

CLIMATE CHANGE ADAPTATION IN SOUTH EASTERN EUROPE



A BACKGROUND REPORT



The Environment and Security Initiative (ENVSEC) transforms environment and security risks into regional cooperation. The Initiative provides multistakeholder environment and security assessments and facilitates joint action to reduce tensions and increase cooperation between groups and countries. ENVSEC comprises the Organization for Security and Co-operation in Europe (OSCE), Regional Environmental Centre for Central and Eastern Europe (REC), United Nations Development Programme (UNDP), United Nations Economic Commission for Europe (UNECE), United Nations Environment Programme (UNEP), and the North Atlantic Treaty Organization (NATO) as an associated partner. The ENVSEC partners address environment and security risks in four regions: Eastern Europe, South Eastern Europe, Southern Caucasus and Central Asia.



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This publication has been prepared on behalf of UNEP in the framework of ENVSEC by Venice International University and Siena University. Zoï Environment Network has finalized, reviewed, layouted the study. Numerous organizations and experts from Albania, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia contributed to the publication. The financial support for the preparation has been provided by the governments of Austria and Finland.

ISBN: 978-2-940490-08-0

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Editorial and production team:

Selina Angelini, Viviana Re (TEN Centre, Venice International University)
 Eleonora Guadagno, Massimiliano Montini, Francesca Volpe (REPROS Center, University of Siena)
 Lesya Nikolayeva, Otto Simonett (Zoï Environment Network)
 Harald Egerer, Pier Carlo Sandei (UNEP Vienna)

Editing:

Geoff Hughes

Maps and graphics:

Matthias Beilstein, Emmanuelle Bournay, Yann Demont

Design and layout:

Carolyne Daniel

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* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

ACRONYMS AND ABBREVIATIONS

DABEO	Dinaric Arc and the Balkans Environment Outlook
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse gas
GIS	Geographic information system
HDI	Human Development Index
HFA	Hyogo Framework for Action
IMF	International Monetary Fund
IMPEL	Implementation and Enforcement of Environmental Law
IPCC	Intergovernmental Panel on Climate Change
NWP	Nairobi Work Programme
RENA	Regional Environmental Network for Accession
SAP	Stabilisation and Association Process
SBSTA	Subsidiary Body for Scientific and Technological Advice
SEE	South Eastern Europe
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

ACKNOWLEDGMENTS

This report was prepared by an interdisciplinary team composed by Selina Angelini (TEN Centre, Venice International University), Viviana Re (TEN Centre, Venice International University), Eleonora Guadagno (REPROS Center, University of Siena), Massimiliano Montini (REPROS Center, University of Siena) and Francesca Volpe (REPROS Center, University of Siena). The TEN Centre team was primarily responsible for chapter 3, whereas the REPROS Center team was primarily responsible for all the other chapters.

The authors would like to acknowledge comments and inputs received from the countries' representatives, the participants in the workshop "Adaptation to the Impacts of Climate Change for Reducing Security Risks in SEE" held in Venice on 19–20 May 2011 and the other experts and stakeholders.

Editorial support was provided by Geoff Hughes at Zoï Environment Network.

The authors are solely responsible for the views expressed here, which do not necessarily represent the opinion of the United Nations Environment Programme, its Executive Director or the countries addressed by the report.

INTRODUCTION

Climate change no longer needs to be presented as a global phenomenon likely to affect ecosystems and international security. In terms of food security, water scarcity and forced migrations, as well as in important sectors such as agriculture, energy, transport, tourism and health,¹ climate change is now a well recognized threat and a top priority driving the agendas of politicians. In spite of the acknowledged urgency of properly and effectively fighting this phenomenon, however, a binding international agreement to fight climate change in the long term has proved to be difficult to reach. Some progress has been made, but the way ahead is neither short nor smooth. Furthermore, climate change, in order to be properly tackled, needs to be considered in an integrated way, as a part of the greater challenge of sustainable development. In fact, the United Nations Department of Economic and Social Affairs regards climate change as an urgent global challenge with long-term implications for the sustainable development of all countries.²

The linkages between climate change and sustainable development are highlighted in the most important legislative instruments concluded so far to fight climate change. The United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol have been designed to play key roles in the pursuing of climate change objectives within the framework of sustainable development. In fact, their main achievements, such as the introduction of binding emission reduction commitments for developed countries, together with the principle of common but differentiated responsibilities and flexible mechanisms, can be read as attempts to address environmental, social and economic goals in an integrated way.

While mitigation seeks to limit climate change by reducing the emissions of greenhouse gases (GHGs) and by enhancing opportunities for carbon sequestration, adaptation aims at reducing the vulnerability of natural and human systems against actual or expected climate change effects.³ Adaptation entails an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects. The goal of adaptation is to moderate harm or exploit beneficial opportunities.⁴ From the sustainable development perspective, the response to climate change requires both mitigation and adaptation.⁵

The purpose of the present report is to consider the adaptation challenge in the South Eastern Europe (SEE) region. The first three chapters analyse the main adaptation challenges from a physical point of view, and the last two chapters concentrate on the policy perspective, with a presentation of existing management and governance models and a proposal for future adaptation strategies in SEE.

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1 IP/09/519 - Adapting to climate change: the European Union must prepare for the impacts to come, 2009.

2 UN Department of Economic and Social Affairs - Division for Sustainable Development, Climate Change & Sustainable Development, http://www.un.org/esa/dsd/dsd_aofw_cc/cc_index.shtml.

3 IPCC, Climate Change 2007: Synthesis Report, Annex II, 2007.

4 IPCC, Climate Change 2007: Working Group II: Impacts, Adaptation and Vulnerability, Appendix I, 2007.

5 White Paper Adapting to Climate Change: Towards a European framework for action, COM(2009)147 final.

THE SINTA PROJECT⁶

The SEE region is among the European areas that in recent years has been assessed for impacts of climate change by conducting climate scenarios with regional climate models. This complex geographic area posed a clear challenge to the capability of present generation simulation models.

In recent years a scientific project called SINTA (Simulations of climate chaNge in the mediTerranean Area) has been funded by the Italian Ministry for Environment, Land and Sea with the aim to conduct global and regional climate projections with a focus on the SEE area. This SINTA project established a scientific cooperation between the Italian National Institute of Geophysics and Volcanology and Serbian partners including the Republic Hydrometeorological Service and the University of Belgrade. The main objectives of this project were to perform a set of global and regional simulations.

Figures 1 and 2 show the expected temperature and precipitation differences between the historical record (1961–1990) and the climate projections for 2070–2100. Due to the increase in GHGs, the surface air temperatures are projected to increase by 1.2°C–3.5°C for the winter season, and by 1.8°C–4.2°C for the summer season. Local topography accounts for some variations. Overall, surface air temperatures in the Balkans are projected to increase by 2.0°C–2.4°C. Precipitation over most of the region is projected to decrease by as much as 50 per cent.

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⁶ This box presented by the Euro-Mediterranean Centre for Climate Change.

Figure 1: Expected temperature differences between the historical record (1961–1990) and the climate projections for 2070–2100 (winter, left; summer, right)

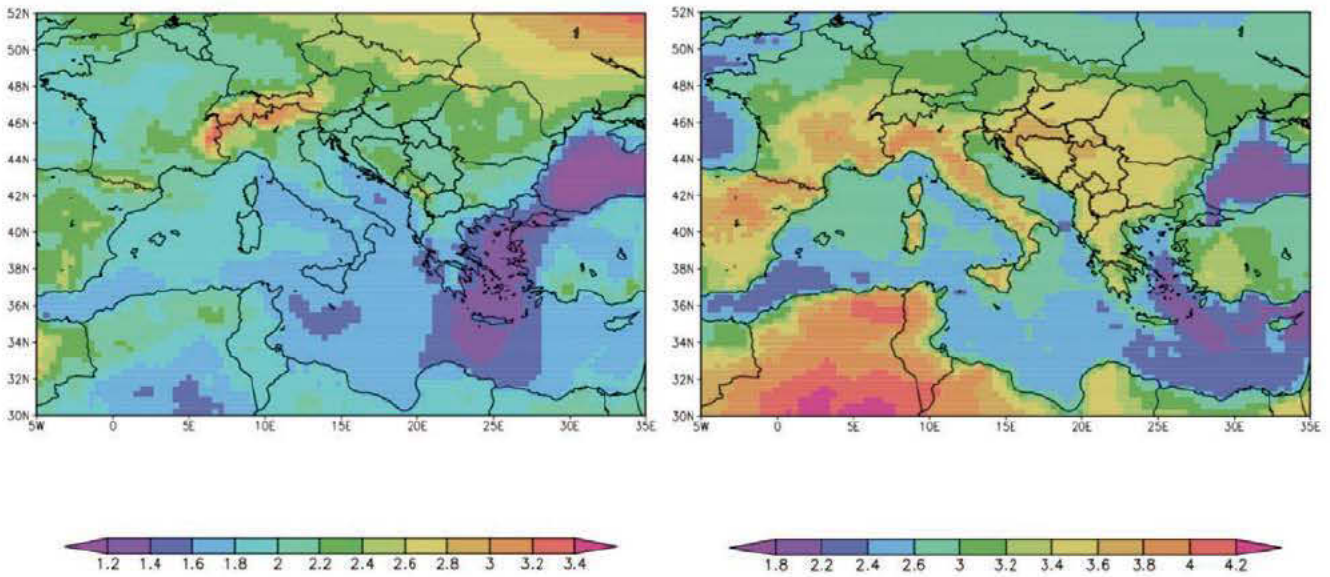
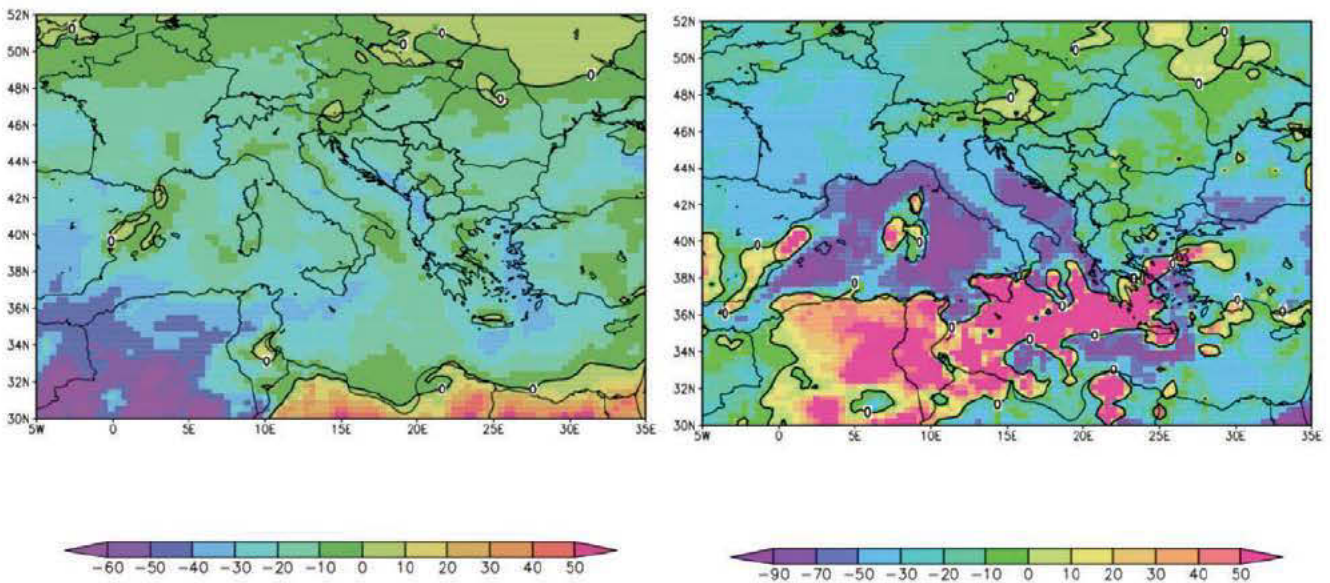


Figure 2: Expected precipitation differences between the historical record (1961–1990) and the climate projections for 2070–2100 (winter, left; summer, right)



The Adaptation Challenge: Focus on South Eastern Europe

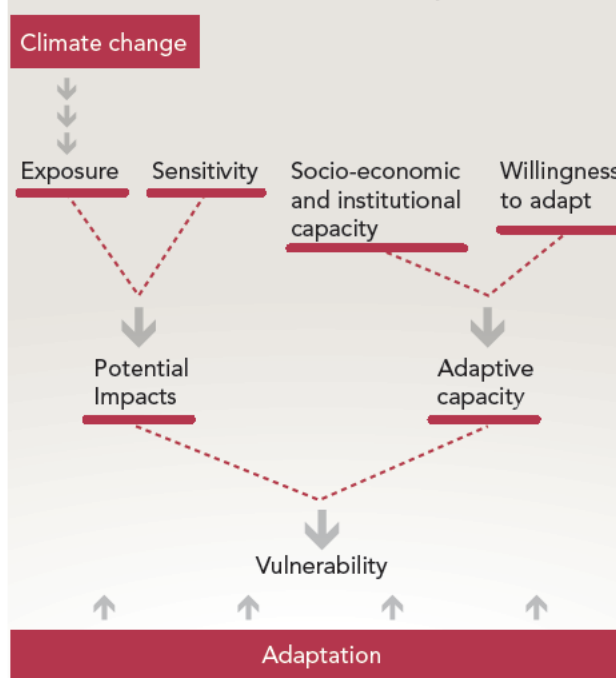
2.1 THE ADAPTATION CHALLENGE AT THE INTERNATIONAL AND EUROPEAN LEVELS

After a period in which the attention of scientists and politicians has been devoted primarily to mitigation, adaptation seems to be finally a part of climate change negotiations. Since climate change is already occurring and its impacts cannot be avoided, adaptation policies are needed to reduce vulnerability to climate change. Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes (IPCC, 2007). Vulnerability is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity and its adaptive capacity (EEA, 2008).

Even if we succeed in reducing GHGs emissions, we will still face the impacts of climate change for at least the next 100 years. The Intergovernmental Panel on Climate Change (IPCC), reports with high confidence that there are viable adaptation options that can be implemented at low cost, and that higher cost-benefit ratios can be achieved by implementing some adaptation measures at an early stage compared to retrofitting long-lived infrastructure at a later date (IPCC, 2007).

Adaptation is any adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities.⁷ While mitigation refers to the efforts to limit the man-made causes of climate change, adaptation relates to taking action to be more resilient to current climate change impacts, less susceptible to future ones and in a position to take advantage of the emerging opportunities.⁸ Figure 3 shows a conceptual diagram for climate change vulnerability and adaptation.

Figure 3: Conceptual diagram for climate change vulnerability and adaptation



Source: European Commission, SEC (2009), from EEA (2008).

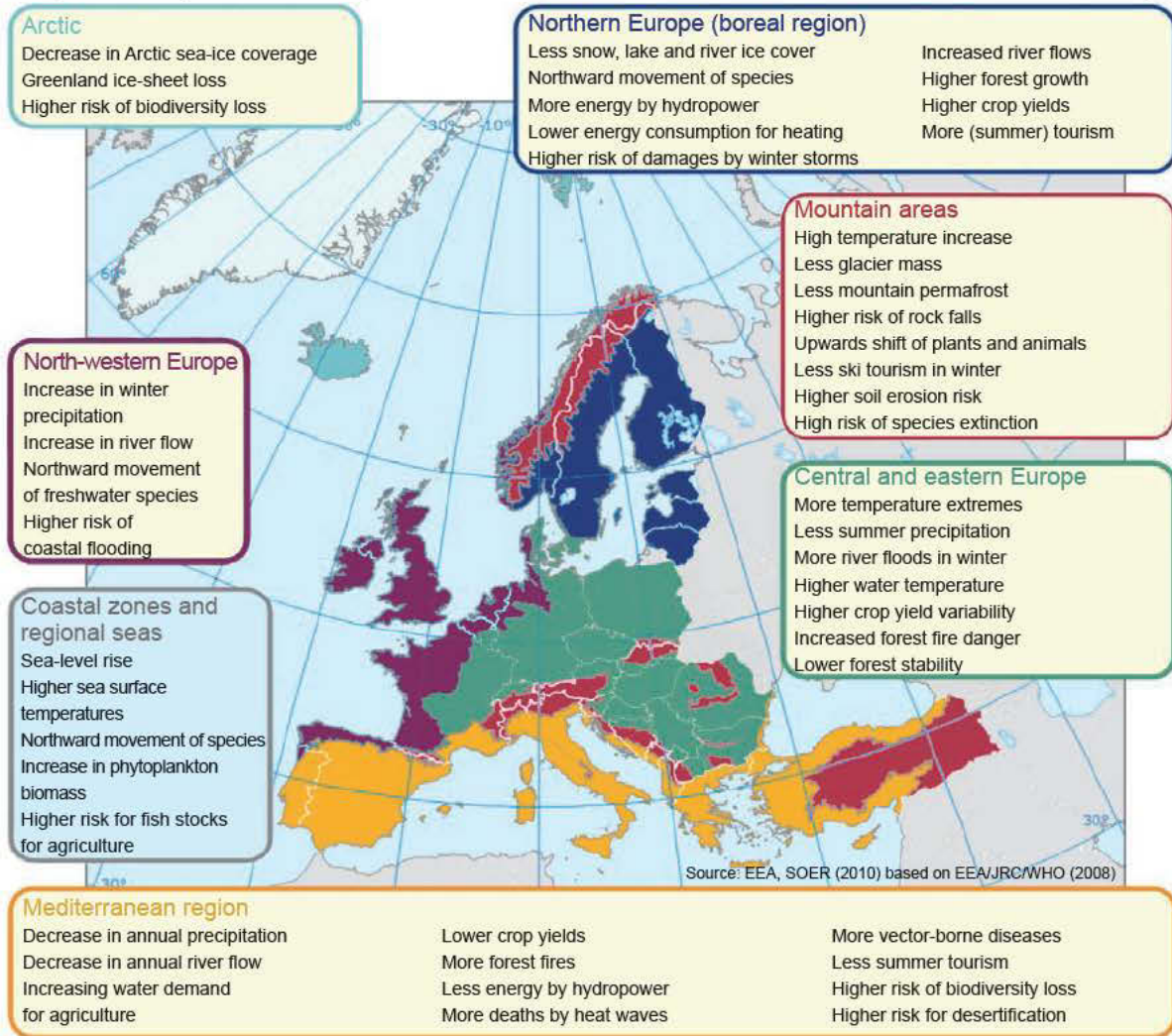
Adaptation is a cross-cutting issue aimed at enhancing resilience to climate change impacts in different sectors and based on such measures as using scarce water more efficiently, building flood defences, developing drought-tolerant crops and choosing tree species and forestry practices less vulnerable to storms and fires.

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7 IPCC, Climate Change 2007: Synthesis Report, Annex II, cit.

8 EU, MEMO/09/145.

Key past and projected impacts of climate change and effects on sectors in Europe



The map above shows the main past and projected impacts of climate change and the related effects on the various sectors across Europe.

Annual average temperatures are projected to increase 1.0°C–5.5°C, with the greatest warming expected in Southern Europe and the Arctic. Winter precipitation is projected to increase in Northern Europe, and summer precipitation to decrease in Southern Europe. Sea level rise may exceed the 2007 IPCC projection of 0.18 m–0.59 m by 2100. Extreme events will become more frequent and more intense even in the short term.⁹

According to the European Union projections, various economic sectors will be affected differently by climate change. The main impacts will occur in agriculture, tourism and energy, but climate change will also have profound effects on human, animal and plant health,¹⁰ and is expected to deepen regional differences in Europe’s natural resources and assets.¹¹ The impacts of climate change vary across the different regions of Europe and are more evident in the areas that are most vulnerable in terms of sensitivity and adaptive capacity,¹² such as the Mediterranean Basin and Southern Europe (especially due to heat and droughts), the Alps (because of the rapid melting of snow and ice), coastal zones and the Arctic and Outermost regions.

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 10 White Paper Adapting to Climate Change, cit.
 11 IPCC, Climate Change 2007: Synthesis Report, cit.
 12 For a definition of “adaptive capacity” see note n. 15.

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 9 SEC(2009)387, cit.

2.2 SOUTH EASTERN EUROPE COUNTRY PROFILES

For the purpose of this report, South Eastern Europe includes the following countries: the Republic of Albania, Bosnia and Herzegovina, the Republic of Croatia, the former Yugoslav Republic of Macedonia, Montenegro and the Republic of Serbia. Kosovo* is a special case. A 1999 United Nations Security Council resolution placed Kosovo* under a transitional United Nations administration. In 2008, after nearly two years of inconclusive negotiations to determine Kosovo's* final status, Kosovo* declared independence. At Serbia's request, the United Nations General

Assembly sought an advisory opinion from the International Court of Justice on whether Kosovo's* unilateral declaration of independence complied with international law, and the Court issued an advisory opinion stating that international law did not prohibit declarations of independence. In late 2010, Serbia agreed to a United Nations resolution acknowledging the Court's decision and calling for a new round of talks between Serbia and Kosovo*. This report treats Kosovo* as a territory, not a state.



Map produced by ZOI Environment Network, February 2012

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→ ALBANIA

Albania, whose capital city is Tirana, has a surface area of 28,748 km², and shares borders with Montenegro, the territory of Kosovo*, the former Yugoslav Republic of Macedonia and Greece. To the west lie the Adriatic and Ionian Seas. Albania is in the humid sub-tropical zone of the Northern Hemisphere and belongs to the Mediterranean climatic zone (mild temperate; cool, cloudy, wet winters; hot, clear, dry summers). Albania has three transboundary lakes – Ohrid and Presp (with the former Yugoslav Republic of Macedonia), and the Skadar/Scutari/Shkodër (with Montenegro). Seventy per cent of the country is mountainous and the highest mountain, Korab, reaches 2,753 m. The main natural resources of the country are petroleum, natural gas, coal, bauxite, chromate, copper, iron ore, nickel, salt and timber. Hydropower is an important part of the energy sector. Industry represents 23.5 per cent of the country's GDP, while agriculture contributes 20.1 per cent and services 56.4 per cent.

The GDP per capita is about US\$ 8,000 per year, while the Human Development Index (HDI) stands at 0.719 and the Gender Gap Index at 0.672. The unemployment rate is 13.7 per cent and 12.5 per cent of the people lives below the poverty line. Albania has a population of almost 3 million fairly evenly split between urban and rural (World Bank, 2010), with a density of 109 people per km². Since 1990, the urban population has been growing and by 2025 about 60 per cent of the population is expected to live in the capital and the coastal area.

Albania is making the difficult transition from a closed, centrally-planned state to a more modern open-market economy. Macroeconomic growth averaged around 6 per cent per year between 2004 and 2008, but declined to about 3 per cent in 2009–2010. Inflation is low and stable. The government has taken measures to curb violent crime and recently adopted a fiscal reform package aimed at reducing the large gray economy and attracting foreign investment. Remittances, a significant catalyst for economic growth, have declined from 12–15 per cent of GDP to 9 per cent in 2009. The agricultural sector, which accounts for almost half of employment but only about one fifth of GDP, is limited primarily to small family operations and subsistence farming because of lack of modern equipment, unclear property rights and the prevalence of small, inefficient plots of land. Energy shortages, because of a reliance on hydropower and antiquated and inadequate infrastructure, contribute to Albania's poor business environment and lack of success in attracting the new foreign investment needed to expand the country's export base. Foreign direct investment is among the lowest in the region, but the government has embarked on an ambitious programme to improve the business climate through fiscal and legislative reforms. The completion of a new thermal power plant near Vlore has helped diversify generation capacity, and plans to upgrade transmission lines among Albania, Montenegro and Kosovo* should help to relieve the energy shortages.

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→ BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina, whose capital is Sarajevo, borders Croatia, Serbia and Montenegro and has a 20-km coastline on the Adriatic Sea. It has a total area of 51,197 km², of which 43 per cent is forest. Bosnia is in the mountainous north, which is covered with deep forests. The highest peak is Livanjsko Polje at 2,764 m. Herzegovina occupies the flat south. The country has seven main rivers – the Una, Sava, Vrbas, Bosna, Drina, Spreca and Neretva. The main natural resources of the country are coal, iron ore, bauxite, copper, lead, zinc, chromite, cobalt, manganese, nickel, clay, gypsum, salt, sand and timber. Industry represents 25.9 per cent of the GDP and service sectors contribute 64.3 per cent.

The country's GDP per capita is about US\$ 7,751 per year, and the HDI is 0.710. The unemployment rate is 43.1 per cent and 18.6 per cent of the people lives below the poverty line. Bosnia and Herzegovina has a population of 4.6 million (World Bank, 2010) of which 47 per cent lives in towns, and has a population density of 90 people per km².

The war in Bosnia and Herzegovina saw production decrease by 80 per cent from 1992 to 1995 with soaring unemployment. After the war, output recovered rapidly from 1996 through 1999, but growth slowed from 2000 to 2002. Between 2003 and 2008, GDP growth exceeded 5 per cent per year, but the country experienced a decline in GDP of more than 3 per cent in 2009 reflecting local effects of the global economic crisis. One of Bosnia's main economic challenges in 2010 has been to reduce spending on public sector wages and social benefits to meet the International Monetary Fund (IMF) criteria for obtaining funding for budget shortfalls. Banking reform accelerated in 2001 as all the Communist-era payment bureaus were shut down; foreign banks, primarily from Austria and Italy, now control most of the banking sector. The konvertibilna marka – the national currency introduced in 1998 – is pegged to the euro, and confidence in the currency and the banking sector has increased. Bosnia's private sector is growing, but foreign investment has dropped off sharply since 2007.



→ CROATIA

Croatia, whose capital is Zagreb, borders Slovenia, Hungary, Serbia, Bosnia and Herzegovina and Montenegro, and has 1,777 of coastline on the Adriatic Sea. Its total land area is 56,594 km², 38 per cent of which is forest. The main natural resources of the country are oil, coal, bauxite, low-grade iron ore, calcium, gypsum, natural asphalt, silica, mica, clays and salt. Hydropower, shipbuilding, food processing and chemicals are important economic activities. Industry represents 27 per cent and service sectors 64 per cent of GDP. The GDP per capita is about US\$ 19,803 per year, the HDI is 0.767 and the Gender Gap Index is 0.694. The unemployment rate is 32 per cent, and 28.7 per cent the people live below the poverty line. Croatia has a population of 4.4 million (World Bank, 2010) 57 per cent of which live in cities, and a population density of 78 people per km².

Once one of the wealthiest of the Yugoslav republics, Croatia suffered badly during the 1991–1995 war as output collapsed and the country missed the early waves of investment in Central and Eastern Europe following the fall of the Berlin Wall. Between 2000 and 2007, however, Croatia's economic fortunes began to improve slowly, with moderate but steady annual GDP growth between 4 per cent and 6 per cent led by a rebound in tourism and credit-driven consumer spending. Inflation over the same period has remained the same and the currency stable. Nevertheless, several problems still remain, including a high unemployment rate, a growing trade deficit and uneven regional development. The state retains a large role in the economy, as privatization efforts often meet stiff public and political resistance. While macroeconomic stabilization has largely been achieved, structural reforms lag because of deep resistance on the part of the public and lack of strong support from politicians.



→ THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

The former Yugoslav Republic of Macedonia, whose capital city is Skopje, is bordered by Serbia, the territory of Kosovo*, Albania, Greece and Bulgaria. It has a total landlocked surface area of 25,713 km², 36 per cent of which is forest. Its central valley is formed by the Vardar River and framed by the Šara and Osogovo mountains. The main natural resources of the country are low-grade iron ore, copper, lead, zinc, chromite, manganese, nickel, tungsten, gold, silver, asbestos, gypsum and timber. Industry represents 29.6 per cent and services 58.3 per cent of GDP. The GDP per capita is about US\$ 6,617 per year, the HDI is 0.701 and the Gender Gap Index is 0.700. The unemployment rate is 32 per cent and 28.7 per cent of the people live below the poverty line. The former Yugoslav Republic of Macedonia has a population of just more than 2 million people, of which 60 per cent lives in cities, and a density of 79 people per km².

At the time of its independence in September 1991, the former Yugoslav Republic of Macedonia was the least developed of the Yugoslav republics, producing

a mere 5 per cent of the total federal output of goods and services. The collapse of Yugoslavia ended transfer payments from the central government and eliminated advantages from inclusion in a de facto free trade area. An absence of infrastructure, United Nations sanctions on the downsized Yugoslavia, and a Greek economic embargo over a dispute about the country's constitutional name and flag hindered economic growth until 1996. Since then, the former Yugoslav Republic of Macedonia has maintained macroeconomic stability with low inflation, but it has so far lagged the region in attracting foreign investment and creating jobs, despite making extensive fiscal and business sector reforms. Official unemployment remains high at 31.7 per cent, but may be overstated based on the existence of an extensive gray market, estimated to be more than 20 per cent of GDP. In the wake of the global economic downturn, the former Yugoslav Republic of Macedonia has experienced decreased foreign direct investment, lowered credit and a large trade deficit.

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→ MONTENEGRO

Montenegro, whose capital city is Podgorica, became independent from the State Union of Serbia and Montenegro in 2006. It has a land area of 13,812 km². The country has almost 300 km of coastline on the Adriatic Sea, and is bordered by Croatia, Bosnia and Herzegovina, Serbia, the territory of Kosovo* and Albania. Montenegro is mostly mountainous, and the highest peak – Bobotov Kuk – is 2,522 m. The largest lake, Skadar/Scutari/Shkodër, extends into Albania.

The main natural resources of the country are bauxite, coal and timber. Aluminum and hydropower are important economic activities. The country's GDP per capita is US\$ 10,432 per year, and its HDI is 0.679. The unemployment rate is 14.7 per cent and 7 per cent of the people live below the poverty line. The estimated population of the country is just more than 600,000 with a density of 45 people per km². Seventy per cent of the population lives in cities.

The dissolution of the loose political union between Serbia and Montenegro in 2006 led to separate membership in several international financial institutions, such as the European Bank for Reconstruction and Development, and in January 2007 Montenegro joined the World Bank and IMF. Montenegro is pursuing its own membership in the World Trade Organization and signed a Stabilisation and Association Agreement with the European Union in October 2007. The European Council granted candidate country status to Montenegro at the December 2010 session. Unemployment and regional disparities in development are key political and economic problems. Montenegro has privatized its large aluminum complex – the dominant industry – as well as most of its financial sector, and has begun to attract foreign direct investment in the tourism sector. The global financial crisis has had a significant negative impact on the economy due to the ongoing credit crunch, a decline in the real estate sector and a fall in aluminum exports.

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→ **SERBIA**

Serbia, whose capital city is Belgrade, is the successor of the State Union of Serbia and Montenegro. It is bordered by Hungary, Romania, Bulgaria, the territory of Kosovo*, the former Yugoslav Republic of Macedonia, Montenegro, Croatia and Bosnia and Herzegovina. Its landlocked land area is 77,474 km². The country is largely formed by plains and low hills. The Danube (which crosses the capital city), the Sava and the Drina are the main rivers. The main natural resources of the country are oil, arable land, gas, coal, iron ore, copper, zinc, antimony, chromite, gold, silver, magnesium, pyrite, limestone, marble and salt. Industry represents 22.6 per cent and services 64.5 per cent of GDP.

The GDP per capita is US\$ 11,621 per year, and the HDI is 0.735. The unemployment rate is 17.2 per cent and 8.8 per cent of the people lives below the poverty line. The population of Serbia is 7.3 million people (including the autonomous region of Metohija). The population density of the country is 95 people per km², and 52 per cent of the population lives in cities.

Milosevic-era mismanagement of the economy, an extended period of international economic sanctions and the damage to Yugoslavia's infrastructure and industry during the NATO airstrikes in 1999 left the economy only half the size it was in 1990. After the ousting of the former Federal Yugoslav

President Milosevic in September 2000, the coalition government implemented stabilization measures and embarked on a market reform programme. After renewing its membership in the IMF in December 2000, the Federal Republic of Yugoslavia continued to reintegrate into the international community by rejoining the World Bank and the European Bank for Reconstruction and Development. Belgrade has made progress in trade liberalization and enterprise restructuring and privatization, including telecommunications and small and medium size firms. It has made some progress towards European Union (EU) membership, signing a Stabilisation and Association Agreement with Brussels in May 2008, and with full implementation of the Interim Trade Agreement with the EU in February 2010.

Serbia is also pursuing membership in the World Trade Organization. Structural economic reforms needed to ensure the country's long-term viability have largely stalled since the onset of the global financial crisis. Serbia, however, is slowly recovering from the crisis. Economic growth in 2010 was a modest 1.7 per cent, following a 3.1 per cent contraction in 2009, but exports rose by over 16 per cent and manufacturing output increased 3.2 per cent. High unemployment and stagnant household incomes are ongoing political and economic problems.

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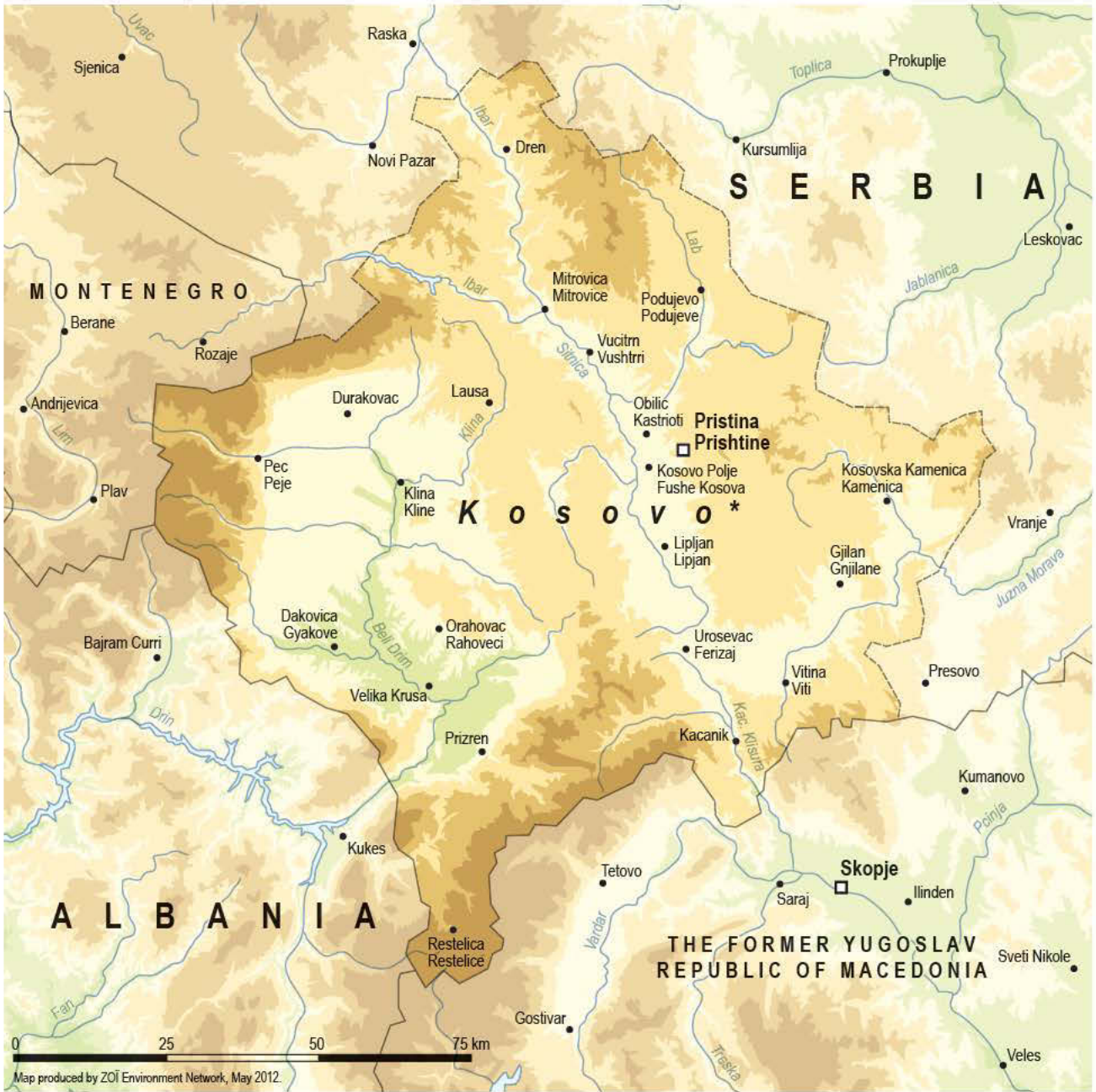
→ KOSOVO*

Kosovo* is a unilaterally declared independent state, whose capital city is Pristina. In 1999, the United Nations Security Council approved Resolution 1244 establishing the United Nations Interim Administration Mission in Kosovo*, and authorized an international peacekeeping force. Kosovo's* landlocked area of 10,887 km² borders with Serbia, the former Yugoslav Republic of Macedonia, Albania and Montenegro. Most of its terrain is mountainous, and the highest peak is Deravica at 2,656 m. The two main rivers are the White Drin and the Ibar. The main lakes are Gazidova, Radonjic, Batlava and Badovac. The main natural resources of the country are nickel, lead, zinc, magnesium, lignite, kaolin, chrome and bauxite. The GDP per capita is about US\$ 2,500. The unemployment rate is 45 per cent, and 30 per cent of the people live below the poverty line. Kosovo* has a population of 1.8 million (World Bank, 2010) with a population density of 166 people per km².

Over the past few years Kosovo's* economy has shown significant progress in transitioning to a market-based system and in maintaining macroeconomic stability, but it is still highly dependent on the international community and the diaspora for financial

and technical assistance. Remittances from the diaspora – located mainly in Germany, Switzerland and the Nordic countries – are estimated to account for about 13–15 per cent of GDP, and donor-financed activities and aid account for another 7.5 per cent. Kosovo's* citizens are the poorest in Europe with an average annual per capita income of only US\$ 2,800. Unemployment, around 40 per cent of the population, is a significant problem that encourages outward migration and black market activity. Most of Kosovo's* population lives in rural towns outside of the capital. Inefficient, near-subsistence farming is common – the result of small plots, limited mechanization and the lack of technical expertise. With international assistance, Kosovo* has been able to privatize half of its state-owned enterprises (by number), and over 90 per cent by value. Minerals and metals once formed the backbone of industry, but output has declined because of ageing equipment and insufficient investment. A limited and unreliable electricity supply due to technical and financial problems is a major impediment to economic development, but Kosovo* has received technical assistance to help improve accounting and controls.

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.



* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

2.3 SOUTH EASTERN EUROPE REGIONAL PROFILE

During the 1990s and the first decade of the twenty-first century, the SEE countries focused on reconstruction, democracy and the building of free-market institutions. Support came from foreign direct and indirect investments from the World Bank, the World Trade Organization and European Union institutions and member states, as well as public and private investors who saw new markets in the region.

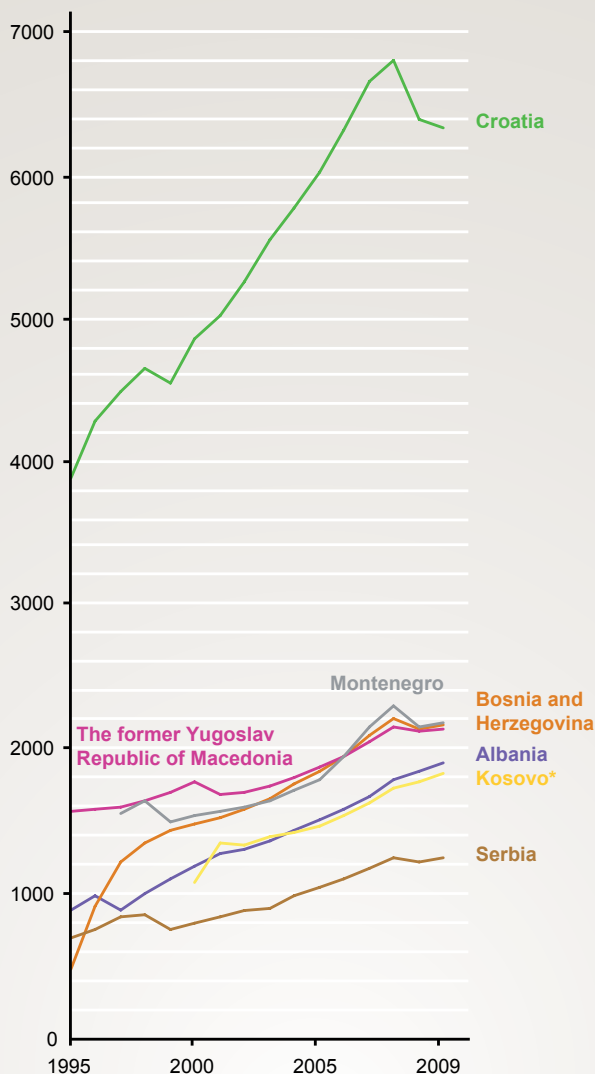
Several oil and gas pipelines and similar infrastructure projects have been planned in the region, and some are under construction. Despite the sudden access to international markets and the rapid growth in GDP that occurred in all SEE countries, the unemployment rate and external debt still remain high, according to the World Bank. Figure 4 shows the recent trends in GDP per capita for the countries in the region.

The transition from a centrally planned to a market economy in the region – spurred by the liberalization of trade, financial flows from donors and migration remittances – is transforming the old economies based on planned agriculture, exploitation of natural resources and heavy industry economies into service-based systems.

The industrialization process, which ran in parallel with the creation of new nations, was the major cause of a huge urbanization and rural-to-urban migration phenomenon, and led to rapid and unplanned land-use changes. The changes in the traditional use of agricultural lands affected the maintenance of soil productivity as well as the protection of the natural and cultural landscape. The massive building of houses and infrastructure contributed to deforestation and undermined the sustainable use of land. Despite the decreased economic relevance of agriculture, however, the sector still employs almost half of the population in some SEE countries.

From a social and political perspective, heterogeneity and fragmentation are two of the most relevant characteristics of the SEE region, both in geographic and social terms. The recent wars created significant movements and displacements of population, some temporary, other permanent, within and outside the SEE area. The existing fragmentation might have a negative effect in terms of environmental management. The diversity of fauna and flora is

Figure 4: GDP in the West Balkans
constant 2000 USD per capita



* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence. Source: World Bank, 2011.

exceptional in the region, but many species are endangered and their protection is often hindered by the presence of multiple jurisdictions. Multilateral agreements protect just about 6 per cent of the region, the most relevant area being Stara Planina Nature Park, on the Serbian border with Bulgaria, and Prespa Park, which covers parts of Greece, the former Yugoslav Republic of Macedonia and Albania.

2.4 OVERVIEW OF CLIMATE CHANGE IMPACTS IN SOUTH EASTERN EUROPE

Addressing the climate change impacts that might damage the environment and threaten the future well-being of the population is a matter of urgency. Climate change is expected to increase the frequency and magnitude of extreme events with related damages caused by floods, droughts, forest fires, heatwaves

and other climate-related hazards. It is also expected to cause reductions in crop yields, decreased water availability and reduced hydropower potential, and to increase number of people exposed to vector-borne and waterborne diseases. Adaptation could significantly reduce these effects.¹³

Figure 5: Climate change in the West Balkans: Key findings, trends and projections

	ALBANIA ¹	BOSNIA AND HERZEGOVINA	CROATIA	THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA	MONTENEGRO	SERBIA
Air temperature change (last half century)	↑	↑ ²	↑	↑	↑	↑
Precipitation change (last half century)	↓	↔ ³	↓	↓	↔	↔
Extreme weather events and climate-related hazards (1990–2009)	↑	↑	↗	↑	↑	↑
Water resources availability in the future (forecast period until 2100)	↓	↓ ⁴	↓ ⁵	↓	↓	↓
Health infectious and vector-borne diseases ⁶	↑	↑	↑	↑	↑	↑
Greenhouse gas emissions (in CO ₂ eq) for period observed	↓	n.a. ⁷	↗	↓	↓	↓
Policy instruments, actions and awareness	↑	↗ ⁸	↑	↑	↑	↑
Climate observation and weather services (1990–2009)	↗	↗	↑	↗	↗	↑

¹ Information related to vulnerability assessment and adaptation options is based on the study focused on the Drini River Cascade (area from Kukes up to the Lezha Plain).

² Air temperature change covers only 11-year period 1990-2000 compared to reference period (1961-1990).

³ Precipitation change covers only period 1999-2008 compared to reference period (1961-1990).

⁴ Lower river flows are expected although scenarios are to be introduced in Second National Communication; "water managers are still using historical climate data to design water infrastructure and guide management decisions".

⁵ Decrease is expected, although further studies are required.

⁶ In West Balkan countries reliable health statistics on the impacts of climate change on population health, illness and mortality do not exist, since mandatory health records do not contain information for such a complex evaluation. According to National Communications under the UNFCCC, estimated data indicate an increase in the number of strokes and mortalities, mostly as a result of higher temperatures.

⁷ Greenhouse gas emissions are available only for the base year (1990).

⁸ Basic systems providing information on water resources were never rebuilt after the breakdown of the former Bosnia and Herzegovina Hydrometeorological Service during the early 1990s. One of proposed adaptation measures is the development of a Hydrological Information System.

Sources: Most recent National Communications to the United Nations Framework Convention on Climate Change.

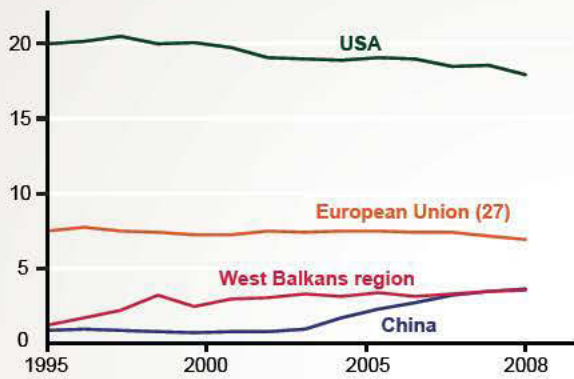
Produced by ZOI Environment Network, 2012.

.....
 13 Joint Statement by the Ministers responsible for environment of the Republic of Albania, Bosnia and Herzegovina, The former Yugoslav Republic of Macedonia, Montenegro and the Republic of Serbia on combating climate change in South East Europe. Sarajevo, November 14, 2008, http://www.rec.rs/eng/images/stories/news/Ministerial_Statement_November14th_2008.pdf.

The SEE region bears the effects of climate change out of proportion to their contribution to the cause. The CO₂ emissions for the SEE countries range from less than 1 metric tonne to just over 8 metric tonnes per capita per year. As a group, their annual per capita emissions are a bit more than one half those of the European Union countries, and a bit more than one quarter those of the United States. The largest disparity is evident in the total emissions figures: compared to China, the US and the EU, the west Balkans' emissions barely register.

Figure 6: CO₂ emissions in different regions

metric tonnes per capita



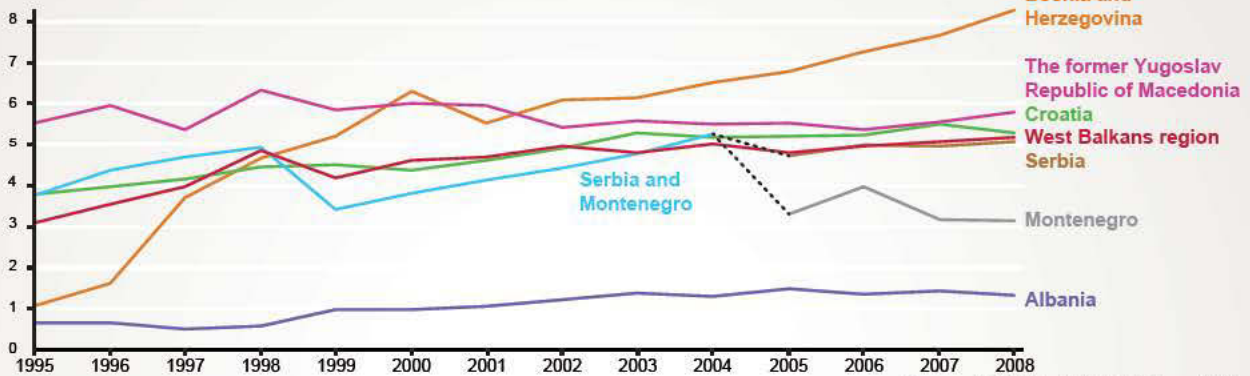
absolute number in millions in 2008



Sources: World Bank, United Nations, 2011.

Figure 7: CO₂ emissions in the West Balkans

metric tonnes per capita



Sources: World Bank, United Nations, 2011.

The SEE region is getting warmer and is projected to continue on this warming trend generally in proportion to the expected increase in global temperatures. Similarly, the region is receiving less precipitation and is projected to experience further decreases, although precipitation patterns will continue to vary according to terrain, elevation and proximity to the sea. The effect of warmer temperatures on evaporation, together with the decline in precipitation, will make the region drier.

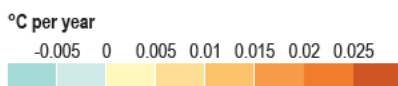
Albania, Bosnia and Herzegovina, Croatia and the former Yugoslav Republic of Macedonia all conform to these general trends, with Albania expecting more frequent droughts. In Croatia, the reduction in annual precipitation is attributable to changes in the frequency of low-intensity rain days and to a significant increase in the incidence of dry days. In the former Yugoslav Republic of Macedonia – where the frequency and intensity of floods and droughts has already increased – the sharpest declines in precipitation are expected to occur in the summer, along with the greatest increase in temperature; winter precipitation is expected to

remain unchanged. Serbia is getting warmer and wetter, and is the only SEE country to show an overall increase in precipitation, but like the former Yugoslav Republic of Macedonia has also experienced more frequent and intense droughts. Montenegro, too, is part of the warming trend, and has been experiencing more frequent extreme heat since 1998, but annual precipitation has remained fairly constant with some fluctuations around the norm.

Climate change is already affecting the SEE countries from both the physical and the economic point of view. The countries face a complicated problem: a growing risk of damages caused by meteorological, hydrological and climate extremes and catastrophes and, at the same time, a high poverty rate and the necessity for economic development. In addition, the SEE countries have limited access to knowledge, technology and financing, and have a great need for capacity-building and systemic institutional and individual development, all of which has to be coupled with the requirements of the EU Stabilisation and Association Process.¹⁴



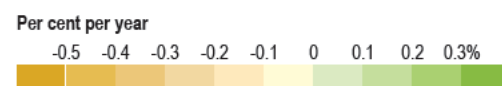
Change in temperature, 1951-2006



Map produced by ZOI Environment Network, March 2012.
 * This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.
 Source: Climatewizard (www.climatewizard.org).



Change in precipitation, 1951-2006



Map produced by ZOI Environment Network, March 2012.
 * This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.
 Source: Climatewizard (www.climatewizard.org).

14 Republic Hydrometeorological Service Of Serbia, Southeast European Climate Change Framework Action Plan for Adaptation: Role of the Academic Communities Or Research needs in the field of Impacts, Vulnerability and Adaptation to Climate change, Danube Rectors' Conference, 4-6 February 2010, Serbia.

2.5 POPULATION AND MIGRATION

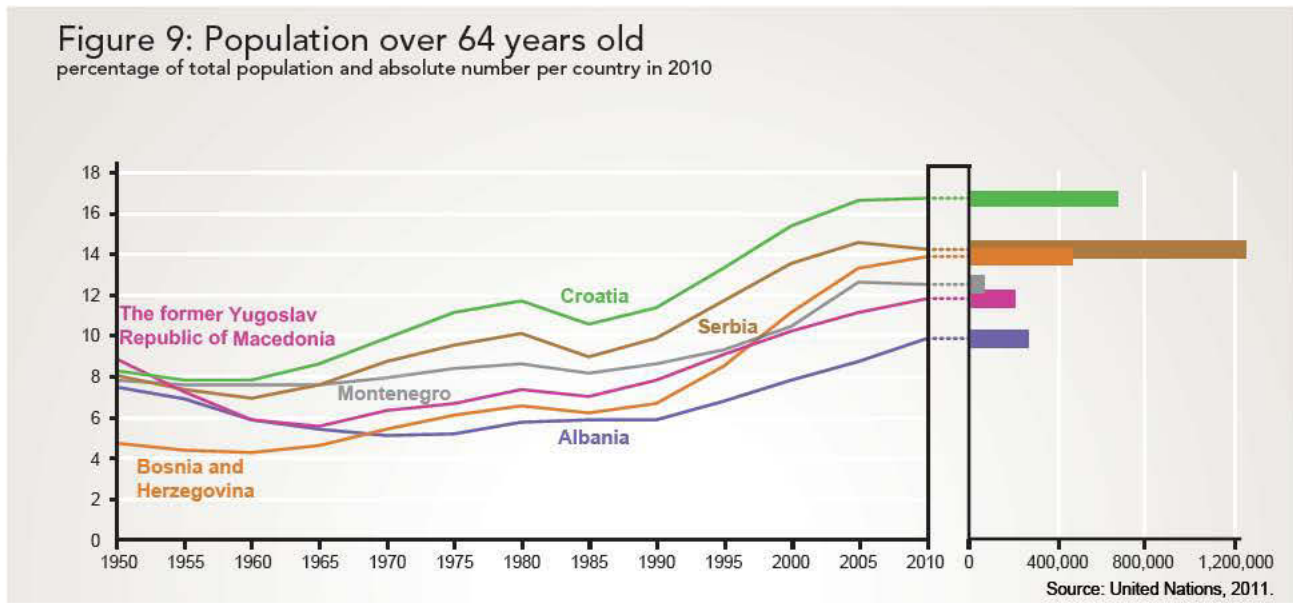
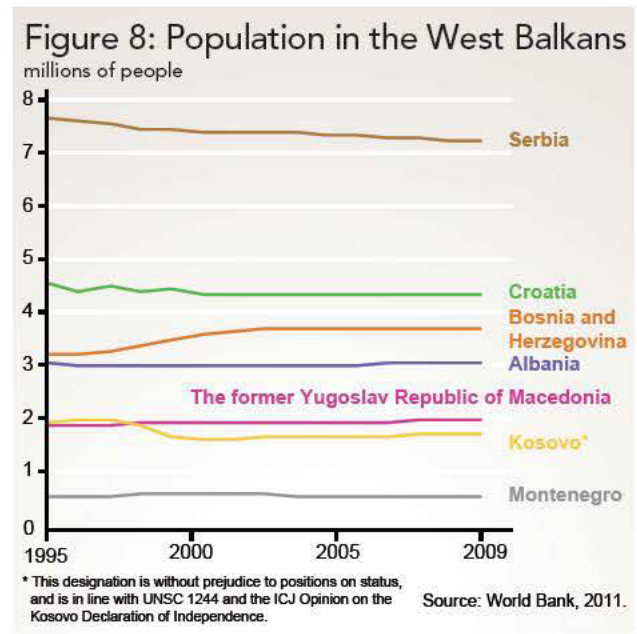
The demography of the Balkans is anything but static. Populations are ageing, fertility rates are declining and people are moving from rural to urban areas. Ethnic distributions within countries have political implications regarding the rationale for statehood, and international ethnic migration within the region is high as is emigration to other nearby states, Europe, the United States and other western countries.

The overall populations in Croatia, Montenegro and Serbia are declining, and Serbia's population, among the oldest in Europe and with a low fertility rate, is shrinking by 30,000 per year. The former Yugoslav Republic of Macedonia attempted to provide financial aid to ethnic Macedonians (who have a low birth rate) to encourage them to have more children while excluding ethnic Albanians (whose birth rate is high) from the programme, but a constitutional court struck down the attempt. In Albania, the fertility rate has fallen from 2.0 to 1.3 births per woman, and large numbers of women of child-bearing age have left the country. Emigration and war reduced the population in Bosnia and Herzegovina, but accurate figures are hard to obtain, and a political controversy is holding up progress on a 2011 census.

A report prepared by the United Nations Department of Economic and Social Affairs shows that the current ageing of the population is unprecedented, and that the twenty-first century will witness even more rapid ageing than the past century. Over the last half century, higher levels of development and education

have led to an almost 50 per cent decline in the global fertility rate, and new drugs, pharmaceutical technologies and higher nutritional standards have extended life expectancies.

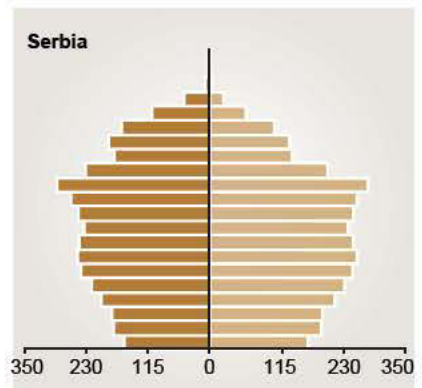
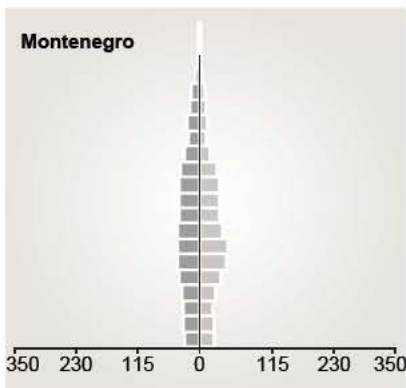
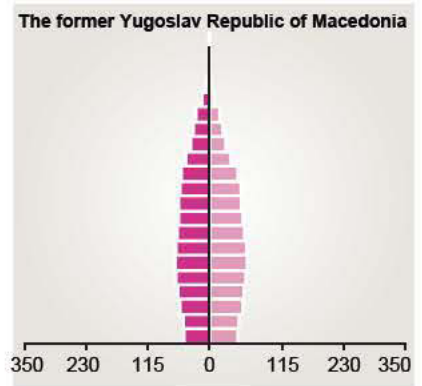
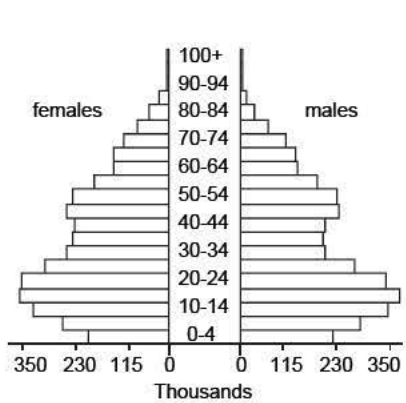
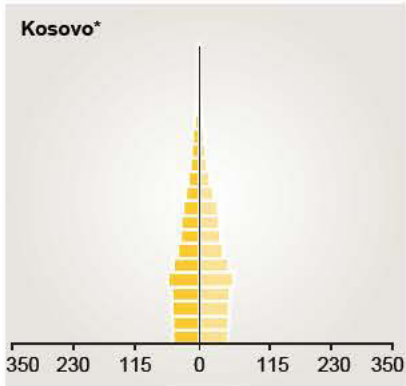
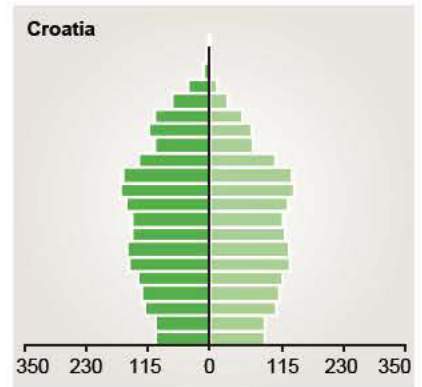
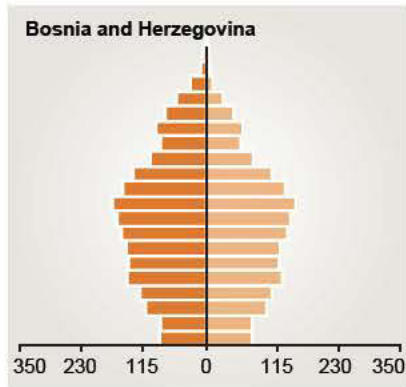
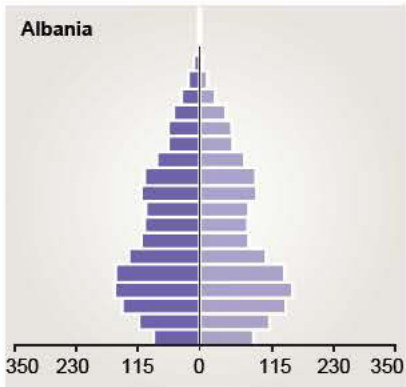
This ageing of the population – long present in post-industrialized countries – is now becoming important in countries with transitional economies.





Age pyramids

Absolute number of people per age category in 2010



* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: US Census, 2011.

Emigration from the West Balkans

Number of people born in a West Balkans country living abroad

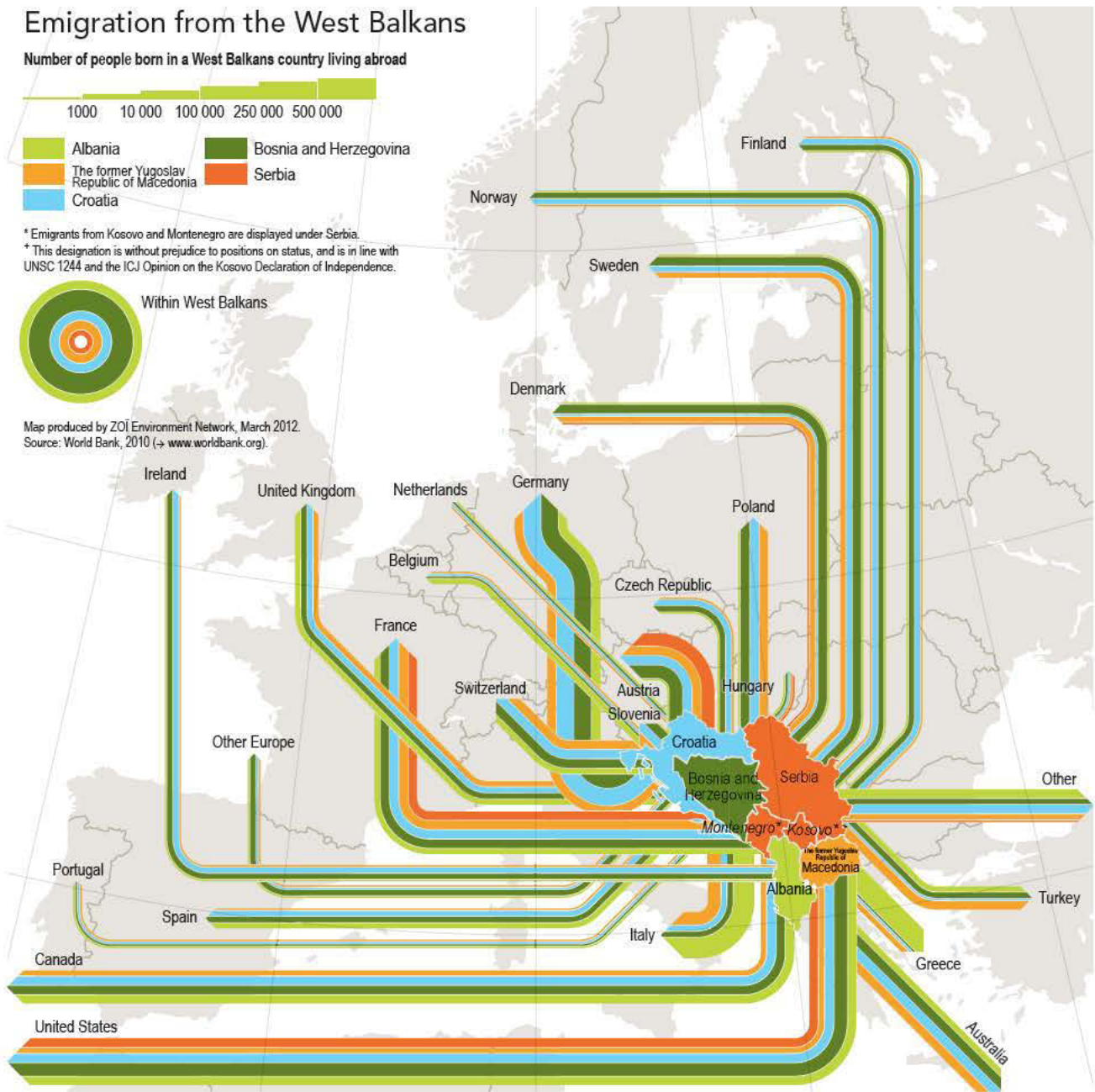


* Emigrants from Kosovo and Montenegro are displayed under Serbia.
 † This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.



Within West Balkans

Map produced by ZOI Environment Network, March 2012.
 Source: World Bank, 2010 (→ www.worldbank.org).



2.6 CLIMATE CHANGE AND GENDER

Since climate change is the most pressing global challenge facing our world today, it is very important to understand the differential cause and effect of environmental degradation on men and women and, importantly, the role of women as agents of change with regard to mitigation and adaptation to climate change.

A recent publication of the United Nations Development Programme (UNDP) makes the following findings and recommendations:

While changes in the environment affect everyone, they affect men and women differently. Women's and girls' traditional responsibilities as food growers, water and fuel gatherers and caregivers connect them closely to available natural resources and the climate, making them more likely to be affected by environmental hardships.

Affected first and worst, poor women are rendered all the more vulnerable by longstanding inequalities that silence their voices and neglect their needs. Identifying and addressing women's needs, as well as promoting women as decision makers, are critical elements to ensure the success of environmental policy and programming.

Yet women are not only victims of climate change and environmental degradation – they also possess the knowledge and skills that are critical to finding local solutions. Environmental policies, programmes and finance, therefore, should incorporate and benefit from this know-how while supporting women in the face of today's unprecedented environmental challenges.

Given the requisite tools and the support, women are a driving force for development. Indeed, experience shows that the resiliency of households and communities depends in great part on the resiliency of women. UNDP seeks to provide women with the support they need to get their families, their communities, and nations, on the right track.

To assist poor women (and men), UNDP helps governments to:

- Include women in environmental planning, finance, budgeting, and policy-making processes
- Deliver energy and environment services, such as clean water and mechanized power, to poor women
- Leverage financing for women's organizations and entrepreneurs working to mitigate and/or adapt to climate change
- Harness women's local knowledge to protect, sustain and manage the environment and its resources
- Identify win-win opportunities that link policies for gender equality and the environment with more equitable forms of growth.¹⁵

In practice, however, both at the global and the country level, there are still barriers to women's entry and influence in the political arena, barriers that should be overcome through their increased empowerment. Figure 10 shows the relationships among women's leadership, sustainable development and global governance.

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 15 <http://www.beta.undp.org/content/dam/undp/library/corporate/fast-facts/english/FF-Gender-Environment.pdf>

Figure 10: Cross-cutting issues: Women's leadership, sustainable development and global governance

Women are empowered as decision-makers and leaders, especially in environmental and sustainable development arenas.



Sustainable development policies, plans and practices are gender responsive.

Global Governance is transparent, accountable and effective.

Source: WEDO, 2011



Population displacement, 1991-2001

- Croats
- Muslims
- Serbians
- Others (Albanians, Hungarians)

Map produced by ZOI Environment Network, February 2012.
Sources: Philippe Rekacewicz; Le Monde diplomatique (→ www.monde-diplomatique.fr); UNEP/GRID-Arendal (→ www.grida.no).

Analysis of Climate Change Impacts in South Eastern Europe

3.1 CLIMATE CHANGE AND WATER

→ OVERVIEW OF THE REGION

Climate change has severe consequences for water and natural ecosystems as well as for human activities (Bates et al., 2008). As climate change can induce water stress in a variety of ways beyond reduced precipitation (World Bank, 2009), a sound knowledge of all the components of the water cycle is of paramount importance to the development of management strategies and the prevention of the negative impacts on water quality and availability often associated with climate change.

Water resources are currently abundant in the South Eastern Europe region, but pressures caused by environmental pollution and climate change might affect them. In order to address this possibility, SEE countries will have to resort to new national strategies to respond to their water emergencies and needs. The countries of the region also face several transboundary issues related to shared natural resources.

In South Eastern Europe, the number of transboundary river basins almost doubled after the break-up of the former Yugoslavia (UNEP/GRID-Arendal, 2007), and the region now has 13 internationally shared river basins (map below and table 1) and four transboundary lake basins (map below and table 2). In addition to surface waters these countries also share subsurface waters that may be more difficult to study and manage.



Table 1: Shared river basins in South Eastern Europe

River basin	Countries	Length (Km)	Basin area (Km ²)
Crni Drim	The former Yugoslav Republic of Macedonia, Albania	177	11,967
Danube	Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Bulgaria, Moldova, Romania, Kosovo*	2,860	817,000
Drin	Albania, the former Yugoslav Republic of Macedonia Serbia, Kosovo*	285	11,756
Drina	Montenegro, Bosnia-Herzegovina, Serbia	346	19,570
Kolpa (Kupa)	Slovenia, Croatia	296	10,032
Lepenec	The former Yugoslav Republic of Macedonia, Kosovo*	75	770
Neretva	Bosnia-Herzegovina, Croatia	218	10,380
Pčinja	The former Yugoslav Republic of Macedonia, Serbia	128	3,140
Sava	Slovenia, Croatia, Bosnia-Herzegovina, Serbia	945	95,719
Struma (Strimonos)	Bulgaria, Greece, Serbia	415	10,797
Strumica	The former Yugoslav Republic of Macedonia, Bulgaria	114	1,895
Una	Croatia, Bosnia-Herzegovina	207	10,400
Vardar (Axios)	The former Yugoslav Republic of Macedonia, Greece	338	25,000

Source: UNEP/GRID-Arendal, 2007

Table 2: Shared lakes in South Eastern Europe

Lake	Countries	Surface Area (Km ²)	Max. Depth (m)	Elevation (m)
Dojran	Greece, the former Yugoslav, Republic of Macedonia	43.1	10	148
Limni Mikri Prespa;	Albania, Greece	48	NA	857
Ohrid	Albania, the former Yugoslav Republic of Macedonia	358	288	NA
Prespa	Albania, Greece, the former Yugoslav Republic of Macedonia	273	54	853
Shkodra (Scutari or Shkodër)	Albania, Montenegro	400	44	6

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Aquifers in the region are essentially of two types – karstic, dominated by limestone and dolomites; and alluvial-sedimentary. The Dinaric Karst aquifer system spreads along the Dinaric coast and its mountainous hinterland. The alluvial-sedimentary aquifers are located in the areas of the Danube River and its tributaries (UNECE, 2007).

Many transboundary karstic aquifers in South Eastern Europe are reported to provide 60–80 per cent of the total water usage in their areas, and some of the Dinaric karstic groundwater of Bosnia and Herzegovina, Serbia, Croatia, the former Yugoslav Republic of Macedonia and Albania meet 90 per cent of total water demand (UNECE, 2007).

Some karstic aquifers systems are also used to generate hydroelectric power by diverting discharging groundwater (UNECE, 2007); this diversion comes with an associated decrease in water availability. Alluvial aquifers are mainly located in the lowland parts of the major river basins, and generally cover a greater area than karstic aquifers, and due to their position in alluvial valleys are often used by human settlements.

The strong linkages of aquifer systems with both rivers and lakes highlight the need to protect the ecosystems of these surface waters. River basins and aquifer systems support human activities and natural ecosystems. Water resources are exploited for irrigation, drinking water supply, industrial needs, livestock production and tourism activities. Highly fractured karstic aquifers are more vulnerable to pollution and climatic stresses, and any change in precipitation patterns or land use can have severe consequences on water quality, quantity and groundwater flows (Merla, 2007).

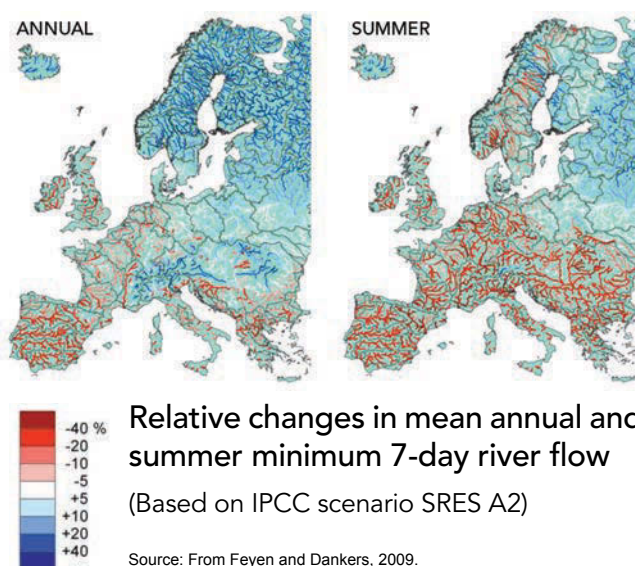
A wide range of studies identifies water pollution problems for the transboundary river basins in South Eastern Europe. The quality of the Vardar River, shared by the former Yugoslav Republic of Macedonia and Greece, is affected by heavy metal pollution from smelter and fertilizer plants, a ferro-alloy plant, solid waste disposal and the discharge of untreated industrial wastewater from the industries located in the watershed (Milovanovic, 2007). Other sources of pollution include agricultural runoff from cultivated areas and untreated domestic wastewater discharged directly into the river. All of these problems require shared monitoring programs and cooperation between institutions to develop integrated river management.

South Eastern Europe countries appear to need improved protection of the water supply and new investments and regulations for sanitation, irrigation and hydroelectricity (Skoulikidis, 2009). Some areas polluted by inorganic and organic wastes still lack detailed knowledge on water quality (Culla et al., 2005; Terzić et al., 2008).

→ IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES

Variations in temperature, precipitation anomalies and the increased frequency of extreme events may lead to water resources degradation and may cause severe consequences for ecosystems and human well-being. The nature of the impacts and the resilience of the natural environment will vary according to the way climate change manifests itself. Most human and natural systems will more easily adapt to slow changes in averages, while adapting to sudden and catastrophic changes would be more difficult (World Bank, 2009).

Changes in average precipitation can potentially have impacts on ecosystems, biodiversity, food production, water resources availability (IPCC, 2007) and river flows (map below). Annual river discharge has changed over the past few decades across Europe, and in particular has decreased in some areas of SEE, due to observed changes in precipitation (EEA, 2004). This trend is likely to continue in the coming years. In fact, the SEE region could experience a decrease in annual mean precipitation (IPCC, 2007), and an associated decrease of water runoff (Milly et al. 2005; Milly et al. 2008).



Finally, the models project that the interval between rainfall events will increase in many European areas, with the greatest magnitude in South Eastern Europe (World Bank, 2009). Changes in precipitation patterns over the year can increase flooding rates or extreme droughts periods (Feyen and Dankers, 2009). The latter, in particular, are foreseen to be a serious concern for SEE countries as the entire region has been experiencing an increase in climate extremes.

Despite the region's industrial expansion, SEE economic development is strongly tied to agricultural production. Considering the high water dependency of this sector and the expected trend for reduced

precipitation, this sector – in case of severe droughts – would rely on surface and groundwater withdrawals for irrigation. Such withdrawals will affect ecosystems and water stocks, and exacerbate the pressure on the natural system.

Water quality can also be affected by climate change as more intense precipitation or flooding remobilize salts or pollutants in the aquifer system or rivers. Droughts can cause flow reductions from lakes and streams, and increase the concentration of pollutants and potentially change the biological properties of water reservoirs.



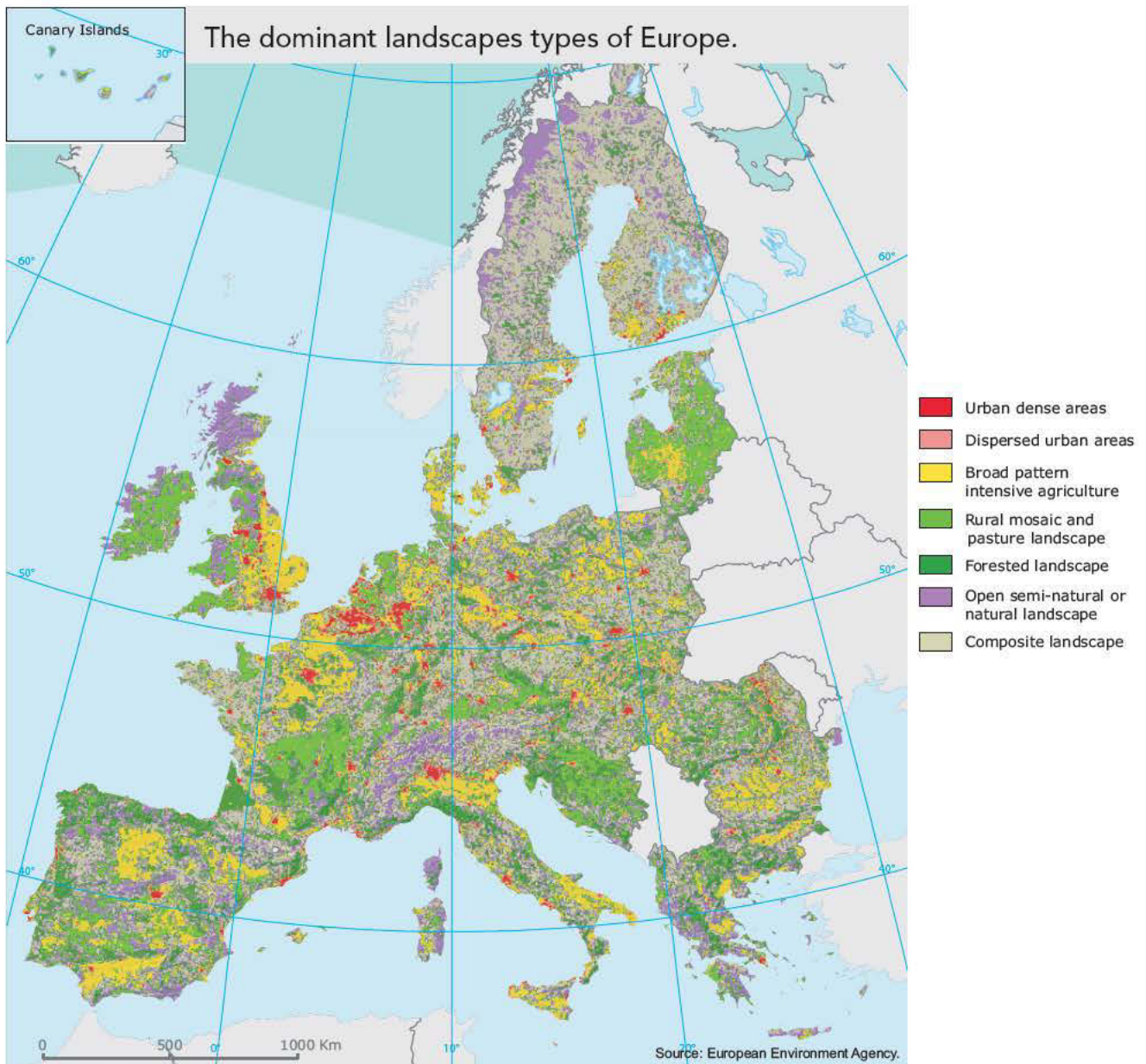
Map produced by ZOI Environment Network, February 2012.
 * This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.
 Sources: United Nations Economic Commission for Europe: Second Assessment of Transboundary Rivers, Lakes and Groundwaters, 2011 (→ www.unece.org/env/water/); Sava River Basin Analysis Report, International Sava River Basin Commission, 2009 (→ www.savacommission.org/); Jaroslav Cerni Institute (→ www.jceni.org/); Wikipedia article "Seman" on 21 December (→ <http://de.wikipedia.org/wiki/Seman>); Wikipedia article "Vjosa" on 21 December (→ <http://de.wikipedia.org/wiki/Vjosa>); Wikipedia article "Tisza" on 21 December (→ <http://en.wikipedia.org/wiki/Tisza>).

3.2 CLIMATE CHANGE AND NATURAL RESOURCES

→ OVERVIEW

The South Eastern Europe region ranges from high mountains, karstic areas and river valleys to plains and coastal areas. This variety is reflected in the biodiversity and in the richness of natural resources. The region includes the Dinaric Arc ecoregion, which extends from the Alps in Slovenia through Croatia and a large part of Bosnia and Herzegovina and Montenegro, ending in the north of Albania. It is partly defined by a central mountain range that extends into Serbia, Kosovo* and the former Yugoslav Republic of

Macedonia. The central and southern part of the SEE area is dominated by the Dinaric Alps, which mark the convergence of three distinct ecological zones – the Mediterranean, Balkan and Central European (WWF, 2010). The land cover map of the SEE region (figure 3.3) shows that the percentage of the forested area is 30–60 per cent of the total area. Since most of the population lives either near the coastal areas or in the main cities, these forested areas are relatively wild and the density of population is in general quite



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low. The SEE region is rich in terms of flora and fauna. Thanks to the large variety of ecosystems, the former Yugoslavia was one of six European centers of biological diversity, and is home to 39 per cent of Europe's vascular plant species, 51 per cent of fish, 74 per cent of birds, and 68 per cent of mammals. The SEE countries' biodiversity is further enhanced by endemic and relic species and ecosystems, which are only found in this region, giving them global significance (World Bank, 2003).

According to recent biodiversity assessments (Minkova, 2006), Albania has 27 species endemic to the country and 160 species endemic to South Eastern Europe. The country has a high diversity of ecosystems and habitats, and the rich spectrum of biodiversity includes approximately 756 fauna species. More than four fifths of the forest is classified as semi-natural, with the remaining part divided between natural forest and plantations. Productive forests are 82 per cent of the total, and remaining 18 per cent is protected. Forest plantations are mainly broadleaved and 10 per cent of the forests is old-growth, temperate forest, which has almost disappeared in the rest of Europe and needs to be protected from climate change effects.

Croatia also has a great diversity of ecological systems and habitats – wetlands, mountains, Mediterranean forests, karstic areas, coastal lands, islands, sea, arable land and grasslands. Out of the total number of forest species, there are about 260 endemic timber species, 60 of which are interesting from different economic points of view (AA.VV., 2001).

The forest estate in Croatia falls into two categories – the more productive continental forests in the north, and the Mediterranean forests in the south, where mainly rather unproductive ecosystems of oaks and pines predominate. In the country as a whole,

broadleaved species make up more than four fifths of the growing stock volume. Croatian forests provide about 80 per cent of the wood processed in Croatia (FAO website). Clear-cutting is prohibited by the Croatian Forest Act and the natural regeneration of forests is the fundamental approach (AAVV, 2001).

Macedonian natural biodiversity – with 18,000 taxa of flora, fauna and fungi, of which over 900 are endemic – is considered to be among the most diverse in Europe, being especially important in terms of global biodiversity due to its high level of endemism and relicts (AA.VV., 2010). This high biodiversity is due to the great diversity on geology, soil, varying climatic influences and the varying altitude (AA.VV., 2010; Minkova, 2006).

Species diversity in Bosnia and Herzegovina is one of the highest of the European countries due to the presence of heterogeneous habitats developed under the conditions of Mediterranean, mountainous sub-Mediterranean and continental climates. It is estimated that 30 per cent of the total endemic flora of the Balkans is contained within the flora of Bosnia and Herzegovina. According to the World Resources Institute, most taxonomic groups have few threatened species, with the exception of fishes, for which 25 of the 77 species are threatened.¹⁶

Montenegro, too, has diverse ecosystems with rich flora and fauna. With approximately 3,250 plant species, the country is viewed as one of the floristically most diverse regions of the Balkan Peninsula (Pavlović et. al, 2010). One of the most forested countries in Europe, Montenegro has various belts of forest vegetation including evergreen Mediterranean, sub-Mediterranean thermophilous deciduous forests, mountain oak forests, mountain mesophilic beech forests and coniferous forests. Forests are mainly owned by the state, and 81 per cent of this resource is used for commercial purposes.

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Forests are one of the prime natural resources of Serbia, and wood products are important both in terms of traditional cultural values and income sources.

Kosovo*, despite its relatively small area, has a rich ecosystem and thirteen local endemic plant species concentrated along the border of Albania and the former Yugoslav Republic of Macedonia at Sar planina. This mountainous area is linked with Prokletije, Durmitor and the coastal Dinara mountains and represents the Balkan centre of endemic biodiversity.

Kosovo's* plant diversity is the result of complex interactions of physical factors creating a wide variety of habitat conditions for plant growth, and is further enriched by the presence of species driven south during ice-age periods. More than 60 per cent of the forests are publicly owned. The high demand for wood in the aftermath of the conflict is putting increasing pressure on the long-term sustainability of Kosovar forests and ecosystems. The wood is mainly used for heating and construction. The risk of erosion in the Kosovo* mountainous areas is also high. Forests fires destroyed 3,263 ha in 2000. The soil is fertile on the plains, but is extremely degraded in the municipalities of Pristina, Kosovska Mitrovica, Obiliq, Polje and Glogovac by open coal pits, disposal of soot, slag, barren soil, heavy metals and the discharge of waste waters (REC, 2000).

Land degradation and karstic phenomena are two common problems in SEE. Desertification is becoming more and more urgent, mainly because of increasing aridity, partially due to climate change (KertCsz, 1999). Karstic phenomena – the chemical weathering of rock by the action of water – are common in the Dinaric Arc region, where water erosion transforms carbonate bedrock and creates surface and underground features that host unique habitats. Some areas in Croatia suffer from both water and wind erosion. In addition, the soil quality in the SEE region is not particularly good, and in Croatia the soil is polluted by heavy metals, pesticides and petrochemicals. The former Yugoslav Republic of Macedonia has similar problems. The main causes are bad management of urban and industrial waste, mining activities and war legacies. Another relevant cause of land degradation is the abandonment of the agricultural areas and the lack of maintenance of terraces in mountain areas.

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→ IMPACTS OF CLIMATE CHANGE ON NATURAL RESOURCES

Climate change has strong impacts on natural resources and on mountain areas, where more frequent extreme weather conditions and events are worsening the already sensitive situation. This section discusses the impacts on biodiversity, forestry and soils.

• BIODIVERSITY

The preservation of ecosystems and natural resources generally entails national plans and policies as well transboundary agreements and international plans. Montenegro adopted a sustainable development plan that starts with an analysis of the current situation and then defines the key issues for further development and actions from the social, environmental and economic perspectives. Bosnia and Herzegovina prepared a report on biodiversity targets starting with a screening analysis of the current biodiversity and the definitions of main critical issues, and then defining the key areas for the protection of biological diversity – promoting sustainable use, addressing the threats to biological diversity and maintaining the goods and services of biological diversity as a basis for human well-being.

Climate change primarily affects biodiversity through the modification of background conditions – average temperature, water availability and new environmental stresses. Flora and fauna need to adapt to the new conditions so that the ecosystem structure can change. In addition, climate change can enable new species to colonize an area and can cause others to disappear. The ecosystem itself can also migrate or disappear. Finally, the migration of flora and fauna increases the problems of colonization by alien species with negative effects on local biodiversity as well as on agriculture and plant diseases.

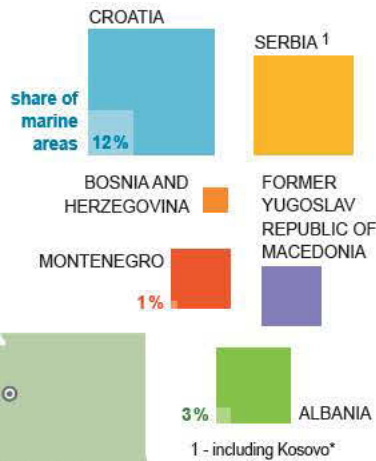
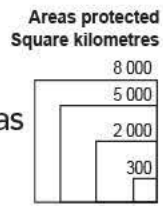
Biodiversity protection entails the identification of protected areas and the establishment of a network of natural areas that allows the movement of animal and vegetal species according to their natural equilibrium. Natura 2000 and the Emerald network¹⁷ are good examples of these networks. The SEE area already has many protected areas and transboundary parks; map below shows the proposed areas of special conservation interest identified in the Emerald process.

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¹⁷ The Emerald network initiated under the Bern Convention on the Conservation of European Wildlife and Natural Habitats, aims to extend a common approach to the designation and management of protected areas, equivalent to Natura 2000, to non-EU countries in Europe and northern Africa (Council of Europe, 1999) (EU, 2007).

West Balkans protected areas

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Designated sites



The creation of the Emerald Network was followed by training workshops on the identification of habitat and species per biogeographic region, the development of distribution maps of selected species and habitats in a geographic information system including digital boundaries for areas of special conservation interest and a final report on project activities and results.

BOX 1:

SCUTARI LAKE - A TRANSBOUNDARY PARK

Lake Skadar, also called Lake Scutari and Lake Shkodër, is on the Montenegro–Albania border, and is the largest lake on the Balkan Peninsula. It is named after the city of Shkodra in northern Albania.

This transboundary lake – one of the largest bird reserves in Europe and included in the Ramsar Convention list of wetlands of international importance – provides habitat for 270 bird species, among which are seagulls, herons and some of the last pelicans in Europe. There are many fish species, especially carp, bleak and eel. The Albanian part is a managed nature reserve. The Montenegrin part has been a national park since 1983. Its surface can vary from 370 km² to 530 km². The lake is a cryptodepression, filled by the river Morača and drained into the Adriatic by the 41 km-long Bojana, which forms the international border on the lower half of its length. There are additionally some fresh water sources at the lake bottom. Some small islands such as Beška, with two churches on it, and Grmožur, a former fortress and prison, can be found on the south-west side of the lake.

PRESPA LAKES

These two lakes are shared by Greece, Albania and Macedonia. Of the total surface area, 190 km² belongs to Macedonia, 84.8 km² to Greece and 38.8 km² to Albania. The area has been protected since 2000. The two lakes are the highest tectonic lakes in the Balkans, standing at an altitude of 853 m. This may be the first instance of an SEE transboundary area protected according to the European Union rules. This initiative is an application of the EU Framework Directive on Water.

• FORESTRY

The higher temperatures combined with more frequent and intense droughts associated with climate change will increase the risk of forest fires, and South Eastern Europe is already experiencing more fires over larger areas – more than 38,000 fires that burned more than 450,000 hectares between 1988 and 2004 in Albania, Croatia, the former Yugoslav Republic of Macedonia and Serbia and Montenegro. No reliable data are available to estimate the economic losses, but the environmental damage includes loss of habitat, soil erosion and greenhouse gas emissions.

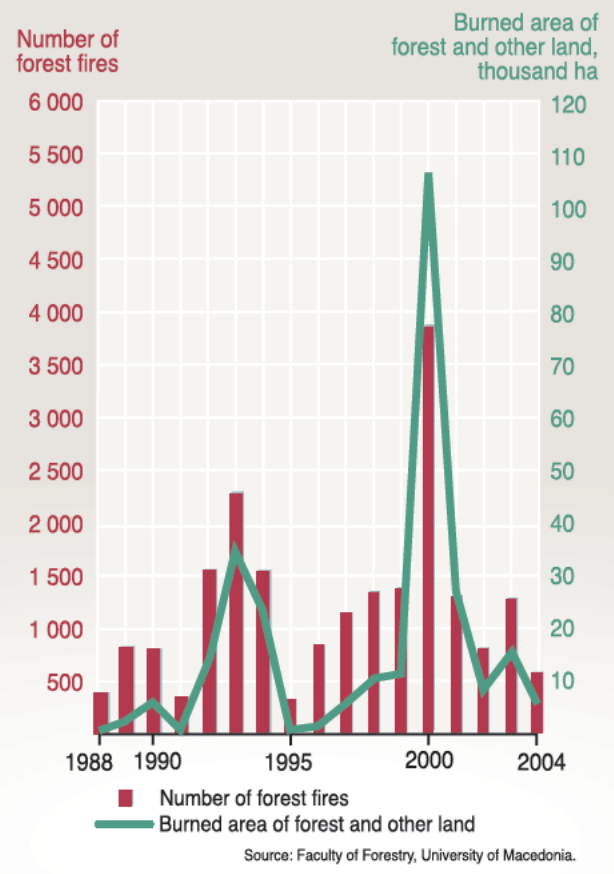
Forestry is an important economic sector in the SEE region, where the use of wood as fuel is common and policies aimed at preserving the resource in the long term are weak. In Albania the structure of the high altitude forests has been completely modified by the intensive harvesting – over the last 40 years illegal cutting was 2–3 times the annual cutting allowance (Minkova, 2006).

In Kosovo*, illegal wood harvesting is an acute problem connected with energy availability and poverty: during the winter the population heavily relies on burning wood for heat. The annual allowable cut was initially estimated by the Kosovo* Forest Agency at 70,000 m³ from coppice forests (Gashi, 2010). Forest lands covers about half of Kosovo* and half of these lands is owned by the State.

In 1996, some 3,129 fires destroyed 29,000 hectares of woodland in Croatia. Over the past 20 years almost 7 per cent of Croatia’s forest lands (or 2.5 per cent of its total area) has been destroyed by fire. In 2000, 300 fires occurred in Serbia damaging 4,000 hectares of forest (Minkova, 2006).

Montenegro has no reliable assessment of the current state of its forests nor a monitoring or control system. The country also suffers from illegal cutting and from fires: in the last 15 years, more than 1,000 large forest fires were recorded in Montenegro, and an area of about 15,300 ha was burned and approximately 500,000 m³ of timber damaged or destroyed (Pavlović et. al, 2010).

Figure 11: Forest fires in Albania, Macedonia, Montenegro, Serbia and Bulgaria



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• SOIL DEGRADATION

One of the consequences of higher temperatures and more frequent and intense droughts resulting from climate change is an increase in desertification in arid and mountain areas. Changes in temperature and precipitation affect the equilibrium of the soil, and cause the loss of normal soil functions. After a period without precipitation, for example, the soil is not able to absorb rainfall, and excessive runoff, landslips and floods become more frequent and dangerous.

Croatia and Albania already suffer from desertification. In Albania, erosion affects 25 per cent of the country. The most critical areas are Shkodra, Tropoja, Saranda and Gjirokastra. The situation is even more critical in Croatia where 90 per cent of the soil surface is exposed to water and wind erosion. Large amounts of sediment enter the delta and are deposited along the Neretva River bank (Minkova, 2006). In Serbia and Montenegro, the excessive cutting of trees in mountainous areas is one of the causes of the increased erosion and flooding, in particular in the Tara and Lim basins (Minkova, 2006).

Although the SEE area is characterized by a mountainous landscape and abundant forest coverage, there are areas where desertification is a concrete environmental issue. Moreover, the risk of fire and the overexploitation of resources can expose new areas to desertification. Limited budgets for protection only make the problem more difficult to address effectively. Over time, the degradation of the land may lead to land abandonment and loss of livelihoods with attendant consequences for social and economic equilibrium.

3.3 CLIMATE CHANGE AND ENERGY

→ OVERVIEW

According to a forthcoming Zoī Environment Network report, “Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels, and other forms of energy received as input to a system. Primary energy can be non-renewable or renewable.” Primary energy consumption by fuel in the SEE region is mainly coal, lignite and oil.

Final energy is a form of energy available to the user following the conversion from primary energy. A country always has higher primary energy consumption than final energy consumption; the

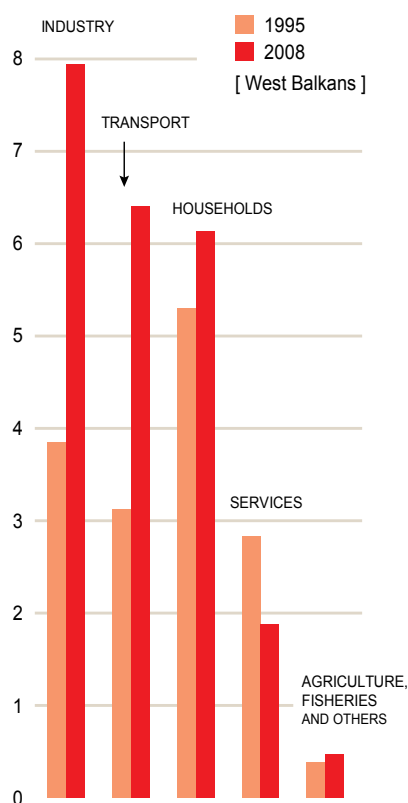
difference between the two represents the losses in the energy system. Figure 12 shows the shift in final energy consumption by sector in the region from 1995 to 2008.

Nearly half of the energy consumed by private households in the region comes in the form of electricity, which is widely used for space heating and hot water (EEA, 2007b).

The countries of South Eastern Europe are neither big energy producers nor consumers (EIA, 2011), and the region may be able to rely on renewable energy to satisfy future energy needs and growing energy demand (UNEP/GRID-Arendal, 2007). If the gap between production and consumption of conventional fuels becomes wider, however, the SEE countries will have to consider all the possible alternative energy sources, including renewable sources that might make an important contribution to regional energy supply and security (OECD/IEA, 2008).

Figure 12:
Energy consumption shift

Final energy consumption by sector
Million tonnes of oil equivalent

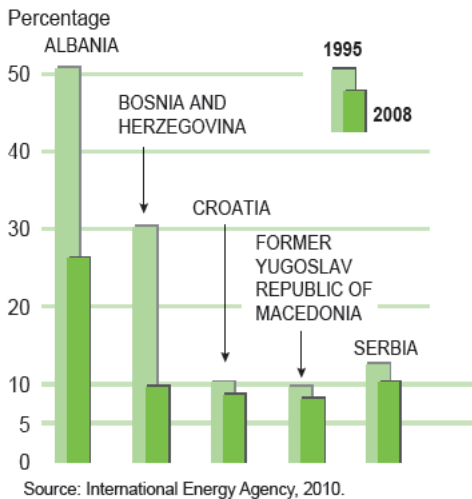


Source: International Energy Agency, 2010.

In the SEE region, hydropower and biomass already account for significant, but declining, shares of the electricity mix and household heating needs. Figure 13 shows the trends in the share of renewable energy by country from 1995 to 2008.

Figure 13: Share of renewable energy in primary energy consumption

West Balkan countries



Despite the increasing attention on renewable energy sources, the current patterns of energy use in the region still produce significant environmental impacts, which are mainly associated with high carbon intensity.

Figure 14: Energy consumption by sector

Share of each sector in total final energy consumption in 2008

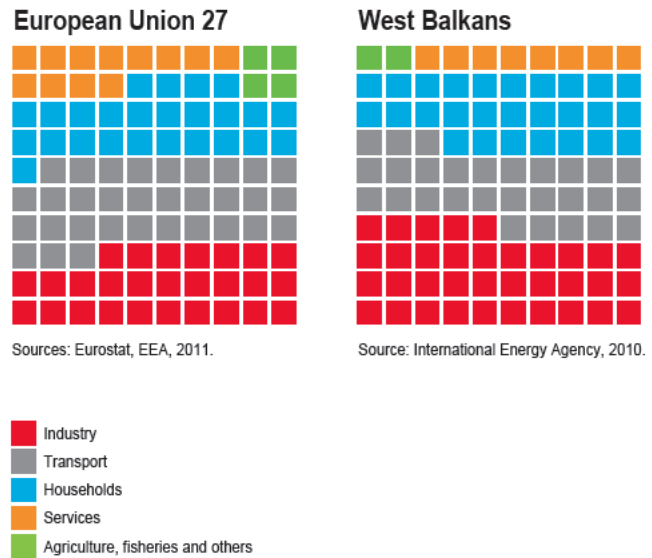
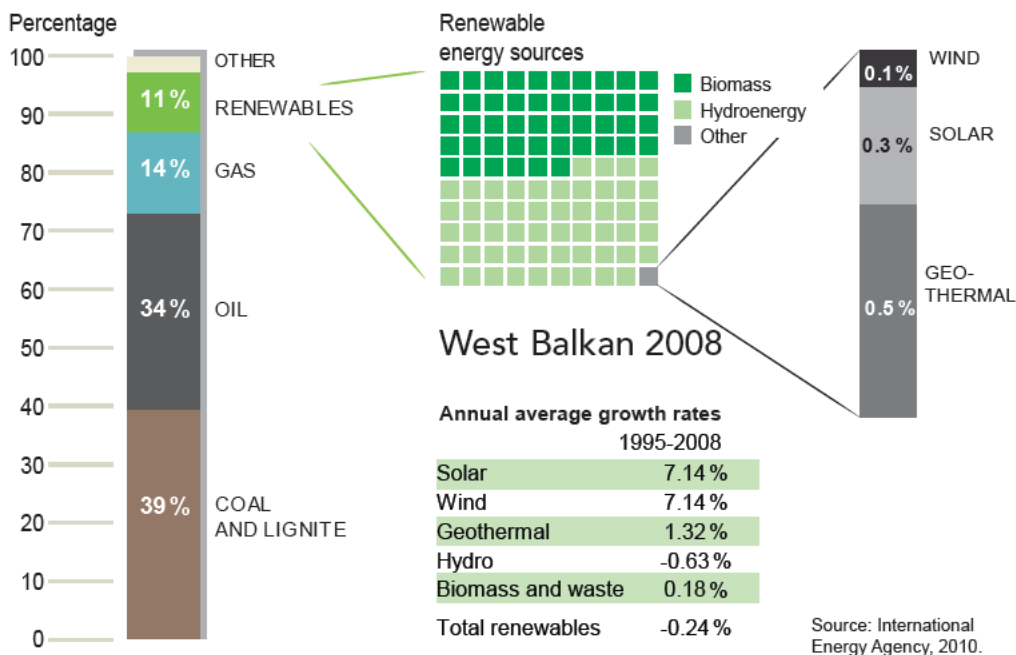


Figure 15: Energy consumption by fuel




→ IMPACTS OF CLIMATE CHANGE ON THE ENERGY SECTOR

Temperature rise across the region will lead to changes in the level and timing of peak demand, resulting in a flattening of the electricity consumption profile across the year, as demand for cooling energy rises and heat energy declines. This can be translated into some economic impacts such as lower heating costs and higher cooling costs. If countries experience hotter summers and warmer winters, the energy demand will decrease in winter for heating and increase in summer for cooling. All those changes in energy demand must be taken into account in order to plan adequate strategies for energy production and management, together with the associated need for more energy efficient buildings.

Electricity systems such as those in South Eastern Europe may strain to meet heavier demands for air conditioning, particularly if they rely on hydropower, which could be simultaneously affected by accelerated evaporation and drought and changes in the timing and volume of flow to storage systems (World Bank, 2009). Decreased precipitation can significantly reduce river flows, even though in the near term such reductions may be balanced by glacial melt in the mountain regions. This melting will potentially

increase stream flow in the initial phase, but the final result would be a general decline over time affecting hydropower potential (Alcamo et al., 2007). In addition to seasonal water availability, changing environmental conditions will affect generation efficiency and reservoir management, and especially affect already water-scarce areas. More frequent extreme events, such as flooding, would also threaten all types of energy infrastructure, with an associated increase of maintenance costs. Extreme events and increased flooding might also damage biomass production, with strong impacts especially in the regions that are actually more favorable for the application of those techniques.

The operation of nuclear power production will also be affected by water availability problems and temperature concerns due to the high dependence of those power plants for cooling water. Lower levels in lakes and rivers, reduced runoff, accelerated evaporation and warmer water could deplete water for cooling or cause restrictions on cooling water intake or discharge, constraining facilities' generation capacity (World Bank, 2009).



Climate change can potentially impact power transmission network functions, reduce efficiency or alter structural integrity, especially for older and poorly maintained facilities. Transmission capacity, already constrained in parts of SEE (World Bank, 2009), may be altered by climate change, and hampered by poor management practices, especially during summer peak demand. All the highlighted stresses could have severe impacts on the human population and result in interrupted and more expensive electricity generation.

BOX 2:

SOLAR CELLS FOR ELECTRIC BICYCLES IN PODGORICA, MONTENEGRO

On 16 September 2010, the Office for Sustainable Development of Montenegro opened solar cells for electric bicycles in front of the old government building. This initiative is supported by GIZ, a German organization that promotes international cooperation for sustainable development. The aim of this project is to promote bicycles as solar-powered vehicles that do not pollute the environment.

3.4 CLIMATE CHANGE AND KEY ECONOMIC SECTORS IN THE REGION

Climate change generally makes an already sensitive environmental situation worse. This section discusses some relevant climate change impacts related to key economic sectors in the region.

→ AGRICULTURE

Agriculture has a significant role in the sensitivity of South Eastern Europe to climate change. Almost half of the land in the region is used for agriculture – 19 per cent in pastures and 29 per cent in arable land and permanent crops. Estimates of agricultural employment vary, as do survey definitions, but between 18 per cent and 58 per cent of the working population is engaged in agriculture, and the sector is an important employer in the region, maybe the most important employer. Agriculture, on average, contributes 17 per cent to the region's GDP. Croatia's 6.0 per cent agricultural share of GDP, the lowest in the region, is still significantly higher than the EU average of 1.6 per cent.

Albanian agriculture is one of the country's largest and most important sectors, and contributes significantly to agricultural biodiversity with nine local breeds of goats and five breeds of sheep (Minkova, 2006). Agricultural land in Croatia is nearly 60 per cent of the total country land area. Every third household in Croatia owns agricultural property, but usually the propriety is in small, fragmented lots with modest production potential. Croatian soils – formed on high silicate rocks or on lime or dolomite – support small-scale private cattle-breeding farms, and a narrow range of arable crops, extensively planted with few chemicals and mineral fertilizers (Volk, 2011).

In Kosovo* about half of the land area is devoted to forestry and half to agriculture, which supports 60 per cent of the population. The main products are corn, wheat and barley. Inadequate irrigation systems limit agricultural production. The technology is usually obsolete and inefficient and the advisory services are not adequate. Regional conflicts left over half of the agricultural equipment lost or in need of repair (REC, 2000). Only 0.65 per cent of the total land area devoted to agriculture in Bosnia and Herzegovina is irrigated. Fertile lowlands cover 16 per cent of

agricultural land in this country, while 62 per cent is less fertile hilly and mountainous areas, and the Mediterranean area accounts for 22 per cent. Erosion and flooding of farmlands endanger harvests and the sustainable use of soil.

As a mainly mountainous country, Montenegro has only a small part of its land devoted to agriculture and pasture. Urbanization and industrialization have infringed on farmland, and there has also been an expansion of pastures and meadows with no regard to the erosion and degradation of the soil. Small farms (less than 5 ha) dominate, and while they cannot compete with intensive production, they do have opportunities for diversified production and low levels of mineral fertilizer and pesticide applications, and the possibility to develop organic production.

Serbia is well suited for intensive agricultural production, which is one of the key sectors in the national economy. More than 10 per cent of Serbian people is employed directly or indirectly in this sector (Stefanovic et al., 2010). Half of the land area is devoted to agriculture, but the practices are so intensive that a major part of the land is classified as degraded, and the rate of soil erosion is three to four times the natural level. Serbia is the only net exporter of agricultural and food products in the SEE area, while in other countries price competitiveness is limited to crop products such as cereals and industrial crops, tobacco, some fruits, vegetables and wine.

Traditionally, agriculture has been one of the most important sectors in the Macedonian economy. In the past this sector has shown an important flexibility and has contributed significantly to social and economic stability. From the beginning of the 1990s many industrial facilities were closed down. This resulted in increased labour availability in the agricultural sector, from both the rural and urban population (Volk, 2011).

The climate change impacts on the agriculture sector of the region are likely to be significant – disruptions of the precipitation regime, an increase in temperatures and a higher risk of drought and extreme weather events are among the effects with implications for agricultural production and stability. Disease incidence and pest infestations are also likely to increase.

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→ INDUSTRY AND MINING

Economic development is a key issue in SEE countries, and since the 1990s new realities and new needs have influenced industry and development in the region. The industrial sector is often insensitive to the environment, and the region has many old industrial facilities, a low energy and raw material efficiency, a weak technological level and a high production of waste.

A recent European Environment Agency report makes the following observations:

- Improving environmental performance is usually not considered a priority by companies' management, and general awareness about environmental issues remains fairly low. There are few examples of corporate social responsibility initiatives in the region. In addition, there is little pressure from consumers and public opinion.
- Investment in environmentally sound technologies is generally limited to large and export oriented companies.
- Many categories of environmentally sound technologies have not yet been tested in the SEE region, and are
- For some export-oriented industrial companies, improved environmental management is a necessity for entering or maintaining their share of foreign markets. In countries more advanced in transition, there is already an increasing demand from industrial companies for services related to environmental management systems (ISO 14001) to meet environmental requirements in export and supply chains (EEA, 2007).

Mining, in particular with regard to the extraction of precious metals, is another important economic sector in SEE countries. The major mined metals include: aluminum, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel and zinc. Relevant precious metals are gold, palladium and platinum. Industrial minerals, represented by a broad range of carbonate and silicate rocks, gravels, and sands as well as clays and volcanic materials are also important. Mineral fuels extracted in the region include coal (lignite), natural gas and petroleum (UNEP, 2010). Prior to the 1990s, the region was the major European source of copper, lead and zinc, and Albania was the third largest producer of chromate.

The environmental issues and concerns related to mining are common in the SEE region. Badly operated or abandoned mining sites have already caused severe pollution in SEE countries, some with impacts reaching across national boundaries – heavy metal spills from Sasa tailings in the former Yugoslav Republic of Macedonia; various releases at Majdanpek and Veliki Majdan in Serbia and at Mojkovac in Montenegro (UNEP, 2010). There are many abandoned mining sites that are causing health problems. High remediation costs, lack of expertise and poor public policies make mining one of the priorities to be tackled by SEE environmental policies. The map below shows the distribution of hazardous sites, water pollution and mining hot spots in the region.



The more frequent and intense storms related to climate change, combined with the mining legacy in the region raise the spectre of a flood resulting in an environmental catastrophe, possibly one with international implications. Mine tailings – the waste material remaining after metal and mineral extraction – contain complex compounds and residual chemicals used in the extraction process, and are held indefinitely in tailings management facilities. The volume and contamination level of waste in these facilities can be high, and maintaining reliable storage and management of the tailings is a challenge under any circumstances.

Unfortunately, many tailings management facilities in South Eastern Europe are abandoned, neglected or orphaned. Without routine monitoring and maintenance these facilities deteriorate and become vulnerable to failure and the consequent release of toxic contamination. The main exposure pathways for such releases are rivers, and the combination of river flooding and tailings management facility failure poses a major threat in the region. Such an event within a country would be bad enough, but when the river crosses international borders and the event involves more than one country, the potential for conflict between the affected countries rises.

BOX 3: MINING

VARES – REUSE OF SMREKA MINE PIT

Vares is a mountain town in the centre of Bosnia and Herzegovina with a population of over 10,000 inhabitants. It is famous for production of iron, lead and zinc. A large pit at the mining site has been converted into an artificial lake used in summer for recreation. The area is also used for agricultural purposes such as stock-raising and fish farming.

JALOVISTE MOJKOVAC, MONTENEGRO

The Brskovo lead and zinc mine operated from 1976 to 1991, and left a vast amount of mine tailings. In an effort to contain the tailings, the United Nations Development Programme supported a project to build a tailing mine impoundment facility. In addition to the physical construction, the project included elements of capacity-building for local and national stakeholders in the area of effective environmental management.

The facility occupies an area of 19 ha and contains approximately 2 million m³ of disposed materials. It was designed and constructed in three stages of increasing elevation, finishing at an elevation of 807.5 m. Its construction followed a principle of complete isolation from the Tara River. An embankment dam built using gravel from the riverbed stretches 1130 m, with an average height of 12.5 m, and retains high waters of the river. The dam slope and impoundment facility are constructed to prevent migration of impounded masses into the groundwater and the Tara River.

→ **TRANSPORT**

Climate change, transport and air quality interact in several ways. Transport emissions contribute to air pollution and the greenhouse gases that cause climate change, and the effects of climate change – higher temperatures, in particular – exacerbate the human health responses to air pollution. An efficient transport sector would reduce the emissions of GHGs and lessen the health effects of air pollution, but while the transport system in South Eastern Europe has improved in recent years, the standards are generally low, and in the region's large, rapidly growing cities, traffic is one of the main causes of poor air quality.

Among the problems contributing to the transport sector's inefficiencies are ageing vehicles, poor vehicle maintenance, variable fuel quality, the poor condition of many of the roads and frequent traffic congestion. The use of leaded fuel has been reduced, but it is not yet banned in the former Yugoslav Republic of Macedonia, Bosnia and Herzegovina, Serbia or Montenegro. Public transport within and between cities is inadequate. In addition, passenger transport demand has grown steadily in recent years, and freight transport demand almost doubled between 2001 and 2006.

Box 4: Transport**Biking in Belgrade**

Sustainable transport in cities provides for biking, car sharing and car pooling, and biking in Belgrade is a good example of the potential for progress in this area. The structure of the city is conducive to biking – it is possible to ride a bike practically everywhere. At present, bicycles carry less than 2 per cent of the traffic in Belgrade, but as part of a master plan for urban development, the city has embarked on a programme to build more bicycle paths. The initial priority is new paths for recreational biking, and the long-term target is to achieve a modal share of 10 per cent (EEA, 2007).

West Balkan major freight corridors

- Motorway (doubled by railway)
- Railway for which no motorway alternative exists
- Pan European corridors
- Merchandise port of importance for the Balkan freight traffic



→ TOURISM

Tourism is mostly concentrated in coastal areas and in historical cities, and is one of the largest and fastest growing economic sectors in the region (EEA, 2007). Mountain tourism includes both winter and summer activities. All the SEE countries have at least one ski resort, and promote other winter activities as well. In warmer weather, mountain tourism emphasizes natural heritage, national parks and local culture and features. In addition to the usual coastal and marine tourism activities, the region offers hiking, walking, horseback riding, cycling, balloon rides, hunting and fishing.

The most dramatic effect of climate change on tourism is the prospect that sea level rise could eventually inundate coastal areas. Disruptions in the precipitation regime and rising temperatures may have less dramatic if more immediate consequences affecting the length and quality of tourism seasons. Indirect effects are equally significant: environmental conditions are critical to tourism, and several climate-induced environmental changes will have profound effects – biodiversity loss, diminished landscapes, increased natural hazards and an increase in vector-borne diseases, to name a few.

BOX 5:**PERAST: CAR-FREE VILLAGE**

Perast, Montenegro, is the first marine village in the Mediterranean region offering a climate-neutral mobility system, which was developed with the cooperation of the Italian Ministry for the Environment, Land and Sea.

The basic principle is to limit the use of private cars in the town. Only residents and those with temporary permits can drive, and all others may visit Perast on foot or using environmentally friendly vehicles. Bikes are available for touring the village and its breathtaking waterfront. The car restrictions are intended to increase the attractiveness of Perast, and to create a sustainable system that includes the reorganization of the parking system. The energy needed for the Perast vehicles will be produced by a dedicated photovoltaic power plant.



Political and Legislative Responses to Adaptation Challenges

4.1 THE INTERNATIONAL LEVEL

The analysis of the main impacts of climate change provided in the previous chapters shows that the growing attention given to adaptation, both at international and European policy levels is well justified. Adaptation to climate change, in fact, poses important challenges not only with regard to the design of feasible and suitable scientific responses to the impacts of climate change, but also with respect to policy, governance and management. The most important international programmes for adaptation include the Hyogo Framework for Action, the Nairobi Work Programme and the Cancun Adaptation Framework.

The Hyogo Framework for Action (HFA) was adopted by the Member States of the United Nations at the World Conference on Disaster Reduction in 2005 as a “10-year plan to make the world safer from natural hazards”.¹⁸ It was created as an instrument to implement disaster risk reduction and build nations’ and communities’ resilience to disasters by achieving effective reduction of disaster losses in lives and in social, economic and environmental assets. The plan is structured around the following five priorities for action: ensuring that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; identifying, assessing and monitoring disaster risks and enhancing early warning; using knowledge, innovation and education to build a culture of safety and resilience at all levels; reducing the underlying risk factors; and strengthening disaster preparedness for effective response at all levels.

For each priority, various key activities are listed and, in general, attention is given to collaboration and cooperation among states, international and regional organizations, institutions and civil society. The HFA is linked to the International Strategy for Disaster Reduction framework adopted by the Member States of the United Nations in 2000 to achieve substantive reduction of disaster losses and to build resilient communities and nations, as an essential condition for sustainable development.¹⁹ The secretariat of the International Strategy for Disaster Reduction serves as the focal point for the implementation of the HFA.

In 2005 the Nairobi Work Programme (NWP)²⁰ was launched under the umbrella of the UNFCCC and its Subsidiary Body for Scientific and Technological Advice of the Convention (SBSTA) to support all Parties, especially developing countries (including the least developed countries and small island developing states), to improve their understanding of vulnerability and adaptation to climate change and to take informed decisions on practical adaptation measures based on a sound scientific, technical and socio-economic rationales.

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¹⁸ Hyogo Framework for Action, <http://www.unisdr.org/eng/hfa/hfa.htm>. For further info on the Hyogo Framework see International Strategy for Disaster Reduction (ISDR), The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to disasters at http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf.

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¹⁹ International Strategy for Disaster Reduction, <http://www.unisdr.org/#>.

²⁰ Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change, http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php. In December 2006, at SBSTA 25 in Nairobi, Parties adopted conclusions relating to the “Five-year programme of work on impacts, vulnerability and adaptation to climate change”. COP 12 renamed the five-year programme of work to the “Nairobi work programme on impacts, vulnerability and adaptation to climate change”.

The NWP is structured around the following nine areas of work: methods and tools; data and observations; climate modelling, scenarios and downscaling; climate-related risks and extreme events; socio-economic information; adaptation planning and practices; research; technologies for adaptation; and economic diversification. Each of these work areas has a timetable for actions and deliverables. The NWP stresses the roles of stakeholders – Parties, intergovernmental and non-governmental organizations, the private sector, communities and others. After the second phase of the NWP, in December 2010, the SBSTA noted that progress had been made towards meeting the objectives, especially in advancing knowledge of adaptation and in catalysing action, but that additional effort was needed to assist the Parties in improving their understanding and assessment of impacts, vulnerability and adaptation and in taking informed decisions on the implementation of practical adaptation actions and measures.

Adaptation has been recognized, together with mitigation, technology, finance and a shared vision, as one of the five key issues in the framework of the UNFCCC negotiations after 2012. The Copenhagen Accord stressed the need for enhanced action on adaptation to reduce vulnerability and build resilience

in the most vulnerable developing countries, providing for developed countries' financial commitment to address both adaptation and mitigation. This is to be funded by US\$ 30 billion for 2010–2012 and long-term finance of US\$ 100 billion annually by 2020. The 2010 Cancun Adaptation Framework²¹ clearly affirms that adaptation must be addressed with the same level of priority as mitigation.

The Cancun Adaptation Framework identifies five clusters: implementation, support, institutions, principles and stakeholder engagement. An adaptation committee at the global level is to promote the implementation of enhanced, coherent action on adaptation, together with the strengthening or the establishment of institutions such as regional centres and networks, in particular in developing countries. The guiding principles, besides a general accordance with the UNFCCC, include basing decisions on the best available science and, as appropriate, on traditional and indigenous knowledge and following a country-driven, gender-sensitive, participatory and fully transparent approach, especially taking into consideration vulnerable groups, communities and ecosystems. Finally, the Framework recognizes the importance of engaging a broad range of stakeholders at the global, regional, national and local levels.

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 21 Cancun Adaptation Framework, paras 11-35 Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention, 2011.

4.2 THE EUROPEAN LEVEL

The European Commission has explicitly recognized that a more strategic approach is needed to ensure that timely and effective adaptation measures are taken to promote coherence across different sectors and levels of governance.²²

At the EU level, the first European Climate Change Programme aimed at identifying the most cost-effective policies and measures to cut GHGs emissions. The second Programme, launched in 2005, addressed the adaptation issue through the creation of a dedicated working group consisting of the following subgroups: Building national strategies for adaptation (country reports); Impacts on water cycle and water resources management and prediction of extreme events; Agriculture and forestry; Biodiversity; Human health; Regional planning, built environment, public and energy infrastructure, Structural funds; Marine resources and coastal zones and tourism; Urban planning and construction; Role of insurance industry; and Development cooperation. The general objective of the working group is to define the EU role in adaptation policies in order to fully integrate adaptation into relevant European policy areas, to identify good and cost-effective practice in the development of adaptation policy and to foster learning.²³

In 2004, the EU Council of Ministries adopted the European Union Action Plan on Climate Change in the Context of Development Cooperation, which lists support for adaptation as one of its strategic objectives. The Action Plan includes measures aimed at sustaining partner countries in three strategic areas – drafting of vulnerability assessments and national adaptation programmes of action for least developed

countries; developing guidelines for integrating climate change into development programmes; and supporting capacity-building in developing country institutions to prepare for (and reduce the) impact of climate change-related disasters.²⁴

To address the adaptation challenge, the European Union, on the basis of the consultation launched in 2007 by the Green Paper on Adapting to Climate Change in Europe,²⁵ issued in 2009 a White Paper on Adaptation.²⁶ This White Paper designs a two-phase framework for adaptation measures and policies to improve Europe's resilience to climate change. The framework is based on four approaches: improving the knowledge base on climate change impacts, vulnerabilities, costs and options for adaptation measures; integrating climate change impacts into all key European Union policies; financing climate change policy measures; and supporting wider international efforts on adaptation by helping non-European countries to improve their resilience and capacity to adapt to climate change, stressing the importance of European Union external cooperation.

The White Paper highlights the role of the Global Climate Change Alliance,²⁷ through which the EU provides resources to address climate change in less developed countries. The Global Climate Change Alliance, started in 2007, is aimed at deepening the policy dialogue between European and developing countries, in particular least developed countries and small island developing states, as well as providing financial and technical assistance for both mitigation and adaptation measures and for the integration of climate change into development strategies.

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22 White Paper on Adaptation, cit.

23 ECCP II - WG 2: Impacts And Adaptation, Mandate, http://circa.europa.eu/Public/irc/env/eccp_2/library?l=/impacts_adaptation&vm=detailed&sb=Title.

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24 EU action against climate change - Working with developing countries to tackle climate change, European Commission, 2006.

25 The Green Paper devotes one section to the integration of adaptation into EU external actions, dealing specifically with adaptation measures in developing countries.

26 White Paper - Adapting to climate change: Towards a European framework for action, COM(2009)147 final.

27 Global Climate Alliance, http://www.gcca.eu/pages/14_2-Background-and-Objectives.html.

Adaptation is one of its priority areas and related actions include the establishment of national plans based on in-depth research on the likely effects of climate change, reliable climate observation as well as the development and implementation of adaptation strategies. Moreover, in the White Paper, the EU affirms its intention to set up an Impact and Adaptation Steering Group, supported by a number of technical groups and composed by representatives from EU Member States involved in the formulation of national and regional adaptation programmes, and a Clearing House on climate change impacts, vulnerability and adaptation as a Web-based platform for the exchange of information across Europe. Such a mechanism should play an important role in creating a common and shared knowledge basis, thus easing national, regional and local assessments of the impacts of climate change throughout Europe. Table 3 provides an overview of the main tasks assigned to the Clearing House.

Table 3: The Clearing House Mechanism on climate change

CLIMATE CHANGE OBSERVATIONS AND SCENARIOS	IMPACTS AND VULNERABILITY	ADAPTATION PLANS AND STRATEGIES	ADAPTATION MEASURES, ACTIONS
<ul style="list-style-type: none"> • GMES – Essential climate variables • Link with GFCS + regional / national centers • Land-use, water, socio-economic observations, statistics and scenarios 	<p><i>Integration information on climate, land-use, water, ecosystems, socio-economic variables</i></p> <ul style="list-style-type: none"> • Exposure to impacts, sensitivity and adaptive capacity • Detailed geographical and sectoral perspective • Vulnerability indicators, policy-oriented 	<ul style="list-style-type: none"> • Information on existing adaptation strategies, key institutions and stakeholders • Joint activities between MS and third countries (research, adaptation measures) • Practical tools for the development of adaptation policy 	<p><i>Extended database of measures</i></p> <ul style="list-style-type: none"> • Typology • Assessment of environmental, social economic impacts • Identifying no-regret measures

Source: J. Delsalle, European Commission, DG Environment, Workshop with National Adaptation Knowledge Platforms, Brussels, 2009

In 2009, in the preparatory phase of the Copenhagen Conference, the EU released a communication²⁸ aimed at reaching a comprehensive climate change agreement in Copenhagen addressing both mitigation and adaptation. The communication stressed the need for systematically integrating adaptation into national strategies while improving the tools to define and implement adaptation strategies. The approaches include methodologies and technologies for adaptation and capacity-building, as well as a strengthened role for the UNFCCC process by mobilizing stakeholders and a more coordinated approach to risk management and disaster risk reduction. The related costs, estimated by the UNFCCC at US\$ 23–54 billion per year by 2030 for all the developing countries, could be partially covered by the existing Adaptation Fund. Additional funds will also be needed, and innovative sources of finance will have to be explored.²⁹ To this end, in 2009 the European Council, recognizing the need for a significant increase in public and private financial flows to 2020, declared its willingness to contribute Fast-Start funding of € 2.4 billion annually for 2010–2012.

In the same year, the EU launched the Strategy for Supporting Disaster Risk Reduction in Developing Countries, an effort to contribute to sustainable development and poverty eradication by reducing the burden of disasters on the poor and the most vulnerable countries and population groups by means of improved disaster risk reduction.³⁰ This strategy aims at integrating disaster risk reduction within development cooperation efforts and climate change adaptation, in line with the 2007 Bali Action Plan, which identifies disaster reduction strategies as a means to enhance action on adaptation.

The EU committed itself to support the three following strategic objectives: to sustain developing countries in integrating disaster risk reduction considerations into their development policies; to support developing countries and societies in reducing disaster risk more effectively through targeted action on disaster prevention, mitigation and preparedness; and to integrate disaster risk reduction considerations more effectively into EU development and humanitarian aid policies and programming. In so doing, the EU identified focal areas ranging from ensuring that disaster risk reduction is a national and local priority with a strong institutional basis for implementation to using knowledge, innovation and education in order to build a culture of safety and resilience at all levels. Besides turning to the full range of funding instruments at its disposal, the EU will also explore other ways of mobilizing innovative, additional funding.

The EU also funded, or co-funded, many projects for adaptation, such as the Advancing Capacity to Support Climate Change Adaptation project to create a geographically diverse set of adaptation schemes to address climate risks in developing countries,³¹ the Tropical Forests and Climate Change Adaptation project to help the communities which depend on tropical forests to adapt to climate change³² and the Adaptation and Mitigation Strategies project to improve understanding of the synergies, trade-offs and conflicts between adaptation and mitigation policies.³³ Furthermore, it supports several other bilateral or regional projects to help adaptation and capacity-building efforts by developing countries.

4.3 THE SOUTH EASTERN EUROPE LEVEL

The South Eastern Europe countries have already developed national plans containing specific initiatives on adaptation. The tables below show the main anticipated initiatives by sector for each of the SEE countries.³⁴

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 28 Towards a comprehensive climate change agreement in Copenhagen, COM(2009)39,.

29 For an in-depth analyses of the different funding options, see COM(2009)39.

30 EU Strategy for Supporting Disaster Risk Reduction in Developing Countries, COM(2009)84 final.

.....
 31 Advancing Capacity to Support Climate Change Adaptation project, www.acccaproject.org/accca/.

32 Tropical Forests and Climate Change Adaptation, http://www.cifor.cgiar.org/trofcca/_ref/home/index.htm.

33 Adaptation and Mitigation Strategies project, <http://www.adamproject.eu/>.

34 Please note that it was not possible to obtain an information on the adaptation plan of Kosovo/Territory under UN Administration.

Table 4

ALBANIA

Sector	Measures (Republic of Albania: Ministry of Ministry of Environment)
Water	<ul style="list-style-type: none"> → Modification of existing physical infrastructure → Construction of new infrastructure → Water pollution control → Improvement of the monitoring and forecasting system for flood and drought → Drafting and approval of new legislation for water use → Setting a real water consumption fee → Implementation of the Integrated Coastal Zone Management Plan
Natural Ecosystem	<ul style="list-style-type: none"> → The establishment and maintenance of protected areas (in-situ conservation) → The active management of wild populations outside of protected areas (inter-situ management) → The maintenance of captive populations (ex-situ methods) → Monitoring
Agriculture	<ul style="list-style-type: none"> → Afforestation and the setting up of the barriers to protect the arable land threatened by soil erosion and alteration → Planning of agricultural production toward xerophilic crops to allow adaptation to the higher winter and summer temperatures and to the scarcity of water in summer. → A significant improvement in irrigation sector. → In plant protection from different pests and diseases. → In plant protection from different pests and diseases.
Forestry	<ul style="list-style-type: none"> → Preparation of the Strategy of Sustainable Development of Forest. → Preparation and implementation of the research programs. → Evaluation of the actual situation for each forest type, in relation with climate change and sea level rise. → Increasing of the protected forest area. → Reduction of the illegal cuttings at the maximum extent and studying of the real need for fuelwood. → Increasing of the investments to implement more actions in existing forests and environmental protection areas. → Implementation of actions to increase the existing forest productivity → Increasing of the forest area through the new reforestation. → Study and monitoring of the forest health situation as well as effects of applied measures in forests.
Tourism	<ul style="list-style-type: none"> → The provision of new power supply resources and the rearrangement of the appropriate distribution system. → The construction of new sewage systems for both households and industry, as well as new processing units for all the urban waste. → The rehabilitation of several road segments, and the construction of new roads, compatible with international quality standards, with high embankments so as to handle the rise of the sea level.
Energy	<ul style="list-style-type: none"> → Consider expected change of runoff / water flow rate in integrated resource planning. → Account for the expected change in runoff / water flow rate in the design of hydropower plants. → Invest in energy conservation (Demand site Management) measures for space cooling. → Reduce energy subsidies. → Account for the expected change in runoff/water flow rate in the design of thermal power facilities.

BOSNIA AND HERZEGOVINA

Sector	Measures (Bosnia and Herzegovina: Ministry of Environment and Tourism of Federation of BiH, the Ministry of Physical Planning, Civil Engineering and Ecology of Republic of Srpska)
Water	<ul style="list-style-type: none"> → Inclusion in the coastal zones management programmes → Construction dams and accumulation reservoirs for hydropower generation, agriculture, drinking water, tourism, fish-farming, etc. → Reduction in anthropogenic impacts on the coastal and sea areas. → Training on the efficient use of water and reduction of losses in distribution → Strengthening the system of water quantity monitoring and forecasting; → Development of a Hydrological Information System
Natural Ecosystem	<ul style="list-style-type: none"> → Improvements in the legislative system and in enforcement in the area of nature protection → Improvement of the protected areas management system → Implementation of nature protection measures throughout the country → Increase in the amount of territory designated as protected areas by law. → Consideration of potential changes in habitat due to climate change when establishing the boundaries of national parks and protected areas
Agriculture	<ul style="list-style-type: none"> → Changes in crop mix → Modification of crop rotation → Inclusion of agriculture in water management programmes → Construction of reservoirs and canals for agricultural needs → Use of drip irrigation techniques → Training for farmers and decision-makers on new technologies for land cultivation → Training on protection of livestock against overheating → Assisting farmers to cover costs of bad weather insurance policies
Tourism	<ul style="list-style-type: none"> → Promote the development of year-round tourism → Providing information to entrepreneurs from the tourism industry about anticipated climate changes (change in the snow regime) → Production of artificial snow
Forestry	<ul style="list-style-type: none"> → Conduct a detailed mapping of forests → Afforestation of bare areas → Change of species in the process of forest development → Establishment of plantation forests for the needs of industry and energy → Increased protection of forests against pests and plant diseases → Higher level of care for forest protection → Improve the forest fire protection system
Energy	<ul style="list-style-type: none"> → Planning of energy development (energy industry) within the regional cooperation (SEE) initiative → Introduction of integrated water resource management → Development of renewable energy sources to promote employment opportunities (especially in villages) and decrease the level of dependence on energy imports → Include the effects of anticipated climate changes during development of annual and seasonal energy balances → Stimulation of increases in energy efficiency on the demand side (buildings, industry, transport) → Public campaigns and training on energy efficiency.

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CROATIA

Sector	Measures (Republic of Croatia: Ministry of Environmental Protection and Physical Planning)
Water	<ul style="list-style-type: none"> → Planning and management → Investigation and study of the natural systems → Strategy of water resources management
Agriculture	<ul style="list-style-type: none"> → Reduced application of agrochemicals → Reduced leaching of nutrients and ecologically risky chemical → Reduced emission of greenhouse gases from soil → Choice and adequate rotation of winter and spring crops, high-density crops and row crops, as well as crops with longer and/or shorter growing periods, in compliance with the new changed climate conditions → Development of new agricultural areas → Reintroduction of old, domestic cultivars that used to be grown in these parts → Animal protection from direct sunshine by providing shady places or roofed shelters.
Forestry	<ul style="list-style-type: none"> → Natural regeneration → Introduction indigenous tree species, especially those that are missing in the structure of forest community and belong to that habitat.
Tourism	<ul style="list-style-type: none"> → The development of tourism through the principle of “multifunctional role of agriculture and land”.
Energy	<ul style="list-style-type: none"> → Gas Introduction Program: PLINCRO → Energy Efficiency Programs: KUENZgrada - building energy efficiency, MIEE - industrial energy efficiency networks, KOGEN – cogeneration, KUENcts - district heating systems energy efficiency, TRANCRO - transport energy efficiency → Renewable Energy Resources Programs: BIOEN - energy from biomass and waste, SUNEN - use of solar Energy, ENWIND - use of wind Energy, GEOEN - use of geothermal Energy, MAHE - small hydro projects

THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Sector	Measures (The former Yugoslav Republic of Macedonia: Ministry of Environment and Physical Planning)
Water	<ul style="list-style-type: none"> → Modernization of the hydro-meteorological network → Data monitoring establishment → Reconstruction and rehabilitation of the built structures and systems → Water resources management → Modernization of the network, data monitoring establishment of the meteorological, hydrological and water quality parameters, efficient processing of the measured data, implementation of the real time predictive models → Water losses reduction, placing of pressure and flow meters, implementation of dual supply systems for potable and non-potable water, recycling of water for non-potable uses, rain water collection for non-potable uses. → Water efficient appliances, waste water purification and their re-use, street and car washing with recycled waters.

Natural Ecosystem	<ul style="list-style-type: none"> → Establishing scientific infrastructure for evaluation of climate change impact on biodiversity and terrestrial ecosystems and training of experts for climate change issues and implementation of modern technologies → Collection of data necessary for the estimation of climate change impact on biodiversity and establishment of database with a detailed study of the distribution and origin of refugial communities in the former Yugoslav Republic of Macedonia and migration paths → Establishment of intersectoral body between the sector of water resources management and biodiversity → Elaboration of the climate change impact on biodiversity and terrestrial ecosystems in the former Yugoslav Republic of Macedonia and preparation of National Strategy → Public awareness raising concerning climate change issues. → Elaboration of biocorridors and migration paths of different species in climate change condition → Establishment of seed bank of endemic and other important species → Evaluation of the possibilities for preservation of vulnerable animals in captivity → Increasing the surface of protected areas and establishment of new protected areas and preparation of network of protected areas in accordance with the recommendations of NATURA 2000, EMERALD etc → Establishment of network of climatological stations in the region of Nidzhe and Mariovo in order to obtain more detailed data of the changes in the clima zonal ecosystems
Agriculture	<ul style="list-style-type: none"> → Defining the parameters of sustainability and their limits are one of the most important challenges of the soil science in the years to come → Education of the farmers how to improve their agricultural practice in order to overcome problems caused from the climate changes and if possible, to turn such changes into advantage through better use of irrigation water, improved agricultural practice, planting crops and cultivars that are adapted to expected changes, changes in soil cultivation in order to conserve soil → Better use of available water, better use of soil fertility and better use of prolonged growing period → Redirections of the breeding programs' goals towards adaptation of the new genetic proveniences to different climate conditions → Application of new feed and feeding management programs → Proper farmhouse construction and farmhouse equipment that will enable keeping the farmhouse microclimate inside the range of thermo neutrality.
Forestry	<ul style="list-style-type: none"> → Permanent control of the oak dieback process, as well as the other tree species, and a sanitary cut should be performed that could lead to prevention of development of some specific tree diseases, harmful insects and animals → Increase of the protection degree of the forests from forest fires at much higher level from the present one
Energy	<ul style="list-style-type: none"> → The optimal expansion plan in the electro power system for the next 30 years is projected → New hydro power plants will be built, some of them reversible

MONTENEGRO

Sector	Measures (The Republic of Montenegro: Ministry for Spatial Planning and Environment)
Water	<ul style="list-style-type: none"> → Prepare the cadastre of water resources and each water resource with all its characteristics and identify areas of potential danger → Establish a high level of information exchange among different institutions dealing with water resources → Provide a modern automated measuring and control system for the controlled management of water resources → Provide numerical models and their use in daily operational practice, for the purpose of daily monitoring of the status of water resources → Amendments to the applicable legislation in the field of spatial planning in order to include the problem of climate change in coastal during the preparation of spatial planning documentation → Provide for maximum possible protection of water sources from the penetration of sea water
Natural Ecosystem	<ul style="list-style-type: none"> → Establishing an infrastructure for scientific research of impacts of climate change on biodiversity, terrestrial ecosystems and the sea → Training of experts on the issues of climate change and implementation of modern technologies → Collection of necessary data to assess the impacts of climate change on terrestrial ecosystems, the sea and biodiversity → Appointment of an intersectoral group which will deal with the issues of water resources → Elaboration bio-corridors and migratory routes of various species under the conditions of climate change → Establish a gene bank of endemic, threatened and endangered species → Assessment of options for the protection of biodiversity (species) under ex situ conditions → An increase of surface area under protection in accordance with the approved official documents (The Spatial Plan of Montenegro until 2020; The National Strategy for Sustainable Development)
Agriculture	<ul style="list-style-type: none"> → Make the agricultural system more flexible, so as to minimize any adverse impacts and disasters on a broad level → Introduction of the use of breeds that are resistant to heat stress and tropical disease → Education for the producers in the application of new technical adjustments
Forestry	<ul style="list-style-type: none"> → Conversion of coppice forests into high forests → Rehabilitation of degraded forests; → Substituting of failed natural regeneration in high forest; → Preventive measures to protect forests and methods of biological fighting must have a primary character.

SERBIA

Sector	Measures (The Republic of Serbia: Ministry of Environment and Spatial Planning)
Water	<ul style="list-style-type: none"> → Build regional systems (Banat, West Bačka, Rzav, etc.) → Improve maintenance of existing source profiles → Reduce loss in water supply systems → Build waste water treatment plants for all residential areas larger than 2000 ES → Harmonize the building of new irrigation systems for the needs of agriculture → Reconstruct the existing drainage system (the Danube region, HS DTD, etc.) and build new drainage systems → Develop existing systems and increase protection against flooding, especially in large residential areas (Belgrade, Novi Sad, etc.), as well as in the areas with inadequate protection against floods → Forestation of areas degraded by erosion → Protect capital values from erosion and torrents
Natural Ecosystem	<ul style="list-style-type: none"> → Create a data base on biodiversity → Introduce monitoring of the effects of climate change on biodiversity → Adjust the protection programme at the level of species → Develop structures for the scientific evaluation of biodiversity status affected by climate change → Develop models for the assessment of the effects of climate change on biodiversity → Regulate management plans for protected areas
Agriculture	<ul style="list-style-type: none"> → Improve the methodology for the assessment of vulnerability based on agroclimatic indices → Change soil treatment by using techniques that will conserve the humidity of soil → Develop monitoring system for early warning against drought → Introduce measures to reduce erosion in hilly and mountainous areas → Optimal fertilization → Install nets for protection against hail and frost → Simulate climate change impacts on agricultural production by using plant production models → Model the occurrence of plant diseases and vermin under changed climate conditions
Forestry	<ul style="list-style-type: none"> → Revitalize forests in the Danube foreland basin → Improve resilience and revitalize → Develop dynamic and purpose-oriented conservation of forest biodiversity, areas under forests and urban areas
Tourism	<ul style="list-style-type: none"> → Develop climate monitoring system and spatial data bases concerning local and regional climate change, including information about extreme climate episodes and disasters and vulnerability of certain areas so that they may be used in strategic planning
Energy	<ul style="list-style-type: none"> → Improve the use of biomass for products and energy

Besides their national initiatives, the SEE countries have started to develop common cooperation plans and activities, and after a long period of conflict, a certain degree of cooperation and integration in the region is occurring.

Table 5 shows how SEE countries are involved in international or interregional initiatives for environmental protection and the preservation of natural areas. It focuses in particular on actions that have already been implemented or are in progress.

Table 5: Regional and cross-border cooperation among SEE countries

Country	State of regional and cross-border cooperation
Albania	<ul style="list-style-type: none"> → SEECP; → South East European Cooperation Initiative; → The Adriatic –Ionian Initiative; → The Black Sea Economic Forum; → REReP; → Memorandum of Understanding on the Management of Use of Common Natural Resources; → DABEO; → The Central European Initiative
Bosnia and Herzegovina	<ul style="list-style-type: none"> → REReP; → FORMEZ; → MoFTER; → Sava River Basin Framework Agreement; → Dinaric Arc Initiative; → The Central European Initiative; → Danube Cooperation Process.
Croatia	<ul style="list-style-type: none"> → Sava River Basin Framework Agreement; → Memorandum of Understanding on the Regional Electricity Market in South East Europe; → Agreement on the Protection of the Adriatic Sea and Coastal Area from the Pollution; → UNEP/MAP; → Commission on the Protection of the Adriatic Sea; → Agreement on Foundation of Joint Committee for Natural Wealth Management and for Cooperation in Natural and Other Catastrophes; → DABEO; → The Central European Initiative; → Dinaric Arc Initiative; → Danube Cooperation Process; → Alps-Adriatic Working Community
The former Yugoslav Republic of Macedonia	<ul style="list-style-type: none"> → SEECP; → The Central European Initiative → Memorandum of Understanding on the Management of Use of Common Natural Resources; → The Join Protect Document of Neighbourhood Initiative; → Trilateral Project for Prespa Park; → CARDS/INTERREG III A; → INTERREG III B CADSES; → DABEO; → Dinaric Arc Initiative

Country	State of regional and cross-border cooperation
Montenegro	<ul style="list-style-type: none"> → SEECP; → The Black Sea Economic Forum; → The International Commission for the Protection of the Danube River; → REReP; → DABEO; → Dinaric Arc Initiative; → The Central European Initiative; → Danube Cooperation Process.
Serbia	<ul style="list-style-type: none"> → SEECP; → The Black Sea Economic Forum; → The International Commission for the Protection of the Danube River; → REReP; → Cooperation in the Area of Plant Quarantine and Plant Protection; → Agreement on Foundation of Joint Committee for Natural Wealth Management and for Cooperation in Natural and Other Catastrophes; → DABEO; → Dinaric Arc Initiative; → The Central European Initiative; → Danube Cooperation Process.
Kosovo*	<ul style="list-style-type: none"> → REReP; → DABEO; → Dinaric Arc Initiative; → Danube Cooperation Process.

Source: Elaboration on countries' national communications to the UNFCCC

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Positive examples of interregional cooperation for environmental protection in the SEE region include several initiatives related to the preservation of the wealth and integrity of the Dinaric Arc – the Dinaric Arc Initiative,³⁵ the Dinaric Arc Ecoregion Project³⁶ and the Dinaric Arc and the Balkans Environment Outlook (DABEO).³⁷ These cooperative ventures support various actions for the conservation of biological diversity and the sustainable management of natural resources and related economic sectors such as agriculture, water and waste management. DABEO, in particular, addresses the specific need to report on a highly ecologically sensitive mountainous region, which includes parts of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Kosovo* and Slovenia. Its main purpose is to develop a fully informed, professional and scientifically valid integrated environmental assessment of the Dinaric Arc and Balkan Mountains region using a coherent data collection process to assure comparability across national borders and integration across disciplines. A DABEO Database and Information System is meant to support an eventual regional policy instrument, and to guide local, national and regional actions and policies to improve environmental conditions and the quality of life in local communities.³⁸

In 2008, five of the South Eastern Europe countries – Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia – reached agreement on a South-East European Climate Change Framework Action Plan for Adaptation creating a common platform for subregional cooperation on climate change. This action plan, which aims to design and implement effective adaptation responses in the region, identifies adaptation needs and actions with regard to different sectors, as shown in table 6.

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35 <http://www.cbddinaricarc.com/content/view/13/28/>.

36 <http://www.cbddinaricarc.com/>.

37 <http://www.grid.unep.ch/activities/assessment/DABEO/index.php>.

38 <http://www.grid.unep.ch/activities/assessment/DABEO/index.php>.

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Table 6

1. CLIMATE CHANGE AND PUBLIC HEALTH, SAFETY AND EMERGENCY PREPAREDNESS

Need for information exchange and technology transfer:

- improving current information on the health impacts of weather and climate extremes;
- perform regular health monitoring, establish emergency alert systems and data sharing. There should be health surveillance monitoring in extreme cases of weather, e.g. to observe the possible effects of hot dry summers or flooding on human health
- facilitate of sharing of data and lessons learnt, e.g. awareness raising with the examples of the best and good practices
- help addressing the climate change issues in health adaptation in health and non-health policy areas (water, building, etc.)
- incorporate climate change adaptation measures into national environmental health action plans
- incorporate climate change adaptation measures into national action plans on environment and children's health
- improve access to information for the stakeholders and the public

Needs for additional research:

- impact assessment (health-related effects of temperature increase, air pollution, probabilities of future risks from flooding, infectious diseases, etc.)
- adaptation assessment (surveillance and monitoring of pathogens, epidemiological studies on exposure and relative risks, risk and (cost-benefit modeling, etc.)
- mapping of vector-borne diseases at the sup-regional level, produce risk maps to aid direct activities in potential risk areas.

Specific needs:

- establishment of national early warning systems for the notification of harmful effects of weather variables on human health
- strengthening of capacities at the national and local levels (education, awareness raising and the creation of legal frameworks, institutions and an environment that enables people to make well-informed decisions for the long term benefit of their society).

2. CLIMATE CHANGE AND WATER RESOURCES MANAGEMENT, FRESHWATER QUANTITY AND QUALITY, WATER SUPPLY

Need for information exchange and technology transfer:

- share information and research outputs within sub-regional countries (current climate trends and extremes and their impacts on water resource management, freshwater quantity and quality, and water supply, cost-benefit analyses and cross-sectoral studies – if any)
- share the lessons learnt for the connection between water issues and land use planning, particularly in relation to flood risk management.

Needs for additional research:

- establish a high-quality climate and hydrological database, archival and reference data sets
- employ unified methods of data quality control, analyses of historical data for climate change detection studies, trend analyses, model development / validation
- research of the assessment of anthropogenic influence on hydrological changes
- assessment of climate-induced changes in the hydrological cycle and cost benefit analyses of adaptation options (this requires major research advances in the field of climatology, hydrology, land use planning, socio-economy and multi-objective decision making under conditions of uncertainty)
- development of the methodology for ground water vulnerability assessment
- employment of high resolution models for climate change projections
- simulation of water balance under climate change conditions
- development of methodologies to evaluate the efficiency of measures for flood and drought management
- research on the improved design standards for each domain of intervention (irrigation, water supply, flood and droughts, erosion and sedimentation, water resource management, monitoring and water quality)
- flooding and erosion risk mapping

Specific needs:

- development of a database on extremes (droughts and floods) and establishment of an early warning system for floods and droughts
- incorporate climate change adaptation measures into relevant national strategic and planning documents
- training and equipment for national / local water management organizations and operators
- modernization / construction of irrigation systems in drought-prone areas
- refurbishment of the existing and construction of new flood protection and drainage systems
- enlargement and modernization of the existing network of meteorological and hydrological stations, including ground water monitoring system (quality and quantity)
- improvement of national insurance schemes against flood and drought damage
- strengthening of the capacities of the National Hydrometeorological Services, particularly their observation networks, telecommunications, processing, forecasting and early warning systems

3. CLIMATE CHANGE AND AGRICULTURE AND FORESTRY**Need for information exchange and technology transfer:**

- dissemination of available information on the coping of agriculture and forestry with the current climatic variability
- dissemination of available information on vulnerability from extreme events and their cost evaluation, and “no regret” measures
- organization of awareness and information campaigns, training programmes for decision makers and potential users, farmers and foresters, relating to the environmental and socio-economic implications of climate change etc.
- training of institutions and farmers for adopting the best available practices for climate change adaptation

Needs for additional research:

- research on the impact of climate change on planting dates and cultivars
- research on the impact of climate change on crop and forest yield, pests and diseases
- research on the impact of climate change on the effects of extreme events, such as forest fires, on agriculture and forestry directly and on the market for agricultural and forestry products, etc.
- development of a database on droughts and forest fire and risk mapping
- identification and development of adaptation measures and techniques to combat the negative effects climate change on agricultural production and forestry

Specific needs:

- construction/upgrade of monitoring/warning systems to survey fires, insects, diseases and other disturbances in forestry/agriculture
- development of monitoring tools for droughts sensitivity and other indicators of vulnerability to climate change impacts
- incorporate climate change adaptation measures into national agricultural and forestry strategic development documents
- development of adaptation programmes on climate change in the forestry sector
- enlargement and modernization of the existing network of meteorological/agro meteorological stations for drought and establishment of a forest fire early warning system
- preparation of basic regional maps in GIS format (soil, vegetation, erosion, drought and forest fire risk map etc.)

4. CLIMATE CHANGE AND LAND USE, BUILDINGS AND TRANSPORTATION

Need for information exchange and technology transfer:

- dissemination of available information on coping with land use, building and transportation with the current climatic variability
- organization of awareness and information campaigns, training programmes for support to policy-makers in the spatial development sphere and planners, in particular, on the environmental and socio-economic implications of climate change, requirement for new building codes, etc.
- raising awareness of the need for the protection of cultural resources, such as historical buildings, cultural monuments, and archaeological sites, from the damage caused by climate change impacts, such as flooding, erosion and storm events.

Needs for additional research:

- revaluation and planning relating to the potential impacts of coastal flooding associated with sea level rise
- evaluation of land use change under climate change conditions
- cost calculation of potential adaptation measures and assessment of no-action costs
- improved design standards for buildings
- incorporation of climate change impacts info into construction, operations and maintenance of infrastructure projects (Road Strategic Plans and Standards, Project Management Manual, Design Procedure Manual, Transportation System Strategy, Plan, Surface Water Design Manual, etc.)

Specific needs:

- regularly updated risk maps as a planning tool for regional planning work
- risk and vulnerability assessments at the regional level
- incorporation of climate change adaptation measures in the spatial plan
- incorporation of climate change adaptation measures into physical and urban plans
- incorporation of climate change adaptation measures into strategic impact assessment

5. CLIMATE CHANGE AND TOURISM

Need for information exchange and technology transfer:

- dissemination of available information on the coping of tourism with current climatic variability
- organization of awareness and information campaigns, training programmes for support both for policy-makers and tourism practitioners, relating to the environmental and socio-economic implications of climate change
- introduce education and awareness programmes for all tourism stakeholders – in the public and private sectors – as well as for customers
- raising awareness of the need for protection of culture resources, such as historical buildings, cultural monuments, and archeological sites, from damage caused by climate change impacts, such as flooding, erosion and storm events

Needs for additional research:

- evaluation and planning relating to the potential impacts of coastal flooding associated with sea level rise
- development of efficiency standards in new tourist facilities, as well as mechanisms for energy conservation
- development of regional and local climate information services tailored to the tourism sector and promotion of their use among tourism stakeholders. Capacity building for the interpretation and application of this information
- assessment of the suitability of the SEE climate for tourism in 2020, 2050, 2080, based on existing models and scenarios.

6. CLIMATE CHANGE AND COASTAL ZONES

Need for information exchange and technology transfer:

- sharing of information, knowledge, experience and best practices relating to the adaptation measures in coastal zones
- dissemination of available information on the coping off the development of coastal zones with current climatic variability
- organization of awareness and information campaigns, training programmes for the support of policy-makers and the public relating to the environmental and socio-economic implications of climate change to coastal areas
- raising awareness of the need for protection of coastal areas from damage caused by climate change impacts, such as flooding, erosion and storm events

Needs for additional research:

- evaluation and planning relating to the potential impacts of coastal flooding associated with sea level rise
- evaluation of the impacts of sea level rise on ground water and water availability
- evaluation of the impacts of climate change on fisheries and other marine species
- development and transfer of adaptation technologies

Specific needs:

- construction/upgrading of monitoring/warning systems to survey vulnerabilities in coastal areas
- integrated impact scenarios for coastal areas
- improvement of early warning and response systems

7. CLIMATE CHANGE AND BIODIVERSITY AND ECOSYSTEMS

Need for information exchange and technology transfer:

- share experience for addressing the impacts of climate change on biodiversity and for the development of strategies for adaptation to increase resilience and provide accommodation for biodiversity under climate change
- dissemination of available information on coping of biodiversity with current climatic variability
- organization of awareness and information campaigns, training programmes for support for both policy-makers and local communities relating to the impact of human-induced activities and climate change on biodiversity and ecosystems
- raising the awareness of the need to protect biodiversity and ecosystems from the damage caused by climate change impacts, such as flooding, erosion and storm events
- distribution map of the major types of ecosystems, map of biomes and mapping of habitats and types of vegetation for the precise inventory of biodiversity

Needs for additional research:

- research on the impact of climate change and extreme weather events on species survival
 - research on the impact of climate change on changes in the composition of habitats, including the expected increase in invasive species diseases
 - research on the impact of climate change on changes in seasonal timings that will affect dependencies and reproduction of species
 - research on the impact of climate change on land use, agriculture, water and forestry, as well as biodiversity
 - development of scientific tools to evaluate the effects of climate change on local fish and wildlife populations and habitats
 - assessment of climate change impacts on SEE wetland ecosystems
 - assessment of climate change impacts on SEE mountain ecosystems
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Specific needs:

- development and update of regional climate scenarios and projections
- enhancement of the capacity to use tools and impact assessment models for biodiversity
- risk and vulnerability assessment for the protected areas in the SEE region
- enlargement and modernization of the existing network for monitoring the status of biodiversity components by monitoring the phenology of bioindicator species
- enlargement and modernization of the existing network of mountain meteorological stations with vertical and slope distribution for biodiversity vulnerability assessment

8. CLIMATE CHANGE AND ENERGY

Need for information exchange and technology transfer:

- dissemination of available information on the impact of current climatic variability on energy production and consumption (supply and demand)
- organization of awareness and information campaigns, training programmes for support to both policy and energy decision makers, and users relating to the socio-economic implications of climate change
- raising the awareness of the need to use alternative sources of energy

Needs for additional research:

- integrated research on the climate impact on water resources (precipitation, runoff) and energy production/consumption
- research on the climate change impact on the potential of renewable energy sources (wind, solar energy maps, hydro, geothermal, biofuel, etc.)
- development of a methodology for the evaluation of the climate impact on energy production and consumption

Specific needs:

- development and update of high resolution regional climate scenarios and projections
- unified methodology for the evaluation of the climate impact on the energy sector, cost-benefit analysis and assessment of no-action costs, establishment of the capacities to monitor and respond to the anticipated climate change impacts at the institutional and community levels
- incorporation of climate change adaptation measures into national energy strategic and planning documents

The South East European Climate Change Framework Action Plan for Adaptation promotes regional and international support for adaptation informed by the best science, and by environmentally sound and economically efficient climate resilient development.³⁹ An ad hoc working group comprising representatives and appointed experts from SEE countries provides overall coordination, while the Regional Environment Centre for Central and Eastern Europe, together with the SEE Sub-regional, Virtual Climate Change Centre,⁴⁰ is in charge of the secretariat and technical support to this group.

The South Eastern Europe Disaster Risk Mitigation and Adaptation Programme⁴¹ promotes disaster risk reduction focusing on the regional dimension of risks while promoting partnerships among neighbouring countries affected by common natural hazards. It is a collaborative initiative developed by the World Bank and the United Nations International Strategy for Disaster Reduction in collaboration with a number of partners,⁴² and involves Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Moldova,⁴³ Montenegro and Serbia.⁴⁴ The aim of this programme is the reduction of vulnerability to natural hazards and the increase of climate change adaptation in SEE countries. The programme is in line with the Hyogo Framework and is structured around three main focus areas: hydrometeorological forecasting, data sharing and early warning; coordination of disaster mitigation, preparedness and response; and financing of disaster losses, reconstruction and recovery, and disaster risk transfer (disaster insurance).

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 39 For a detailed analysis of the foreseen programmes for adaptation see chapter 5 of The South East European Climate Change Framework Action Plan for Adaptation.

40 The SEE/VCCC is a network of national institutions of the participating countries: ministries, hydrometeorological services, scientific institutions, NGOs, and other stakeholders.

41 The World Bank, Global Facility for Disaster Reduction and Recovery, International Strategy for Disaster Reduction, South Eastern Europe Disaster Risk Mitigation and Adaptation Programme - Result Assessment, 2008-2009.

42 The partners in this initiative include the World Meteorological Organization (WMO), the United Nations Development Programme (UNDP), the European Union and the European Commission (EU/EC), the Swedish Civil Contingency Agency (MSB), the Disaster Preparedness and Prevention Initiative for South Eastern Europe (DPPI SEE) and the Regional Cooperation Council for South Eastern Europe (RCC SEE).

43 Moldova, although to the extent of this report is not considered as a SEE country, nevertheless it is included in the SEEDRMAP programme, whose countries are listed as indicated in the main text.

44 The World Bank and the United Nations International Strategy for Disaster Reduction are replicating the same approach in Central Asia.

A common adaptation strategy for the SEE region could also be linked to the ongoing EU Stabilisation and Association Process (SAP). Within the SAP, regional cooperation is one of the most important qualifying indicators of the countries' readiness to be accepted as Member States by the EU, pursuant to the *acquis communautaire*.⁴⁵

In parallel with the SAP, some regional plans have been developed among SEE countries and the EU, such as:

- The Disaster Risk Reduction Initiative, which supports capacity-building of the Western Balkan countries and Turkey as well as data collection, processing and sharing and the preparation of a regional strategy to build local capacity, develop weather forecasting and early-warning systems, invest in infrastructure and disaster mitigation measures and establish a regional disaster insurance scheme⁴⁶
- The Civil Military Emergency Preparedness Council for South Eastern Europe, the objective of which is to ease transboundary cooperation during emergencies, and to develop and maintain emergency responses and GIS databases for the region⁴⁷
- The Belgrade SEE Climate Change Initiative adopted in 2007 in the framework of the Sixth Ministerial Conference on "Environment for Europe" for the enhancement of subregional cooperation in the climate change sector⁴⁸
- The Community Civil Protection Mechanism and the Civil Protection Financial Instrument, which facilitate the preparedness and the cooperative response to major emergencies.⁴⁹

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 45 For further information on the Stabilisation and Association Process see annex C.

46 <http://www.proventionconsortium.org/?pageid=32&projectid=1>.

47 http://ec.europa.eu/echo/civil_protection/civil/vademecum/hr/2-hr-1.html.

48 http://ec.europa.eu/echo/civil_protection/civil/prote/mechanism.htm.

49 http://ec.europa.eu/echo/civil_protection/civil/prote/finance.htm.

Moreover, in order to promote the accession to the EU, SEE countries are participating in the following networks:

- The Regional Environmental Network for Accession (RENA), which is financed by the EU and aims at facilitating the accession process of SEE countries. It helps the beneficiaries in exchanging information and experience related to their preparation for accession. In particular, RENA is structured in four working groups – Strategic Investments and Planning; Climate Change; Cross Border Cooperation and Multilateral Agreements; and the Environmental Compliance and Enforcement Network for Accession. The climate change working group results will be measured by the ability of beneficiary countries to move towards compliance with the EU *acquis communautaire*, and to prepare their societies for the threats and possible opportunities deriving from climate change.⁵⁰
- The European Network for the Implementation and Enforcement of Environmental Law (IMPEL), which is an international association of the environmental authorities of the Member States and aims at sharing information and best practices in order to enhance the implementation of EU environmental law. The European Commission is also a member of IMPEL and shares the chairmanship of meetings.
- The Environment Compliance and Enforcement Network for Accession, which is one of the RENA working groups. This is an informal network for the countries of South Eastern Europe, focusing on the enforcement of environmental laws through the exchange of best practices. In 2004, the network started to focus on pre-accession activities.

One other important cooperation initiative established in the SEE area is the Energy Community,⁵¹ which encompasses the EU and the following countries: Albania, Bulgaria, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro, Romania, Serbia and Kosovo*.⁵² The purpose of the Energy Community is to organize relations among the Parties, and to create a legal and economic framework in order to set up an integrated energy market allowing for cross-border energy trade and integration with the EU. Its goals include establishing a stable regulatory and market framework to attract investments in power generation; increasing the security of energy supply; improving the environmental standards in relationship with energy supply in the region; enhancing competition at the regional level; and exploiting economies of scale.

Following a top-down approach, the Energy Community Treaty provides for the creation of a single energy market, defining Parties' rights and obligations and requiring them to implement core elements of the *acquis communautaire*, to pledge themselves to the principle of mutual assistance and to adopt development plans bringing their energy sectors in line with EU standards.

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

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51 http://www.energy-community.org/portal/page/portal/ENC_HOME.

52 Romania and Bulgaria joined the European Union in 2007, and have since been "participants" in the Energy Community, along with several other EU Member States. Moldova, Norway, Turkey and Ukraine obtained observer status in 2006, as well as Georgia in 2007. In 2010 and 2011 respectively, Moldova and the Ukraine joined the Energy Community as Contracting Parties.

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50 http://www.renanetwork.org/index.php?view=wgroup&groups=wgroups&id_group=2.

4.4 THE STABILISATION AND ASSOCIATION PROCESS

All the SEE countries are involved in the Stabilisation and Association Process with a view to accession to the EU. A key step in the process is the conclusion of a Stabilisation and Association Agreement, in which all mutual obligations for increasing prosperity and economic growth are confirmed – regional free trade; the creation of regional markets for electricity and gas; the development of transport, energy and telecommunication infrastructure; environmental protection; research, technology and development; and parliamentary cooperation.⁵³

The SAP process also addresses the development of democracy-based political systems. To this effect, the European Commission is supporting in particular the enforcement of the rule of law, good governance and judicial and administrative reforms.

The “Copenhagen criteria”⁵⁴ are the basic conditions to which a prospective member must conform. In order to join the EU each new country has to:

- Be a stable democracy that respects human rights and the rule of law and protects minorities
- Have a functioning market economy and have the capacity to cope with competitive pressure and market forces within the Union
- Adopt common rules, standards and policies so as to comply with the full body of EU legislation, namely to adapt to the *acquis communautaire*.

4.5 NATIONAL AND REGIONAL INITIATIVES

The World Bank and the United Nations Development Programme are active in the South Eastern Europe region, funding numerous national and regional initiatives related to climate change and sustainable development. The following tables list recent initiatives by country and for the region.

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⁵³ Moreover, the SAA is prepared and evaluated in accordance with other institutions and agencies, such as UN/ISDR, UNHCR, UNDP, UNICEF, WFP, WHO, FAO, WB, IAEA, NEA/OECD, WMO, IFRC, ICRC, NATO, JICA, MIC, and CEB.

⁵⁴ http://ec.europa.eu/enlargement/enlargement_process/accession_process/criteria/index_en.htm.

Table 7

ALBANIA

World Bank

- 2005-2011: The objective of the Natural Resources Development Project for Albania is to establish and maintain sustainable, community-based natural resource management in about 218 communes in upland, and mountainous erosion-prone lands.
- 2005-2012: The development objective of the Integrated Coastal Zone Management and Clean-up Project for Albania is to set-up and initiate an integrated coastal zone management approach to reduce coastal degradation
- 2008-2012: The objective of the Albania Disaster Risk Mitigation and Adaptation Project (AL-DRMAP) is to strengthen institutional capacities: (a) to reduce Albania's vulnerability to the natural and manmade hazards; and (b) to limit human, economic, and financial losses due to these disasters. There are five components to the project. The first component is the disaster risk management and preparedness.
- 2008-2012: The development objectives of Energy Community of South East Europe Adaptable Program Loan (APL) Program - Fifth APL for Albania Dam Safety Project are to: (i) contribute to safe guarding the major hydroelectric plants of Albania; and (ii) improve their operational efficiency and enhance the stability of power supply for the regional electricity market. The project's main impact will be to prevent a possible catastrophe resulting from a dam failure.

UNDP

- 2009-2014: The UNDP/UNEP/GEF Global Solar Water Heating Market Transformation and Strengthening Initiative, aims at accelerating the market development of solar water heating in Albania with an objective to facilitate the installation of 75,000 m² of new installed collector areas over the duration of the project, an annual sale of 20,000 m² reached by the end of the project and with expected continuing growth to reach the set target of 520,000 m² of total installed SWH capacity by 2020.
- 2007-2011: Strengthening capacities in the Western Balkans countries to address environmental problems through remediation of high priority hot spots - Albanian Component . The overall objective of the proposed project is to accelerate the achievement of environmentally sustainable development in Albania (MDG-7) by integrating the principles of sustainable development into national and local policies and programmes, observing the commitments of the Albanian Government within the EU accession process.
- 2006-2011: Integrated Ecosystem Management in the Prespa Lakes Basin of Albania, the former Yugoslav Republic of Macedonia and Greece. To catalyse the adoption of integrated ecosystem management (IEM) in the trans-boundary Prespa Lakes Basin of the former Yugoslav Republic of Macedonia, Albania, and Greece to conserve globally significant biodiversity, mitigate pollution of the trans-boundary lakes, and provide a sustainable basis for the Basin's further social and economic development.
- 2008-2012: Identification of adaptation response measures in the Drini - Mati River Deltas. The overall development goal of this Medium Size Project is to assist Albania in establishing a mechanism by which strategies to moderate, cope with, and take advantage of the consequences of climate change are enhanced, developed, and implemented.
- 2008-2011: Identification and prioritization of environmental hotspots in Albania. To support the Albanian government in achieving its midterm objective to rehabilitate polluted areas to meet basic safety standards through (a) intervention in "hot spot" areas and (b) elimination of toxic materials.
- 2010-2013: EU Environment Requirements Programme. The overall objective of the "One UN Environment Pillar" is to accelerate the achievement of environmentally sustainable development in Albania (MDG-7) by integrating the principles of sustainable development into national and local policies and programmes, observing the commitments.

BOSNIA AND HERZEGOVINA

World Bank

- 2005-2012: The overall objective of the Water Quality Protection Global Environment Facility (GEF) Project for Bosnia and Herzegovina is reduction of ground-based pollution from municipal sources into the Neretva and Bosnia rivers. Overall progress in project implementation was proceeding more slowly than expected.
 - 2007-2012: The objective of the Agriculture and Rural Development Project is to assist Bosnia and Herzegovina (BiH) to strengthen the capacity of its State-level and Entity-level institutions to deliver more efficient and effective agricultural services and support programs as well as to make a substantial contribution to an acceleration of BiH's eligibility to access support under the European Union Instrument for Pre Accession for Rural Development (IPARD).
 - 2008-2013: The objective of the Forests and Mountain Protected Areas Project for Bosnia and Herzegovina (BiH) is to strengthen the institutional and technical capacity for sustainable Protected Areas (PAs) and natural resource management, and expand the BiH network of forest and mountain PAs. There are three components to the project. The first component is the protected area development.
 - 2008-2014: The Second Solid Waste Management Project for Bosnia and Herzegovina aims at improving the availability, quality, environmental soundness, and financial viability of solid waste management services in participating utilities/regions. There are three components to the project.
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UNDP

- 2008-2012: KARST. The project promotes conservation and sustainable management practices for maintaining the Karst Peatlands in Livanjsko polje. Livanjsko Polje, with an area about 41,000 hectares is the most important peatland in Bosnia and Herzegovina and represents a significant part of the Cetina River catchment area, influencing water availability including in neighbouring Croatia.
- 2009-20122: Climate Change Facility for BiH Cities. This project has supported development of a Sustainable Energy Action Plan for City of Banja Luka as a pilot exercise, which will serve as a basis for demonstrating and advocating adoption and implementation of the model in other BiH towns.
- 2009-2013: BiH Biomass energy for employment and energy security. Bosnia and Herzegovina has significant biomass energy resources, and the rural population in particular is highly dependent on wood for energy. However, despite the large potential for biomass energy, a number of interrelated market barriers - including the limited availability of financing, a lack of business models and management skills, limited information availability and low awareness - combine to restrict the self-sustaining growth of this market.
- 2009-2012: Mainstreaming Environmental Governance: Linking Local and National Action in BiH. MDG-F Environment and Climate Change Programme titled "Mainstreaming environmental governance: linking local and national action in BiH" is supported through the Millennium Development Goals Achievement Fund, funded by the Spanish government as a contribution to enhance the national ownership of the MDGs achievement, under the UN Reform framework.

CROATIA

World Bank

- 2007-2012: The objective of the Inland Waters Project of Croatia is to improve water supply services, wastewater services, and flood protection measures in municipalities selected from the inland part of Croatia. The project will have two components: (1) Technical Assistance (TA) through which assistance will be provided to Hrvatske Vode (HV) and participating utilities to implement the project.
- 2006-2012: The Croatia Agricultural Acquis Cohesion Project aims to develop sustainable systems and capacities within the Ministry of Agriculture, Forestry and Water Management (MAFWM) to ensure timely compliance with European Union acquis (legal) conditions in the rural sector.
- 2007-2012: The objective of the Croatia Agricultural Pollution Control Project is to significantly increase the use of environmentally friendly agricultural practices by farmers in Croatia's Danube River Basin in order to reduce nutrient discharge from agricultural sources to surface and ground water bodies.
- 2008-2014: The objectives of the Second Coastal Cities Pollution Control Project are: (i) to improve the provision of efficient and sustainable wastewater services in participating coastal municipalities; and (ii) to reduce the nutrient load entering Croatia's coastal waters from, and pilot innovative 'wastewater treatment solutions in, selected municipalities.
- 2011-2016: The objectives of the European Union Natura 2000 Integration Project are to: (i) support park and county public institutions to implement Natura 2000 objectives in investment programs in Croatia; (ii) strengthen capacity for EU-compliant reporting and biodiversity monitoring; and (iii) introduce programs that involve a wide group of stakeholders in Natura 2000 network management.
- 2011-2015: The development objective of the Integrated Land Administration System Project for Croatia is to modernize the land administration and management system to improve the efficiency, transparency and cost effectiveness of government services.

UNDP

- 2007-2013: Conservation and Sustainable Use of Biodiversity in the Dalmatian Coast. The COAST Project covers the Dalmatian coast, which entails four counties: the Zadar, Šibenik-Knin, Split-Dalmatia and the Dubrovnik-Neretva Counties. Within these, 4 demonstration areas were recognized and selected due to their exceptional biological value and unique landscape.
- 2005-2013: Removing Barriers to Energy Efficiency. The EE Project aims at removing barriers for the implementation of economically feasible, energy efficient technologies and measures in residential and public sectors in Croatia, with the final goal to reduce energy consumption and the associated greenhouse gases, as well as raising public awareness about efficient use of energy.

THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

World Bank

- 2006-2012: The development objective of the Sustainable Energy Project of the former Yugoslav Republic of Macedonia is to develop a sustainable market for energy efficiency (EE) and renewable energy (RE) by supporting the development of an enabling framework, institutional capacity, and necessary financing mechanisms.
 - 2007-2012: The objective of the Agriculture Strengthening and Accession Project for the former Yugoslav Republic of Macedonia is to improve the delivery of the Borrower's assistance to the agriculture sector in a manner consistent with the European Union's (EU) pre-accession requirements. The closing date for the project will be extended from September 30, 2011 until June 30, 2012.
 - 2011-N/A: The objective of the Additional Financing for Energy Community of South East Europe Project is to support the functioning of the former Yugoslav Republic of Macedonia Power Transmission System Operator (MEPSO) in the context of the regional power market through financing investments necessary to rehabilitate and upgrade the power transmission network, increase the level of interconnection with neighboring power systems, and to strengthen the institutional capacity of AD MEPSO.
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UNDP

- 2008-2011: Strengthening the Capacities of the Crisis Management Center. The main objective of this project was to support the central and local governments to strengthen the system for crisis management and ensure effective and timely response to natural disasters.
- 2009- 2011: Energy Efficiency in Building Sector. The main objective of this project is to contribute to the processes of reducing the energy consumption in residential and public buildings, regulate energy losses and greenhouse gas emissions, and increase the country's energy independence.
- 2010-2011: The Economics of Climate Change Adaptation. The project has two main objectives. The first is to assess the capacity of national experts and institutions to estimate the economic value of climate change damages and the benefits and costs of adaptation measures. The second is to measure potential climate change damages in the country based on the existing capacities and to provide recommendations for future action. Economic estimates of climate change impacts are being prepared in sectors such as hydrology, agriculture, energy demand and forestry, along with cost and benefits of adaptation. Key stakeholders will be provided with tools for improving climate change related research, planning and decision making.
- 2010-2012: Biodegradable waste management in Prespa. The overall objective of this project is to support the establishment of an efficient system for biodegradable waste management in the Prespa region. This will help improve the lives of the local population and ensure better environmental protection.

MONTENEGRO

World Bank

- 2003-2012: The main objective of the Environmentally Sensitive Tourist Areas Project is to create ecological and commercially sustainable solid waste collection and disposal services in Montenegro coastal municipalities, needed to maintain a clean, and environmentally attractive coastal area.
 - 2007-2013: The objective of the Energy Community of South East Europe Third Adaptable Program Loan (ECSEE APL3) Project in Montenegro is to improve the efficiency and reliability of the power system in Montenegro, through better supply security and closer integration into the regional markets.
 - 2008-2012: The development objective of the Montenegro Energy Efficiency (MEE) Project is to improve energy efficiency performance in targeted public sector buildings in order to provide a demonstrated basis for development of a sustainable energy efficiency improvement programme in the public sector in Montenegro.
 - 2009-2014: The development objective of the Institutional Development and Agriculture Strengthening Project for Montenegro is to improve the delivery of government assistance for sustainable agriculture and rural development in a manner consistent with the European Union's (EU's) pre-accession requirements.
 - 2010-N/A: The objective of the Additional Financing for Montenegro Environmentally Sensitive Tourist Areas Project is to create ecological and commercially sustainable solid waste collection and disposal services in Montenegro coastal municipalities, needed to maintain a clean, environmentally attractive coastal area.
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UNDP

- 2004-N/A: Environmental GIS. The project focuses on implementing consistent systems for creating and sharing basic data in the key areas of forestry, biodiversity and spatial planning. Information systems supporting these sectors that are developed in a progressive manner have a greater prospect of being successful.
- 2007-2012: Spatial Planning Support Project (SPSP). Integrating sustainable development principles into processes of spatial planning and legalization of informal settlements and improving enforcement of the legislation on Planning and Construction, thereby establishing a clear link between economic growth, poverty reduction and environmental sustainability.
- 2007-2011: Strengthening capacities in the Western Balkan countries to address environmental problems through remediation of high priority hotspots: Lead and Zinc Tailing Mine Impoundment (TMI) in Mojkovac. The remediation of the Lead and Zinc Tailing Mine Impoundment in Mojkovac will remove the main barrier to investment in the Municipality of Mojkovac. In parallel to that process, UNDP in cooperation with the Municipality of Mojkovac will work establishing and implementing the strategy for sustainable development that will focus on economic valorization of protected areas, organic agriculture, nature based tourism, capacity building for municipal officials for implementation of the environmental management legislation, and support for small and medium local businesses.
- 2007-2011: Global Environmental Facility and Energy Portfolio. The project objectives are to assist the Government of Montenegro in complying with the Rio Conventions through focus on environmental protection, development of small hydro power, implementation of energy efficiency measures, and diversification of renewable sources of energy.

SERBIA

World Bank

- 2005-2011: The Serbia and Montenegro component of the Energy Community of South East Europe Program Project (ECSEE APL3-Serbia) provides investment support and technical assistance for Serbia, and complements donor assistance that creates and develops the capacity of the Transmission, System, and Market Operator and the regulatory agency --obligations Serbia has to fulfill under the Athens Memorandum.
 - 2005-2013: The development objectives of the Additional Financing for the Irrigation and Drainage Rehabilitation Project are to: a) improve the capacity for increased agricultural yields through support to high priority rehabilitation of drainage and irrigation infrastructure; b) reduce the risk of damage from flooding to land, crops, property, infrastructure as well as reducing risk of life loss from flooding in project areas; and c) improve water resources management and strengthen the associated water resource management institutions and policies.
 - 2007-2011: The Transitional Agriculture Reform Project development objective is to enhance the competitiveness of Serbian agriculture. The global environmental objective is to conserve the globally important ecosystem in the Stara Planina mountainous area.
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UNDP

- 2007-2011: Biodiversity Strategy, Action Plan and National Report. The project enables the State of Serbia to prepare the first Biodiversity Strategy and Action Plan (BSAP), through two Republic Strategies, and the first National Report as the initial step to follow up on the national commitments to the Convention of Biodiversity ratified in 2002.
- 2010-2014: Ensuring financial sustainability of the protected area system. The objective of the project is to improve the financial sustainability of Serbia's protected area system.
- 2010-2014: Support to Sustainable Transport in the City of Belgrade. The goal of this project is to reduce national greenhouse gas (GHG) emissions in Serbia by meeting the project objective of improving access and sustainable transport modes in Belgrade.
- 2011-2013. Vlasina Lake Ecotourism Promotion and Environment Protection. The project will support the municipality of Surdulica to pursue its strategic vision of ecotourism development through employment generation and preservation of the environmental and cultural heritage in the protected area of the Vlasina Lake.

KOSOVO*

World Bank

- 2006-2011: The Kosovo* Energy Sector Clean-Up and Land Reclamation Project aims to: (a) address environmental legacy issues related to open dumping of ashes on land; (b) enable the Kosovo* Energy Corporation (KEK) to free land for community development purposes currently taken by overburden materials and enable KEK to remove Kosovo* A ash dump; and(c) build capacity in KEK for continued clean-up and environmentally good practice mining operations.
 - 2011-2017: Agriculture and rural development. The project aims to assist the Republic of Kosovo* to promote competitiveness and growth in the livestock and horticulture sub-sectors through the implementation of selected measures of its agricultural strategy and institutional development.
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UNDP

- 2011-N/A: Support the Ministry of Environment and Spatial Planning (MESP) for Environment and Climate Change. Facilitate MESP to establish mechanisms for coordination of environment agenda, conduct public awareness activities highlighting environmental issues as major agenda and initiation of at least one regional cooperation project related to environment and climate change.
- 2011- N/A: Conservation of Biodiversity and Sustainable Land Use Management in Dragash/Dragaš - I) conservation of biodiversity - II) the re-establishment and development of improved local businesses based on sustainable land use - III) environmentally sound energy services; and iv) improved capacities and empowerment of local governments, community leaders and women to promote development.

* This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

SOUTH EASTERN EUROPE REGION

World Bank

- 2008-2013: The development and global environmental objective of the Neretva and Trebisnjica River Basin Management Project for Europe and Central Asia is to provide mechanisms for the efficient and equitable water allocation amongst the users of the Neretva and Trebisnjica river basin (NTRB) at the transboundary level and for enhancing the basin ecosystems and biodiversity through improved water resources management.
 - 2011-2015: The objective of the South East Europe and Caucasus Catastrophe Risk Insurance Facility Project for Europe and Central Asia is to help increase access of homeowners, farmers, the enterprise sector, and government agencies to financial protection from losses caused by climate change and geological hazards.
 - 2011-N/A: The development objective for the South East Europe and Caucasus Catastrophe Risk Insurance Facility Project for Europe and Central Asia is to enable Europa Re, a catastrophe and weather-risk re-insurance facility, to develop new weather risk insurance and reinsurance products, automate insurance underwriting, pricing and claims settlement processes for such products, and increase public awareness of weather risk in participating countries.
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UNDP

- Regional demonstration programme around demand driven projects in nine locations in the Western Balkans (Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and UN Administered Province of Kosovo*) suffering from the legacy of polluting industries and requiring industrial renewal, environmental cleanup and new economic initiative. The aim of such projects is to achieve improvement of environmental situation and quality of life for citizens living in and around polluted areas through least cost measures, improved local and national policy dialogue and supply of domestic professional services in the environmental management sector. While the main focus will be the physical works needed to mitigate the ecological problems, institutional strengthening and capacity building will be an important subject running throughout the programme.
- 2011- N/A: Conservation of Biodiversity and Sustainable Land Use Management in Dragash/Dragaš - I) conservation of biodiversity - II) the re-establishment and development of improved local businesses based on sustainable land use - III) environmentally sound energy services; and iv) improved capacities and empowerment of local governments, community leaders and women to promote development.



Prospects for integrated adaption in the region

Most of the proposed actions in the South-East European Climate Change Framework Action Plan for Adaptation are preliminary steps – information and awareness campaigns, training, research, assessment, mapping and analysis. The focus on such basic measures reveals how far the South Eastern Europe countries have to go in order to develop concrete adaptation measures. A close reading of the list raises a number of questions: Who does what? How? In what time frame? At what level of analysis – local, subnational, national or regional? And how does the preliminary work, once completed, get used to develop specific adaptation programmes and projects?

In highly developed countries, the answers to these questions would be hashed out among the various departments, ministries and stakeholders at all levels of government. In the SEE region, the equivalent structures and institutions are still developing, and

simply listing the proposed actions may not be enough to launch the efforts of the individual countries. On the other hand, all six of the SEE countries covered in this report have participated in projects funded by the United Nations Development Programme Global Environment Facility, and as result have enhanced their capacity to manage climate change adaptation. Through the process of complying with UNFCCC assessment and reporting requirements, the countries have already demonstrated an increased awareness and knowledge of climate change.

The South-East European Climate Change Framework Action Plan for Adaptation is a regional forum with a promising beginning, but has no institutional or political authority, and other models for regional cooperation may be able to incorporate the plan into a stronger scheme with international partners and the opportunity for significant funding.

Table 8: South-East European Climate Change Framework Action Plan for Adaptation
Summary of proposed activities by sector

Sector	Proposed activities
Public Health	<ul style="list-style-type: none"> • Perform regular health monitoring • Establish emergency alert systems and data sharing • Conduct impact and adaptation assessments
Water Resources	<ul style="list-style-type: none"> • Build or modernize irrigation systems in drought-prone areas • Build or rehabilitate flood protection and drainage systems • Expand and modernize the network of meteorological and hydrological stations • Improve national flood and drought insurance schemes
Agriculture and Forestry	<ul style="list-style-type: none"> • Conduct research on the impacts of climate change on planting dates and cultivars, and on yields, pests and diseases • Conduct research on the effects of extreme events on agriculture and forestry • Develop databases on droughts and forest fires
Land Use, Buildings and Transportation	<ul style="list-style-type: none"> • Improve design standards for buildings • Incorporate climate change impacts information into the construction, operations and maintenance of infrastructure projects
Tourism	<ul style="list-style-type: none"> • Develop efficiency standards for new tourist accommodations
Coastal Zones	<ul style="list-style-type: none"> • Evaluate the impact of sea level rise on groundwater and water availability • Improve early warning and response systems
Biodiversity and Ecosystems	<ul style="list-style-type: none"> • Conduct research on the impacts of climate change on species survival, habitat composition and structure, invasive species, and seasonal phenomena • Assess climate change impacts on wetland and mountain ecosystems
Energy	<ul style="list-style-type: none"> • Conduct research on the impacts of climate change on renewable energy sources • Conduct integrated research on the impacts of climate change on water resources (precipitation and runoff) and energy production and consumption
General	<ul style="list-style-type: none"> • Organize information and awareness campaigns and training programmes • Create and develop maps • Establish early warning systems • Raise awareness • Incorporate climate change adaptation into national and urban plans

Note: Information presented in this table is excerpted from table 2 in the South-East European Climate Change Framework Action Plan for Adaptation.

The EU Stabilisation and Association Process and its Regional Environmental Network for Accession could become the organizing focus for a regional approach to adaptation. All of the SEE countries are already engaged in the process, and the RENA structure offers a logical place for the coordination of regional adaptation strategies, but whether the EU would consider taking responsibility for the additional mission is an open question. The scheme makes more sense for the period of transition to EU membership than it does in the long run.

The Alpine and Carpathian Conventions – each of which provides a platform for cooperation for environmental protection and sustainable development – offer a template for the region, and the United Nations Environment Programme (UNEP) is an independent player who may be able to assist in the development of a Dinaric Arc Convention. The existing conventions and the prospective Balkan convention arose from the recognition of transboundary issues related to ecosystem protection, and all three are defined by transboundary mountain regions. They relate more to the Convention on Biological Diversity than to the UNFCCC, but a Dinaric Arc Convention could nevertheless provide a platform for regional climate change adaptation strategies, and may be able to bring all the existing agreements together under one roof.

Any new scheme designed to coordinate adaptation in the SEE region would do well to consider the array of organizations, programmes, initiatives and agreements currently contributing to adaptation projects and strategies in the region. The idea of having one comprehensive regional adaptation mechanism may be attractive, but in light of the myriad efforts already in place, the best overall approach may emerge from a recognition of what each component can contribute to the cause.

Climate change adaptation would also be entirely compatible with a transition to a green economy. The idea of a green economy emerged from the recognition that the economy is crucial to the achievement of sustainability, and that today's economies fail to account sufficiently for pollution, resource depletion, declining ecosystem services and the consequent inequities that affect the poor. The transition to a green economy would entail creating the conditions for public and private investments that include environmental and social goals. Such investments would drive economic growth while reducing carbon emissions and pollution, enhancing energy and resource efficiency and preventing further losses of biodiversity and ecosystem services.

The measures for responding to climate change – both through mitigation and adaptation – are entirely consistent with the green economy model, as are sustainable development projects. The difference is that a green economy would take a more comprehensive approach, one designed so that all projects meet the tests for sustainability as a matter of course. The South Eastern Europe countries may be able to adopt national policies that encourage a green economy while simultaneously pursuing separate sustainable development and climate change adaptation projects.

References

CHAPTER 2

- Apostolova B., Gender Wage Gap in Western Balkan Countries, World Bank International Conference on Poverty and Social Inclusion in the Western Balkans WBalkans 2010 Brussels, Belgium, December 14-15, 2010
- CEU, Making the case for Environmental Justice in Central & Eastern Europe, 2007 CEU
- CE, Communication (2008) 127 final from the commission to the European parliament and the Council
- CIA the World Fact Book, 2011, <https://www.cia.gov/library/publications/the-world-factbook/geos/ci.html>.
- Douma W., Massai L. and Montini, M. The Kyoto Protocol and Beyond 2007 TMC Asser Press
- Di Cosola M., Stati, Nazioni e Minoranze, La ex-Jugoslavia tra revival etnico e condizionalità europea, 2010, Giuffrè
- UNEP- GRIDA http://maps.grida.no/go/graphic/balkans_topographic_and_political_map
- European Environment Agency, State of the Environment Report (SOER) 2010.
- European Environment Agency, Environmental trends and perspectives in the Western Balkans: future production and consumption patterns, 2010.
- EC, EU Action against Climate Change - Adapting to climate change, 2008.
- EC, Regional cooperation in the western Balkans a policy priority for the European Union, 2005 European Community
- EC White Paper Adapting to Climate Change: Towards a European framework for action, COM(2009)147 final.
- ENDS (2005), EU Pressed to Safeguard Eastern Environment. Environment Daily 1798, 11 January.
- Franzinetti G., I Balcani dal 1878 ad oggi, 2001 Carocci
- Grant W., Matthews D. and Newell P. (2000), The Effectiveness of European Union Environmental Policy. London: Mcmillian.
- Hösh E., Storia dei Balcani, 2006, Il Mulino
- IPPC, Climate Change 2007: Synthesis Report – Summary for Policymakers, 2007.
- ISDR, South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative: Risk Assessment for South Eastern Europe, 2007, UN/ISDR
- Massey E., Bergsma E., Assessing adaptation in 29 European countries, IVM, 2008
- Meadows D., Randers J., Meadows D., Limits to Growth: The 30-Year Update, 2007 Chelsea Green Publishing Company
- Minkova J., REReP, Environmental Snapshot of South Eastern Europe, REC, 2006
- Montini M., Developing CDM Projects in the Western Balkans, 2010 Springer
- Montini M., Il Protocollo di Kyoto ed il Clean Development Mechanism: aspetti giuridici e istituzionali. L'esperienza nei Balcani, 2008 Giuffrè
- Montini M., Bogdanovic S., Environmental Security in South-Eastern Europe. Agreements and Their Implementation – International, 2011Springer-NATO for Peace and Security Series
- Pévelakis G., I Balcani, 1994, Il Mulino
- South Eastern Europe Disaster Risk Mitigation and Adaptation Program (SEEDRMAP), Concept Note.
- Steiner A., Second Preparatory Committee for United Nations Conference on Sustainable Development (UNCSD or Rio 2012), 2011, <http://www.un.org/News/Press/docs/2011/envdev1201.doc.htm>.
- United Nations Department of Economic and Social Affairs - Division for Sustainable Development, Climate Change & Sustainable Development web page http://www.un.org/esa/dsd/dsd_aofw_cc/cc_index.shtml
- United Nations, Report of the World Commission on Environment and Development: Our Common Future.
- UNDP-Carpathian Project, INTERREG III B CADSES, EU VASICA: Vision and Strategies in the Carpathian Area, 2007, UNDP
- UNDP Expert Group Meeting on “Integrating Disaster Reduction and Adaptation to Climate Change”, Havana, Cuba, 17-19 June 2002, 2002
- UNDP How-to guide: National Institution Frameworks for the Kyoto Protocol Flexible Mechanisms in Eastern Europe and the Commonwealth of Independent States, 2006, UNDP
- UNFCC, Convention Cadre sur les Changement Climatiques: guide, 2008 UNFCC
- WB International Strategy for Disaster Reduction, The World Bank, South Eastern Europe Disaster Risk Management Initiative, Desk Study Review Risk Assessment in South

Eastern Europe, Final Report, 2007.

CARE <http://www.careclimatechange.org/toolkits>

CEFTA <http://www.cefta2006.com/>

CIA <https://www.cia.gov/library/publications/the-world-factbook/>

Civil Protection http://ec.europa.eu/echo/civil_protection/civil/prote/mechanism.htm

Climate Law www.climatelaw.org

DEFRA <http://ww2.defra.gov.uk/>

ECENA <http://ecena.rec.org/>

EFC <http://www.fao.org/forestry/efc/en/>

EM-DAT <http://www.emdat.be/database>

FEEM <http://www.feem.it/getpage.aspx?id=62>

IISD www.iisd.org

IMPEL <http://impel.eu/>

IPCC www.ipcc.ch

ISDR <http://www.unisdr.org/>

Kyoto club www.kyotoclub.org

OCDE http://www.oecd.org/home/0,3675,fr_2649_201185_1_1_1_1_1_1_1,00.html

PECCN <http://www.careclimatechange.org/about-peccn/who-we-are>

Prevention Consortium <http://www.proventionconsortium.org/?pageid=32&projectid=1>

Prevention web <http://www.preventionweb.net/english/>

REReP <http://archive.rec.org/REC/programs/REREP/>

RSPCSEE <http://www.rspcsee.org/>

SAA <http://www.stabilitypact.org/about/default.asp>

UNDP <http://hdr.undp.org/en/data/profiles/>

UNECE www.unece.org/

UNFCCC www.unfccc.int

US government <https://www.cia.gov/library/publications/the-world-factbook/>

WB <http://data.worldbank.org/>

WEF <http://www.weforum.org/issues/global-gender-gap>

WWF <http://www.panda.org/>

CHAPTER 3

AA.VV., 2010. Bosnia and Herzegovina Fourth Report to the United Nations Convention on Biological Diversity 2010 Biodiversity Targets National Assessments

AA.VV., 2009. The Second Annual Report on the Implementation of the National Strategy of Sustainable Development of Montenegro for the period April 2008 – September 2009

AA.VV., 2001. The First National Communication of the Republic of Croatia to the United Nations Framework Convention on Climate Change (UNFCCC), Republic of Croatia, Ministry of Environmental Protection and Physical Planning.

REPORT ON NATIONAL SITUATION OF BIODIVERSITY IN ALBANIA <http://www.grida.no/enrin/biodiv/biodiv/national/albania/home.htm>

AA.VV., 2008. South East European Climate Change Framework Action Plan for Adaptation. 136 pp.

ADRICOSM, 2011. <<http://www.meteo.co.me/adricosm/index.php>> [Accessed 9 July 2011]

Albania tourism website < <http://www.albaniantourism.com/> > [Accessed 23 March 2011]

Alcamo J., Flörke M.I., Märker M., 2007. Future long-term changes in global water resources driven by socio-economic and climatic changes *Hydrol. Sci. J.* 52 247–75.

Al-Mansour F., 2011. Energy efficiency trends and policy in Slovenia. *Energy*. 36(4), 1868-1877

Al-Mansour F., Merse S., Tomsic M., 2003. Comparison of energy efficiency strategies in the industrial sector of Slovenia. *Energy*. 28, 421–440.

AQUASTAT, 2011. http://www.fao.org/nr/water/aquastat/maps/AQUASTAT_water_resources_and_MDG_water_indicator-March_2009.pdf (consulted 2/28/2011)

ARD-BIOFOR IQC Consortium, 2003, Kosovo*: Biodiversity Assessment, USAID/Kosovo*.

Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds., 2008: Climate Change and Water. Technical

Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 210 pp.

Baettig, Michèle B., Martin Wild, and Dieter M. Imboden. 2007. "A climate change index: Where climate change may be most prominent in the 21st century." *Geophysical Research Letters* vol. 34.

Bartók B., 2010. Changes in solar energy availability for south-eastern Europe with respect to global warming. *Physics and Chemistry of the Earth*. 35, 63–69.

Bozicevic Vrhovcak M., Tomsic Z., Debrecin N., 2005. External costs of electricity production: case study Croatia. *Energy Policy*. 33, 1385–1395.

- Calo` F., Parise M., 2009. Waste management and problems of groundwater pollution in karst environments in the context of a post-conflict scenario: The case of Mostar (Bosnia Herzegovina). *Habitat International*. 33, 63–72.
- Callaway et al. The Economic Impacts of Climate Change in Montenegro: A First Look, UNDP.
- Carvalho F.P., Oliveira J. M., 2010. Uranium isotopes in the Balkan's environment and foods following the use of depleted uranium in the war. *Environment International*. 36, 352–360.
- Comprehensive Assessment of Water Management in Agriculture (CAWMA). 2007. *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. London: Earthscan, and Colombo: International Water Management Institute
- Cosic B., Stanic Z., Neven Duic N., 2011. Geographic distribution of economic potential of agricultural and forest biomass residual for energy use: Case study Croatia. *Energy* 36, 2017–2028.
- Croatia tourism website <<http://croatia.hr/it-IT/Homepage>> [Accessed 22 March 2011]
- Cullaja A., Haskob A. Mihoc A., Schanzd F., Brandle H., Bachofenf R., 2005. The quality of Albanian natural waters and the human impact. *Environment International* 31, 133–146.
- Custodio E., 2002. Aquifer overexploitation: what does it mean? *Hydrogeology Journal*. 10(2): 254–277,
- D. Sollitto et al., 2010, Assessing heavy metal contamination in soils of the Zagreb region (Northwest Croatia) using multivariate geostatistics, *Catena* 80, pp 182–194.
- Dalmacija B, Ivančev-Tumbas I, Zejak J, Djurendić M. Case study of petroleum contaminated area of Novi Sad after NATO bombing in Yugoslavia. *Soil Sediment Contam* 2003;12(4):591–611
- Dangic A. & Dangic J., 2007, Arsenic in the soil environment of central Balkan Peninsula, southeastern Europe: occurrence, geochemistry, and impacts, *Trace Metals and other Contaminants in the Environment*, Volume 9, pp 207–236
- Darko D., Slobodan M. , Vladimir P., Sava K., 2009. Sustainable development of lignite production on open cast mines in Serbia. *Mining Science and Technology*. 19, 0679–0683.
- Deitz L., Stirton L, Wright K., 2009. South East Europe's electricity sector: Attractions, obstacles and challenges of Europeanisation. *Utilities Policy* 17, 4–12
- Dodic S.N., Zekic V.N., Rodic V.O., Tica N.L., Dodic J.M., Popov S.D., 2010. Situation and perspectives of waste biomass application as energy source in Serbia. *Renewable and Sustainable Energy Reviews* 14, 3171–3177.
- Dolar M., Vidrih B., Kajfez`-Bogataj L., Medved S., 2010. Predicted changes in energy demands for heating and cooling due to climate change. *Physics and Chemistry of the Earth* 35, 100–106.
- Dugalica et al., 2010, Heavy metals, organics and radioactivity in soil of western Serbia, *Journal of Hazardous Materials* 177, pgg 697–702.
- Duic N., Juretic F., Zeljkoc M., Bogdana Z., 2005. Croatia energy planning and Kyoto Protocol. *Energy Policy*. 33, 1003–1010.
- EEA – European Environment Agency (2004): Impacts of Europe's Changing Climate. An indicator-based assessment. Report No 2/2004.
- http://reports.eea.europa.eu/climate_report_2_2004/en/impacts_of_europes_changing_climate.pdf
- EEA, 2007 Europe's Environment – The fourth assessment, EEA
- EEA, 2007, Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia EEA Report No 3/2007.
- EEA, 2010, 10 messages for 2010 Mountain Ecosystem, EEA
- EEA_CC, 2009, Adapting to Climate changes, EEA_CC
- Elliott, C., 2005, Nature conservation and spatial planning in Slovenia: continuity in transition, *Land Use Policy* 22 (2005) 265–276.
- Erjavec E. et al., 1998, The European Union enlargement – the case of agriculture in Slovenia, *Food Policy*, Vol. 23, No. 5, pp. 395–409
- European Commission, 2001, Transport and Energy infrastructure in South East Europe.
- European Environment Agency (EEA), 2007a. Europe's environment – The fourth assessment. 452 pp.
- European Environment Agency (EEA), 2007b. Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia Joint UNEP-EEA report on the opportunities and lessons learned. EEA Report No 3/2007.
- F. Nannoni et al., 2011, Fractionation and geochemical mobility of heavy elements in soils of a mining area in northern Kosovo*, *Geoderma* 161 (2011) pp 63–73.
- FAO, 2010, official website www.fao.org
- FAO, Global Forest Resources Assessment 2005, FAO
- Feyen, L., R. Dankers, 2009. The impact of global warming on streamflow drought in Europe, *J. Geophys. Res.*, 114, D17116, doi:10.1029/2008JD011438.
- FYROM tourism website <<http://www.exploringmacedonia.com/>> [Accessed 23 March 2011]
- Ganoulis, J. 2008a. 'Web-base interactive databases for common monitoring of shared waters'. Presentation at the UNECE Working Group on Monitoring and Assessment Ninth Meeting, Geneva, 17-18 June 2008. Available at <http://www.unece.org/env/water/meetings/wgma/2008/Ganoulis.pdf>. [Accessed 15 March 2011]

- Ganoulis, J. 2008b. Recent Advances in Transboundary Groundwater Management in the Balkans Region. Presentation to the IV International Symposium on Transboundary Waters Management, Thessaloniki, Greece, 15–18 October 2008. Available at <<http://www.inweb.gr>>. [Accessed 15 March 2011]
- Gashi, 2010, Kosovo* Forest Inventory Project 2002-2003, International Conference SDI 2010 – Skopje; 15-17.09.2010
- Gašić S, Budimir M, Brkić D, Nešković N. Residues of atrazine in agricultural areas of Serbia. *J Serb Chem Soc.* 002;67(12):887–92.
- Giannopoulos G. A., 2005, Main transport challenges in South Eastern Europe, after enlargement, *European Transport \ Trasporti Europei* n. 30, pp. 3-13.
- Glavonjic et al., 2005, Forest and Forest Products Country Profile: Serbia and Montenegro, UN & FAO
- Glück K. et al., 2010, The preconditions for the formation of private forest owners' interest associations in the Western Balkan Region
- Golusin M, Tesic Z., Ostojic A., 2010. The analysis of the renewable energy production sector in Serbia. *Renewable and Sustainable Energy Reviews*, Volume 14 (5), 1477-1483.
- Gorton M., Sauer J., Peshevski M., Bosev D., Shekerinov D., Quarrie S., 2009. Water Communities in the Republic of Macedonia: An Empirical Analysis of Membership Satisfaction and Payment Behavior. *World Development.* 37, (12), 1951-1963.
- Government of Montenegro Office for Sustainable Development, 2009. The Second Annual Report on the Implementation of the National Strategy of Sustainable Development of Montenegro for the period April 2008 – September 2009.
- Grødelan D A.B., 2006. Public perceptions of non-governmental organisations in Serbia, Bosnia & Herzegovina, and Macedonia. *Communist and Post-Communist Studies.* 39, 221-246.
- Hamilton et al., 2005, Climate change and international tourism: A simulation study, *Global Environmental Change* 15 (2005) pgg 253–266.
- Hannam J.A. Dearing J.A. , 2008, Mapping soil magnetic properties in Bosnia and Herzegovina for landmine clearance operations, *Earth and Planetary Science Letters* 274 pp 285–294
- Hristovski K., Olson L., Hild N., Peterson D., Burge S., 2007. The municipal solid waste system and solid waste characterization at the municipality of Veles, Macedonia. *Waste Management.* 27, 1680–1689.
- Hristovski K.D., Hild N.R., Young-Hristovski J. E., 2010. The environmental management system in the Republic of Macedonia – problems, issues and challenges. *Communist and Post-Communist Studies.* 43, 115–124.
- Hrovatin N., Pittman R., Zoric´ J., 2009. Organisation and reforms of the electricity sector in Slovenia. *Utilities Policy.* 17, 134–143.
- Ilic M, Grubor B, Tesic M. The state of biomass energy in Serbia. *Therm Sci* 2004 ;8(2):5-20.
- International Energy Agency (IEA), 2011. Energy indicator database. Available online at <http://www.iea.org/country/maps.asp> [Accessed 07 April 2011].
- IPCC, 2007. Parry M.L., Canziani O.F., Palutikof J.P., van der Linden P.J., Hanson C.E. (eds.), 2007. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Jakovljevic M.D. et al., 1997, Factors influencing the distribution of heavy metals in the alluvial soils of the Velika Morava River valley, Serbia, *Applied Geochemistry*, Volume 12, Issue 5, September 1997, pp 637-642
- Jednak S., Kragulj D., Bulajic M., Pittman R., 2009. Electricity reform in Serbia. *Utilities Policy.* 17, 125–133.
- Jovancic P., Tanasijevic´ M., Ivezi D., 2010. Serbian energy development based on lignite production. *Energy policy.* 39 (3), 1191-1199
- Kabashi S., Bekteshi S., Ahmetaj S., Kabashi G, Najdovski D, Zidanšek A, Šlaus I., 2011. Effects of Kosovo's* energy use scenarios and associated gas emissions on its climate change and sustainable development. *Applied Energy.* 88,473–478.
- Kaczensky et al., 2003 The impact of high speed, high volume traffic axes on brown bears in Slovenia, *Biological Conservation* 111, pgg 191–204.
- Kaczenskya P. et al., 2003, The impact of high speed, high volume traffic axes on brown bears in Slovenia, *Biological Conservation* 111 pgg 191–204
- Kaisarevic S., Lübcke-von Vare U., Orcic D., Streck G., Schulze T., Pogrmic K., Teodorovic I., Brack W., Kovacevic R., 2009. Effect-directed analysis of contaminated sediment from the wastewater canal in Pancevo industrial area, Serbia. *Chemosphere* 77, 907–913.
- Kaligarica M. et al., 2008, Traditional agricultural landscape in Goricko Landscape Park (Slovenia): Distribution and variety of riparian stream corridors and patches, *Landscape and Urban Planning* 85, pgg 71–78
- Karagiannidis A., Papageorgiou A., Perkoulidis G., Sanida G., Samaras P., 2010. A multi-criteria assessment of scenarios on thermal processing of infectious hospital wastes: A case study for Central Macedonia. *Waste Management.* 30, 251–262.
- Karaj Sh., Rehl T., Leis H., Müller J., 2010. Analysis of biomass residues potential for electrical energy generation in Albania. *Renewable and Sustainable Energy Reviews.* 14 (1), 493-499.
- Karovic Maricic V., Danilovic D., 2010. Preliminary management and optimization of a gas reservoir in central Serbia. *Journal of Petroleum Science and Engineering.* 70, 107–113.

- Kaštelan-Macan M, Ahel M, Horvat AJM, Jabučar D, Jovančić P. Water resources and waste water management in Bosnia and Herzegovina, Croatia and the State Union of Serbia and Montenegro. *Water Policy* 2007;9:319–43.
- Keesstra S.D., van Huissteden J., Vandenberghe J., Van Dam O., de Gier J., Pleizier I.D., 2004. Evolution of the morphology of the river Dragonja (SW Slovenia) due to land-use changes. *Geomorphology* 69, 191–207.
- KertCsz A & Mika J., 1999, Aridification – Climate Change in South-Eastern Europe, *Phys. Chem. Earth (A)*, Vol. 24, No. 10, pp. 913-920.
- KertCsz et al., 1999, Aridification – Climate Change in South-Eastern Europe, *Phys. Chem. Earth (A)*, Vol. 24, No. 10, pp. 913-920, 1999
- Klánová J. et al, 2007a , Are the residents of former Yugoslavia still exposed to elevated PCB levels due to the Balkan wars? Part 1: Passive air sampling network, *Environment International* 33, pgg 719–726.
- Klánová J. et al, 2007b , Are the residents of former Yugoslavia still exposed to elevated PCB levels due to the Balkan wars? Part 2: Passive air sampling network, *Environment International* 33, pgg 727–735.
- Kobal I., Vaupoti J., Mitic´ D., Kriston J., Ančik,ù M., Jerančić S., Škofljanec M., 1990. Natural radioactivity of fresh waters in Slovenia, Yugoslavia. *Environment International*.16, 141-154.
- Koscak M. 1998, Integral development of rural areas, tourism and village renovation, Trebnje, Slovenia, *Tourism Management*, Vol. 19, No. 1, pp. 81-86.
- Kosovo* tourism website < <http://www.visitkosova.org/>> [Accessed 22 March 2011]
- Lehnera B., Czisch G., Vassoloa S., 2005. The impact of global change on the hydropower potential of Europe: a model-based analysis. *Energy Policy*. 33, 839–855.
- Loppi S. , Riccobono F., Zhang Z.H., Savic S., Ivanov D., Pirtosos S.A., 2003. Lichens as biomonitors of uranium in the Balkan area. *Environmental Pollution*. 125, 277–280.
- Maticic B., 1999, The impact of agriculture on ground water quality in Slovenia: standards and strategy, *Agricultural Water Management* 40 (1999) pgg 235-247
- Medved S., 2006. Present and future ecological footprint of Slovenia—The influence of energy demand scenarios. *Ecological Modelling*. 192, 25–36.
- Merla A., 2007. GEF strategic priorities with regard to groundwater management in South Eastern Europe – The case of the Dinaric Karst Transboundary Aquifer. International Roundtable “Integrated Management of Shared Groundwater in South Eastern Europe” Within the framework of Petersburg Process Phase II / Athens Declaration Process and GEF IW:LEARN, Activity D2 Brdo pri Kranju, Slovenia.
- Merla A., 2009. Protection and Sustainable use of the Dinaric Karst Aquifer System (DIKTAS). 5th GEF Biennial International Waters Conference in Cairns, Australia
- availableonlineat : http://iwlearn.net/abt_iwlearn/events/iwc5/iwc5_presentations/merla_iwc5_diktas.pdf [Accessed 13 March 2011]
- MESP/ DEP, 2003, Kosovo*: State of the Environment Report, UNMIK.
- Mihajlov A. Opportunities and challenges for a sustainable energy policy in SE Europe: SE European Energy Community Treaty. *Renewable and Sustainable Energy Reviews*. 14, 872–875.
- Milad M., Schaich H., Bürgi M., Konold W., 2007. Climate change and nature conservation in Central European forests: A review of consequences, concepts and challenges. *Forest Ecology and Management*. 261, 829–843.
- Milly, P.C.D., J. Betancourt, M. Falkenmark, R.M. Hirsch, Z.W. Kundzewicz, D.P. Lettenmaier, and R.J. Stouffer. 2008. “Stationarity is dead: whither water management?” *Science* 319, 573–574.
- Milly, P.C.D., K.A. Dunne and A.V. Vecchia. 2005. “Global pattern of trends in streamflow and water availability in a changing climate.” *Nature* 438, 347–350.
- Milovanovic M., 2006. Water quality assessment and determination of pollution sources along the Axios/Vardar River, Southeastern Europe. *Desalination* 213, 159–173.
- Minkova, 2006, Environmental Snapshot of South Eastern Europe REReP Country Profiles, REC
- Montenegro tourism website < <http://www.tourism-montenegro.com/>> [Accessed 23 March 2011]
- Moussiopoulos N., Helmis C.G, Flocas H.A., Louka P., Assimakopoulos V.D., Naneris C., Sahn P., 2004. A modelling method for estimating transboundary air pollution in southeastern Europe. *Environmental Modelling & Software* .19, 549–558
- Nakaa K. et al., 2000, Constraints and opportunities to forest policy implementation in Albania, *Forest Policy and Economics* 1, pp 153-163.
- OECD/IEA, 2008. Energy in the Western Balkans. The Path to Reform and Reconstruction. 416 pp.-
- OSCE, UNEP, UNPD, NATO, 2004, Environment and security consultation in South eastern Europe, OSCE, UNEP, UNPD, NATO
- Parajka J., Kohnová S., Bálint G., Barbuc M., Borga M., Claps P., Cheval S. , Dumitrescu A. , Gaume E., Hlavcová K., Merz R., Pfaundler M. , Stancalie G., Szolgay J. , Blöschl G., 2010. Seasonal characteristics of flood regimes across the Alpine–Carpathian range. *Journal of Hydrology*. 394, 78–89.
- Pavloić et al., 2010. The initial national communication on Climate Change of Montenegro to the United Nations Framework Convention on Climate Change (UNFCCC).

- PERAST: CAR FREE VILLAGE, 2011 <<http://www.kotor-bay.com/perast/>> [Accessed 9 July 2011]
- Pettersson F., 2007. Carbon pricing and the diffusion of renewable power generation in Eastern Europe: A linear programming approach. *Energy Policy*. 35, 2412–2425.
- Pollitt M., Evaluating the evidence on electricity reform: Lessons for the South East Europe (SEE) market. *Utilities Policy* 17, 13–23
- Popovic, 2009, The Regional Environmental Reconstruction Programme for South Eastern Europe (REReP) A Decade's Difference, REC
- Potocnik P., Thaler M., Govekar E., Grabec I., Poredos A., 2007. Forecasting risks of natural gas consumption in Slovenia. *Energy Policy*. 35, 4271–4282.
- Puri S. and Aureli A., 2005. Transboundary Aquifers: A Global Program to Assess, Evaluate, and Develop Policy, *Ground Water*, Vol 43 (No.5) pages 661-668)
- Qevani et al., Series 2: Agriculture and Environment Statistics – Agricultural Household Survey 2008, Statistical Office of Kosovo* (SOK).
- Qevani et al., Series 2: Agriculture and Environment Statistics – Agricultural Household Survey 2008, , Statistical Office of Kosovo* (SOK)
- Ravnik D. , Rajver D., Poljak M., Zivic M., 1995. Overview of the geothermal field of Slovenia in the area between the Alps, the Dinarides and the Pannonian basin. *Tectonophysics*. 250, 135-149.
- REC, 2000. Strategic Environmental Analysis of Kosovo*.
- Schneider D., Duic N., Bogdana Z., 2007. Mapping the potential for decentralized energy generation based on renewable energy sources in the Republic of Croatia. *Energy*. 32,1731–1744
- SEETO, South-Eastern Europe Core Regional Transport Network Development Plan 2011, 2010.
- Serbia tourism website < <http://www.serbia.travel/>>
- Serbula S.M. et al, 2010, Concentrations of particulate matter and arsenic in Bor (Serbia), *Journal of Hazardous Materials* 181, pgg 43–51.
- Silva P., Klytchnikova I., Radevic D., 2009. Poverty and environmental impacts of electricity price reforms in Montenegro. *Utilities Policy*. 17, 102–113.
- Skoulikidis N. T., 2009. The environmental state of rivers in the Balkans—A review within the DPSIR framework. *Science of the Total Environment* 407, 2501–2516.
- Slovenia tourism website < <http://www.slovenia.info/>> [Accessed 22 March 2011]
- Stafilova et al., 2010, Heavy metal contamination of topsoils around a lead and zinc smelter in the Republic of Macedonia, *Journal of Hazardous Materials* 175, pp 896–914.
- Stefanovic et al, 2010. Initial national Communication of the Republic of Serbia. 170 pp.
- Strith U., Zupan G., Butala V., 2007. Review of green electricity production in Slovenia. *Renewable and Sustainable Energy Reviews*. 11, 2201–2208.
- Terzić S., Senta I., Ahel M., Gros M., Petrović M., Barcelo D., Müller J., Knepper T., Marti I., Ventura F., Jovančić P., Jabučar D., 2008. Occurrence and fate of emerging wastewater contaminants in Western Balkan Region. *Science of The Total Environment*. 399, 66 – 77.
- Tesic M, Kis F, Jovanovic V. Suggested strategy for wide-scale introduction of biodiesel in Serbia. *Contemp Agric Eng* 2009; 35(3):207-13.
- Tesic M., Ferenc Kiss F., Zavargo Z., 2011. Renewable energy policy in the Republic of Serbia. *Renewable and Sustainable Energy Reviews* 15, 752–758.
- Ulaj et al., 2009, Series 1: General Statistics Kosovo* in Figures 2009, Statistical Office of Kosovo* (SOK)
- UNDP/UNEP/OSCE, 2003. Environment and Security – Transforming risks into cooperation “The Case of Central Asia and South Eastern Europe” ISBN: 82-7701-023-0.
- UNEP – EEA, 2007, Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia Joint UNEP-EEA report on the opportunities and lessons learned, UNEP – EEA.
- UNEP, 2010, Mining and the Environment in the Western Balkans, 2010
- UNEP, KICK THE HABIT, A UN GUIDETI CLIMATE NEUTRALITY. 204 pp.
- UNEP/GRID-Arendal, 2007. Balkan Vital graphics. Environment without borders. ISBN: 978-82-7701-046-5, 43 pp.
- UNEP/GRID-Arendal, 2007. Balkan Vital graphics. Environment without borders. ISBN: 978-82-7701-046-5, 43 pp.
- UNEP/GRID-Arendal, ‘Transboundary river basins of the Balkans, overview’, UNEP/GRID-Arendal Maps and Graphics Library, 2007, <<http://maps.grida.no/go/graphic/transboundary-river-basins-of-the-balkans-overview>> [Accessed 14 March 2011]
- United Nations Economic Commission for Europe, 2007. OUR WATERS: JOINING HANDS ACROSS BORDERS. First Assessment of Transboundary Rivers, Lakes and Groundwaters.
- Vercic D., Vercic A.T., Laco K., 2006. Coorientation theory in international relations: The case of Slovenia and Croatia. *Public Relations Review*. 32, 1–9.
- Vidič, Transboundary Air Pollution in Croatia, National Contribution to the EMEP Assessment Report.
- Volk T., 2011, Agriculture in the Western Balkan Countries, IAMO

Western Balkans Environmental Programme, 2011 <<http://me.westernbalkansenvironment.net/content/view/27/186/lang,en/>> [Accessed 9 July 2011]

Westphal, Michael I. 2008. Summary of the Climate Science in the Europe and Central Asia Region: Historical Trends and Future Projections. Background paper prepared for World Bank report. Washington, DC.

World Bank, 2003, Serbia and Montenegro Country Environmental Analysis, World Bank

World Bank, 2007, Integrating Environment into Agriculture and Forestry Progress and Prospects in Eastern Europe and Central Asia - Volume II - Kosovo* – Review, World Bank.

World Bank, 2009. Adapting to Climate Change in Europe and Central Asia. Full report, 133 pp.

WWF, 2010, Final Report of the WWF Protected Areas for a Living Planet – Dinaric Arc Ecoregion Project Protected Area Gap Analysis.

Zekic V., Rodic V., Jovanovic M. , 2010. Potentials and economic viability of small grain residue use as a source of energy in Serbia. *Biomass and Bioenergy*. 34, 1789-1795.

Zunic Z.S., Yarmoshenko I.V., Birovljev A., Bochicchio F., Quarto M., Obryk B., Paszkowski M., Celikovic I., Demajo A., Ujic' P., Budzanowski M., Olko P., McLaughlin J.P., Waligorski M.P.R., 2007. Radon survey in the high natural radiation region of Niska Banja, Serbia. *Journal of Environmental Radioactivity*. 92, 165-174.

CHAPTER 4

Barontini S., Faggian P., Grossi G., Kouwen N., Maran S., Scaroni P. and Ranzi R., Impact of climate change scenarios on water resources management in the Italian Alps. *Geophysical Research Abstracts* 8 EGU06-A-05100, 2006

Bartaletti F., *Geografia e cultura delle Alpi*, Franco Angeli, Milano, 2004

Boyce J.K., *The Political Economy of the Environment*. Edward Elgar, Cheltenham, 2002

Bowen A., Chatterjee B. and Fankhauser S. Adaptation and economic growth. Paper prepared for the Department for International Development. February, 2009

Brooks N., Vulnerability, risk and adaptation: A conceptual framework, Tyndall Centre for Climate Change Research, Working Paper 38, 2003

Bruce D., State and local sales tax revenue losses from e-commerce: updated estimates. Center for Business and Economic Research. 2001

Burton I., The growth of adaptation capacity: practice and policy. In: *Adapting to Climate Change: An International Perspective* [Smith, J., N. Bhatti, G. Menzhulin, R. 1996

Carrillo J.D., T. Mariotti, Strategic ignorance as a self disciplining device, *Review of economic studies*, 2000

Euro-limpacs — Integrated Project to Evaluate the Impacts of Global Change on European Freshwater Ecosystems, 2008. Deliverable No. 301. Euro-limpacs position paper — impact of climate change on European freshwater ecosystems: consequences, adaptation and policy. www.eurolimpacs.ucl.ac.uk/oldsite/docstore/Deliverable_301.pdf (Accessed May 2009).

EC — European Commission, 2009. Adapting to climate change: Towards a European framework for action. White paper. COM(2009), 147/4 final.

EEA — European Environment Agency, 2005, Vulnerability and Adaptation to Climate Change in Europe, EEA technical report no. 7/2005.

European Union (2008). The Economics of Ecosystems & Biodiversity (TEEB) study. An Interim report. Available at <http://ec.europa.eu/environment/nature/biodiversity/economics/>

UKCIP (2009). A changing climate for business. Business planning for the impacts of climate change. UKCIP Publication.

UKCP09 (2009). UK Climate Projections 2009. Available at <http://ukcp09.defra.gov.uk/> UK Water Industry Research (2003). Effect of climate change on river flows and groundwater recharge

UKCIP02 scenarios. UK Water Industries Research, London.

UNDP (2002). A climate risk management approach do disaster reduction and adaptation to climate change. UNDP Expert Group Meeting. Havana, June 17-19. UNDP (2007).

UNFCCC (2007). Investment and Financial Flows to Address Climate Change. Climate Change Secretariat, Bonn.

WWF (2000): The Global 2000: A representation approach to conserving the earth's distinctive ecoregions. Online on the WWW under URL: http://www.panda.org/about_wwf/where_we_work/ecoregions/about/what_is_the_g200.cfm.

WWF/CERI (2001): The status of the Carpathians (November 2001). Online: <http://www.carpathians.org/docs/status.pdf>.

CARE <http://www.careclimatechange.org/toolkits>

CEFTA <http://www.cefta2006.com/>

CIA <https://www.cia.gov/library/publications/the-world-factbook/>

Civil Protection http://ec.europa.eu/echo/civil_protection/civil_prote/mechanism.htm

Climate Law www.climatelaw.org

DEFRA <http://ww2.defra.gov.uk/>

ECENA <http://ecena.rec.org/>

- EFC <http://www.fao.org/forestry/efc/en/>
- EM-DAT <http://www.emdat.be/database>
- FEEM <http://www.feem.it/getpage.aspx?id=62>
- IISD www.iisd.org
- IMPEL <http://impel.eu/>
- IPCC www.ipcc.ch
- ISDR <http://www.unisdr.org/>
- Kyoto club www.kyotoclub.org
- OCDE http://www.oecd.org/home/0,3675,fr_2649_201185_1_1_1_1_1,00.html
- PECCN <http://www.careclimatechange.org/about-peccn/who-we-are>
- Prevention Consortium <http://www.proventionconsortium.org/?pageid=32&projectid=1>
- Prevention web <http://www.preventionweb.net/english/>
- REReP <http://archive.rec.org/REC/programs/REReP/>
- RSPCSEE <http://www.rspcsee.org/>
- SAA <http://www.stabilitypact.org/about/default.asp>
- UNDP <http://hdr.undp.org/en/data/profiles/>
- UNECE www.unece.org/
- UNFCCC www.unfccc.int
- WEF <http://www.weforum.org/issues/global-gender-gap>
- WWF <http://www.panda.org/>
- Di Cosola M., Stati, Nazioni e Minoranze, La ex-Jugoslavia tra revival etnico e condizionalità europea, Giuffrè, 2010
- Douma W., Massai L. and Montini, M. The Kyoto Protocol and Beyond, TMC Asser Press, 2007
- EC, Regional cooperation in the western Balkans a policy priority for the European Union, European Community, 2005
- EC http://ec.europa.eu/enlargement/enlargement_process/accesion_process/how_does_a_country_join_the_eu/sap/index_en.htm.
- ENDS, EU Pressed to Safeguard Eastern Environment. Environment Daily 1798, 2005
- Energy Community http://www.energy-community.org/portal/page/portal/ENC_HOME.
- Franzinetti G., I Balcani dal 1878 ad oggi, Carocci, 2001
- Grant, W., D. Matthews and P. Newell, The Effectiveness of European Union Environmental Policy. London: Mcmillan, 2000
- Hösh E., Storia dei Balcani, Il Mulino, 2006
- IRGC, An introduction to the IRGC Risk Governance Framework, International Risk Governance Council, Ginevra, January 2006
- ISDR, South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative: Risk Assessment for South Eastern Europe, 2007
- Jimenez R., Cooperative Environmental Management: A Network Approach for Environmental Ventures, <http://wscsd.org/cooperative-environmental-management-a-network-approach-for-environmental-ventures/>.
- Massey E., Bergsma E., Assessing adaptation in 29 European countries, IVM, 2008
- Meadows D., Randers J., Meadows D., Limits to Growth: The 30-Year Update, Chelsea Green Publishing Company, 2007
- Minkova J., REReP, Environmental Snapshot of South Eastern Europe, REC, 2006
- Montini M., Developing CDM Projects in the Western Balkans, Springer, 2010
- Montini M., Il Protocollo di Kyoto ed il Clean Development Mechanism: aspetti giuridici e istituzionali. L'esperienza nei Balcani, Giuffrè, 2008
- Montini M., Bogdanovic S., Environmental Security in South-Eastern Europe. Agreements and Their Implementation – International, Springer-NATO for Peace and Security Series, 2011
- Pévelakis G., I Balcani, Il Mulino 1994
- RENA <http://www.envforum.eu/doku.php/rena/start>, <http://www.renanetwork.org/index.php?view=countries>

CHAPTER 5

Apostolova B, Gender Wage Gap in Western Balkan Countries, World Bank International Conference on Poverty and Social Inclusion in the Western Balkans WBalkans 2010 Brussels, Belgium, December 14-15, 2010

Bartaletti, F. Geografia e cultura delle Alpi, Franco Angeli, Milano, 2004

CEU, Making the case for Environmental Justice in Central & Eastern Europe, 2007

CE, Communication, 127 final from the commission to the European parliament and the Council, 2008

De Jongh P. and Captain S., Our Common Journey: A Pioneering Approach to Cooperative Environmental Management. London: Zed Books, 1999

Albania's Initial and Second National Communication on Climate Change under the UNFCCC: http://unfccc.int/files/meetings/seminar/application/pdf/sem_albania_sup3.pdf

Bosnia's Initial National Communication under UNFCCC <http://www.global-issues-rtd.info/programmes/2130.html>

Croatia's First National Communication under UNFCCC <http://unfccc.int/resource/docs/natc/cronc1.pdf>

Montenegro's Initial National Communication on Climate Change of Montenegro under the UNFCCC: <http://www.unfccc.me/doc/INC-ENG.pdf>

Slovenia's First, Second, Third and Fourth National Communication under UNFCCC: <http://unfccc.int/resource/docs/natc/sloenc1.pdf>

Serbia's Initial National Communication on Climate Change under the UNFCCC: <http://unfccc.int/resource/docs/natc/srbnc1.pdf>

The FYR of Macedonia's Initial and Second National Communication on Climate Change under the UNFCCC: <http://unfccc.int/resource/docs/natc/macnc1.pdf>

The World Bank, International Strategy for Disaster Risk Reduction, World Meteorological Organization, Finnish Meteorological Institute, Strengthening the Hydrometeorological Services in South Eastern Europe, http://www.wmo.int/pages/prog/dra/vcp/documents/Strengthening_Hydrometeorological_SEE.pdf

The World Bank, South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative - Risk Assessment for South Eastern Europe -Desk Study Review, 2008.

UNDP-Carpathian Project, INTERREG III B CADSES, EU VASICA: Vision and Strategies in the Carpathian Area, 2007, UNDP

UNDP How-to guide: National Institution Frameworks for the Kyoto Protocol Flexible Mechanisms in Eastern Europe and the Commonwealth of Independent States, 2006, UNDP

UNDP Montenegro The Economic Impacts of Climate Change in Montenegro: A First Look <http://www.unfccc.me/doc/CC-ENG.pdf>

UNFCCC, Convention Cadre sur les Changemnet Climatiques: guide, 2008 UNFCCC

