fertiliser Input per Hectare (kg/ha)	% Agricultural Land Irrigated	Increase in Agricultural Land 2000-2005 (%)
Albania	41	31	31.4	-2
Bosnia and Herzegovina	42	15	0.14	+1
Bulgaria	48	31	11.04	-6
Croatia	48	55	0.35	-15
FYR Macedonia	49	18	4.43	+1
Serbia	55	55	0.57	0

Intensification of farming has had negative environmental impacts in some areas, but overall the environmental impact of agricultural activities is lower than in the past. The level of mechanisation in small-scale agriculture is low, so that with relatively light machines and manual labour environmental impacts are minimal.

There was a significant decline in fertiliser consumption from 1990 (**Figure 15**). Levels remained more or less stable in SEE until 1999 when reports show they decreased by nearly 10 %.¹⁹⁴ The use of pesticides per hectare of agricultural land is much higher in western Europe than in SEE. However, the legacy of localised hot spots of pesticide contamination in SEE remains.

Figure 15: Mean Fertiliser Consumption: SEE and Other Regions

(source: EEA 2007)



Livestock production has been declining since 1990 and mountain farming in the Western Balkan countries has been all but abandoned. Where livestock is still kept households often have only one or two cows, and most farmers are

¹⁹⁴ EEA Report No 1/2007

elderly.¹⁹⁵ This strongly limits the possibilities for commercial dairy operations even where opportunities for quality production exist. Sheep production is in a similar situation, with most sheep producers being uncompetitive in comparison with lowland or foreign sheep flocks. Even with the decline of livestock production, a growing source of pollution in rural areas is large-scale pig and poultry breeding units, as nitrates from manure pollute drinking water, and cause eutrophication of coastal and marine waters.

Organic agriculture has been recognised as an option for and a possible competitive advantage of the region. Many small private farms have good preconditions to start organic production activities owing to the low level of fertilisers and pesticides used in recent decades. Initial steps have been made in this respect in some countries. In Croatia for example the Government introduced subsidies to support organic farming in 2003 (400 Euro/ha of arable land), which led to a tenfold increase in the size of the area under organic management from the previous year. Croatia now has a fully functioning domestic inspection and certification system.

Elsewhere in the region organic farming is promoted by NGOs who provide advisory and certification services as part of European networks, as broader state support and marketing initiatives are still missing and local markets for organic products are undeveloped. There is little cooperation with other sectors within the context of sustainable rural development however, such as (agro) tourism, which could provide additional market and higher value-added to the product by moving it further along the production chain, nor is there is much information on, or concern for agricultural production for home use and informal markets for agricultural products.¹⁹⁶

3.5.2. Country descriptions

3.5.2.1. Albania

Agriculture is an important sector of Albania's economy, contributing 22.8 % of GDP in 2005, the largest proportion of GDP of all the countries covered in this study. Nearly half the active population was employed (45.6%) in agriculture in 2004¹⁹⁷ and 41% of land is agricultural. Albania is divided into four geo-climatic zones based on topography, climate, soils and vegetation: the south western coast; and the north western coast; and in the fertile coastal plains, the intermediate hilly region and the non-arable mountain zones.

Albania is a mountainous country where only a small percentage of land is considered appropriate for cultivation. Agriculture is characterized by small plots and a diversification of crops and livestock, extensive farming and low productivity. The main crops are wheat, maize, potatoes, vegetables, and forage crops for cattle. From 1994 to 1998, livestock provided 75 to 85% of farmers'

¹⁹⁵ UNEP February 2006

¹⁹⁶ Stritih, Jernej et al. 2007

¹⁹⁷ WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

income.¹⁹⁸ In 2007 over 80% of households kept livestock,¹⁹⁹ which in Albania includes cattle, sheep, goats, pigs and chickens, with some beekeeping.

The use of fertilizers and pesticides has fallen drastically since 1990 due to economic decline. Nevertheless, since 1994, the use of fertilizers and pesticides increased with the take-off of agricultural activities, with growing demand leading to increased interest in rehabilitating fertilizer factories, potentially heavy polluters. In addition, about 1000 t of obsolete pesticides have accumulated in agriculture (farms and storage). They are stored in environmentally unsatisfactory conditions and represent a real threat to the population and the environment. There are no facilities for the destruction or disposal of these hazardous chemicals.²⁰⁰

Soil erosion is also a threat to the environment as many terraces in the mountains are not maintained and are overgrazed. One fifth of the country suffers from strong erosion and 70% from medium erosion.²⁰¹

Organic farming is a governmental objective, but legislation on organic farming adopted in 2004 on production, processing, certification and marketing of 'bio' products is not yet fully implemented. In 2007 about 13 700 hectares, including wild collection areas, are managed organically and certified. According to the Ministry of Agriculture, Food and Consumer Protection there are about 90 certified organic farms.²⁰²

3.5.2.2. Bosnia and Herzegovina

Agriculture contributed 10.6% of GDP in 2006. In 2004 only 3.7% of the population was employed in the sector,²⁰³ the lowest rate of all the countries covered in this study. Of the total terrain, about 42% of land is classified as arable, but much has lain unused since the war and an estimated 50% of agricultural land is underused or unmanaged.²⁰⁴

The best soil is in the river valleys which are suitable for producing wheat, barley, soybean, and corn, cattle breeding, orchards, vegetables, medicinal herbs and industrial crop production. The poorer quality highland soil is used for cattle breeding. Livestock production makes up about 50% of agricultural production and includes cattle, sheep, pigs, and bee-keeping.²⁰⁵

Uncontrolled pre-war pesticide use was a problem, and although during the war agrochemical inputs were drastically reduced allowing the land to recover, agricultural redevelopment will bring back this risk of overuse, as training in the

¹⁹⁸ UNECE 2002a

¹⁹⁹ World Bank 2007

²⁰⁰ UNECE 2002a

²⁰¹ Ibid

²⁰² Guda, Anula 2007

²⁰³ WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

²⁰⁴ UNECE 2004

²⁰⁵ Ibid

application of pesticides and other protective agents (quantity, dosage, time of application, frequency) is inadequate and unsystematic, and there is no environmental monitoring of agriculture.

While the current use of mineral fertilizers and pesticides is still low; the real problem is that soils will become exhausted without additional nutrients. Since the war farmers have not been able to invest in soil improvement, and crop rotation has been limited to the main crops. Poor agricultural practices and the low level of farmers' knowledge are partially to blame for erosion that has endangered 89% and badly damaged 10% of the land.²⁰⁶

In 2006 in B&H 0.01% of the total agricultural area was under organic management. There were 122 organic farms and 310 ha under organic cultivation.²⁰⁷ There is no national legislation on organic farming. There appears to be considerable interest in expanding the production of organic foods, but lack of legislation on organic farming and of data about contaminated soils and degraded land is a hurdle.

3.5.2.3. Bulgaria

The agricultural sector represented 8.5% of GDP in 2006, and employed 5.5% of the workforce in 2004.²⁰⁸ Of the land, about 48 % is arable in Bulgaria, but this decreased by 6% from 2000-2005. This land is spread across three regions: the North-Eastern region, the Southern-Central region and the Northern-Central region. Among the main crops produced are wheat, maize, barley, potato, sunflower, grapes, peaches, apricots, apples, melons, nuts and tobacco. Livestock production includes sheep, pig and cattle breeding, poultry farming, and bee-keeping.

The post-communist transformation of Bulgarian agriculture has brought a number of environmental challenges. The use of chemical fertilizers and pesticides has declined since 1989, reducing drastically the risk of chemical contamination of soils, waters, and farm produce but past use has left a legacy of environmental problems. Currently almost 25% of soils are acidified²⁰⁹ and the lack of effective manure storage capacities and sewer systems in the majority of farms contribute significantly to the persistence of the problem. Very few livestock farms possess safe manure-pile sites, the majority of them using primitive dunghills, or no facilities at all, contribute to pollution of air, water and soils, and creating general discomfort.

²⁰⁶ Ibid

²⁰⁷ Ibid

²⁰⁸ WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

²⁰⁹ Bachev, Hrabrin 2008

Case Study 31) The Parshevitsa Dairy Moderna Vratsa, Bulgaria

Location: Villages situated in the Cherna River valley, near Vratsa, Bulgaria

Brief History: The problems of the Cherna River date back 5-6 years. The Parshevitsa dairy upstream, pollutes the water by releasing large amounts of organic waste from milk processing, which turns the River white at regular intervals due to periodic whey spills. This waste is kept in pits in this karstic region, however during rainfall these pits overflow into the Cherna River, turning the river white and creating an unpleasant odour. The inhabitants of the affected villages, Lyutadzhik and Gorno Ozirovo, are unable to use the water either for animal rearing or domestic use.

Current Situation: Repeated control visits from the Regional Inspectorate for Environment and Water showed that pollution is not a problem, so the village inhabitants insisted on an ad-hoc examination to determine the source of pollution. A member of the Bulgarian Parliament, Georgy Bojinov of the Communist Party had committed to assist with resolving the conflict but the cost of determining the exact cause of the pollution was too high, and the planned investigation was cancelled. The two villages want to apply under different programs for tourism development but the risk under current conditions is prohibitive.

The practice of monoculture or simple rotation by most large farm managers, and concentration on a few profitable crops (such as sunflower and wheat) has also degraded soil quality and organic content.

Another serious environmental challenge has been caused by inadequate storage and disposal of out-of-date or prohibited pesticides from defunct public farms. As much as 82% of all polluted localities in the country are associated with these dangerous chemicals,²¹⁰ and very few of these sites have been inspected. Agriculture has also significantly impacted biodiversity in the country in several ways. Policies of intensification and introduction of foreign varieties and breeds during the communist period, and the lack of any protection of biodiversity have led to degradation of the rich diversity of local plants and endangerment of some 37 animal breeds and extinction of 6 others.²¹¹ Abandonment of a considerable portion of agricultural lands from 1990 has allowed the uncontrolled development of species that have consequently suppressed that of others, and valuable ecosystems (such as permanent natural and semi-natural grassland) have been severely damaged due to undergrazing, or intrusion of shrubs and trees into grasslands. In addition, conversion of fertile semi-natural grasslands into cultivable crops, vineyards or orchards has resulted in irreversible disappearance of plant species diversity. Meanwhile, in other areas unsustainable over-grazing by private and domestic animals has degraded a number of public pastures. The introduction of genetically modified crops has been done without independent assessment of possible hazards to traditional and organic production or human health.

²¹⁰ Ibid

²¹¹ Ibid

Case Study 32) Forestry in Stara Zagora Ecocentre for Chamber of Commerce and Industry, Bulgaria

Location: Stara Zagora, Bulgaria

Brief History: According to the Regional forestry management of Stara Zagora, forest fires in the region in 2007 completely destroyed 160 thousand m³ of timber in July and August, spreading over 52 thousand ha of coniferous and deciduous woodlands. Scores of people have contacted the eco-centre and expressed the desire to be involved in forest maintenance and protection, recognising the role of forests in maintaining ecological balance and cleaning polluted air in the region.

Current Situation:

The Ecocentre has started a charity campaign for the restoration of burnt down forests in the region together with the public donation fund of Stara Zagora. Also supporting the campaign are: the Municipality of Stara Zagora; the regional Governor; USAID; the Stara Zagora Chamber of Commerce and Industry; the Sarnena Gora Tourist Society; the Association of Public Foundations in Bulgaria; Gorichka bg; the Bulgarian Donation Forum; and the Help for Charity in Bulgaria Foundation.

At the end of 2007, 13 646 ha were managed organically by 240 producers constituting 0.3 % of the agricultural land in the country. In addition to the agricultural land there were almost 400 thousand hectares of wild collection areas. In the national plan for the development of organic farming in Bulgaria, it is stipulated that by 2013, 8% of agricultural land in the country should be used to produce organic foods and 3% of the foods sold should be organic. European funds have been allocated to organic agriculture until 2013, and farmers can apply for EU subsidies under the Rural Development Programme.²¹²

3.5.2.4. Croatia

In Croatia the agricultural sector represents 7.4% of GDP and employs 6.5% of the population.²¹³ About 48% of the land is arable. There are three agricultural regions in Croatia: the Pannonian region, the mountainous area and the Mediterranean zone. The Pannonian region in the south is the most fertile with high yields of cereals including wheat. The mountain region is characterised by small holdings of stockbreeding and arable farming for fodder, and fruit production. Conditions in the Mediterranean region favour olives, figs, citrus fruits, etc. Livestock production in Croatia (45% of the value of agricultural production in 1999)²¹⁴ includes cattle, pigs, poultry, horses, sheep, and goats.

Croatia's agriculture is based on traditional extensive exploitation in the mountain region and low fertilizer and pesticide use. Intensive crop production has damaged land in some areas, but overall, expansion of agricultural land and intensification of production has not occurred. This is due to unfavourable

²¹² Research Institute of Organic Agriculture (FiBL) <http://www.organic-world.net/bulgaria.html#c324>

²¹³ WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

²¹⁴ UNECE 1999

economic conditions, the presence of landmines and the depopulation of rural areas.

The consumption of pesticides and fertilizers is fairly low (25% of the Western European mean) compared to that of the former public agricultural units, which had consumption similar to that of developed countries.

In Croatia, as in other countries of the former Yugoslavia, livestock farms use large quantities of water (liquid manure contains 96 to 98.5 per cent of water and is classified as sludge). Large farms are estimated to produce one third of the total quantity of manure but there are no accurate data on the quantity of manure from large livestock farms that is discharged directly or indirectly into surface water.

Croatia is leading the way in the region with initiatives to promote and develop organic agricultural production. In 2005, 0.2% of agricultural land was allocated for this use.²¹⁵ An increase in ecological livestock breeding has also occurred as a result of financial incentives. The Croatian government has supported organic production with several initiatives and there are now 265 organic farms covering 7355 ha. There are also about 17 000 hectares of ecological “bee pasture”, of which the certification is worldwide unique.²¹⁶

3.5.2.5. FYR Macedonia

Agriculture represented 13% of FYR Macedonia's GDP in 2006, and employed 10.3% of the workforce in 2004.²¹⁷ Forty nine per cent of the land is arable with three types of climate: one Mediterranean; one eastern European; and a high mountain climate, suitable for livestock rearing. Sixty-two per cent of the arable land is used for cereal production, with more than half for maize. Industrial crops include sunflowers and tobacco, and vegetables cover 17% of arable land.²¹⁸ Numbers of livestock are small, with cattle and sheep (but not goats) on the decline.

FYR Macedonia is a water scarce country on the whole, with water deficiency during the summer and on average 100 days per year of drought in the centre of the country. During the growing period evapo-transpiration (about 640 mm) is much higher than rainfall (190 mm)²¹⁹ so high-crop yields are possible only with irrigation, which puts pressure on water resources. Agriculture consumes 34% of the country's water.²²⁰ Furthermore, discharges and serious contamination from pig farms and slaughterhouses is a serious source of water pollution and threat to available sources in certain areas.

²¹⁵ Republic of Croatia, MePPPC November 2007

²¹⁶ Ost-West Contact 31 October 2007 http://www.organic-market.info/web/News_in_brief/Agriculture/Organic_agriculture_in_Croatia/176/177/0/4039.html

²¹⁷ WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

²¹⁸ UNECE 2002b

²¹⁹ Ibid

²²⁰ Ibid

The consumption of agrochemicals continues to decrease, but their use in the private sector is uncontrolled. Problems with waste water from agriculture have been noted in the River Bregalnica (Delchevo and Kochani), in the Vardar near Gostivar and near Negotino from newly developed areas and in Pelagonija. Lake Ohrid is also reported to suffer from pollution by agricultural run-off (phosphorus). Pesticide and herbicide residues in soils have not been extensively investigated, but low levels of propanil and molinate have appeared in rice fields, and DDT as well as other slowly degrading pesticides and herbicides are still present in rice fields in some regions (Kochani).

Case Study 33) Pollution and Irrigation in the Vardar River Kalinka Ecological Society, FYR Macedonia

Location: The Vardar River in South Macedonia.

Brief History: The municipality of Valandovo is in a mainly agricultural area that is irrigated by the heavily polluted Vardar River. The health of the inhabitants of the municipality is at risk from the agricultural products they consume.

Current Situation: Ecological Society Kalinka is cooperating with Farmahem (a private firm), which has begun a complete analysis of the water used for irrigation. The analysis has so far found the water to be a category 2, apart from phosphorus and BKP5 which are category 5. The results of the biological analysis as well as the results from the chemical analysis are soon to be published. Preparation of a feasibility study for the construction of an accumulation system, to be used as a non – powered irrigation system, is also in progress.

In the western part of the country erosion is a serious problem characterized by pasture run-off from torrential rains due to overgrazing and scarce soil cover. In the north-eastern area erosion also occurs on steep barren mountains, where poor farmers use forage cut from trees to feed their cattle. Here short and intensive rainfalls result in floods and landslides.

Sources of soil degradation include land abandonment due to a lack of labour (old age) and mechanization. Stubble burning is widespread and leads to a reduction of organic substances in the soil. Eleven thousand hectares of soil are reported to be saline, and improper irrigation practices are partially to blame.

Impacts on biodiversity from agricultural activities have been noted but not quantified. For example, long periods of drought and the lack of irrigation water in the reservoirs have changed the use of rice paddies, and this has led to the disappearance of migratory birds from the region. Due to the drastic decrease in the number of cattle in the mountains, there has also been a marked reduction in predator birds which feed on carcasses.

In FYR Macedonia a complete legal framework for organic production is in place. The Law on Organic Agricultural Production adopted in 2004 and other by-laws regulate provisions for production, processing, marketing and labelling of organic

production for human consumption and animal feeding. They also provide the basic conditions for inspection and certification of organic agriculture. In 2007, out of the total cultivated land, organic farming has a share of around 0.1%.²²¹

3.5.2.6. Serbia

Agriculture represented 12.7% of GDP in 2005, and employed 16.8% of the workforce in 2004.²²² Of the land, an estimated 55% is arable. The country's landscape is diverse, ranging from plains to high mountains. Vojvodina in the north is a rich fertile plain suitable for agriculture (83.5% is in agricultural use). Central Serbia's topography is mountainous with numerous rivers and creeks. Kosovo-Metohija in the south has a varied, hilly landscape. Serbia has excellent agricultural land, which is well suited to intensive agricultural production. The main crops are cereals, including maize and wheat, livestock fodder (mainly alfalfa), and industrial crops such as sugar beets and tobacco.

Serbia's territory was originally covered with forests, shrubs, steppe vegetation and marshes. The original vegetation was removed to obtain areas for either mountain pastures or lowland arable land. Marshes were drained and steppes were irrigated for agricultural crops. Declines in Serbian biodiversity are directly attributable to the expansion of agriculture and its impacts on the loss of natural habitat, particularly on the Pannonian Plains. Although the trend of this conversion has slowed in recent years, the impacts are still being felt, and the remaining natural vegetation is still endangered by overgrazing by livestock, especially in the mountains.

Case Study 34) Organic Agriculture and Health Food Production TERRAS Organic Food Association, Serbia

Location: Subotica, Serbia

Brief History: The first Law on organic agriculture and organic products harmonized with EU requirements was passed in 2000 in Serbia, with a second one passed in 2006. However, the problem is that no regulations for facilitating organic production have been enacted, therefore despite growing demand, the supply of organic products in the market has decreased.

Current Situation: In order to encourage organic production, in the last three years the State has offered subsidies for organic production, but the terms are so restricting that no one has received them as of yet. It is a paradox that while there is growing demand for TERRAS' organic products both within the country and abroad, the market cannot provide for it. Regression has actually been the trend, rather than progress, due to problems with labelling and sales of organic products. In cooperation with other stakeholders (businessmen, NGOs, certification organizations, farmers), the TERRAS Association has initiated meetings with the Ministry of Agriculture, which is working to eliminate obstacles to organic production. Serbia is especially encouraged by the EU for this kind of production. The formation of working groups composed of representatives of the relevant Ministries, institutions, NGOs, farmers and businessmen is currently in progress. The solution involves education as well as marketing of organic products at home and abroad.

²²¹ Trajković, Radomir 2008

²²² WRI http://earthtrends.wri.org/searchable_db/index.php?theme=8&variable_ID=205&action=select_countries

Fertilizer consumption decreased from 115 kg/ha in 1991 to 36 kg/ha in 2002, leading to a significant reduction in the eutrophication of water bodies. Current soil pollution and eutrophication problems are mostly connected to effluents from livestock farms. The main point sources of organic discharge in Serbia are around 130 pig farms with 1.2 million heads.²²³ Wastewater is discharged into lagoons or natural depressions, where after a period of 6 months, it is extracted to fertilize agricultural areas. An extremely small number of farms have facilities for waste treatment but rarely are such facilities properly operated and functioning. Pollution in the Danube River, which is a transboundary watercourse of great significance, is of great concern.

In 2006 the Ministry of Agriculture announced a new law on organic production in compliance with the European Regulations 2092/91, but standards are not yet finalized and EU certifiers are still certifying organic operators in Serbia. Organic development in Serbia is export-driven, and the most important organic products are wild or cultivated fruit and berries, and wild mushrooms. There are no official data on organic production in Serbia, but an estimate by certification organizations reported 72 certified operators in 2006. Organically certified land is approximately 2411 ha, or 0.14% of arable land, and another 2155 ha is under conversion.²²⁴

4. Discussion and Analysis

The reports compiled and submitted by the Focal Point CSOs participating in this study contain a wealth of case studies that could be developed in collaboration with ecological economists to benefit the work of these and other CSOs involved in environmental conflicts. In this final section specific topics are identified and examined with the objective of highlighting how environmental CSOs in South East Europe might potentially make use of concepts and methods of ecological economics.

4.1. *Depopulation and the Environment in SEE*

The population in the region of SEE decreased by 8% from 1995 to 2005. The average population density in the region is under 90/km², considerably less than Western European countries such as Italy, Germany or the Netherlands, which have densities of over 300/km². Generally, decreasing population density would mean lower HANPP (Human Appropriation of Net Primary Production) and a reduction in pressures on biodiversity. The low density in the region is potentially conducive to conservation in the form of natural parks that are not in conflict with economic interests. However, contrary to Malthusian doctrine, where overpopulation leads to environmental degradation and resource scarcity, in SEE quite a different phenomenon is apparent whereby depopulation and rural-urban migrations are in fact creating a variety of environmental pressures.

²²³ UNECE 2007

²²⁴ IFOAM 2008

One example of this is the soil degradation resulting from inadequate terrace maintenance in mountainous areas which has afflicted large swathes of the region. Abandonment of agricultural lands also affects remaining agriculture in that as plots are abandoned, adjacent plots can suffer increased invasions by pests and weeds and less sunlight due to shading from regenerated forests.²²⁵

The year 2007 saw heat waves in the Balkans and widespread forest fires. Over the past 20 years, the frequency of forest fires has increased in SEE.²²⁶ Whether this increase is related to depopulation cannot be clearly established, but depopulation does lead to increased fuel load in forests and a lack of feeling of responsibility for forest protection by the local population as well as a lack of people to detect and suppress fires early, resulting in an increase of fires and burnt areas.

Rural depopulation also transforms territory, sometimes leading to a loss of valued cultural landscapes. In addition, the rural-urban shift has important implications for consumption patterns. The lack of waste collection in the SEE region may be attributed in part to the low population densities in some regions, while dense urban areas offer relatively more integrated service provision such as waste collection and collective transport, even if the management of waste is insufficient.

An examination of the driving forces of declining birth-rates, and the rural-urban shift and links with environmental factors could therefore provide useful insights into the relationship between (rural) depopulation and environment. This should be tied into an exploration of how rural economies can be bolstered through sustainable resource management to stem the population drain.

4.2. Putting the Polluter Pays Principle into Action

EU environmental policy has officially adopted the “polluter pays” principle, which requires that the costs of pollution be borne by those who cause it. The EU also has an environmental liability directive which holds operators liable for taking preventive action to avoid an imminent threat of environmental damage. As can be evidenced by the case studies outlined in this report, the countries of SEE are still far from putting this concept into action.

Forcing the polluter to pay for damages inflicted is particularly problematic in the region due to the large number of industrial and mining sites that were abandoned or orphaned during the transition period. In the 1990s, the economy of SEE declined considerably with widespread closures of factories and mining sites. While pollution decreased with the drop in industrial output, as plants were either abandoned or privatised, no clear liability was established. This has left a

²²⁵ MacDonald et al. 2000

²²⁶ Stritih, Jernej et al 2007

legacy of “hot spots”, particularly mining sites where the necessary closure steps were never taken. As a result of this a series of accidents have already occurred: heavy metal spills from Baia Borsa tailings in Romania which contaminated seven countries in the region; the cyanide spill from Baia Mare in Romania; heavy metal spills from Sasa tailings in Macedonia; and various releases at Majdanpek and Veliki Majdan in Serbia, and Mojkovac in Montenegro.²²⁷

The damage from abandoned sites brings up an interesting paradox in ecological economic accounting. Material flow analysis measures the material throughput of an economy, whereby higher throughput is seen as an indicator of environmental pressure – particularly as regards domestic extraction. However, while an ecological economist might see relative dematerialisation of the economy and decreasing material flows due to mine closures, environmental pressures may actually be increasing due to poor maintenance. Furthermore, the region still holds many rich mineral resources. If environmental damage related to their exploitation is to be mitigated a bonding system must be implemented that ensures that sufficient financial resources are set aside in the case of an accident or abandonment of a mine.

4.3. Corporate Accountability

“Environmental Injustice” refers to a disproportionate distribution of the burdens of pollution or resource extraction, whereby externalities are shifted onto weaker social groups or future generations. When companies are still active and engaging in polluting activities, ecological economics can help in the valuation of the environmental and social damages borne by the local communities in order to help formulate an argument for compensation and in favour of “Environmental Justice.” The liability of companies for waste produced and emitted can be calculated in some cases and the companies made accountable to those they have shifted the costs of their activities onto. The Veles situation in Macedonia is a case in point where a smelter for lead and zinc has historically impacted the health of the local population. Not only has the company responsible not rehabilitated the contaminated soil and water, it aims to restart operations despite the opposition of the local community.

Another instance of liability is that attributed to the Korporata Energjetike Kosovës (KEK) power plant in Serbia which was the source of a spill in 1983 that contaminated the drinking water of the residents of the city of Kraljevo with high phenol concentrations. Issues of liability and compensation have never been confronted although NGOs in the area have campaigned for such action. The Ibar Kraljevo Environmental Movement is trying to raise awareness of the value of the river for industry, agriculture, water supply and tourism. Ecological economics could benefit these efforts through outlining the environmental services of the river as well as valuing the damage inflicted (in economic and environmental terms) by the indiscriminate dumping of pollutants. Sometimes

²²⁷ UNEP 2007

value is best understood by policy makers and the public when it is expressed in euro terms, however it should be noted that ecological economics stresses “incommensurability of values”. While a monetary sum can never account for the true value of a life, it can hold significant political currency.

Finally, the Parshevitsa dairy in Vratsa Bulgaria is another case where the polluter pays principle should be implemented. The effects of the dairy polluting the river can be calculated in terms of lost tourism revenue and other “externalities” that the villagers suffer. CEECEC is currently calculating the ecological debt of a company in Belgium, Umicore, in the Antwerp suburb of Hoboken, which could be useful for CSOs wishing to undertake similar valuations in SEE.

4.4. *Payment for Environmental Services*

Because it is not always viable to force a polluter to pay for damage inflicted, a new trend has emerged in environmental governance whereby polluters are paid *not* to pollute: this is more commonly referred to as payment for environmental services (PES). PES can take the form of cash transfers from users of environmental services to providers of these services conditional upon continued provision. Such schemes are frequently implemented in watershed management, where downstream users pay upstream land managers to refrain from certain polluting activities. The payment can either be the opportunity cost of foregone income, or the cost of the reduction of pollution, however PES can sometimes also work when only a token sum is offered that contributes to raising environmental awareness and creating a sense of shared responsibility for a shared ecosystem. A well known example of a successful PES scheme is the system established by the city of New York to protect its drinking water sources. In the late 1990s, this city increased water fees by nine percent to pay farmers and forest producers to improve management in order to protect the Catskill/Delaware and Croton watersheds.

One case study where a PES scheme could be attempted is in the case of Ohrid Lake, where pollution released by upstream users has contributed significantly to decreases in fish catches by a factor of ten in as many years. After assessing the source of the pollution and how it can be mitigated, downstream users such as the fishermen could pay those upstream to implement better practices. Even if the sum were not significant, the implementation of a PES scheme could help the NGO’s goal of raising awareness, forming the basis of an attention-grabbing campaign whereby the local population becomes informed of contributions paid by fishermen toward improved water management practices and ultimately, protection of a community resource.

Another area where Payment for Environmental Services could be conceptualized is in organic farming. A certification system for organic products similar to that operating in Croatia represents a type of PES through which

consumers pay a premium to maintain the environmental health of the soil. Entry fees to national parks represent another form of PES scheme where users pay for the preservation of the landscape. This is already happening in Lastovo Croatia, but not so successfully due to the fact that the cost of collecting the fee exceeds the revenue. This is an example of excessive transaction costs in a PES scheme. Ecological economics could help determine the appropriate level of fees.

Beekeeping is widespread in the region. In the context of declining pollinators, a PES scheme could be implemented whereby pollinating services are paid for general support of biodiversity maintenance and organic farming. Finally bio-prospecting contracts are another form of possible PES because the region is well known for its medicinal and aromatic plants.

4.5. Energy Alternatives and Decision-making mechanisms

There is no ideal energy source, and even energy classified as “renewable” such as hydropower or agro-fuels can have serious negative impacts on the environment as well as the livelihoods of local communities. The tool of cost-benefit analysis (CBA) has traditionally been used to gauge the benefits and costs of a proposed infrastructure project. CBA is a neo-classical approach to decision making which attempts to achieve “efficient resource allocation.” Yet a report issued by the World Commission on dams published in 2000²²⁸ heavily criticised the use of CBA in deciding on the feasibility of large dam projects. As Soderbaum writes, “Ideas about what is efficient and preferable in a democratic society has to remain open and cannot be dictated by science alone. The ‘monetary reductionism’ of CBA and its ideas about correct prices do not fit well into the present debate about Sustainable Development where instead multidimensionality and a separate consideration of social, environmental and monetary impacts is the norm.”²²⁹

In the report, the World Commission on Dams preferred a technique called Multi-stakeholder decision-making, articulated in ecological economics as Social Multi-Criteria Evaluation (SMCE). This approach includes stakeholders in the decision making process and looks at a range of alternatives. Such an approach would be helpful in resolution of the dam conflict in Neretva river in Croatia. The re-routing of the Toplodolska River into Lake Zavoj in South-eastern Europe for electric power as well as the coal-fired thermal power plant in Porto Romano, Albania, are other energy projects that could benefit from a deliberative approach such as SMCE.

The Centre for Regional Research and Cooperation - Studiorum (CRPRC) case study about bio-diesel production in Macedonia also has important possibilities for research collaboration. Ecological economics has been critical of bio-fuel

²²⁸ World Commission on Dams 2000

²²⁹ Soderbaum, P 2001

production due to its use of land for fuel as opposed to food, the consequent increase of the HANPP to the detriment of other species, and its low energy return on energy input (EROI). This case is different however because bio-fuel production will also decontaminate the soil. An extended cost-benefit analysis to complement the planned indicator-based economic analysis might shed light on the potential benefits of sustainable bio-fuel production combined with soil regeneration.

On the basis of existing demand for electricity in Kosovo, known deposits of lignite should produce sufficient energy to last 1000 years. Yet lignite is far from an ideal energy source. Lignite has a very low EROI. Moreover for every tonne of lignite burned one tonne of carbon dioxide is produced. Lignite is a common fuel in the region and the high sulfur content is a source of sulfur dioxide emissions. Local research groups have argued that a World Bank funded initiative to build a third generator called Kosovo C will put an unbearable strain on the environment, and that Kosovo cannot absorb additional lignite-exploitation capacities without visibly endangering its living environment. Limitations on Kosovo's future development include its high population density (220/km²), limited water resources, and a decreasing ratio of arable land per capita. This is a case where the resilience, or the ability of a system to withstand shocks without changing into another system, of Kosovo's ecosystem is being threatened. In this context, a modified cost-benefit analysis or SMCE taking into account the environmental externalities and other factors could support arguments against lignite mining in Kosovo and in other areas of the region. This could be combined with an analysis of possible alternatives (solar, wind generation, etc.).

4.6. *The search for Sustainable Tourism*

The challenge of creating sustainable tourism is one shared by all of the countries of the region featured in this study. Due to the history of conflict, tourism is undeveloped in the region, however low-impact tourism is often viewed as one way to raise funds that can be put towards conservation efforts in the region's numerous national parks and protected spaces.

The question of what level of tourism development is "appropriate" does not elicit uniform responses. It would seem inappropriate to construct a private ski resort in a protected area, such as the one planned in the Rila Park, Bulgaria. It would seem similarly inappropriate to build a tourist village within a sensitive ecosystem, as in the one contained in the Bulgaria's Strandzha Nature Park. However, establishing tourist infrastructure is often seen as key to stemming depopulation and reviving certain rural areas.

A related issue is how citizens' livelihoods can be harmonised with conservation efforts. The conflict between local people and wildlife or wilderness preservation is a recurring theme. The discussion and investigation of possibilities for

community management of resources is one that is valid for the case studies of Serbia's Djerdap National Park, and the Neretva River in Croatia.

Two of the case studies featured in the CEECEC project focus on how ecological economics can be used in the study of sustainable tourism alternatives. In the case of Lastovo National Park in Croatia, the aim is to limit the damage inflicted by nautical tourism by finding appropriate economic instruments to help sustain the infrastructure of buoys to preclude the use of anchors that damage underwater coral, and to possibly reduce the total number of visitors. In contrast, in Djerdap National park the focus is on encouraging low-impact tourism so as to support a sustainable local economy that doesn't need to depend on illegal fishing, hunting or forestry within the Park's boundaries. Through a Willingness to Pay analysis and surveys about people's transportation habits, a possibility being explored is to encourage users to come on bicycle.

A common complaint among the CSOs surveyed is that governments do not seem to give due value to natural parks and landscapes. While the economic benefits of a factory or a mine are easy to calculate, the economic benefits of a pristine lake or biodiversity are more difficult to gauge. Ecological economics provides a range of valuation techniques that can help express the value of nature in monetary terms. This includes methods such as the Travel Cost Method, surveys undertaken form the basis of calculations of money spent on travel, hotels, etc... to enjoy these natural spaces. Another survey method is called Contingent Valuation based on Willingness to Pay where respondents are asked how much they would pay to preserve a natural space or alternately how much they would accept in compensation for its destruction. There is also a range of economic and physical planning policy instruments available for regulating the tourism industry.²³⁰

4.7. Economic Instruments and Green Consumption

The SEE region lags far behind Western Europe when it comes to consumption, use of private vehicles and waste production. But with high growth rates in all of these fields, at least until 2008, the region may soon rival the unsustainability of its Western neighbours. Regarding waste management and vehicle use, all of the NGO respondents in this study stressed the need for waste separation and increased public transport infrastructure. Ecological economics can help in the task of ascertaining which economic instruments would be most effective in impacting citizens' behaviour and consumer habits.

A UNEP report notes that the use of economic instruments to influence transport demand in the region is still very limited.²³¹ For example, Croatia is the only

²³⁰ Logar, Ivana 2009

²³¹ EEA and UNEP 2007

country that has tolls on its motorways, but these are used to recover construction costs rather than to manage demand.²³² As well, many of the fleets in the region are very old and pollution intensive. To encourage the use of greener vehicles, import taxes could be put on second-hand cars which pollute, or subsidies offered for fuel-efficient vehicles. This is being considered in Albania and in FYR Macedonia.

Apart from these economic instruments to influence consumption, particular institutional systems which can be conducive to sustainable consumption patterns could be highlighted. For example, the tradition in the region of using public transport, low car ownership and extensive collective transport networks could be capitalised upon to reduce individual car ownership.

Economic instruments for waste management also need to be carefully analyzed and implemented. Croatia provides a positive example regarding management of packaging waste. In January 2006, the Croatian Government introduced an Ordinance on Packaging and Packaging Waste as a means of implementing the EU Packaging Directive. The goal was to recover the full cost of packaging waste from beverage containers and was composed of three types of fees: i) a disposal fee for every unit, according to the packaging material used (about EUR 0.015/unit) ii) a returnable fee (deposit) collected to encourage final consumers to return empty packaging (EUR 0.07/unit) and iii) a 'stimulating' fee to encourage the producers to use reusable packaging. From January to October 2006, approximately 650 million units had been returned, equivalent to 73 000 tonnes of packaging waste. The glass collected had quadrupled from the previous year. The strategy also reduced the litter problem significantly.

Separation of organic waste also has promising positive externalities, including reduction of landfills, creation of biogas and possible Clean Development Mechanism (CDM) credits from reduction of greenhouse gases (methane from waste dumps). Another polemical issue regarding waste management is the relative advantages and disadvantages of incinerators. In light of the fact that incineration for energy production also requires the production of a large amount of waste (in contradiction of sustainable waste management principles of reducing and reusing), SUNCE in Croatia has requested expert help on conducting cost benefit analyses and/or SMCE into incineration versus recycling as alternative final steps of sustainable waste management processes.

4.8. Climate change

All the countries surveyed are or will be obliged to fulfil commitments under the Kyoto and post-Kyoto arrangements. The economic crisis of 2008-09 is changing the situation however, with carbon prices declining unless more strict reduction

²³² Green Action 2005 in EEA and UNEP 2007

commitments are undertaken. CSOs will therefore need to understand the international debates on carbon taxes and markets in emissions permits.

Serbia has recently ratified the Kyoto protocol and is devising a strategy for selling carbon credits under the CDM. Italy considers that of four Balkan countries surveyed (Albania, Macedonia, Montenegro, Serbia), Serbia offers the best investment opportunities in CDM projects with the potential to generate credits of 20-25 million mt of CO₂ annually.

In 2004, the energy consumption per unit of gross domestic product (GDP) in Serbia and Montenegro was five times the world average while CO₂ emissions per unit of GDP were at least six times the world average. These figures suggest the scope for reducing emissions is large. Proposed CDM schemes include methane recovery from farms and distilleries, equipping landfill sites for biogas recovery, construction of biomass plants for forest residues and use of renewable energy sources such as small hydropower plants and wind farms. Carbon credits can also be obtained through forestry projects and the use of biomass from a nature reserve or else from the creation of green belts that would also act as wind-breaks for prime agricultural land.

4.9. *Institutions*

In several of the case studies in this report, issues of “property rights” appear, whether it is the “right” to pollute a lake or the “right” to use wind for electricity generation. There is sometimes a trend in post-communist countries to accept glib generalizations such as the mis-named “tragedy of the commons” where there is a wealth of experience in these countries to do research on property forms and the management of natural resources. CSOs may therefore find it useful to be brought up to date on debates on relations between forms of property and environmental management.

As regards physical planning, we find that SEE countries have traditions of physical spatial planning that can certainly be misused but that could also be used for protecting the environment.

Furthermore, the reports submitted from the CSOs in this study place much emphasis on (the lack of) environmental education in the region. The ecological economics perspective views demand as socially constructed and preferences as formed by social influences including formal and informal education. An ecological economics analysis can assess shifts in demand curves for some products, and the influence of customary standards of consumption.

4.10. SEE, the Environmental Kuznets Curve and socio-ecological transitions

The Environmental Kuznets Curve can provide a framework for the analysis of relations between environmental indicators and economic growth. The Environmental Kuznets Curve is a hypothesized relationship between various indicators of environmental degradation and income per capita, whereby in the early stages of economic growth degradation and pollution increase, but beyond some level of income per capita (which will vary for different indicators) the trend reverses, so that at high-income levels economic growth leads to environmental improvement. This implies that the environmental impact indicator is an inverted U-shaped function of income per capita.²³³

In common with Western and Central Europe, it is to be expected that in Eastern European economies some forms of pollution will decline with economic growth (such as sulphur dioxide production from power stations using lignite, as better technology is introduced). Other forms, particularly those related to consumption such as domestic waste, will increase. For carbon dioxide, the trend is often increased production as the economy grows, but in energy-intensive economies burning low quality coal, there is a possibility of carbon dioxide decline even with some economic growth as these countries move to cleaner fuels and as energy efficiency increases. CSOs should be aware however of the debates on the “rebound effect” or Jevons paradox: increased efficiency may lead indirectly to increased resource use. For example, the use of more fuel-efficient cars can encourage people to drive more as the price of fuel per km decreases.

A major policy goal of the European Union is the relative and ideally, the absolute decoupling of the economy from material and energy inputs. Relative decoupling refers to lower material and energy use for each unit of GDP while absolute decoupling means the reduction of total energy and material use even while GDP rises. In line with this policy goal there is a recognised necessity for socio-ecological transitions to lower levels of energy and materials use.²³⁴ This is relevant for CSOs involved in environmental conflicts, because many such conflicts are directly linked to what in ecological economics (and industrial ecology) is called the Metabolism of Society. Both on the input side, and on the output (waste) side, conflicts arise because of the increased use of material and energy.

As we have seen in SEE, not only the extraction of coal and minerals or diversion of water for hydro-electricity lead to conflicts. Even seemingly innocuous energy sources such as wind energy, or even the extraction of sand and gravel, may give rise to conflicts. Thus CSOs fighting against these processes have an important role to play in highlighting the need for, and guiding this ecological transition. The material flows calculations published by Eurostat can be useful for CSOs in this process, because such data can enable CSOs to trace trends in the

²³³ Stern, David 2003

²³⁴ Fischer-Kowalski, M. and Haberl, H. 2007

material intensity of the economy (materials per unit of GDP), the movements in the various components of the material flows (exports and imports of materials), and the evolution of the physical trade balance (imports of material flows minus exports).

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Annex 1: Survey Methodology

a) Methodology

In order to accomplish the objectives of this research, three main stages were identified by Endemit, comprising:

1. identification of the particular Balkan countries where the work would take place. This was based on the accepted definition of the Balkan region as outlined in the report, but as already stated Greece was excluded from the start due to its relative level of economic development, and Montenegro removed later due to lack of interest in participation.
2. identification of the main CSOs working in each of these countries considering the relevance of each in terms of environmental issues at stake and scope for ecological economics research. This involved sending invitations to the complete list of organisations from the Regional Environmental Centre (REC) NGO Directory of South Eastern Europe (2006), specifically the Directory of West Balkan Environmental Civil Society Organisations http://www.rec.org/REC/Databases/NGO_Directory_SEE/Find.html. This list was supplemented by the Environmental NGOs Electronic Network in Macedonia www.eco.net.mk/forum, and Endemit's already existing contacts. In addition, Bulgarian organisations were found through the BlueLink web portal www.bluelink.net and its Ecoindex of Bulgarian environmental NGOs.

After the development of this CSO e-network, a focal point organisation (FPO) was appointed for each country.²³⁵ FPO selection was based on responses received from the organisations contacted in the initial invitation, and further suggestions from the REC country offices.

3. identification of the main environmental conflicts or problems in each of these countries that the identified CSOs were working on. Since there was no previously existing compiled data on regional environmental problems and conflicts, collecting basic information was a necessary first step. Endemit used a survey as its primary research tool for the identification of the main environmental conflicts and problems in the region. The strength of the survey was that it enabled the examination of a large number of cases, with the benefit that it could provide relevant information in a short time frame (the database and e-network were formed in June 2008, the survey developed and distributed in July, data collected from July-September, and analysed in October of the same year) that could be used for further research.

The survey was prepared in English and made available via the Endemit website both in English and Serbian. FPOs were charged with translating and distributing

²³⁵ The full list of FPO and the Network members can be found on the Endemit website: http://www.endemit.org.rs/en/activities/ee-network_members.htm

the questionnaire along with the project summary to the members of the e-network in their respective countries, and other prominent and relevant environmental organisations from outside the e-network. Each FPO then collected the completed surveys and drafted a national report.

The questionnaire ([Annex 1b](#)) was composed of 3 sets of questions in an open format. The first group of questions addressed the organisation's basic information including its main activities, previous projects, the organisation's central task, as well as its main goals for the next 5 years. The second set of questions focused on the environmental conditions in the country. Questions in this section addressed the major national environmental problems, with a short description of each identified problem and the national strategies for solving the identified environmental problems. The third set of questions focused on the specific environmental problems/conflicts that every organisation is currently working on. In order for a problem/conflict to be described, the following questions were asked: location; brief history of the conflict; main stakeholders and their role; current situation; identification of the major expertise that could improve work on the selected problem; cooperation with other NGOs and their names; and finally, about cooperation with experts and their field of research.

Based on the data gathered in the surveys, each FPO produced a national report. Altogether, 51 completed questionnaires were collected: 4 from Albania, 9 from Bulgaria, 6 from Bosnia and Herzegovina, 4 from Croatia, 19 from Macedonia, and 9 from Serbia. The national reports were translated into English and forwarded to Endemit, who then compiled the final report. The ecological economics analysis was contributed by Leah Temper and Prof. Joan Martinez Alier of ICTA, UAB.

b) Survey

Ecological Society "Endemit"
 Oracka 42, 11080 Belgrade, Serbia
 e-mail: office@endemit.org.yu
 web: www.endemit.org.yu mob: +381641790820



1. General Information about your Organisation

Name of Organisation	Abbreviation	
Address		
Phone number	Fax number	
E-mail address	Website address	
Contact Person		
Number of staff	_____ employees _____ volunteers	
Level of activity (tick all appropriate)	<input type="checkbox"/> international <input type="checkbox"/> national <input type="checkbox"/> regional (within the country) <input type="checkbox"/> local	
Main areas of work (e.g. biodiversity, climate change, forestry, water, waste, economic instruments, energy...) (maximum 60 words)		
Activities (e.g. advisory, education, awareness rising, policy implementation, fieldwork, research, env. impact assessment, management...) (maximum 60 words)		
Previous Projects Activities (maximum 120 words)		
Goals for future 5 year period (maximum 60 words)		
Organisation's Mission (maximum 60 words)		

2. Information about situation of environment in your country

<p>Major Environmental Problems on national level by your point of view</p> <p>(give a short description of each identified problem) (maximum 1000 words - 2 pages)</p>	
<p>Are there existing strategies/solutions for mentioned problems on national level? (give a brief description)</p> <p>(maximum 250 words)</p>	

3. Information about problem(s) /conflict(s) that your organization is currently dealing with regarding environment (specific cases you work with).

<p>Introduction and description of 3 or more conflict/ problem(s) you are working in. With reference to particular cases.</p> <p>Guidelines for description of problem/conflict:</p> <ol style="list-style-type: none"> 1. Location (context) 2. Brief history of the conflict 3. Main Stakeholders/Actors involved and their position/role in the conflict 4. Which is the present situation of the case? 5. State which type(s) of expertise or collaboration you think would improve the impact of your work, giving specific examples <p>(maximum 1000 words - 2 pages)</p>	
<p>Cooperation with other NGOs</p> <p>- Name?</p> <p>(maximum 120 words)</p>	

Annex 2: Environmental Legislation (Source: UNDP, 2007)

Country / territory	Environmental legislation transposing EU acquis adopted by parliament
Albania	<p>Law Concerning the Creation and Operation of Land Protection and Administration Structures, 2001</p> <p>Law on Fishing and Aquaculture, 1995, 2002</p> <p>Law on Water Reserves, 1996, 2000, 2001</p> <p>Law For Protected Areas, 2002</p> <p>Law on the Protection of Transboundary Lakes, 2003</p> <p>Law on Environmental Impact Assessment, 2003</p> <p>Law on Environmental Protection, 2002</p> <p>Law on Chemical Substances and Preparations, 2003</p> <p>Law on Protection of Air from Pollution, 2002</p> <p>Law on Environmental Treatment of Solid Waste, 2003</p> <p>Law on Protection of Marine Environment from Pollution and Damage, 2002</p> <p>Law concerning the Environmental Treatment of Polluted Waters, 2003</p> <p>Law on Organization and Functioning of Local Governments, 2000</p> <p>Law on Civil Emergencies, 2001</p> <p>Law on Establishment of Coast Guard, 2002</p> <p>Law on Service of Control for chemical Fertilisers, 1999</p> <p>Law on Protection of Arable Land, 2004</p> <p>Law on Regulatory Framework of the Sector of Water Supply and Collection and Treatment of Waste Waters, 1996, 2005</p> <p>Law on Service of Plant Protection, 2005</p> <p>Law on Efficiency of Energy, 2005</p> <p>Law on Forest and Forest Service, 2005</p> <p>Law on Administration of Hazardous Waste, 2006</p> <p>Law on Protection of Biodiversity, 2006</p>
Bosnia and Herzegovina	<p>Framework Environmental Law FBiH 2003, RS 2002</p> <p>Law on Nature Protection RS 2002, FBiH 2003 Brčko District 2004</p> <p>Law on Waste Management FBiH 2003, RS 2002 Brčko District 2004</p> <p>Law on Eco Fund FBiH 2003, RS 2002</p> <p>Law on Air Protection RS 2002, FBiH 2003 Brčko District 2004</p> <p>Law on Waters RS 2006, FBiH 2006</p> <p>Law on Spatial planning RS 2002, 2003, FBiH 2002, Brčko District, 2003, 2004</p> <p>Law on Free Access to Information FBiH 2001, RS 2001</p> <p>BH Law on Free Access to Information, FBiH 2000</p> <p>Brčko District Law on Environmental Protection 2004</p> <p>Brčko District Law on Water Protection 2004</p> <p>Brčko District Law on Communal Affairs 2004</p>

Country / territory	Environmental legislation transposing EU acquis adopted by parliament
Croatia	Environmental Protection Act, 1994, 1999, Draft 2007 Nature Protection Act, 2005 Act on Waste Management, 2004, 2005 Act in Water Management, 2005 Act on Protection from Noise, 2003 Act on Air Quality Protection, 2004 Forestry Act, 2005 Act on Access to Information, 2003 Act on Flammable Liquids and Gases, 1995 Act on Transport of Dangerous Substances, 2003 Act on Agricultural Land, 2001, 2002 Construction Act, 2003, 2004 Act on Technical Requirements for Products and Certificate of Compliance, 2003 Civil Obligation Act, 1991, 1994, 1996, 1999 Criminal Code, 1997, 1998, 2000, 2001 General Administrative Procedure Act, 1991, 1996 Administrative Litigation Act, 1991, 1996 Physical Planning Act, 1994, 1998, 1999, 2000, 2002, 2004 Act on Fire-Fighting, 2004 Act on Protection and Rescuing, 2004 Act on Fire Protection, 1993, 2005 Act on Chemicals, 2005 Act on Genetically Modified Organisms, 2005 Maritime Code, 2004 Act on Ports and Sea Public Good, 2003
FYR Macedonia	Law on Environment, 2005 Law on Free Access to Public Information, 2006 Law on Protection and Rescue, 2004 Law on Fire Fighting Services, 2004 Law on Ambient Air Quality, 2004 Law on Waste Management, 2004 Law on Drinking Water Supply and Urban Wastewater Drainage, 2004 Law on Concessions, 2002, 2003 Law on Nature Protection, 2004, 2006 Law on Protection from Noise in the Environment, 2007 Law on Physical and Urban Planning, 2005 Law on Energy, 2006 Law on Organic Agriculture Production, 2004

Country / territory	Environmental legislation transposing EU acquis adopted by parliament
Serbia	Law on Environmental Protection, 2004 Law on EIA, 2004 Law on IPPC, 2004 Law on SEA, 2004 Law on Public Information, 2003, 2005 Law on Waters, 1991, 1992, 1993, 1994, 1996 Law on Planning and Construction, 2003, 2006 Law on National Parks, 1993, 1994 Law on Mining, 1995, 2006 Law on Geological Investigations, 1995 Law on Forestry, 1991, 1992, 1993, 1994, 1996 Law on Hunting, 1993 Law on Fishery, 1994 Law on Production and Trade of Poisonous Substances, 1995, 1996 Law on Protection from Ionising Radiation, 1996 Law on Genetically Modified Organisms, 2001 Law on Agricultural Land, 2006 Law on Energy, 2004 Law on Standardisation, 2005 Law on Accreditation, 2005 Law on Metrology, 2005 Law on Planning and Construction, 2003

Annex 3: CSO Contact List (FPOs in bold)

Country	No.	CSO Name	Website	Email	Contact Person
Albania	1.	Albaforest		albaforest@yahoo.com	Mehmet Meta
	2.	Albanian Centre of Excellence (ACE) / Qendra Shqiptare e Ekselences (QSHE)		edinkus@yahoo.com	Edmon Hoxha
	3.	Albanian Ecological Club Kruja (AEC) / Klubi Ekologjik Shqiptar Kruja (KESH)		muharremgoci@yahoo.com	Muharrem Goci
	4.	Association for Development of Environmental Policies — G & G Group / Shoqata për Zhvillim të Politikave Mjedisore – G & G group	www.ggggroup-al.com	info@gggroup-al.com	Sazan Guri
	5.	Association for Sustainable Rural Development / Per Nje Zhvillim Rural Te Gendrushem		alzama@yahoo.com	Alban Ibrahliu
	6.	Awareness for Progress / Shoqata Ndërgjegjësimit për Progres		zhprifti@abissnet.al	Zhaneta Prifti
	7.	Environmental and Social Protection and Development (ILIRIA) / Shoqata Mbrojtja dhe Zhvillimi Mjedisore Social (ILIRIA)		iliria_alb@hotmail.com	Abdulla Diku
	8.	Environmental Centre for Development, Education and Networking (EDEN) / Qendra EDEN	www.eden-alb.org	eden@eden-alb.org eden@albmail.com	Erisa Llaka

Country	No.	CSO Name	Website	Email	Contact Person
	9.	Environmental Women's Association (AEWA) / Gruaja Ambjentaliste Shqiptare (GASH)		lulieno@yahoo.com	Luljeta Leno
	10.	For Progress and Civilization (FPC) / Për Progres dhe Civilizim (PPC)		pcivilizim@yahoo.com	Ilirian Maculi
Bosnia and Herzegovina	11.	Association for Development, Improvement and Promotion of Ecological Agriculture, Tourism and Environment Protection (UG EKOPOT) / Udruzenje za Razvoj, Unapredjenje i Promociju Ekopoljoprivrede, Turizma i Zastitu Okoline (UG EKOPOT)	www.ekopot.org	ekopot@bih.net.ba	Edina Busovaca
	12.	Association for Tolerance Against Differences / Udruzenje Tolerancijom Proitiv Razlicitosti (ToPeeR)	www.topeer.ba	topeer@teol.net nvotopeer@gmail.com	Snezana Seslija
	13.	Centre for Civil Cooperation (CCC) / Centar za Gradjansku Suradnju (CGS)		cgs-li@tel.net.ba	Sonja Garic
	14.	Centre for Environmentally Sustainable Development (CESD) / Centar za Okolisno Održivi Razvoj, (COOR)		coorsa@bih.net.ba	Tarik Kupusovic Erna Coric
	15.	Eko Put Ecological Association / Ekolosko Udruzenje Eko Put	www.ekoput.com	ekoput@gmail.com	Snezana Jagodic Vujic

Country	No.	CSO Name	Website	Email	Contact Person
	16.	Fondeko - Association for Stimulation of Sustainable Development and Quality of Life / Fondeko Udruzenje za Podsticanje Uravnotezenog Razvoja i Kvaliteta Zivota	www.fondeko.ba	fondeko@bih.net.ba	Halida Vukovic
	17.	Local Development Initiative (LDI) / Lokalna Inicijativa Razvoja (LIR)	www.lir.ba	info@lir.ba lir@inecco.net	Lana Vukcevic
	18.	Women's Nature Association / Udruzenje Zena Priroda	www.uzpriroda.org	priroda@teol.net	Zeljana Plavica
Bulgaria	19.	Bulgarian Biodiversity Foundation	www.bbf.biodiversity.bg	bbf@biodiversity.bg	Desislava Zhivkova
	20.	Ecocentre for Chamber of Commerce and Industry	www.go-starazagora.com	ecocenter@go-starazagora.org	Toni Kutsarov
	21.	Green Varna Association	www.zelenavarna.org	info@zelenavarna.org	Krastyo Krastev
	22.	Greener Bourgas Foundation	www.greenbourgas.org	greenbs@unacs.bg	Ivana Boncheva Daniela Kotruleva
	23.	Kalimok	www.kalimok.org	kalimok@gmail.com	Yordan Kutsarov
	24.	Moderna Vratsa		modernavratza@abv.bg	Valya Krasteva
	25.	Partnership for New Europe Association / Partnyorstvo za Nova Evropa		yani_65@abv.bg	Yani Kirilov Georgiev
	26.	Terra Ecological Club		terra@bluelink.net	Fidanka Batcheva
27.	Zlatishka Kotlovina Ecological Society		kambana.press@abv.bg	Todor Georgiev Chompalov	

Country	No.	CSO Name	Website	Email	Contact Person
Croatia	28.	Argonauta Ecological Society / Ekoloska Udruga Argonauta	www.argonauta.hr	mail@argonauta.hr	Martina Markov Podvinski
	29.	Association for Nature, Environment and Sustainable Development (SUNCE) / Udruga za Prirodu, Okolis i Odrzivi Razvoj Sunce (SUNCE)	www.sunce-st.org	gabrijela@sunce-st.org	Gabrijela Medunic Orlic
	30.	Divina Natura Ecological Society / Ekoloska Udruga Divina Natura		divina-natura@hi.t-com.h	Ante Sprlje
	31.	Eko-Eko Komin Ecological Organisaton / Ekoloska Udruga Eko-Eko Komin	www.neretva.org/unieter	goranzol@yahoo.com	Zdeslav Medak
	32.	Eko Zadar Association for Organic Farming and Environment Protection / Eko Zadar Udruga za Promicanje Ekoloske Proizvodnje Hrane i Zastitu Okolisa (EKO ZADAR)	www.ekozadar.org	ekozadar@inet.hr	Irma Beram
	33.	Green Action Ecological Association / Ekoloska Udruga Zelena Akcija	www.zelena-akcija.hr	za@zelena-akcija.hr	Jagoda Munic
	34.	Green Istria Association / Udruga Zelena Istra	www.zelena-istra.hr	udruga-zelena-istra@pu.t-com.hr	Dusica Radojic
	35.	Green Osijek Ecological Society / Ekolosko Drustvo Zeleni Osijek	www.zeleni-osijek.hr	zeleni-osijek@os.htnet.hr	Jasmin Sadikovic
	36.	Nobilis Ecological Organisation / Zastitarsko Ekoloska Organizacija Nobilis	www.nobilis.hr	zeon@ck.htnet.hr	Sinisa Golub

Country	No.	CSO Name	Website	Email	Contact Person
FYR Macedonia	37.	Biosfera -Centre for Education and Protection of the Environment and Nature / Biosfera - Centar za Edukacija Zastita na Zivotna Sredina i Priroda	www.biosfera.org.mk	biosfera@mt.net.mk	Nesad Azemovski
	38.	Centre for Local Development / Centar za Lokalen Razvoj (CELOR)	www.celor.org.mk	contact@celor.org.mk	Stole Georgiev
	39.	Centre for Regional Research and Cooperation- Studiorum (CRPRC) / Centar za Regionalni Istrazuvanja i Sorabotka- Studiorum (CRIS)	www.studiorum.org.mk	office@studiorum.org.mk	Aleksandar Mancevski
	40.	Citizens' Committee for Development Probistip (CCD Probistip) / Građanski Komitet za Razvoj Probistip (GKR-PROBISTIP)		gkrprobistip@yahoo.com zivkabt@yahoo.com	Zivka Mihajlova
	41.	EcoAction Ecological Society / Ekolosko Drustvo EcoAction		ecoactionte@yahoo.com	Pranvera Kasami
	42.	Ednakvi za Site Union of Citizens / Zdruzenie na Gragani Ednakvi za Site	www.ednakvizasite.org.mk	ednakvi@yahoo.com	Zaklina Paunovska Angelkovik
	43.	Ekumena Union of Citizens / Zdruzenie na Gragani Ekumena		ekumenavasilevo@yahoo.com	
	44.	FLORA Ecological Society / Ekolosko Drustvo FLORA		saskovel@yahoo.com	Sasko Velkovski

Country	No.	CSO Name	Website	Email	Contact Person
	45.	Florozon Association for Protection of Natural Environment and Sustainable Economic Development / Florozon Zdruzenie za Zastita na Prirodnata Sredina I Odrzliv Ekonomski Razvoj (Florozon Skopje)	http://www.florozon.org.mk/	florozon@yahoo.com	Kiril Ristovski
	46.	Grasnica Ecological Society / Ekolosko Drustvo Grasnica		grasnica@yahoo.com	Gjoko Zoroski
	47.	Green Power Ecological Group / Ekoloska Grupacija Green Power		greenpowermk@yahoo.com	Igor Smilev
	48.	IZVOR Union for Protection of Environment, Cultural and Historical Landmarks and Human Health / Zdruzenie za Zastita na Zivotnata Sredina Kulturno - Istoriskite Znamenitosti I Covekovot Zdravje IZVOR	www.stonedolls.com.mk	izvorkratovo@yahoo.com	Milos Dimitrovski
	49.	Kalinka Ecological Society / Ekolosko Drustvo Kalinka	www.eko-kalinka.blogspot.com	ekoloskodrustvo_kalinka@yahoo.ca	Gosevski Dusko

Country	No.	CSO Name	Website	Email	Contact Person
	50.	Macedonian Green Centre - Union of Citizens Lobbying for Promotion and Research of Environmental Issues / Makedonski Zelen Centar- Zdruzenie na Gragani za Lobiranje, Zastapuvanje i Istrazuvanje na Orashanjata od Oblasta na Zivotnata Sredina	www.zeleni.org.mk	zeleni@zeleni.org.mk	Metodija Sazdov
	51.	Municipal Centre for Rock Art (MCRA) / Opstinski Centar za Karpesta Umetnost (OCKU)	http://rockart.50webs.com	stevcedonevkratovo@yahoo.com	Stevce Donevski
	52.	National Council of Women of the Republic of Macedonia Skopje / Nacionalen Sovet na Zheni na RM (NSZM-SOZM)	http://www.sozm.org.mk	sozm@mt.net.mk sozmmc@unet.com.mk	Savka Todorovska
	53.	NATYRA Ecological Society / Ekolosko Drustvo NATYRA		natyra_likove@yahoo.com milosevski.goran@yahoo.com	Bajram Sulejmanil Goran Miloshevski
	54.	NETOP Union for Protection of Natural and Cultural Heritage of Mariovo / Zdruzenie za Zastita na Prirodnoto i Kulturnoto Nasledstvo na Mariovo NETOP	www.netop.org.mk	netopmariovo@yahoo.com	Katerina Mavrovaska
	55.	ORT Training for Sustainable Development / ORT Obuka za Odrzliv Razvoj	www.ort.org.mk	orts@mt.net.mk ortp@mt.net.mk orts@t-home.mk	Biljana Stevanovska

Country	No.	CSO Name	Website	Email	Contact Person
	56.	Proaktiva Association of Citizens / Zdruzenie na Gragani Proaktiva	www.proaktiva.org.mk	info@proaktiva.org.mk	Ilija Sazdovski
	57.	Society for Academic Education / Društvo za Edukacija Akademik	http://akademikkruisevo.googlepages.com	akademikkruisevo@gmail.com	Dragan Jankoski
	58.	Women's Organisation of Mavrovi Anovi (WOMA) / Organizacija na Zeni na Opština Mavrovi Anovi (OZMA)		ozma@mt.net.mk	Pandorka Dimova Dingovska
Serbia	59.	Association of Young Researchers of Bor / Društvo Mladih Istraživača Bora	www.mibor.rs	mibor@ptt.rs	Dragan Randjelovic
	60.	Centre for Ecology and Sustainable Development (CESD) / Centar za Ekologiju i Održivi Razvoj (CEKOR)	www.cekor.org	dinatasa@yahoo.com	Natasa Djereg
	61.	Ecolibri Bionet-Centre for Biodiversity Conservation and Sustainable Development / Ecolibri Bionet - Centar za Čuvanje Biodiverziteta i Održivi Razvoj /	www.ecolibribionet.co.rs	office@ecolibribionet.co.rs	Aleksandar Vlajic
	62.	Eko Ibar Environmental Movement / Ekološki Pokret Eko Ibar	www.ekoibar.org.rs	ekoibar@yahoo.com ekoibar@ptt.rs	Miroslav Pavlovic
	63.	Endemit Ecological Society / Ekolosko Društvo Endemit	www.endemit.org.rs	office@endemit.org.rs	Ivana Petric

Country	No.	CSO Name	Website	Email	Contact Person
	64.	Non-Smokers Educational Centre-RP / Nepusacki Edukativni Centar –RP	http://nec-rp.wetpaint.com	necpkg@yahoo.com ekonec@yahoo.com	Milisav Pajevic
	65.	Stara Planina Society for Environmental Protection / Društvo za Zastitu Zivotne Sredine Stara Planina	http://stara-planina.rs .	staramt@ptt.rs	Dragan Taskov
	66.	TERRAS Organic Food Association / Udruzenje za Organsku Hranu TERRAS		terras@terras.org.rs	Snjezana Mitrovic
	67.	Young Researchers of Serbia (YRS) / Mladi Istrazivaci Srbije (MIS)	www.mis.org.rs	office@mis.org.rs	Milka Gvozdenovic