Environment and sustainable rural tourism in four regions of Serbia

Southern Banat • Central Serbia • Lower Danube • Eastern Serbia

-as they are and as they could be-
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UNEP and Young Researchers of Serbia (YRS) have prepared this report which presents regional environmental studies for four regions: South Banat, Lower Danube, East Serbia and Central Serbia. The objective is to assess and better understand the current status of the environment, review resource use and management practices, and identify challenges and opportunities for sustainable rural tourism management and initiatives.

Specific emphasis is given to protected areas and the necessary supplementary tourism support structures including energy efficiency and waste management. The report then examines how sustainable rural tourism could contribute to the conservation of the environment, and identifies the potential benefits in support of rural development in these regions.

This report recognises that tourism is fundamentally reliant upon the quality of the environment, which is why the relationship between the two is vitally important. Development inevitably brings changes and tourism development results in changes which can be positive or negative. The ‘globalisation of tourism’ has led to many studies and assessments which analyze the relationship between tourism and the environment. The influence of tourism and the environment on each other are quite complex, and it is the acknowledgement and management of these influences so as to maximise positives and limit negatives which is the embodiment of sustainable tourism. All tourism, therefore, should strive for sustainability with an emphasis on retaining as many of the benefits as possible within the local community.

In addition, this report recognises that rural tourism, which is in a consistent growth phase in Europe and globally, combines many different aspects of experiencing, sharing and showcasing rural life. These rural experiences can be defined in terms of rural activities and accommodation experience. The combination of these forms the essence of rural tourism and its development can have a significant impact on the economic and cultural vibrancy of rural living if combined successfully with rural development strategies.

A comprehensive desk study of all current and proposed legislation and development plans was augmented with a questionnaire targeted at identified interested and affected parties, as well as a selection of in-depth interviews. What surfaced, amongst other issues, was the obvious gap in national, regional and local data collection and monitoring on a number of different fronts. In some cases specific analysis was undertaken to establish baseline data, e.g. energy efficiency in buildings. It is hoped that the study will provide the impetus for further analysis and discussion for policy development.

The analysis of all four regions provides a snapshot of current national sustainable development and the identified national issues which have galvanized opinion in recognition of sustainable tourism development as a key contributor and driver of sustainability in rural Serbia. These issues include:

**Biodiversity** There are few countries in Europe that can boast of possessing such a wealth of biodiversity, both of ecosystems and species. Of the six bioregions of Europe, five can be found in Serbia. The country is interlaced with various floristic kingdoms and a mosaic distribution
Summary

of ecosystems leading to distinct regional differences. The landscape plays an integral part in the identity, economic activity and attraction of each of the four regions. These range from the dominating karst morphology of East Serbia, the influence of the Danube River on the Lower Danube region, the vast expanse of arid sands in South Banat, and the Valjevo mountain range of Central Serbia. A comprehensive rural tourism strategy, supported by national policy, needs to encourage the conservation and sustainable use of biodiversity and the enhancement of diversity in all activities which engage with the natural environment. This strategy should also acknowledge that the conservation of biodiversity cannot be focused only in protected areas; as islands surrounded by an increasingly depleted environment.

The quality of the natural environment, from a rural tourism perspective, is relatively good. However, there are a number of direct and indirect threats that need to be dealt with if sustainable rural tourism is to have a firm foundation.

**Water resources** Only 8% of Serbia’s available water resources originate in the country; the remaining 92% is transit water entering the country through the Danube, Sava and Tisa rivers. Unlike other countries, Serbia has not developed large-scale water purification and transport of transit waters but has become heavily dependent on groundwater, which is under pressure, with little room for future development. Significant investment is required to reduce the reliance on groundwater and to harness water resources in a more sustainable manner.

**Pollution of water, air and soil** is a significant issue and is a result of historically heavy industry, mining, coal-fired power plants, domestic fuel selection, vehicle emissions, transnational effluence, uncontrolled use of agricultural fertilisers and pesticides, inappropriate waste-water management and waste management in general. There is a clear lack of natural resource management, and the high costs, lack of government and financial support for development of water supply management and waste water management in rural areas in particular needs to be addressed. The EU Water Framework Directive could make substantial inroads into these problems. Tourism relies heavily on reliable water sources and water-based tourism in particular will require significant improvements in water quality for a sustainable future.

**Waste management and recycling** is beginning to develop, but from a very low base. Currently, there is an unacceptable level of pollution caused by landfill and illegal dumping. Substantial investment is required in equipment, facilities, awareness programmes, and structural changes to allow for public-private partnerships, and equitable fee paying systems.

**Energy efficiency of buildings** was given particular focus in this report. Despite the existence of thermal building regulations and severe winters, most buildings still have no or insufficient thermal insulation. Domestic housing mostly uses a variety of individual heaters or just stoves and less frequently central heating systems with individual boilers. Solid fuel, mainly wood, is used for heating in most cases. Energy efficiency should be targeted as a priority, along with education and support.
structures by municipalities to enable a cost effective retro-fit programme. From a tourism perspective, energy efficiency is significant for competitive pricing and overall profit margins.

The area of natural heritage under protection is around 5.86% of the total territory of Serbia, which is significantly below the average of European countries. There are currently 463 protected natural heritage areas and a further designation of more than 2.6% of Serbia is in process. It is planned that protected areas will cover 11.5% of Serbian territory by 2013. However, there are continuing problems in the management of protected and other natural resources, which limits the capacity of rural tourism development and benefit to local communities, as well as the benefit to Serbian tourism in general. The scarcity of investment funds for environment protection and environmental awareness education will increase environmental risks in the future if not addressed adequately. Rural Tourism has a key role to play in the conservation and enhancement of the natural environment of Serbia. Since the natural environment is one of Serbia’s strongest attractions, relevant structures and policies need to be reviewed and strengthened to ensure that national and regional plans for conservation and tourism management are holistic, sufficiently financed and include management training.

Rural outward migration over the past 50 years has drained and continues to drain the rural economy. Migration has left many villages with an aging population, depleted services and infrastructure; and with limited capacity to regenerate or take advantage of new opportunities. This has been compounded over the past 15 years by the collapse of the cooperative agricultural system, the tenure of land ownership, and the demise of heavy industry to which many in rural areas were drawn to, leaving farming as a supplementary activity. The challenge is to reverse migration by making the rural economy viable and attractive, with a sustainable agriculture sector, supportive to rural tourism development.

The rich cultural heritage of rural regions has been steadily eroded over many decades through a combination of outward migration, lack of investment and economic decline, weak planning regulations and enforcement, and increasing poverty. Whilst rural tourism development can act as a vehicle for stemming this decline, it requires a comprehensive, holistic approach to the issues within a progressive rural development plan. Uncontrolled construction of accommodation in rural tourism is already evident. There are countless examples across Europe, providing evidence of the fundamental damage this can do to the very core tourism product and the consequential impacts on the socio-cultural fabric of a destination. Clear guidelines and planning policies need to be adhered to and keenly enforced so as to allow for tourism’s development in a sustainable manner. In addition, whilst road infrastructure in rural areas and particularly between rural tourism locations needs to be improved, it needs to be done without damaging the aesthetic value of the landscape and rural ambience.

The renewable energy generation potential in Serbia is over 4.1 million tons of oil equivalents (Mtoe) per year, which represents about a quarter of the current primary energy consumption. Renewable energy has not been
developed in any meaningful manner, except in the case of large hydroelectric power plants, which have had irreversible consequences on water regimes and fishing. This is largely because the use of renewable energy sources has been much more expensive than using conventional energy sources to date. Each of the four regions has the potential to develop one or more renewable energy production schemes but without the necessary support structures and pricing incentives, these options, which carry high investment costs, will not be selected. Tourism could contribute to this infrastructure development by driving demand for renewables.

A viable and sustainable agriculture sector plays a key role in the success of rural tourism. Likewise, rural tourism can also be a driver for enhancing the agriculture sector by presenting opportunities to supplement incomes and promote quality. Not only does agriculture have the capacity to provide many tourism inputs it also has an important role in biodiversity conservation and environmental management. Whilst support through EU Agricultural Policy in the future will be well received, careful consideration needs to be given to balancing the cultural integrity within the rural communities, and agricultural communities in particular, and the development of tourism. Further work to establish organic agricultural production and other forms of sustainable agricultural production and a comprehensive rural development plan needs to be put in place within which agriculture is but one, albeit major, element, and education another.

Forestry is an important economic activity in rural Serbia. It can, if managed sustainably and aligned with international best practices, play a mutually beneficial role with tourism. It provides a number of tourism products directly, such as accommodation, hunting, trails, bird-watching, etc., and indirectly through sustainable forest management and by supporting the development of renewable energy from biomass.

Fishing already has a sizeable domestic base but needs comprehensive planning to ensure long-term sustainability. Meeting international standards will be a prerequisite to attracting meaningful international visitors.

Although there is a great discrepancy in the rural tourism offerings and quality among the different regions, rural tourism is only starting to develop in Serbia, unlike other European countries, where this kind of tourism is quite popular domestically, and well developed. Many ancillary services, fundamental to the sustainability of tourism development, have not yet reached a level of activity in Serbia that either curtails and mitigates against pollution or achieves a standard comparable internationally and adopts sustainability parameters to ensure against future risk.

Rural Tourism development in the four regions should prioritize rural activities and rural accommodation in a sustainable manner. By doing so, there is an opportunity to define a truly Serbian rural tourism experience which is holistic and integrates these different components, thereby creating a competitive positioning for Serbia. The four regions already have existing products which correlate with rural tourism and provide a strong basis for the further development of rural tourism. Hub development is a recognised form of tourism destination development that allows for controlled growth and compliments sustainability. All four regions have capacity to
utilise this approach, often in combination with protected areas. It is therefore fundamental that protected areas management has the capacity to take a decisive stakeholder position in rural tourism development.

Regardless of the evident shortcomings, rural tourism is already playing an important role in rural Serbia and is generating a significant level of income. Rural tourism is an emerging reality in Serbia supported by the more than 32,000 existing beds (registered and non-registered) in rural areas, from which 10,000 beds are exclusively rural. It is estimated that these total beds are generating more than 5 billion RSD annually of accommodation income. Rural tourism could play a key role in Serbia in terms of diversifying the rural economy, and thereby creating employment opportunities which will generate additional incomes for rural households, reduce unemployment (specifically among women and young people) and can help to maintain or repopulate villages. The qualitative analysis of the rural tourism sector shows that there are many gaps along the Serbian rural tourism value chain. From a positive perspective, these gaps represent opportunities that can be harnessed in an environmentally and socially sustainable manner.

One of the clearest gaps identified through the research in this report is the need for awareness raising and human resource development to create greater understanding of how to use the opportunities provided by rural tourism in a sustainable way. A comprehensive programme which supports knowledge and awareness of sustainable rural tourism is required at all levels. This will be fundamental to supporting coordination between the national, regional and local stakeholders (public and private sectors, and civil society).

In consideration of the current issues facing sustainable development in Serbia, it is evident that the promotion of rural sustainable tourism certainly has the capacity to make a significant contribution by acting as a driver and providing the momentum to encourage more sustainable practices.
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<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>ASCIs</td>
<td>Areas of Special Conservation Interest</td>
<td>PA</td>
<td>Protected area</td>
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<td>ASL</td>
<td>Above the Sea Level</td>
<td>PE</td>
<td>Public enterprise</td>
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<td>CBD</td>
<td>Convention on Biological Diversity</td>
<td>PPPPN SRP</td>
<td>Spatial Plan of Special Use Zones within Special Nature Reserve</td>
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<tr>
<td>CE</td>
<td>Council of Europe</td>
<td>Ramsar site</td>
<td>Wetland of international importance designated under the Ramsar Convention on Wetlands</td>
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<td>RARIS</td>
<td>Rural Development Agency Eastern Serbia</td>
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<td>CLRTAP</td>
<td>Convention on Long-range Transboundary Air Pollution</td>
<td>RS</td>
<td>Republic of Serbia</td>
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<td>CORINE</td>
<td>COoRdnated INformation on Environment</td>
<td>RSEDP2</td>
<td>Regional Socio-Economic Development Program 2</td>
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<td></td>
<td></td>
<td>SEA</td>
<td>Strategic Environmental Impact Assessment</td>
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<td></td>
<td></td>
<td>SMEs</td>
<td>Small and Medium Enterprises</td>
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<td>DIVA-GIS</td>
<td>Computer program for mapping and geographic data analysis</td>
<td>SNR</td>
<td>Special Nature Reserve</td>
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<tr>
<td>DTD</td>
<td>Danube–Tisa–Danube (canal system)</td>
<td>TOS</td>
<td>National Tourism Organisation of Serbia</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>Emerald</td>
<td>Network of ASCIs to be established in the territory of the contracting parties to the Bern Convention of CE</td>
<td>UNEP</td>
<td>United Nations Environmental Programme</td>
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<tr>
<td>Network</td>
<td></td>
<td>UNDP</td>
<td>United Nation Development Program United Nation Educational, Scientific and Cultural Organization</td>
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<td>EU</td>
<td>European Union</td>
<td>UNESCO</td>
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<td>EuroGites</td>
<td>European Federation of Rural Tourism</td>
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<tr>
<td>FEEE</td>
<td>Foundation for Environmental Education</td>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<tr>
<td>GIS</td>
<td>Geographic information system</td>
<td>NIP</td>
<td>National Investment Program</td>
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<tr>
<td>GIZ/GTZ</td>
<td>Deutsche Gesellshaft für Technische Zusammenarbeit</td>
<td>NP</td>
<td>National Park</td>
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<tr>
<td>HDI</td>
<td>Human development Index</td>
<td>NUTS</td>
<td>Nomenclature of Territorial Units for Statistics</td>
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<td>IBA</td>
<td>Important bird area recognized by BirdLife International</td>
<td>PBA</td>
<td>Protected butterflies Areas</td>
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<td>IPA</td>
<td>Important plant area</td>
<td>UNICEF</td>
<td>United Nation Children's Found</td>
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<td>IPA</td>
<td>Instrument for Pre-Accession Assistance</td>
<td>UNWTO</td>
<td>United Nation World Tourism Organization</td>
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<td>IPARD</td>
<td>Rural Development component of the IPA</td>
<td>WEI</td>
<td>water exploitation index</td>
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<td>IPPC</td>
<td>Integrated Pollution Prevention And Control</td>
<td>YRS</td>
<td>Young Researchers of Serbia</td>
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<td>IPPC</td>
<td>International Plant Protection Convention</td>
<td>ZZP RS</td>
<td>Institute for Nature Preservation of Serbia</td>
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<td>JP</td>
<td>Joint Programme</td>
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<td>LEAP</td>
<td>Local environmental Action Plans Area listed in UNESCO’s</td>
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<td>MAB reserve</td>
<td>Man and the Biosphere Programme</td>
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<td>MDG</td>
<td>Millennium Development Goals</td>
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<td>MDG-F</td>
<td>Spanish Fund for MDG Achievement</td>
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<tr>
<td>MICE</td>
<td>Meetings, Incentives, Conventions and exhibitions</td>
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<td>MP</td>
<td>Master Plan</td>
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<td>MTO</td>
<td>Municipal Tourist Organisation</td>
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<td>Natura 2000</td>
<td>Network of protected areas under the EU Habitat and Bird Directives</td>
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<td>NEAP</td>
<td>National Environmental Action Plan</td>
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The MDG-F Joint Programme (JP) Sustainable Tourism for Rural Development in Serbia has two key objectives to be achieved through cooperation between the participating UN agencies (UNDP, UNEP, FAO, UNWTO and UNICEF) and national partners, namely the Ministry of Economy & Regional Development, Ministry of Agriculture, Forestry & Water Management, and Tourism Organization of Serbia:

**Objective 1 (National level):** Development of legal and policy frameworks for supporting diversification of the rural economy through tourism and contributing to the achievement of Millennium Development Goals. This objective is implemented at the national level by supporting the Government to: 1) develop a National Rural Tourism Master Plan, 2) develop a National Rural Development Programme, and 3) provide guidance for public investments.

**Objective 2 (Local and Regional level):** Better linked and organized local rural tourism and support industries, thus improving local stakeholders’ capacity for delivering services and products, in line with national strategies. This objective is implemented at the local and the regional levels, in four target regions, and aims to provide support in local rural planning, and development and management of tourist destinations.

It is accepted that sustainable tourism is one of the key sectors with strong potential to support the diversification of Serbia’s rural economy. Sustainable tourism has been looked upon, until recently, as a niche market existing only to counter the threats of unmanaged tourism. However, sustainable tourism sees tourism within the destination areas in terms of relationships between host areas, their communities and tourists, and the tourism industry. In the past, the tourism industry has dominated this relationship which has not always had favourable results. Sustainable tourism aims to reconcile the potentially conflicting interests between these three partners to build a robust and resilient industry in which all stakeholders experience benefits.

This report, by UNEP and YRS, presents regional environmental studies for South Banat, Lower Danube, East Serbia and Central Serbia.

**The objective of this study is to:**
- Explore the current status of the environment as the crucial asset in the development of sustainable rural tourism in the selected regions;
- Review the current status of resource use and management practices, and
- Identify challenges and opportunities for sustainable rural tourism management and initiatives.

The aim is to contribute a better understanding of the state of the environment in the four regions and:
- Identify the challenges (and opportunities) for sustainable tourism development in these rural areas.
- Examine how the potential of the protected areas residing within the four regions could best be used for the development of rural tourism.
- Review and develop components on supplementary tourism support structures including energy efficiency and waste management.
- Explore how sustainable rural tourism could best contribute to the protection of nature.
- Identify the potential benefits from the promotion of sustainable tourism in the rural regions.
In accordance with the project objectives, a specific methodology and a collection of data sets were developed for this study. Separate analyses are provided for each of the four designated regions, followed by a synthesis in terms of conclusions and recommendations pertaining to sustainable tourism and rural development in general.

Each regional analysis begins with a description of the physical-geographic and socio-economic features of that region, in order to provide an understanding of their natural and social assets.

The climate of the specified area was analysed using a DIVA-GIS package, with the climate data based on a 50-year period (1950-2000) which was obtained from the WorldClim database. Relevant studies of the contemporary authors were also used. The analyses also included episodic events e.g. floods and periodic droughts as indicators of possible climate change.

Demography, spatial planning and urbanization were analyzed using the two main sources: CORINE\(^2\) (COoRdinated INformation on Environment) database and the municipality yearbook database from the Statistical Office of the Republic of Serbia.

The environment of the four regions in focus was assessed using the most relevant data. Indicators of air, water and soil quality were derived using the time series of data collected by permanent monitoring. Since the capacities and resources of most municipalities to monitor air, water or soil pollution is limited, accurate data on environmental quality was not readily available. Therefore, we extrapolated existing data to specified regions, in order to assess both the natural and heritage values of the regions that may improve tourism development, and to identify potential threats to the development of sustainable tourism.

Indicators of air, water and soil quality were derived by analyzing distance from the nearest polluters or environmental hotspots, examining water supply and demand, infrastructure (sewage and water treatment facilities), pollution sources, soil erosion and possible contamination.

Municipal waste generation and waste management were assessed using data\(^3\) on official and old landfills and illegal waste dumps, including reduction, reuse and recycling.

Indicators of biodiversity were derived using species (rare and endangered species, protected species, autochthonous and alochthonous species, invasive alien species), habitats (forests, steppes, wetlands and rivers, sands, etc.) and landscape diversity, as well as using existing protected areas and internationally significant natural assets (IBA, IPA, Ramsar, proposed World Heritage sites). The main information sources on biodiversity within the specified regions involve Puzović\(^4\), Stevanović\(^5\), and Jakšić\(^6\).


Analysis of current socio-economic conditions in the four regions focuses on demography, urbanization and the potential impacts of energy production, mining, industry, agriculture, forestry and transport on the environment and development of the tourism sector. In consideration of the economic development issues, we analyzed the contributions made by the energy sector, mining, industrial production, agriculture, forestry, transport sector and tourism to the economy of local communities and impacts of these sectors on environment, using available yearbook databases (Statistical Office of the Republic of Serbia) and the state of the environment reports (Serbian Environmental Protection Agency7 and Provincial secretariat for urban planning, construction and environmental protection8).

The most accurate data on the building stock could be gathered in the National Census which is conducted every ten years. In October 2011, the National Census was conducted with strictly defined questionnaire techniques, which contained several questions pertaining to residential buildings, such as: the construction year of the apartment, the area of the apartment, the number of rooms, installation status, fuel used for heating, the construction year of the building, type of building (free-standing single-family house, free-standing duplex house, semi-detached house, terraced house with at least three attached residences each of which has its own entrance, multi-family house with 3–9 apartments, apartment block with 10 or more apartments), external wall material (rigid and soft materials).

However, the answers to these questions could not facilitate the assessment of the quality of energy performance of the buildings nor could they provide the necessary input for the choices of energy rehabilitation in order to enable the evaluation of energy savings on the national level; therefore, it was concluded that there was a need to create methodology to support the formation of a relevant national residential building stock assessment. Such an endeavor was to comprise an independent statistical survey in compliance with the rules of statistics and based on the specific architectural and urban planning parameters in design and construction of residential buildings in Serbia.

The methodology for creating the national typology for (more energy efficient) buildings was developed following the model adopted within the IEE Project TABULA9 using the information gathered in the preliminary Datamine Project taking into account the specifics relevant to Serbia. In order to have precise data about the quality of building stock, an independent investigation was conducted.

Tourism and its impact on the environment were studied from several perspectives. The current tourism offer analysis is based on data provided by the National Tourism Organisation of Serbia, and municipal tourism organizations, from websites, from field research and from the experience of the report’s authors. The potential impact of the tourism sector on the environment was analyzed based on available master plans for tourism development, municipal tourism or strategic development plans and information gathered through fieldwork.

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8 životna sredina u AP Vojvodini: stanje, izazovi, perspektive, Pokrajinski sekretarjat za urbanizam, graditeljstvo i zaštitu životne sredine, 2011 godine (Environment in AP Vojvodina: state, challenges and perspectives, Provincial secretariat for urban planning, construction and environmental protection, 2011)
9 www.building-typology.eu/tabula.html
Policies and legal frameworks relevant to governance, environment protection and rural tourism development were analyzed using the existing environmental strategies, the National Environmental Action Plan (NEAP), Local Environmental Action Plans (LEAPs), local and regional-level development strategies and other relevant documents. Analysis of information available during the first phase also provided an overview of the problems and challenges in implementation of legislation, overview of jurisdictions and similar. Fieldwork research aimed to gather more data regarding the economic instruments and measures for environmental protection at the local level, municipal eco-funds and investments. However, it turned out that for the majority of municipalities no such information was available.

Desktop studies investigated and informed the approach to fieldwork research. As a part of the fieldwork research preparations, the project team created the local stakeholder lists (Annex I). Based on the questionnaire (Annex II) created for this purpose and the analysis of these lists, the fieldwork research team singled out the key institutions, organizations and individuals who were to be interviewed. Interviews were conducted with all the selected stakeholders and concentrated on sustainable tourism development, rural development and environmental protection. Participants in this research were representatives of governmental and local institutions, private companies, non-governmental sector and rural households.

Identified Issues
The geographic coverage of this study; that is, the four regions of Serbia selected, were decided upon at the time of designing the MDG-F Joint Programme (JP) Sustainable Tourism for Rural Development in Serbia. The decision was based upon formerly established criteria, field visits and statistical data. The chosen regions of **Central Serbia, Southern Banat, Lower Danube** and **Eastern Serbia**, have been formed and named but only partly correspond to the established regions within Serbia. The territory of Serbia was divided in 2010 into five regions (NUTS level 2) covering significantly larger areas than the regions used in the study. In addition, the territories administered by municipalities included in the selected regions do not correspond to the territorial organization of administrative regions in Serbia. Some of the municipalities from the administrative regions with the same name have not been included to the corresponding region used in the Study (Southern Banat) or have been grouped together even though they belong to different administrative regions. The consequence of this is that no official regional data could be used with any degree of confidence and so data had to be sought at the municipal level, after which it was grouped according to the configuration of the regions used in the study. In many cases, this data did not exist or was not verifiable.

It is important to emphasize the problem of the availability and quality of data. Some data was easily accessible, either on the official websites of institutions or in their publications. The other data segment, especially the one pertaining to
investments in environmental protection and their distribution, was not easily available. Some data did not eventually reach the authors even though verbal promises had been given by the respondents.

Data on rural tourism turnover is not kept by the majority of municipal tourist organizations so it could not be disaggregated from total tourist turnover. In addition, in cases where such data is available, it differs significantly from the data collected from individual households. This suggests that either households are not reporting the total number of guests, or that they exaggerated this number during the interviews.

As far as the existing data and forecasts on the environmental impact of tourism development are concerned, these differ to a large extent with respect to which entity is providing it. Environmental impact was judged to be the least by the governmental institutions and private companies investing in accommodation and other tourism facilities (such as national parks, the Public Forestry Company “Srbijašume” and the public company for the development of ski resorts in Serbia “Skijališta Srbije”). Studies made by expert and scientific institutions (Institute for Protection of Nature of Republic of Serbia, Faculty of Forestry, Faculty of Biology and Faculty of Geology of the University of Belgrade) suggest a greater impact from both existing and future development of tourism. When it comes to the development of the commercial tourist industry and its impact (on the ecosystems, most notably) the greatest threats were identified by representatives of the NGO sector and professional associations; in some areas these organisations are conducting various activities against such tourism development plans.

Orientation towards the three areas of interest (sustainable tourism, rural development and environmental protection, which, by association, includes energy efficiency, use of renewable energy sources, decrease in CO2 emissions and reduction of waste generation) and their interrelations required an integrated approach and defined the type of data that had to be collected and analyzed. Analysis of documentation and desk research were done using a large number of sources - such as plans, strategies, reports, scientific publications, articles and legal documents. In selecting the final data to be used and analyzed, we paid attention to its reliability and importance for this particular aspect of analysis. Naturally, we also relied on the results of the studies developed within the MDG-F Programme, and by other implementation agencies’ teams working in related fields.

In addition to the desk research and survey, interviews with the representatives of protected area management organizations located in the Regions were performed in order to extract an insight into current developments, e.g. into resources and the potential for rural tourism activities in cooperation with local community. (Questions for semi standardised interview attached in Annex III and list of interviewed representatives in Annex IV of the Document).

2.1 DEFINITIONS
2.1.1 Sustainable Tourism
In consideration of sustainable tourism development potential, the framework of the CBD Guidelines outlined in Managing Tourism and
Sustainable tourism should: contribute to the conservation of biodiversity and cultural diversity; contribute to the well being of local communities and indigenous people; include an interpretation/learning experience; involve responsible action on the part of tourists and tourism industries; be appropriate in scale; require the lowest possible consumption of non-renewable resources; respect physical and social carrying capacities; involve minimal repatriation of earned revenue; be locally owned and operated (through local participation, ownership and business opportunities, particularly for rural people). This embraces two, interrelated, elements of the sustainability of tourism:

- Ensuring that the conditions are right for tourism to continue as an activity in the future;
- The ability of the society and the environment to absorb and benefit from tourism in a sustainable way.

2.1.2. Rural and Rurality

Defining rurality has taken much space in geographical and rural sociology texts but there is little consensus on what constitutes the phenomenon ‘rural’\(^9\). A simplistic definition of rurality can be those areas, which lie beyond major towns and cities and which are, therefore, rural, as opposed to urban, in character\(^9\). Further definition can be derived from population density, size of settlement, land-use and traditional social structures as main characteristics that help identify the area as rural. However there is no universal definition for ‘rural’ as national governments use country specific criteria. For example, rural in Australia is defined as parishes of less than 5000 people while in Denmark and Norway towns of fewer than 10,000 people are considered rural areas\(^9\).

2.1.3. Rural Tourism

The term ‘rural tourism’ has different meanings in different countries. A few examples of the forms it takes in different countries: In India, components of rural tourism include heritage, farm, pilgrim, adventure and nature. In Slovenia, the most important form of rural tourism is tourism on family farms. In Netherlands, the rural tourist product means especially camping on the farm and being linked to route-bound activities as cycling, walking or horse riding. In Greece, the main provision of rural tourism product is bed and breakfast with accommodation in traditionally furnished rooms and with traditional breakfasts often based on homemade products\(^13\).

Rural Tourism is comprised of a spectrum of activities and services organised by the rural Population\(^8\). It is based on principles of sustainability and offers elements of country environment, nature, as well as presenting traditional hospitality and the values of life of the local population. It is the contact with this nature and the personal human contact with the local people which makes rural tourism so unique. Rural accommodation combines different forms of tourism that showcase rural life, art, culture and heritage in rural locations. International trends suggest that Rural Tourism is becoming an increasingly broader concept and that the needs and expectations of domestic and international demand are becoming ever more sophisticated.

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\(^9\) Robinson 1990; Illbery 1997 in Thompson Learning, Tourism - a modern synthesis

\(^10\) IBID


\(^13\) Republic of Serbia Tourism Development Strategy, Ministry of Trade, Tourism and Services, Horwath Consulting, Zagreb, Faculty of Economy, Belgrade, 2005
2. Methodology

Over time researchers have constantly added to understanding the activities that encompass rural tourism. The list includes interest in farms, nature, adventure, health, education, arts, and heritage and experiencing living history such as rural customs, folklore, local traditions, beliefs, and common heritage. The key parameters that define rural tourism are: ‘it is located in rural areas, functionally rural; based on small-scale and traditional activities and enterprises (rural in scale), relies on the traditional qualities of the countryside, develops slowly under the control of local people and is non-uniform (reflecting the complexity of the rural environment).

Rural Tourism, therefore, combines many different aspects of experiencing, sharing and Show casing rural life. These rural experiences can be defined in terms of the rural activities and the accommodation experience. The combination of these forms the essence of Rural Tourism.

From a rural development perspective, Rural Tourism development has the potential to affect the demographic sphere – local people are more motivated to stay in the country, ecological sphere – tourism motivates local people and the authorities to protect the environment more, cultural sphere – local people are more interested to learn about the local culture heritage, since the tourism brings a large number of tourists who want to learn about it (old crafts for example).

2.1.4. Growth of Rural Tourism

With the continuous increase in the number of tourists visiting rural areas, the awareness of developing the region to cater to these needs has grown. In Europe, sliding economies, changes in agricultural practices, the rural-urban migration initiated by the industrialisation, were also contributory factors for this shift (Figure 1). With the increase in popularity and numbers, the impacts of tourism on the environment and people started emerging. As early as the 20th century questions of access to and preservation of valued landscapes were becoming contentious issues. From Figure.1 we can conclude that the development of rural tourism in a region was based on a two-pronged agenda: developmental benefits (job retention, creation of new jobs, farm support, and infrastructural development) and the preservation & conservation of the environment (landscape and nature conservation). Apart from the developmental and environmental reasons, the social criteria (broadening of cultural provision, enrich and revive dying arts and craft forms and social interaction for local people who often live relatively isolated

![Figure 1: The Context of Rural Tourism](source: Thomson Learning)
regions) (Swarbrooke, 1996 in Rátz, & Puczkó, 1998) are also motivational factors for the development of rural areas. It was based on one or more of the above factors, which has led many countries both developed and developing to focus on rural tourism.

So what is it that attracts the tourist to a rural area? Working from the perspective of the tourist, the countryside has been viewed upon as ‘isolated and remote representing peace, difference, even exoticism. Rurality means nature – mental contemplation, aesthetic appreciation or physical activity. Traditional lifestyles represent our heritage and the security of past times. It is this culture and heritage that is often believed to be well preserved between generations in rural areas. Other words/ phrases that people associate with rural tourism is relaxing environment, adventure and challenge, health and fitness, fresh air, wildlife and landscapes, experience of rural communities, culture and lifestyles, a change from everyday urban life, conservation work and explore historic identities, interests in heritage (Thomson Learning).

Tourism in rural areas in the 21st century has built on the original concept with greater focus. Many countries in order to achieve a balanced growth of the urban–rural regions have incorporated the development of tourism. Very often rural tourism is a sub-component of the rural development policy of the nation. The dynamics between the pull and push factors are becoming more complicated and sophisticated. The numbers of visitors to rural areas has increased considerably. The countryside is also increasingly being viewed as a commodity that can be marketed by the tourism industry and consumed by the tourist. With the rapid consumption rate, tourism has needed to develop in all types of countryside to insatiate this growing need. The new forms of rural tourism that are currently in use to describe the tourism activity are agri-tourism/agrotourism, farm tourism, green tourism, soft tourism, alternative tourism, eco-tourism and several others. The World Tourist Organization finds that most popular activities in rural tourism area according to tourists' satisfaction research are: enjoying the rural environment (75%), gastronomy (70%), visiting lakes and rivers (58%), visiting historical and cultural attractions (41%), hunting, fishing and sailing (32%), cycling, riding, hiking and climbing (24%).

Rural tourism is one that extends to all senses. It touches on the physical and psychological level. Tom Stephenson sums up: ‘were not to see landscape, so much as to experience it physically’.

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18 Brown, Frances & Hall, Derek. (ed), 2000, Tourism in Peripheral
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20 Hall, C Michael & Page, J Stephen. 2002, The Geography of
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London, California & N Delhi
3.1 SERBIA'S ENVIRONMENT

3.1.1 Topography, geology and morphology

The Republic of Serbia is located in South-Eastern Europe in the heart of the Balkan Peninsula, and covers an area of 88,361 square kilometres. Serbia shares a border with eight neighbouring countries: Albania (length of shared border, 114 km), Bosnia and Herzegovina (border, 312 km), Bulgaria (border, 318 km), Croatia (border, 241 km), Hungary (border, 241 km), Montenegro (border, 211 km), Romania (border, 476 km) and the Former Yugoslav Republic of Macedonia (border, 221 km).

Apart from being a central-Balkan country, Serbia is a country on the Danube: the Danube, which runs through Serbia for 588 km, is one of the main water transport arteries of the European continent. It flows into the country from Hungary, traverses the Vojvodina Plain, and runs through the capital, Belgrade, before exiting the country through the Balkan Mountains, providing shipping access to inland Europe and the Black Sea.

The territory of Serbia is divided into particularly differentiated topographical complexes. The main tectonic units in the macro-relief of Serbia are:

- **The Pannonian basin**, which in Serbia represents the southern rim of the lowland region of the Pannonian plateau. It includes the alluvial plains and ridges along the Danube and Tisa rivers, loess plateaus (such as Banat, Titel), and the island mountains of the Fruška gora and the Vršačke mountains. The geological basis of the alluvial plains is river material (sand, gravel) while loess is the mother rock of the loess plateaus. The Pannonian Mountains in Vojvodina are of diverse geological composition, where the main geological mass is represented by metamorphic rock from the Triassic, Cretaceous and Pliocene periods.

There are **five main mountain systems** in Serbia, all of different geological age:

a) **The Rhodope Mountains** – part of the Rhodope system in North, Central and South Serbia, were broken into mountain masses and valleys in the Tertiary; the Rhodope mass was the first land mass of the Balkan Peninsula.

b) **The Carpathian Mountains** – the Southern parts reach North-eastern Serbia and the Balkan Mountain system; they are mostly composed of old metamorphic rocks with thick layers of limestone. They have typical karst relief, with numerous canyons and caves.

c) **The Balkan Mountain** System of East and Southeast Serbia is represented foremost by Stara Planina Mountain, a long mountain range which, in Bulgaria, splits the Peninsula into two parts. Western Stara Planina Mountain (Balkan) is situated on the border of Serbia. The geology of the Balkan mountain system is heterogeneous, and the main rock masses are comprised of Palaeozoic metamorphic rocks and Permian sandstones.

d) **The Dinaric mountain** system is situated in Western Serbia, mostly comprised of Triassic and Jurassic limestone rocks, interspersed with flysch and silicates.
3.1.1.2 Soil characteristics

Serbia has 5,113,307 ha of agricultural land, which is 66% of its total area. Arable land and gardens dominate as a category with by far the greatest areas under agricultural production (3,343,916 ha or 65.4%). As for agricultural utilization of soils, the potential of Serbian soils is classified into 8 classes, where the first 4 classes are higher-quality soils and classes 5-8 cover soils mainly unfit for agriculture.

Erosion is a major cause of soil degradation and is estimated to affect up to 80% of agricultural soil in Serbia. In the central and hilly–mountainous regions, erosion is mainly caused by water.

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3.1.2 Hydrology

Only 8% of Serbia’s available water resources originate in the country; the remaining 92% is transit water entering the country through the Danube, Sava, Tisa and other water resources. In 2004, the total annual water abstraction for household and industrial needs was 820 million m$^3$. Out of the total, 55.4% came from groundwater sources, 42% from surface waters like springs, water sources, and artificial reservoirs, and 2.7% from other public water supplies. Serbia is among the poorer regions in Europe with regard to its own specific availability of surface water at about 1,500 m$^3$ per capita per year.

Approximately 85% of the country’s population has drinking water delivered directly to their homes. A number of municipal water supplies, however, lack the revenue to maintain and improve their water supply networks. Water conservation practices have, for the most part, not been implemented. Due to the large losses in the waterways (up to 50%), specific consumption in cities is high with about 460 litres per inhabitant per day, while specific consumption in villages is about two thirds of specific consumption in cities. Water restrictions, particularly in summer, are more frequent.

Only 35% of households have access to sewage networks, primarily in urban centres, while very few devices for wastewater treatment are operational, and in a very small capacity, so the wastewater has usually been discharged into recipients without purification. Access to sanitation services in Serbia has increased during the past decade. Approximately 90% of homes are now connected to sewers and septic tanks. An estimated 85% of Serbia’s wastewater, however, is untreated, resulting in significant groundwater and surface water pollution. The republic has 37 central wastewater treatment facilities: 30 provide secondary treatment, and the remaining seven provide primary treatment. Most of these facilities, however, are old and function poorly. Serbia’s water exploitation index (WEI) in 2004 was 82%, indicating an excessive use of freshwater resources.

3.1.2.1 Ground waters

Several hydro-geological entities can be clearly distinguished in Serbia, mostly located in particular geotectonic units, with nearly the same or similar hydro-geological characteristics as the rock masses and terrain.

- The Pannonian Basin (Banat, Bačka)
- The Sava Marsh (Mačva, Posavo-Tamnava and Srem)
- The Dinarids (South-Western Serbia)
- The Vardar Zone (generally poor in underground waters)
- The Serbian-Macedonian Mass (Central Serbia)
- The Carpathian-Balkanids with the Dacian Basin (Eastern Serbia).

The public water supply in Serbia is related to the end of the last century, and is basically oriented towards the use of subterranean waters (over 95 %), from different water-carrying environments.


3. National context – an overview of environment and sustainable tourism

Only a negligible number of inhabitants use water from the reservoirs or, in extreme cases, by direct scooping from the waterway. The total amount of the water used today for public water-supply of the inhabitants and industry, equals more than 25 m³/s of the high quality subterranean water. According to the Ministry of Energy and Mining, nine out of ten requests for mineral prospecting are made for underground water, which clearly points at their significance. The main commercial mineral water producers are successful companies such as Knjaz Miloš, Voda voda, Voda Vrnjci, Bivoda, Palanački kiseljak, Vlasinka etc.

3.1.3 Climate analyses
The climate of Serbia can be described as moderate-continental with more or less pronounced local characteristics. The spatial distribution of climate parameters is caused by geographic location, relief and local influences as a result of a combination of relief, distribution of air pressure, terrain exposition, presence of river systems, vegetation, and urbanization. Among the geographic characteristics with significant influence on the climate of Serbia are the following: the Alps, the Mediterranean Sea, the Pannonian basin and the valley of the Morava, the Carpathian and Rhodope Mountains and the hilly-mountainous parts with ravines and highland plains. The prevailing aspect and location of river ravines and plains in the northern area of the country allows the deep southward intrusion of polar air masses7.

Annual precipitation rises in average with altitude. In lower regions the annual precipitation range lies between 540 to 820 mm. Areas with an altitude over 1000 m have, on average, 700 to 1000 mm of precipitation, and some mountain summits in the south-western part of Serbia have heavier precipitation up to 1500 mm. The major part of Serbia has a continental precipitation regime with higher quantities in the warmer part of the year, except for south-western parts where the highest precipitation is measured in autumn. June is the rainiest month, with an average of 12 to 13% of total annual precipitation. February and October have the least of precipitation. Snow is characteristic for the colder part of the year, from November to March, and the majority of days with snow cover are in January.

Solar radiation ranges from 1500 to 2200 hours annually and surface air circulation is to a great extent caused by terrain. In the warmer part of the year winds from northwest and west prevail. During the winter months, east and southeast winds, called Košava (Koshava), dominate. Winds from a south-westerly direction prevail in the mountainous part of south-western Serbia. The highest temperature of +44.3°C was measured on July 22, 1939 in Kraljevo.

The lowest temperature of −39.5°C was measured on January 13, 1985 in Karajukica Bunari on the Pešterska visoravan. Air temperature is measured in open areas at a height of 2m above the ground and in special meteorological shelters that protect thermometers from precipitation and radiation. The temperature regime, as a measure of the thermal condition in the territory of Serbia is primarily caused by solar radiation, geographic location and relief. The majority of the territory of Serbia has a moderate climate. The south-western part of the Republic is on the border of Mediterranean subtopic and continental climate.

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7 Republic Hydro-meteorological Services of Serbia
3.1.3.1 Climate Change and its effects in Serbia
Climate change effects are predicted to have an influence on the current climate, temperature and precipitation in Serbia and may entail widespread consequences. With expected higher temperatures and lower precipitation, more extreme weather conditions are predicted, leading to the risk of flooding and droughts. These climate changes are expected to influence agricultural production, rural development, biodiversity and ecosystems. The negative impacts on ecosystems especially may limit the opportunities envisaged from sustainable tourism development. 8

In order to deal with these predicted problems, Serbia has joined the South East European Climate Change Framework Action Plan for Adaptation, the South Eastern Europe Disaster Risk Management and Adaptation Programme, the South East European Forum on Climate Change Adaptation and the EC managed Regional Environmental Network for Accession 9.

Most national classification systems of ecosystems are based on the classification of vegetation, since vegetation is the most important structural (and functional) part of an ecosystem. The vegetation of Serbia is extremely diverse. More than 700 associations and up to 500 sub-associations may be grouped in higher phyto-sociological units (242 alliances, 114 orders and 59 vegetation classes).

This fact best indicates that the territory of present Serbia is characterized by a high diversity of habitats and as a result, is home to diverse plant communities, making this region one of the most significant European centres of diversity of vegetation and ecosystems.

Polydominant forest vegetation in Serbian (and more generally Balkan) canyons represents a valuable pool of species diversity. A great heterogeneity of environmental conditions and specific history of biota in the canyons has resulted in complex communities that represent a significant resource of rare and endangered taxa 8.

3.1.4. Biodiversity
The biological diversity of Serbia, both of ecosystems and species, is extremely high. The ecosystem diversity of Serbia is determined by geological age, geomorphology, petrography, soil and climatic conditions, which are extremely diverse. Another important factor adding to the diversity are the “refugium” characteristics of the Balkan and the Pannonian regions (parts of the European continent where many species took refuge during glacial periods), contributing to the phenomenon (typical for Serbia and whole Balkans) of relict communities, with numerous endemic-relict floral elements from previous geological ages.

Of the six European main bioregions, five can be found in Serbia, with interlaced various floristic elements, and mosaic distribution of ecosystems. Serbia has three biomes: sub-Mediterranean, Middle European and Pontian-South-Siberian. There are about 1,000 floral communities in Serbia, of which the Balkan endemics make up 8.06% (287 taxa) and local endemics make up 1.5% (59 species). The number of fauna species and their diversity is also very large. About 600 flora and 500 fauna species are endangered.

8 Republic Hydro-meteorological Services of Serbia
9 Regional Climate Vulnerability Assessment, South East European Forum on Climate Change Adaptation, 2012

3. National context – an overview of environment and sustainable tourism

3.1.4.1 Species diversity
Although Serbia’s territory is only 1.9% of the European continent, it has very high diversity of species.

According to the number of species and region size, the species diversity of vascular flora of Serbia is among the largest in Europe: 3730 taxa, 18% of all known species in Europe. The abundance and diversity of Serbian fauna is also high compared to other parts of Europe, mainly due to high ecosystem diversity:
- 98 fish species, 16% of all known species in Europe (of seven endemic Danube species, five live in Serbia);
- 46 amphibian and reptiles species 16% of all known species in Europe
- 360 bird species, 51% of all known species in Europe
- 96 mammal species 38% of all known species in Europe.

3.1.4.2. State of Forests
Forests and woodland cover 29% of Serbia’s land area. The country’s geographical position, climatic diversity and habitat conditions create abundant biodiversity in forests and enable the presence of many different forest types and plants. The percentage of forest-covered area increases from north to south of the Republic of Serbia.

Out of the total area covered with forests in the Republic of Serbia, the largest areas are with homogenous broad-leaved forests and the smallest are with mixed coniferous forests.

The complexity and importance of forests, which constitute an important part of the natural and cultural heritage as well as being a source of important raw materials, makes it essential to establish a clear picture of their condition. Their potential, from the aspect of both planning and optimal utilization, and the continuous review of their status and degradation level are closely monitored. Forests are among the most complex ecosystems on earth, so as a result their level of preservation can be taken as a measure of the general level of environmental preservation in any particular region.

Of the whole area covered by forests in the Republic of Serbia:

- 53% are state-owned forests;
- 47% are privately-owned forests.

The coverage in the Republic of Serbia is similar to the world average (29%) and lower than the European average of 46.6%.

Actual coverage in the Republic of Serbia (29%) represents 66.2% of optimal capacity, estimated to be 41.4%. The worst situation is in Vojvodina, with 7% of coverage, where optimal would be 14.3%.

This data suggests that the most important future task is to increase forest coverage, but the urgency of this action varies from region to region. Another consideration is the composition of these forests to maximise load, structure and support of biodiversity.

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Institute for nature conservation of Serbia: Biodiversity of Serbia, 2012


Banković S., (i ost.) 2009. Šumski fond Republike Srbije - stanje i probleme, Glasnik Šumarskog fakulteta, br. 100, str. 730, Beograd
National context – an overview of environment and sustainable tourism

3. National context – an overview of environment and sustainable tourism

3.1.4.3 The main threats to biodiversity in Serbia are:

- Degradation of habitats (increase of agricultural lands, particularly in the Pannonian plains, drainage of swamps and marshes);
- Fragmentation of habitats (transportation routes acting as barriers, hydro-melioration, construction of water accumulations in gorges which are refugium habitats of relict and endemic species and communities);
- Destruction of habitats (the urbanization process, in the period after WWII, has led to enormous expansion of urban areas and tourist centres - in particularly vulnerable ecosystems);
- Excessive use of forests, forest products, medical herbs, game and fish fauna, without measures taken for their renewal, and unsuitable methods used to destroy pests (pesticides, herbicides, game poisoning);
- Introduction of invasive allochtchonous (non-native or alien) species;
- Water, soil and air pollution;
- Mining practices with high environmental impact (open-cast lignite and copper ore mines);
- Fires, floods, accidental pollution by dangerous substances (from industry, transportation, wars).

Pressures on biodiversity in Serbia are mostly reflected in the forests and sensitive ecosystems (wetlands, steppes, forest-steppes, sands, continental salt-springs, high-mountain habitats).}

A better ratio in structure, according to the listed categories, can be observed in state-owned forests, with 53.4% of high forests.

On reflection, the state of forests in the Republic of Serbia is sub-optimal, so priority tasks have been put forward and include:

- Transformation of shoot forests into high forests;
- Melioration of different degraded forms, by reconstruction and inversion as basic remedy measures,

Jelena Beronja: Dandelions

3. National context – an overview of environment and sustainable tourism

3.1.5. Protected Areas

Biodiversity is protected either indirectly within the protected areas or directly through the protection of the species. The system of protected areas in Serbia consists of: five national parks, 16 nature parks, 16 landscapes of outstanding features, 67 nature reserves, and 317 natural monuments.

Currently, 5.91% of the Serbian territory is legally protected, which is significantly below the European national average. Plans are in place to increase this up to 15% by 2015. To this end, Institutes for Nature Conservation in Serbia have already prepared a number of feasibility studies and proposals for protection of areas, which have to be adopted by the Government.

The five national parks are the most important nationally designated areas in Serbia:

Djerdap National Park is situated in the northeast and borders Romania. It is characterized by the Danube canyon and the huge Djerdap gorge (Iron Gates). Vegetation consists of about 60 forest and shrub community types that provide habitats. The Đerdap (Djerdap) National Park stretches along the right bank of the Danube River from Golubački Grad to the dam near Sip (see the chapter 4.4).

Fruška Gora is a 539 m high mountain in northern Serbia, 90% of which is forested. About 1100 plant species have been identified, 12% of which are relict or endemic. In addition to 200 bird species, wildcats, badgers, martens, dormice, bats and other species inhabit the area.

<table>
<thead>
<tr>
<th>Protected area category</th>
<th>Number of areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>National parks</td>
<td>5</td>
</tr>
<tr>
<td>Natural parks</td>
<td>16</td>
</tr>
<tr>
<td>Landscapes of exceptional features</td>
<td>16</td>
</tr>
<tr>
<td>Special nature reserves</td>
<td>67</td>
</tr>
<tr>
<td>Protected habitats</td>
<td>1</td>
</tr>
<tr>
<td>Nature Monuments</td>
<td>317</td>
</tr>
<tr>
<td>Protected sites of cultural and historical value</td>
<td>42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>464</strong></td>
</tr>
</tbody>
</table>

Kopaonik National Park is situated in the central part of Serbia, on the highest parts of Mount Kopaonik. Due to altitude and climate zone differences, the area is characterized by a rich biodiversity, especially of endemic and rare species. Besides biodiversity, its main feature is a very attractive landscape and high landscape and vegetation diversity. The National Park Kopaonik was founded and proclaimed in 1981. It covers an area of 11,800 ha, and has a protective belt of 19,986 ha. The wildlife refuges that are under special protection cover 689 ha. The central part of the Kopaonik Mountain National park is a relatively flat surface at about 1700 m above sea level. The highest point is Pančićev Vrh (Panchic’s Peak, 2017m).

<table>
<thead>
<tr>
<th>Type of area</th>
<th>Number of areas</th>
</tr>
</thead>
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<tr>
<td>Ramsar sites</td>
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</tr>
<tr>
<td>UNESCO MAB reserves</td>
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<tr>
<td>Important Bird Areas (IBA)</td>
<td>42</td>
</tr>
<tr>
<td>Important Plant Areas (IPA)</td>
<td>61</td>
</tr>
<tr>
<td>Protected butterflies Areas (PBA)</td>
<td>40</td>
</tr>
<tr>
<td>Područja u Smaragdnoj (EMERALD) mrezi</td>
<td>61</td>
</tr>
</tbody>
</table>

Table 3.2: Network of internationally acknowledged protected areas in Serbia
Mount Shara National Park (Šar Planina) is in the far south of Serbia, and is home to 20 endemic plant species. Besides diverse vegetation, many animals live there, among them lynx, bear, chamois, eagles. The Šar Planina National Park is in the territory of Kosovo and Metohija. It covers 380km², on the northern slopes of the Šara Mt. Of particular interest are the Balkan endemic and relict pine species Pinus heldreichii H.Christ munika Bosnian pinemolika and Pinus peuce Griseb or molika -Macedonian pine.

Tara National Park comprises a mountain chain in Western Serbia by the Drina river, intersected by river valleys and crags. Its peculiarity is an endemic and relict species of Serbian spruce (Picea omorica) and its habitats. Forests, pastures, peat sites and riverbank vegetation serve as habitats to many animal species and are the main features of the attractive landscape. Tara National Park was established in 1981 and it encompasses the Žrinski and Zvijezda mountains. The park covers approximately 220km² with altitudes varying from 250 to 1,500 m.

3.1.5.1 Internationally acknowledged natural assets
Numerous protected areas in Serbia have international designation and a number of areas are candidates for international recognition in a future. It is hoped and expected that around 20% of the territory will achieve international status, mainly as NATURA 2000 and the Ramsar sites.

Golija-Studenica MAB reserve (listed in UNESCO’s Man and the Biosphere Programme) covers 53,804 hectares. The biosphere reserve includes the Studenica Monastery, which is a cultural World Heritage site and a popular tourist attraction.

Ten Ramsar sites – Eight are in Vojvodina: Obedska Bara, Ludaško jezero (Lake Ludas), Stari Begej/Carska Bara, Slano Kopovo, Gornje Podunavlje (Upper Danube), Kovidljsko – petrovaradinski rit, Zasavica and Labudovo okno while two are in south of Serbia: Vlasina Lake and Peštersko Polje - with a total area of 63,919 ha or 0.72% of Serbia’s territory are Ramsar sites, wetlands of international importance designated under the Ramsar Convention on Wetlands.

The Emerald Network is a network of Areas of Special Conservation Interest (ASCIs), which is to be established in the territory of the contracting parties and observer states to the Bern Convention of the Council of Europe, including, among others, Central and Eastern European countries and the EU Member States. For EU Member States, Emerald Network sites coincide with those of the Natura 2000 network. The Natura 2000 is a network of protected areas under the EU Habitat and Bird Directives. The network consists of Special Protection Areas (SPAs) and Sites of Community Interest (SCIs). The Emerald Network of Areas of Special Conservation Interest – ASCI are designated by observer countries of Bern Convention, and represent direct contribution to Natura 2000 programme implementation.

A pilot project aimed at preparation of the Emerald network of ASCIs started in 2005, when six ASCIs were designated initially: Kopaonik, Obedska Bara, Gornje podunavlje(Upper Danube), Deliblato Sands, Prokletije Mt. and Vlasina Lake. However, Serbia’s Emerald Network now covers 61 sites (or ASCIs), with 1.019.269ha or 11.54% of Serbia’s territory.
BirdLife International provided data on Important Bird Areas - IBAs. A site is recognized as an IBA only if it meets certain criteria, based on the occurrence of key bird species that are vulnerable to global extinction or whose populations are otherwise irreplaceable. An IBA must be amenable to conservation action and management. By definition, an IBA is an internationally agreed priority for conservation action. According to the Bird Life International criteria, there are 42 Important Bird Areas (IBA) in Serbia. The IBA Network covers 14.25% of Serbia’s territory or 1.259.625 ha.

Prime Butterfly Areas (PBA) represent an initial selection of important butterfly areas in Europe, focusing on target species that are conservation priorities across a large and diverse region. Protection and proper management of these areas will help to conserve not only these target species, but also the many other characteristic butterflies they contain. There are 40 PBA in Serbia. PBA Network covers 903.643 ha or 10.23% of the territory of Serbia.

Important Plant Areas (IPA) are natural or semi-natural sites exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of great botanical value. The mapping of IPAs in Serbia is still in preparation. Initial assessments indicated that 222 potential IPAs and 12 cross border IPA sites may be delimited within Serbia. There are 61 IPAs in Serbia covering 8% of its territory.

3.1.5.2. Environmental Governance
The institutional framework for the management of the protected area system in Serbia is comprised of administrative and expert bodies. At the governmental level, the most relevant responsibilities in this field are the:

- Ministry of Energy, Development and Environmental Protection;
- Ministry of Regional Development and Local Self-Government;
- Ministry of Finance and Economy;
- Ministry of Natural Resources, Mining and Spatial Planning;
- Ministry of Agriculture, Forestry and Water Management.

The key role is played by the Ministry of Energy, Development and Environmental Protection, which is responsible for the protection and sustainable management of protected resources, enhancement of biodiversity, monitoring and the sustainable use of protected areas.

The Provincial Secretariat for Urban Planning, Construction and Environmental Protection of Vojvodina also holds important responsibility for monitoring and supporting management of as well as proclaiming new protected areas in the Autonomous province of Vojvodina.

At the expert level, there is The National Environmental Agency with its main function being the collection of data and monitoring. This function is also supported by the Institute for the Protection of Nature of Serbia and the Provincial Institute for the Nature Protection for the territory of the province of Vojvodina.


The other major responsibilities focus on developing studies and proposals for the protection of areas, managing protected species and improving the protection system in Serbia. Serbian protected areas are directly managed by in most cases by the public enterprises and in a few cases by nongovernmental organizations and private companies. According to the legal regulation, areas can be proposed for designation by national authorities, legal or physical entities at the national, regional or local level.

A number of important strategic documents have been adopted in Serbia in the last decade. These include:

- The National Strategy of Sustainable Development,
- The National Biodiversity Strategy,
- The National Environmental Protection Program
- The Strategy on Sustainable Use of Natural Resources (2012) is yet to be adopted.

### 3.1.5.3 Protected areas management

Serbian protected areas (PAs) are directly managed by public enterprises and in a few cases by non-governmental organizations and private companies. According to the legal regulation; areas can be proposed for designation by national authorities, legal or physical entities at the national, regional or local level.

As defined in legal documents, the PA manager can be a legal or physical entity. In reality, the following types of legal entities manage Serbian PAs:

- **Public enterprises for management of national parks (PE NP):** for each of the national parks in Serbia, there is a state owned PE established and supervised by the national Ministry in charge; its functioning is regulated by separate Laws on National Parks (in the procedure at the moment – for each individual NP)

- **Other public enterprises:** the majority of protected areas in Serbia are managed by the PE “Srbijašume” and in Vojvodina by the PE “Vojvodinašume”, operating and applying protection measures through forest estates and forest units (as the company’s organisational centres in the field). PE “Srbijašume” manages 91 protected areas with a total area of 244,573.56 ha (44.7% of the total area of PAs in Serbia), while PE “Vojvodinašume” manages 16 PAs with a total surface area of 73,815.63 ha which is 13.5% of the total area covered by PAs.

- **Other state owned/public organizations:** in some cases, PAs are managed by the local tourist or communal organizations (owned by local governments), or other entities established at the national or local levels; Church units also manage some PAs where there is a specific mixture of natural and cultural heritage in one place (such as Prohor Pčinjski, south Serbia)

- **Private organizations:** foundations or NGOs are in some cases PA managers (environmental, mountaineers, cultural organizations, hunting/fishing associations, etc.).

The largest share in protected areas goes to national parks and nature parks.
3. National context – an overview of environment and sustainable tourism

3.1.6. Environmental Degradation

It is clear that the resolution of a number of pressing problems has, for too long, been deferred in favour of other priorities. In the industrial sector, particularly, the results of inaction are quite clear. Years of neglect have led to contaminated soil, polluted waters and air quality deterioration. The cost has also been paid in worker safety, quality of life and human health.

Local governments are responsible for enforcing state environmental legislation in their constituencies and for providing services such as water supply, sewerage, sanitation, and the collection and disposal of municipal solid waste. Municipal inspectors have fairly limited authority and are not adequately equipped for the tasks they need to perform. They control polluters for whom the municipality issues licenses in the areas of air and noise protection. Reporting to the courts is done by any of the inspectors. Collaboration with courts, though potentially a powerful instrument, is generally underdeveloped. Court proceedings are slow and fines, in the end, are usually small.

A very significant and positive development on the municipal level in Serbia is the widespread creation of Local Environmental Action Plans (LEAPs). The LEAP process, which has evolved in over ten municipalities, has enabled a broad spectrum of local stakeholders to identify local environmental priorities and associated fundable projects.

In Serbia, the major municipal environmental problems are in the areas of air quality, municipal and industrial waste, treatment and storage of hazardous waste, and wastewater treatment.

3.1.6.1. Air pollution

Despite Serbia’s relatively low level of industrial activity, the degree of air pollution remains quite high. Air quality is degraded by outdated industries, inefficient home heating systems, and old motor vehicles using low quality fuel. Sulphur-dioxide and particulate matter levels in industrial and urban areas often exceed permitted concentrations, which contributes to higher incidences of respiratory illness, diseases of the circulatory system and premature mortality. In general, the capacities and resources of most municipalities to monitor air pollution are limited, and accurate data on air quality is often not readily available to the local population.

3.1.6.2. Water Pollution

According to the source of origin and the content of pollutants, wastewater is classified into several groups.

Technological wastewater originates from industrial processes, can be aggressive (acid or base), and contain suspended material, salts of heavy and toxic metals, cyanides, mineral oils, phenol, organic dissolvent and other synthetic organic substances, depending on the applied technology, input raw materials, semi-finished, and final products. Nearly 90% of industrial wastewater is released without appropriate treatment.

The waters from agricultural areas are rich in phosphates and nitrates, and sometimes they contain insecticides, herbicides and fungicides, depending on the season and type of agriculture practiced in the observed area.
The municipal wastewater is a mixture of sanitary and technological wastewater with characteristics of both, and in cases when there is no separate sewerage system in the settlement, after heavy rains, these waters contain large amounts of suspended material.

The cooling waters from the thermoelectric and thermo-energetic power plants are not chemically or bacteriologically polluted, but their temperature is high, provoking disturbances in the thermal regime in the recipient waterway. After the construction of the thermoelectric power plant “Nikola Tesla”, does not ice over downstream from this plant, even during the most severe winters.

The sanitary wastewater originates primarily from households and restaurants, and is characterized by extremely large concentrations of bacteria, viruses and protozoa, with biodegradable organic material of oil and

Main industrial hotspots in Serbia and their key environmental issues:

Pančevo Petrochemical Plant (HCJP Petrokemija):
- Wastewater Treatment Plant (WWTP) receives effluent from a number of units, including the refinery; and inadequate control over input (quantity, concentration) causes frequent process failures and contamination of receiving water;
  - Unlined sludge lagoon threatens soil and groundwater
  - Groundwater and soil contamination by chlorinated solvents
  - Improper storage and disposal of waste (including mercury sludge, chemicals, asbestos-containing materials, PCB-containing transformers and capacitors)
  - Substantial air emissions.

Pančevo Oil Refinery (NIS-RNP):
- Accidental oil discharges into the wastewater stream that leads to the wastewater canal and the Danube
- Large-scale soil contamination from hydrocarbon spills and leaks
- Improper storage of chemicals and waste material
- Excess emissions to air, particularly of sulphur dioxide and particulate matter

Pančevo Fertilizer Factory (HCJP Azotara):
- Disposal of untreated wastewater into the wastewater canal
- Air pollution from nitrogen oxides and ammonia
- Inefficient use of abstracted water for cooling and firewater

Novi Sad Oil Refinery (NIS-RNS):
- Hydrocarbon contamination of soil and groundwater
Novi Sad Oil Refinery (NIS-RNS)
- Hydrocarbon contamination of soil and groundwater
- Damage to the wastewater collection systems
- Improper storage and disposal of oily sludge and chemicals

Bar: RTB Bor - Mining and smelter complex
- Severe air pollution from mining and smelting operations
- Extensive land and soil degradation, including loss of agricultural land and destruction of local buildings
- From failed pit slopes
  - Potential collapse of the concrete culvert/collector running beneath flotation tailings
  - Heavily contaminated industrial wastewater discharged into local receiving waters
  - PCB-containing capacitors buried on the surface of an uncontrolled industrial landfill

Kragujevac: Zastava Group of Companies
- Environmental management responsibilities for the complex’s shared facilities not clearly delineated
- Waste storage locations spread around the site, some accessible to public and children
- Discharge of untreated wastewater to the Lepenica River
- Fuel storage tank next to the river with potential to leak or spill and cause contamination
- Inappropriate storage of PCB-containing equipment; PCB-contaminated site
- Air pollution from power plant and painting process

Kragujevac: Landfill
- Improper sighting and design, and no leachate and landfill gas management
- Landfill accessible to scavengers and animals
- Spontaneous combustion of waste
- Possible improper disposal of hazardous substances

Šabac: Zorka Industrial Complex
- Environmental management responsibilities for the complex’s shared facilities are not clearly delineated
- Storage of gypsum slurry next to the Sava River, as well as storage of hazardous waste (jarosite) in an unlined and unprotected landfill, may be polluting the Sava River
- Additional hazardous and non-hazardous wastes stored in an unlined and unsecured location
- Ammonia and other air emissions
- Improperly closed facilities (e.g. pesticides plant) posing environmental risks

Šabac: Landfill
- Improper location, access control and leachate/landfill gas management
- Potential spontaneous combustion of waste
- Possible improper disposal of hazardous substances due to lack of control

Lazarevac: Kolubara Coal Processing Plant
- Poorly treated wastewater effluent from coal washing units
- Air pollution from lignite processing and coal transport

Lazarevac: Kolubara Power Plant (TPP Kolubara)
- Air and possibly groundwater pollution from fly ash storage and dried lignite storage
- Groundwater pollution from fuel oil storage and spillage
protein origin, and with detergents. The wastewater from farms and slaughterhouses has a similar composition, but the concentrations of waste material are far greater.

The quantity of the wastewater discharged into waterways is constantly increasing as a result of increasing living standards, population increases in urban areas, urbanization and intensification of industrial and agricultural production. Not only is the quantity of the wastewater increasing, but the number of pollutants appears to be increasing as well, which is negatively impacting aquatic systems and impeding the self-purification processes in the water. Toxic and mutagenic substances, which are subject to bioaccumulation through the trophic pyramids, represent a particular threat.

3.1.6.3. Environmental hotspots

Apart from conflict-related environmental damage and its risks to human health it is generally recognized that the majority of the country’s environmental challenges are a consequence of inadequate environmental protection, management systems and practices during the chronic environmental neglect of the past decades.

As a result the post-conflict assessment work of UNEP Balkan Task Force in 1999, from that year onwards UNEP Clean-up Programme and its partners have worked to assess and remedy a number of Serbia and Montenegro’s most urgent environmental problems. Four main “hotspots” which suffered the most damage from NATO air strikes were defined: Novi Sad, Pančevo, Bor and Kragujevac. The total of 27 urgent projects with the ultimate objective of eliminating environmental and possible health consequences for the population were defined, resulting in remediation of site-specific, conflict-related risks and by strengthening institutional capacity in several important areas.

As a result, the conflict-related environmental problems in Kragujevac have been remedied. In Novi Sad the risks to drinking water resources have been controlled and reduced. In view of the progress made at the four sites, Kragujevac and Novi Sad should no longer be considered environmental “hot spots”.

On the other hand, at Pančevo and Bor, which were also the subject of UNEP assessment and cleanup work, activity steps were made in the right direction but much remains to be done before the environmental problems are actually solved at these and many other sites. These problems originate both from the war but also from inappropriate environmental practice in the past. In Bor, the conflict-related problems, in part addressed by the UNEP Clean-up Programme, are minor compared to the area’s considerable overall environmental burden. In Pančevo, which suffered the most, some conflict-related environmental problems persist, though they have been reduced.

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20 UNEP, Ministry for Science and Environmental Protection of the Republic of Serbia and Ministry of Environmental Protection and Physical Planning of the Republic of Montenegro, 2004: From Conflict to Sustainable Development Assessment of Environmental Hot Spots in Serbia and Montenegro
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3.1.7. Waste Generation, Collection and Disposal

The poor standard of waste management has been identified as a pressing environmental issue in Serbia, resulting mainly from as yet inadequate social treatment so far. High-cost, uneconomical organisation, poor quality of service and inadequate care for the environment are the result of a devastatingly poor organisation of waste management.

Municipal waste collection and disposal is the responsibility of local public utilities. The only method of managing waste that is currently practiced in Serbia is disposal in landfills, which mostly fails to meet the most basic requirements of hygiene, technical and technological standards. According to available official data, Serbia has 164 landfills that are used by local utility companies for disposal of wastes and some of them are already filled to capacity.

Most monitored landfills, however, do not meet sanitary standards, and separation or treatment does not occur. In rural areas, waste collection is practically non-existent. Instead, waste is dumped and frequently burned at illegal sites that are often beside roads or on riverbanks and pose sanitary risks.

Some 40% of municipal waste generated in the Republic of Serbia is dumped on illegal landfills sites, beyond the control of public utilities (inspection report from 2009). There are 600 illegal dumping sites in Autonomous Province of Vojvodina, though some have been remediated, and estimates are, thousands in other parts of Serbia.

The former Ministry of Environment and Spatial Planning recognized this as one of the priority problems, and in March 2009 a “Clean up Serbia” campaign was launched. This annual action was largely based on the removal of illegal dumps during one day activities. The aim of the campaign was not only illegal dump cleaning, but a change of awareness about the importance of the environment. In 2011 about 300,000 persons all around Serbia took part, and more than 150,000 m³ of waste was removed from 5,311 locations.

These unofficial landfills are found in rural environments and they are mostly the outcome of insufficient funds allocated for improving the quality of the waste collection system, as well as poor organisation of waste management at local level. Data on the extent of unofficial and old landfills, and estimates as to the amount of disposed waste indicate that some of them have been used for several years, which raises concern over their possible effect on the environment. All kinds of waste are being disposed of in these landfills in an unrestrained fashion – communal, medical, animal remains, hazardous waste, etc.

Characteristics of almost all public utilities in the Republic of Serbia:

- They cover all communal services, not only waste, which can significantly reduce the efficiency and effectiveness of waste collection and treatment;
- Dependence on local policy and monopoly;
- Residents do not pay for waste disposal and do not have an interest in changing the situation;
- The majority of municipalities operate at a loss, as the price of communal services is considered within the social category.
Hazardous waste disposal practices in Serbia are a long way from meeting environmental management standards. There are at present no secured hazardous waste storage or disposal facilities in the country. As a result, although the state is responsible for hazardous waste, the risks and burdens of improper hazardous waste disposal are experienced locally. Many enterprises dump hazardous waste in uncontrolled municipal landfills. Others store it improperly on company grounds.

One of the main drivers of sustainability and proper waste management is ensuring sufficient funding for operating expenses. It is therefore necessary to harmonize the level of fees for waste collection and disposal to ensure sustainable services. Bearing in mind the sensitivity of the issues related to public utility services and the poor economic situation, a new pricing system should gradually be introduced.

There is a strong need for private sector involvement in the waste management system and development of public-private partnerships in this field. Representatives of the recycling industry are convinced that the key for long-term solutions in recycling is public-private partnership.

3.1.7.1. Recycling

While recycling represents one of the crucial elements of environmental sustainability, the existing facilities and programmes in Serbia are relatively limited. The Serbian Recycling Agency reported that in 2007 only 9% of solid waste was recycled (up from 3% in 2003). (This probably includes scrap metal which is currently recycled fairly efficiently by Roma communities.)

Currently between 10 and 15% of waste is recycled in Serbia, and by 2019 the percentage of the total recycling should be increased to 25% (Harmonization with EU member-state strategies requires a recycling rate of 25% of packaged goods).

The main change in the field of recycling is that it has so far been on a voluntary basis. The legal framework for sustainable waste management in Serbia was set up in 2009. Since then the Ministry has issued more than 700 permits for waste management (collecting, transportation, recycling). The total number of permits that were issued by all institutions, including provincial and local government, exceeds 2000.

Municipal collection systems have sprouted in a number of municipalities since, though many still have no public recycling programme or initiative of any kind. Most of the public utility companies do not have the infrastructure for collection and separation of waste.

There are signs of progress, however, from the private sector where three relatively large scale plastic recycling plants have been built in the municipalities of Batočina, Novi Sad, Mladenovo and Gornji Milanovac, positioning Serbia for a jump; Serbia-wide, plastic processing capacity exceeds collected quantities by twelve times. This situation represents an opportunity to dramatically improve solid waste management.

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21 www.ekapija.com/website/sr/page/402314


23 Interview with the Minister of Environment, Mining and Spatial Planning (June 2012), http://www.okradio.rs/vesti/gradjani-pisu/intervju-sa-ministrom-dulicem_18861.html
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3.1.8. Energy efficiency of buildings in Serbia

It is generally acknowledged that increases in non-renewable energy costs globally will be the norm in the future. Consequently, efforts are being made to improve the energy efficiency of all buildings, not just from an environmental perspective but also from a business competitiveness basis. This drive for greater energy efficiency is as important for tourism as for any other sector of the economy and needs to be embraced within any sustainable tourism development strategies. Currently, Serbia is lagging behind many countries in Europe.

Serbia has taken the first steps towards improving the energy efficiency of its buildings. In 2009, the Law on Planning and Construction was enacted that introduced the concept of energy efficiency (Article 4) and the need for energy performance certificates for buildings. It was upon this law that new regulations were adopted in August 2011 stipulating energy efficiency of buildings and the procedures for energy performance certification in terms of annual energy use for heating per square meter of floor area within the thermal envelope and in terms of primary energy and CO₂ emissions. They are fully compliant with the European regulations and contain much stricter requirements for thermal protection in comparison to the previous standards.

The main sources of renewable energy in Serbia are: solar energy, wind, moving water, geothermal energy and biomass. The energy potential of RES in Serbia is over 4.1 million tons of oil equivalents (Mtoe) per year, which represents about a quarter of the current

### Potentials

<table>
<thead>
<tr>
<th>Source</th>
<th><a href="http://www.siepa.gov.rs/site/en/home/1/key_industries/renewable_energy/">www.siepa.gov.rs/site/en/home/1/key_industries/renewable_energy/</a></th>
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</thead>
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<tr>
<td>Biomass</td>
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<td>Solar</td>
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<td>Geothermal</td>
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<tr>
<td>Wind</td>
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<td>Total</td>
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Table 3.3. Potentials of renewable energy sources in Serbia
3. SUSTAINABLE TOURISM IN RURAL SERBIA

3.2. Sustainable Tourism in Protected Areas

Visitation and recreational use of protected areas have been among the main functions and values identified from the very early phases of the emergence and development of the concept worldwide. The growing number of visitors along with the progress of science and environmental awareness has identified the necessity for an integrated and holistic approach to protected area management and planning, so that both natural and cultural resources are preserved, while tourists and the local population are satisfied. There is a steady growth in tourism around the world attracted to protected areas – not only in terms of respecting biodiversity and nature, but also cultural and socio-economic features, including the traditional knowledge of local and indigenous populations.

Developed by globally recognized authors, the Guidelines for Planning and Management of Sustainable Tourism in Protected Areas, were published by IUCN, UNEP, UNWTO and Cardiff University in 2002. The aim was to support efforts by protected area managers and planners to develop tourism while respecting biodiversity and local values. According to the authors of the Guidelines, "protected areas can be “engines of sustainable rural development” (p.29), contributing to all its aspects, not only preserving values, but improving the quality of life."  

As stated in all relevant documents nowadays, ‘protected areas should not exist as islands, divorced from the social, cultural and economic context in which they are located’ (Recommendation 5.29, 5th IUCN World Parks Congress). Strong interdependence between protected areas and the welfare of the surrounding (and wider) community is being internationally recognized not only in environmental, but also in general policy documents, such as the Millennium Development Goals. The role of protected areas in alleviating poverty around the World is emphasized, and a new management category (VI -Protected Areas Managed Mainly for the Sustainable Use of Natural Ecosystems) has been created in IUCN classification of areas, in order to reinforce the balance between human needs and biodiversity protection, by allowing sustainable use of resources and services.

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24 Eagles, P. et al. (2002). Sustainable Tourism in Protected Areas – Guidelines for Planning and Management, Gland: IUCN.

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**Figure 3.1. Potentials of renewable energy sources in Serbia**

Source: www.obnovljiviizvorienergije.rs

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass energy</td>
<td>63%</td>
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<tr>
<td>Hydropotential</td>
<td>14%</td>
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<tr>
<td>Solar Energy</td>
<td>14%</td>
</tr>
<tr>
<td>Wind Energy</td>
<td>5%</td>
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<tr>
<td>Geothermal Energy</td>
<td>4%</td>
</tr>
</tbody>
</table>
Among the main benefits that tourism, based on sustainability principles may bring, (as stated in the previously cited segments of CBD Guidelines), are the opportunities not only to improve short term economy gains, but to open up new opportunities, by enhancing infrastructure, telecommunications, education and healthcare conditions and services. At the same time, a constituent part of protected area management plans should be a set of measures to avoid some of the main risks of tourism development, or to acknowledge them and put in place actions to address problems if they arise.

Some of the negative impacts, besides exceeding the “carrying capacity” of any particular protected area and damaging its values - are neglect of local people’s rights and needs. Participatory mechanisms developed and practiced by protected area management and a quality monitoring and adaptive approach, should contribute to success in sustainable tourism activities development. Introducing certain cultural and other changes not acceptable to the local people and stakeholders can cause damage analogous to that caused by an invasive species entering a new ecosystem.

The emerging concept of ecosystem services opens new perspectives for the more complete understanding of the potential economic benefits provided by protected areas, including those related to tourism and the promotion of local values.

It is not possible even to understand these principles, let alone implement them, without constant improvement in the capacities of protected area managers and staff, and growing awareness among local people and the wider community. It is necessary to strengthen resilience of both natural systems and – mostly rural – communities in building sustainability and developing tourism as part of that process.

A strategic approach to human resources development and coordination at national and local level in applying the above-mentioned principles of sustainable tourism and rural development has yet to be implemented in most of the protected areas. There is a distinct need for commitment from the State to incorporate these principles and values into legislation and policies to support and frame efforts made to improve capacity and thus support the role of protected areas.

3.2.1.1 Protected areas visitors numbers management

Currently, visitor management and monitoring is weak in most of the PAs in Serbia, making it difficult to find exact data on visitor numbers, as this type of data is not collected in an organized manner.

One of the most important tools for protected area managers in developing sustainable tourism is The European Charter for Sustainable Tourism in Protected Areas. Based on the efforts of members from 36 European countries, the Charter stimulates strategic and action planning of sustainable tourism, aiming at “...protection of the natural and cultural heritage and the continuous improvement of tourism in the protected area in terms of the environment, local population and businesses as well as visitors.”
3. National context – an overview of environment and sustainable tourism

3.2.2. Socio-Economics in Rural Serbia

Rural Serbia represents a key part of the Serbian population and resources. Currently 85% of Serbia’s territory is rural, between 44% and 55% of the population lives in rural areas and an estimated 41% of GDP comes from rural areas (primarily agriculture). The rural economy in Serbia is highly dependent on agriculture with approximately 75% of the rural population engaged in subsistence farming.

However, despite the wealth of natural and cultural resources, rural areas continue to suffer from high rates of unemployment, depopulation, low economic activity and decreasing natural resource value. Furthermore, many family members are not registered as agricultural producers but assist in everyday agricultural activities. These issues are specifically related to women and the poor in general. It is estimated that women in rural areas represent approximately 74% of people engaged in family activities without being paid.

Among the PAs included in this study, only the Deliblato Sands has taken concrete action to manage visitor numbers. However, recent studies and analysis only offer estimations of visitors to particular areas.

At the landscape of exceptional features Vršačke Planine (Vršac Mountains) there is no data on visitor numbers, as there are many entrance points which are not controlled. This is a common situation in almost all protected areas in Serbia.

In the Deliblato Sands there are around 6,000 visitors annually; among them, around 1,000 come on organized trips (excursions, students’ visits, etc.) and pay the fee, while others enter without paying the fee and through uncontrolled entrances.

According to the Master Plan for the Lower Danube (which includes the Djerdap National Park), the average usage of tourism capacities (annual occupation of available beds) in the entire region is low: only 25% or 92 days per year. Between 2004 and 2007 this region received on average only 3.7% of visits made to Serbia.

For the other PAs from the analyzed regions, there is no data available on the number of visitors.

Jelena Beronja: Traditional extensive agriculture practice (high nature value farming) in central Serbia
3. National context – an overview of environment and sustainable tourism

The support and funding of rural development in Serbia over the past few years has focused on improving agricultural competitiveness, consolidating land, improving market orientation and developing rural economic infrastructure. However, an increased focus has been given to the diversification of the rural economy to non-agricultural businesses and expanding the current agricultural scope to new businesses.

Rural Tourism has been identified as a key catalyst which can drive the expansion of the rural economy by launching new business initiatives, finding synergies between current agricultural production and tourism and empowering women as income earners.

Figure 3.2. Rural Tourism and its correlation with other types of tourism and products promoted by TOS.
Source: Based on the graph from the Diagnostic of Rural Tourism in Serbia, UN Joint Programme Sustainable Tourism for Rural Development funded by the Spanish MDG Achievement Fund (2011)
3.2.3. Sustainable Rural Tourism Development in Serbia

In order to estimate the contribution of rural tourism to overall tourism, a survey has been conducted with 106 Local Tourism Organisations (LTOs) in Serbia. The full analysis is included in the Economic Contribution Chapter of the Diagnostics report. The study found that rural tourism represents approximately 2.7 million overnights in Serbia. This number is the result of adding proper rural tourism overnights 145,354(16), and general tourism overnights usable for rural tourism 2,556,128(17). Therefore, it is estimated that rural tourism overnights represent 27% of total tourism overnights in Serbia.26

Rural tourism, therefore, already plays an important role in tourism in Serbia. TOS has a special focus on Rural Tourism which is called Village Life. Although Village Tourism is already being promoted by TOS as a rural tourism product, the scope of rural tourism is much wider as shown in the Figure 3.2. This analysis thus shows that a holistic concept of rural tourism has a strong potential to be developed in Serbia in line with the general tourism product and promotion policy of Serbia.

Serbia is currently not recognized on the international market as a tourist destination; particularly not for rural tourism. The reasons why the development of rural tourism is slow and not continuous are several: strong competition in the region, a lack of international standards and quality assurance services, a need for improvement in the diversity of housing in rural areas, a need to improve local infrastructure (especially access via rural roads), the highly seasonal nature of the business of rural tourist households, low education level and lack of human resources.

In addition, the ministries which are in charge do not recognize rural tourism as a promising tourist industry, so investment in rural tourism is insignificant. In fact, foreign investors do not see any real potential in Serbian tourism in general; therefore, investments in tourism are low (the share of funds from foreign direct investments in agriculture and tourism amounts to only 0.4% and 0.1% respectively, while the inflow of foreign money into the financial sector amounts to over 33%).

Whilst national government agencies may not yet be convinced of the promise from sustainable rural tourism development, the conditions are favourable for Serbia to receive considerable benefit.

Current world tourist demand, with an ever-increasing need for new, unfamiliar areas, a rich cultural heritage and a healthy natural environment, suggests that Serbia has the potential to be a receptive space, which can satisfy the needs of tourists. There are several elements that show the positive side of the potential development of rural tourism in Serbia:

• Good physical and geographical position of Serbia
• Diversity of natural resources (dynamic relief, hydrographical features, flora and fauna)
• Favourable climatic characteristics
• Healthy environment (preserved nature, forest areas, and rich mineral waters)
• Cultural and historical treasures (remains of the oldest civilizations, Byzantine art, oriental culture)
• Specific ethnographic elements

26 UNWTO collaboration through meetings and reports
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Besides accommodation, the main tasks of EuroGites are the creation of an information and communication network among its members, standardization of supply in rural tourism, education of the population concerning the benefits of rural tourism and the like. Serbia’s representative in EuroGites is the Serbian National Rural Tourism Association.

Deficiencies in the rural tourism product in Serbia have been highlighted by the Association. Despite progress being made in improving the standard of accommodation facilities and organized residence programmes, the problems to be tackled are the following:

- Insufficient education of interested rural households on how to accept and welcome visitors
- Limited rural tourism products available to attract visitors to any one location, along with poor connections to local tourist organizations and the Tourist Organization of Serbia
- Insufficient and inadequate infrastructure (modern access roads, drainage, drinking water, hygiene and other supporting facilities such as health clinics, post offices, shops and restaurants).

Since June 2010 Serbia has been a member of the European Federation of Rural Tourism (EuroGites), which includes another 25 countries in Europe. The Federation, above all, addresses the problem ofaccommodation in rural tourism. The fact that this sector comprises 15% of the total tourist traffic in Europe shows that it is a significant branch of tourism.

Rural tourism could play a significant role in support of the development of the entire country, arresting rural-urban migration, broadening the rural economy base, and protecting both the natural and cultural environment. In addition it could clarify and inject positivity into Serbia’s social identity, but there are a number of social and economic factors limiting this development.

Although Serbia’s tourism product includes rural tourism, Serbia does not have the image of a rural tourism country. The analysis of the four tourist regions shows that Serbia has good rural tourism development potential and various opportunities which could be offered as distinct to Serbia. First of all, there are the protected natural areas which are already being offered in tourism (Đerdap National Park and Stara Planina Mountain).

However, it appears that these natural resources are not managed, presented or promoted in ways which attract the variety of tourists that similar resources attract in other countries. For example, there is only limited development of themed routes, itineraries,
sightseeing tours and advertising material which would not only promote the significance of such places but also contribute to their environmental management and contribute to the local economy.

In Central Serbia wood is the dominant material and houses resemble Dinara mountain style buildings.

In South Banat for example, houses have facades rich in details, gables facing the street and houses’ longer side follows the regulation line of the street (they are called “Austro-Hungarian” or “Vojvodina type” of houses.)

A facade in front of which is a porch with simple arches is typical of houses in Eastern Serbia.

An important factor in the Serbian rural tourism offer is the authentic and traditional values retained in villages. Architectural styles vary from one region to another, so they could be used to promote each tourist offering.

However, many villages are losing their typical traditional characteristics, thus becoming less interesting for rural tourism development. Currently there are no guidelines concerning reconstruction of houses, so styles vary and do not meet criteria which are sensitive to traditional architecture.

On the whole, the quality of the tourism product offered in Serbia has not reached a high standard, especially as regards accommodation (this does not apply to the Central Serbia region), presentation, content and in few cases even hygiene. Another problem is lack of beds especially in municipalities which could further develop this kind of tourism (Bela Crkva, Vršac, Golubac, Zaječar and Mionica for example).

Currently little real impetus has been generated to up-grade presentation techniques to engage
more visitors. The potential of such elements being offered to tourists is considered enormous, since they will involve the local people, and create employment.

The connection between agriculture and rural tourism, a vital element in the success of any national rural tourism programme, is weak and will need specific focus and actions under the auspices of rural development plans and the consequent rural tourism development plans.

This particularly applies to South Banat, since the very heart of its offering could be agri-tourism (and also wine tourism). This region has a long and rich agricultural production tradition. Specialized rural products, whilst they exist, are not recognized or supported as contributors to the tourism experience.

Tourist advertising campaigns over the last few years point to the importance of rural tourism from a local and national perspective and the quality of this material is constantly getting better. The quality and quantity of brochures and other advertising material is increasing. However, there is a lack of information about additional contents, especially regarding mountains and protected areas. There is a real opportunity to galvanise the approach to marketing by creating a genuinely integrated portal for all information and promotional materials. Increasingly, across tourism, the move is being made to interactivity. This allows for continual improvement in information presentation and in up-dating material, which print material cannot do.

The success of any tourism development lies with the identification of the capacities of all stakeholders and the provision of proactive structures and forums which enable coordination and participation. This is vital, and is a prerequisite for sustainable tourism development. In Serbia the level of coordination necessary has not yet been established but it appears that increasing acknowledgement of this fact is being given greater focus. This is especially true in areas which have already experienced the negative impacts of poorly planned, over optimistic and financially driven projects. Greater awareness of the needs of sustainable tourism development should spur efforts to support appropriate drivers and a national as well as regional vision of sustainable rural tourism.

3.2.4. The five components of sustainable tourism

If such concepts are related to rural tourism, it can be concluded that the basic goals of sustainable rural tourism are the following:

Sustainable tourism is based on the integral and complex principle which emphasizes equally five components: protection of the environment, affirmation of social integrity, preservation of the cultural identity of local people, optimal fulfillment of tourists’ needs and economic profit.

1. Protecting the environment – Preserving protected natural resources, national parks in the first place, and then all parks of nature, resorts and natural monuments. Rural tourism should
3.2.4.1 Biodiversity management guidelines in rural tourism

In addition to protected natural resources, unprotected natural areas should also be emphasized, especially those which stand out as ecosystems, or which have rich biodiversity.

Biodiversity has multiple significances for rural tourism, but it is also under strong influence of rural tourism itself. Although rural tourism is not very developed in Serbia, apart from Central Serbia region, it is necessary to create the projection of activities in order to decrease potential influence of rural tourism, especially in regions where it is expected that it might become intensified.

Rich biodiversity helps contribute to a variety habitats and a robust environment. Biodiversity can also influence the tourist offer in terms of content, thus activities like medical plants collecting, collecting fruits of nature, organizing educational ecological routes, and hunting and fishing, directly depend on biodiversity. That is why it is essential to implement planned measures and activities which would be in function of preserving the biodiversity in villages and their vicinity. These measures include the following:

- **Information gathering and estimation of the contemporary conditions** – this implies gathering of primary data information about all the characteristics of an ecosystem in a rural area, about the number of plants and animal species, especially of those which are important for touristic offer;
- **Vision** – this implies defining what is desired condition, but in accordance with objective contemporary possibilities. This could mean including the biodiversity in the tourist offer of rural regions, thus focusing public eye on the biodiversity problems and organizing different actions of protection (habitats preservation, marking of ecological areas and corridors, collecting funds for various programs of protection);
- **Tasks** – they should directly support vision and goals. They should always include time frame necessary for a certain task. Examples of different tasks: the reconstruction of a damaged ecosystem in order to include it in the tourist presentation (especially if there are some ecosystems damaged during tourist presentation process); marking, creating and marking of tourist itineraries (tracks) within ecosystems preserved; designing and developing of ethical codes made for tourists, and in order to protect the environment;
- **Influence estimation** – this implies analysis of tourism development influences, which could be widespread. Overall estimation of influences is important for every tourism development and for all tourist activities;
- **Influences management** – this is important to minimize negative impacts which tourism might cause. To make it sustainable, tourism should be managed within the frame of the bearing capacity and the level of acceptable ecosystem and sites changes. It should also provide that tourist activities contribute to biodiversity preservation;
- **Improving publicly funded projects** – by establishing a centralized project management function for all public works. This is becoming a standard approach across Europe.
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serve as the stimuli for the foundation of new protected areas, since Serbia does not have a high enough percentage of protected territories. This process, also known as tourist environment protection, implies that the tourist industry requires environment protection programs and can be seen in some of the countries which base their tourist offer on eco and rural tourism. Almost every rural tourism region in Serbia has a network of protected areas. In South Banat there is the Special Nature Resort of Deliblato Sands, Ramsar site Labudovo okno as well. In the Lower Danube region, it is the Đerdap National Park. The tourism product in general, and also rural tourism in Eastern Serbia is based largely on the Stara Planina Mountain natural resort, which, it is hoped, will be proclaimed a biosphere resort (MaB). There are several small protected areas in Central Serbia and they are vital to tourism where they are located. The biggest and most important is the Rajac Mountain Park of Nature, and rural tourism needs to be designed in such a way as to support environment protection at all these sites. (see box: Biodiversity management guidelines in rural tourism)

Furthermore, environment protection applies to preventing the growth and spread of

3.2.4.2 Education as means of strengthening of local community integrity

It is necessary to improve education system in rural tourism to achieve higher satisfaction of local people and to avoid the negative impact of rural tourism on the community. So far education methods have not been functional or efficient. Education helps local residents and potential tourism providers in rural regions coordinate their expectations with real potentials of tourism, and learn more about its realities. They can also learn how to find the way to protect their communities from negative impact which poorly organized tourism can have. Education program of rural tourism officers/providers was organized in 2007, as a part of a project designed by the former Ministry of Trade, Tourism and Services of Serbia. This program was designed not only for service providers in country households, but also for local authority officers, entrepreneurs and farmers. The Department of Geography, Tourism and Hotel Management, Faculty of Sciences in Novi Sad implemented the programme in two modules, on three locations for three clusters recognized by the Tourism Strategy of Republic of Serbia. These were Vojvodina, Western Serbia and Eastern Serbia. The first module included rural tourism theory normative, and the second presented rural tourism experience in successful centers and destinations in Serbia and abroad. Lecturers were professors and tourism officers from the Netherlands, Slovenia, Croatia, Greece and other countries. Although this program was successful, the problem was that this was one training only, and tourism education in Serbia has no continuation. Unlike Serbia, some other rural tourism destinations have such trainings. Trossachs in Great Britain for example, organizes training programs which include approximately 40 creative workshops every year. These activities are in the authority of local tourist chambers. All researches show that local people are ready to participate in further education programmes for rural tourism and this opportunity should not be missed.
pollution, illegal tipping and unplanned and inappropriate development which can already be found in places where rural tourism is starting to develop. Comprehensive sustainable tourism development plans can provide impetus to these objectives when included in a proactive and engaging rural development strategy.

2. Social integrity affirmation – This segment implies that social characteristics of a local community must be preserved during the tourism development process. Any change of habits, introducing of new standards, behavioral models which are unlike traditional ones and which come from tourism, could be regarded as unsustainable tourism development. Educational programs could have a special significance in this concept.

Sustainable rural tourism must pay special attention to local communities especially in South Banat, where there are many different nationalities and minorities, and in Eastern Serbia, where communities are very sensitive to changes because of specific historical and economic circumstances. Development plans in such examples must imply that communities are able to continue their normal development even after rural tourism income is made. There could be some antagonism between local residents involved in rural tourism, and those who do not participate in it and such scenario must not be allowed. Central Serbia region successfully avoided this antagonism problem. However, research shows that even there, local people are not always satisfied with their position.

For example, it is often emphasized that there is not enough encouragement from the local authorities or any other authorities, for that matter (there are not enough credits, no help with household reconstruction works, and no encouragement policy). There is also the problem of lack of information and consultations about development programs strategies and plans. Half of the local people questioned think that they do not have enough information about development programs. On the other hand, local people are aware of the importance of rural tourism in protecting the customs, culture and old crafts. This is especially the case in municipality of Kosjerić, which is regarded as one of the most successful in rural tourism activities in Serbia (chapter 4.2).

Participation of local people in the development process includes several basic methods. These are: passive participation – local people are only informed about development projects; participation through consultations – experts hear out local people, but do not have to act according to their suggestions; bought participation – local people participate in exchange for some stimulation; interactive participation – local people participate in joint analysis and action plan development; self-activation and networking - local people participate through initiatives independent from external factors. Through sustainable tourism local people participate interactively and through self-activation and networking processes. Unfortunately, contemporary levels of organization in tourism in most regions show inadequate level of consultations of local people about rural tourism development.

3. Preservation of cultural identity of local people – Cultural sustainability implies preserving cultural habits of communities which
National context – an overview of environment and sustainable tourism

provide tourist services, are quite often being modified by dominant influences including tourism. Tourism affects habits of domicile inhabitants, their lifestyle or even the dress code. Even if the society survives, its culture can be significantly altered. The smallest amount of tourism can influence local culture, however changes it brings are not easily identified and their progress is not easily seen. This is the reason why this issue is so important for rural tourism. Efforts to address this issue are taking place globally and in all cases an individual and local approach is often the best. Change is inevitable. It is finding a way to manage this change which is required so that a locale does not become subservient to tourism but rather retains control.

Taking this into consideration, all differences and similarities of cultural heritage of rural regions in Serbia must be careful analyzed and monitored. South Banat is a multinational community, so tourism should help preserve the integrity and cultural heritage of minorities (Hungarians, Romanians and Roma) by promoting and preserving their culture and local customs. Eastern Serbia is well known for its specific beliefs, Vlasi minority and sacral heritage (monasteries). These elements have to be included in the tourism offering of this region, but in such a way as to keep the unique characteristics of this region. Western Serbia has to preserve its numerous manifestations, to provide a permanent character for them and to increase traditional elements in their offering. The harvest on Rajac Mountain, for example, which takes place in July, is often advertised as a traditional manifestation. However, places which sell products with no connection to traditional culture what so ever, or the choice of music program are not in compliance with organizers desire to create this manifestation consistent with tradition.

4. Optimal fulfilment of tourist needs – If a tourists returns to a destination after his/her first visit, this shows his/her satisfaction with the offer. How tourists feel can be tested with questionnaires which provide objective picture of their satisfaction. Research shows that tourists are very satisfied with the tourism product in country households in Western Serbia. The best segments of this are wild nature, silence and peace associated with the rural setting. Tourists point out the warm hospitality of local hosts as a great advantage. Tourists are quite happy with the simple offering of this region (walks in nature, sightseeing, etc).

Unfortunately, segments of the tourism product are below internationally recognised sustainable level in other regions. In South Banat rural tourism is found only in the village of Skorenovac. Hungarian tourists who visit this place are mostly quite happy with its offering. One of the reasons is the contact with local Hungarians and the opportunity to learn something about their own culture. In Eastern Serbia, there are numerous problems which should be overcome. Tourists are not satisfied with the quality of roads, information, the lack of additional content and activities, and also the lack of professionalism of local hosts which is not the same as their natural hospitality.

The first segment which should be improved is providing more content in the offering which would make staying in the country more compelling and encourage longer stays. Currently itineraries and theme routes are not
well presented in this region which is not the case in developed European countries. In Austria, for example, cheese roads are very popular and they are seen as a vehicle to increase quality. The offer includes at least five specialties based on different cheeses. Restaurant menus often include the names of cheese manufacturers, thus branding local agricultural products. German offerings (Sächsische Schweiz) include small theme hotels for bicyclers only.

Almost every developed European region and rural tourism country insists on tourists' satisfaction analysis. That is not the case in Serbia. It is necessary to design quality theme routes. They could include contents like local food (Central Serbia and South Banat), visiting archaeological sites (Lower Danube), karsts forms of relief and other forms of geo-heritage (Lower Danube and Eastern Serbia), examining interesting plants and animal species (Eastern Serbia). But, most importantly, a system needs to put in place to measure satisfaction and to provide the basis for constant improvement.

5. Financial income benefit – Sustainability in this sense is understood as the level of financial income which is made through tourism turnover. The indicator of financial turnover made on one destination is the relationship between tourist stay-overs and the number of beds. Apart from Central Serbia, other regions often do not fulfill economic viability, since they do not have enough guests for months, sometimes even over the course of the entire year (especially Eastern Serbia and Lower Danube). It is interesting to analyze the prices of services in country households. The lowest prices are in Eastern Serbia where they vary from 5 to 15 Euro for bed and breakfast service. In Central Serbia prices vary from 10 to 15 Euro for bed and breakfast service. If we compare these prices with European offerings, it is obvious that they are within range, since the prices there vary from 10 Euro (Eastern Europe) to 30 Euro (Western Europe). Reasons for such a small turnover could be found in the non-developed offering; a lack of popularity of rural tourism on the domestic tourism market; poor advertising and general poverty in villages, where it is more obvious than in urban areas. 3.2.5 Current status and potential of rural tourism development in Serbia

3.2.5 Current status and potential of rural tourism development in Serbia

EXTERNAL FACTORS

- Opportunities -
  - Rural Tourism is a broad concept, defined by the rural experiences, which are made up of rural activities and rural accommodation. These experiences are made up of physical and emotional experiences in a rural setting. This broad definition of Rural Tourism is an opportunity for Serbia to differentiate itself by offering a broad and holistic Rural Tourism experience.
  - Rural Tourism does not exist as a product on its own; but is correlated with other tourism typology. The highest correlations are with Cultural–, Nature & Earth–, Sport and Adventure–, Family and Child–, Cruise and Special Interest Tourism. There is an opportunity for Serbia to leverage the association between these products, many of which are already being developed, with a holistic rural tourism experience.
  - Opportunities to strengthen and further develop the village tourism product and strengthen the links with the highly correlated rural tourism products on offer.
- Serbia has the opportunity to further consolidate its positioning as a cultural and natural destination, and provide a more mature rural tourism offer (in terms of product sophistication and quality)
- Leverage initiatives of Master Plans, particularly related to mountains, lakes and rivers, spas, cultural and historic resources.
- Wine tourism and gastronomy potential to be further developed
- Nature and Earth Tourism: development of ecotourism, agro-tourism and mountains and lakes tourism. Also development opportunities along the Danube.
- Potential for Sport and Adventure tourism, especially sport activities in nature
- Wellbeing and Health Tourism: Potential to further develop spa and wellness tourism
- Family and Child Tourism: high potential for future development
- Education of local community on tourism role in overall rural development
- Creating good practice and good examples showing advantages of rural tourism development
- Potential to further develop MICE tourism in rural setting, especially incentives and team building
- Touring: high potential to further develop touring as a product
- Short break: potential to develop short breaks with a focus on rural breaks
- Special Interest tourism: potential to further develop and differentiate special interest products such as hiking, biking, paragliding, fishing, hunting etc

- Threats-
- Loss of competitiveness, especially along the Danube as other regional competitors develop
- Lack of identity and branding for authentic products from Serbia which makes substitutes a threat (e.g. traditional carpets)
- Lack of differentiation of uniqueness and authenticity of Serbian rural tourism

INTERNAL FACTORS
- Strengths -
  - Rural Tourism is already part of the diversification of the rural economy and has the potential to play a key role in its future diversification. Rural Tourism already generates approximately 27% of the overnights in Serbia.
  - Serbia currently has an offer of tourism products which are highly correlated with rural tourism.
  - TOS already promotes product typologies which are highly correlated with rural tourism including Cultural-, Village-, Nature and Earth-, Sport and Adventure- and Special Interest Tourism.
  - In 2007 Rural Tourism was already defined as a product for the future development of tourism in the Tourism Strategy Plan for Serbia (2007).
  - Master Plans previously developed already include the development of key mountains, lakes and rivers, spas, cultural and historic resources. These Master Plans already prioritise products and resources, which are highly correlated with rural tourism, for further development.
  - Serbia is currently positioned primarily as a natural and cultural destination.
  - Serbia has strong common themes throughout the country that create an overall rural tourism experience.
  - Rural tourism: village life products and services that already exist.
  - Ethno tourism: strong basis for further development of ethno tourism offer (like handicrafts etc.)
  - Heritage Tourism (Roman Emperor’s Route, Transromanica route, Fortresses on the Danube, monasteries, castles, UNESCO World Heritage sites)
  - Nature and Earth Tourism: Rich diversity of natural parks, protected landscapes and reserves; rich diversity of mountains, lakes and rivers
  - Sport and Adventure Tourism: already an offer for sport tourism (for example cycling holidays) and adventure activities (like 4X4 trails)
  - Family and Child Tourism: currently there are some interesting products for family and child tourism
  - Wellbeing and Health Tourism: Potential to further develop spa and wellness tourism
  - Education of local community on tourism role in overall rural development
  - Creating good practice and good examples showing advantages of rural tourism development
  - Potential to further develop MICE tourism in rural setting, especially incentives and team building
  - Touring: high potential to further develop touring as a product
  - Short break: potential to develop short breaks with a focus on rural breaks
  - Special Interest tourism: potential to further develop and differentiate special interest products such as hiking, biking, paragliding, fishing, hunting etc
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3.2.6. Tourism Governance

According to the National Tourism Strategy of Serbia (2006), valorisation of products shows that mountains, lakes and rural tourism have high value in attracting potential domestic and foreign visitors. Though protected areas are not focused on particularly in the Strategy, it can be seen that in listing the specific attractions within each of the tourism regions defined, the majority of those selected are protected areas – which are again situated in rural areas or in their close vicinity.

As stated in the Main Report of the MDG-F Project on Rural Development Strategy, “…rural tourism has a key role to play in the protection and enhancement of the natural environment of Serbia. The natural environment is one of Serbia’s greatest assets and it should be protected…” Furthermore, Rural Tourism is already playing an important role in rural Serbia and is generating a significant level of income. “Rural Tourism is an emerging reality in Serbia”

In the Environmental Strategy of this Report, it is strongly affirmed that rural tourism should be developed as a “…catalyst to preserve, protect and manage natural and cultural assets in rural areas, minimizing pressures on biodiversity and supporting the sustainable usage of biological resources in rural tourism projects…with respect to the character, the value and the carrying capacity of the existing rural landscape”.

The Report’s social strategy focuses on the role that rural tourism could play in contributing to the alleviation of a number of social issues in rural Serbia, such as; unemployment, depopulation and the empowerment of women and youth. Among the measures the Strategy proposes are the following:

- To use rural tourism as a catalyst to drive the diversification of the rural economy
- To provide training and skills development
- To activate the participation of women, youth and other disadvantaged groups in rural tourism
- To revitalize rural schools.

Integrated, sustainable management of protected areas could become a powerful mechanism and vehicle to support the realization of these goals by awareness raising and strengthening of capacities of local rural populations for sustainable tourism – if it is based on previously listed guidelines and recommendations. The question is whether there is capacity and readiness among protected area managers and organizations to fulfill this role.

- Weaknesses -

- Lack of holistic approach to rural tourism and lack of leveraging links between different types of tourism and rural tourism
- Insufficient management, poor presentation and interpretation of natural and cultural resources
- Lack of tourist products and promotional activities
- Nautical and Cruise tourism: low current development of nautical and cruise tourism products.
- Touring: infrastructure in rural areas, especially on rural roads, remains a limitation for the development of touring, especially by car

3. National context – an overview of environment and sustainable tourism

Research into the capacities of management and organizations responsible for protected areas in Serbia shows that, even though tourism is included in the management plans of every protected area as an integral part of the promotion and economic development of both protected areas and local communities - there is more “eco” or “ethno” tourism in existence in reality than there is systematically planned and developed sustainable tourism.

The local community is perceived more as being in need of assistance from organizations managing protected areas, rather than as equal partner in planning and implementing activities. The relative lack of environmental awareness among local people is seen as one of the most important problems by protected area managers. However, at the same time, only

3.2.6.1 Sustainable tourism in Special Nature Reserve ‘Zasavica’

One of the best examples in terms of local development of rural tourism utilizing protected areas in Serbia can be seen at the Special Nature Reserve (SNR) Zasavica (Vojvodina, Srem district). The area has been protected since 1997, and is being successfully managed by the Nature Conservation Movement of Sremska Mitrovica, a non-profit and nongovernmental organization. They are involving the local community in the protection and management of Zasavica SNR at several levels:

• By using their existing services (production of food, provision of accommodation);
• By directing their tourism services and products (local crafts or agri-tourism/agro-tourism) towards sustainable tourism, incorporating it into the tourism offer of the SNR and;
• By stimulating local farmers to breed endangered domestic cattle breeds – with important economic but also ecological function (grazing in the floodplains);
• By building their own management capacities through all these activities and processes, this organization is using their own and external partners potential to build capacity within the local community to cooperate, mainly in activities that can be defined as rural or agri-tourism, based on sustainable tourism principles.
two of the 15 organizations which participated in the research hold regular awareness-raising and education activities for the (local or wider) public. As a result, it is not surprising that the capacities of local communities are weak and in need of strengthening.

The survey results show that the support from society and the responsible institutions is perceived by protected area managers and external experts as inadequate – in the opinion of almost 50% of respondents – and that programmes directed at capacity development are organized mostly through internationally funded projects, on an ad hoc basis and without prior systematic training needs assessment. It can also be seen that protected area managers and organizations also need to be strengthened in order for them to be able to meet requirements in building local capacities and implementing the principles of sustainable rural tourism.

On the promising side, there is a visible tendency among protected area managers to pay more attention to organized tourism activities and promotion, as well as to projects, e.g. carrying capacity estimations. The building of visitors’ infrastructure, first of all visitor/information centres, may basically improve opportunities to develop tourism in general, and rural tourism activities - in and around protected areas. But cooperation with local communities in an equal partnership manner is yet to be improved by both national and international efforts, mainly through capacity development of protected area managers and organizations.

Improvements in planning practices in this field, which is partly being addressed by the Ministry of environment, mining and urban planning, supported by internationally funded projects, should contribute to better plans for tourism development. Some initiatives in this direction have already resulted in methodological guidelines for creating modern and participatory tourism plans in protected areas, using the example of the Special Nature Reserve Zasavica[28], though protected area managers still do not make separate and participatory plans, but rather incorporate them into general Management Plans/Programs (long term or annual). Consequently they do not get the attention they deserve.

4.1. Introduction

Serbia is divided into 150 municipalities (Serbian: opštine) and 24 cities (gradovi), which are the basic units of local self-government. [Fig 1] The city may or may not be divided into city municipalities (gradske opštine). There are 33 city municipalities (17 in Belgrade, 5 in Niš, 5 in Kragujevac, 2 in Novi Sad, 2 in Požarevac and 2 in Vranje).

The territory of a municipality is composed of a town (seat of the municipality) and surrounding villages. The municipality bears the name of the seat town.

Figure 1:
Municipalities and cities of Serbia with regions:
(1) Central Serbia, (2) Lower Danube river,
(3) South Banat on the Danube, (4) East Serbia
Regional Studies

4.1.1. Local Regional characteristics
The four regions focused on in this study do not conform to the existing statistical regions. Exceptions and compliances are given in following table (Table 7).

<table>
<thead>
<tr>
<th>Region</th>
<th>Municipality</th>
<th>Statistical region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Serbia</td>
<td>Ljig, Valjevo, Kosjeric, Mionica</td>
<td>West Serbia</td>
</tr>
<tr>
<td></td>
<td>Gornji Milanovac</td>
<td>Central Serbia</td>
</tr>
<tr>
<td>Region of the lower Danube river</td>
<td>Kladovo, Majdanpek, Veliko Gradiste</td>
<td>East Serbia</td>
</tr>
<tr>
<td></td>
<td>Golubac, Pozarevac,</td>
<td></td>
</tr>
<tr>
<td>South Banat on the Danube</td>
<td>Alibunar, Bela Crkva, Kovin, Vrsac</td>
<td>Vojvodina</td>
</tr>
<tr>
<td>East Serbia</td>
<td>Knjaževac, Zaječar, Negotin.</td>
<td>East Serbia</td>
</tr>
<tr>
<td></td>
<td>Pirot, Dimitrovgrad,</td>
<td>Southeast Serbia</td>
</tr>
</tbody>
</table>

Table 7: Municipalities and statistical regions

4.1.2. Demography
The size and quality of the labour force is one of the most important prerequisites for the successful development of tourism, and it is precisely the lack of personnel which appears as a key issue in all the studied regions. Extremely negative population growth became the largest economic and geographical problem over the last decades of the twentieth century in Serbia. Until 1960s, the population in Serbia was growing, while the share of the rural population amounted to 80%. What followed this period was the decline in population, intensifying from decade to decade. Until 1991, urban areas noticed an increase in population, while in the following years there was a decrease in population in these areas as well, because there was no influx of labour force from rural areas. Those years marked the beginning of intensive aging and extinction of villages, which, at the beginning of the twenty-first century, took on the characteristics of an epidemic by spreading rapidly to those areas of Serbia which did not suffer from labour shortages in the previous years.

This phenomenon is most pronounced in the border villages of Knjaževac municipality. Crni Vrh, Ravno Bučje, Aldina Reka, Tatrasnica, Aldinac and other places, have a 10 to 100 times smaller population compared to 1948 or are totally extinct as Repušnica.
One of the key reasons for the disappearance of these villages in the **East Serbia Region** is the neglect of agricultural production in the area where agriculture was the major source of income. Among the agricultural sectors in an especially poor position are beef production and sheep farming (once the most developed agricultural sector as well as the agricultural basis for all mountain regions in Serbia). Taking into consideration the fact that agricultural products and local food represent a significant driver for the development of rural tourism, the recovery of agriculture is a primary factor essential to rural tourism development success and will require a concerted effort.

The negative impact of demographic factors on the development of tourism in the border municipalities is best illustrated by the data presented in the Tourism Development Strategy of the municipality of Dimitrovgrad (2008), where it is clearly shown that some villages are permanently lost when it comes to organization of tourism.

Of the 43 villages within this municipality, as many as 24 villages do not have offspring (up to the age of 20). The worst situation is in the villages of Stara Planina, where there are 8 villages (all without offspring) and with the working population of only 37.

According to some calculations, it is believed that the villages with fewer than 20 residents do not have any real possibility of developing rural tourism. In order to approach rural tourism in an organized way, there should be at least 10 households, or two persons employed per household. If you take into account that not every household is willing or able to deal with tourism, it means that the working population number required needs to be at least 40.

On the basis of the above criteria, it is concluded that only 8 villages in the municipality of Dimitrovgrad have real opportunities for the development of rural tourism. Villages which will become extinct over the next 10-20 years are villages without offspring and no working population. It is estimated that as many as 32 villages of the municipality of Dimitrovgrad will lose their inhabitants, if the government does not take action to solve this problem.

According to the statistical categorization of the demographic age of a municipality there are 7 degrees of age, with all the municipalities in Serbia (excluding Kosovo and Metohija) except Novi Pazar, Tutin, Bujanovac and Presevo, falling into the three oldest categories. This clearly shows how poor the demographic picture

<table>
<thead>
<tr>
<th>Municipality</th>
<th>1948</th>
<th>1971</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Town</td>
<td>Villages</td>
<td>Town</td>
</tr>
<tr>
<td>Negotin</td>
<td>10</td>
<td>90</td>
<td>18</td>
</tr>
<tr>
<td>Zaječar</td>
<td>19</td>
<td>81</td>
<td>38</td>
</tr>
<tr>
<td>Knjaževac</td>
<td>9</td>
<td>91</td>
<td>22</td>
</tr>
<tr>
<td>Pirot</td>
<td>17</td>
<td>83</td>
<td>42</td>
</tr>
<tr>
<td>Dimitrovgrad</td>
<td>13</td>
<td>87</td>
<td>34</td>
</tr>
</tbody>
</table>
of Serbia is, and which, in itself, is a prerequisite for the successful economic development of any country.

The region of Central Serbia includes five municipalities. All municipalities have negative population growth with a special emphasis on the municipality of Ljig with the decline three times greater than the national average.

In addition, Ljig is the only municipality in the region which belongs to the last stage of demographic aging (highest demographic aging), while the oldest population in rural areas is in the municipality of Gornji Milanovac (45.6 years of age). The table shows information for two villages with the oldest population in each municipality. Based on this data, it is not difficult to conclude that the working-age population in these villages is scarce, and that the development potential of rural tourism in them is questionable.

Four municipalities in Southern Banat have extremely negative population growth, which is far more pronounced in villages. What can be considered as a demographic advantage in the South Banat region compared to others is that in these areas there are almost no villages with a few dozen or fewer residents. More populous villages provide an opportunity to improve the organization of rural tourism despite the current unfavourable age structure of the population.
Five municipalities in **the Lower Danube Region** are classified into three categories of demographic aging. The youngest population, and therefore the greatest professional and economic potential can be found in Pozarevac and Majdanpek, while the oldest population lives in Veliko Gradište (highest demographic aging). On the other hand, the municipality of Kladovo has the oldest population in rural areas, with the average age of 46.6.

### Municipality Population growth

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Srbija</td>
<td>- 4,6 ‰</td>
</tr>
<tr>
<td>Požarevac</td>
<td>- 5,0 ‰</td>
</tr>
<tr>
<td>Veliko Gradište</td>
<td>- 11,0‰</td>
</tr>
<tr>
<td>Golubac</td>
<td>- 12,9‰</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>- 8,8 ‰</td>
</tr>
<tr>
<td>Kladovo</td>
<td>- 11,2‰</td>
</tr>
</tbody>
</table>

In addition to the low rate of population growth which, except Pozarevac, is two to three times lower than the national average, all the municipalities in the Lower Danube region are characterized by one of the highest rates of emigration in Serbia. Whilst a significant percentage of the local population is of Vlah ethnicity, large portions of the total population has been going to work to the countries of Western Europe over the last fifty years, which has further influenced the creation of an unfavourable demographic image.

The municipalities of the **Eastern Serbia region** have the worst demographic situation. This is one of the areas in Serbia where migration started earliest. Due to the predominant mountainous terrain, where the infrastructure remained unchanged for decades, a significant proportion of the population has emigrated out of the area. This displacement was slowest in the municipalities of Negotin, since the villages are mostly located on lowland areas and therefore less isolated from infrastructure networks.
Nowadays, the most favourable situation is in Pirot municipality, although the rural mountain villages remained virtually uninhabited. With the exception of Pirot municipality, the other four municipalities fall within the categories with the highest demographic aging, so in that sense the demographic potential of the Eastern Serbia region, compared to other regions, is the weakest.

The worst demographics of all the studied municipalities is in Knjaževac where there are more and more villages without residents (Repušnica) or facing extinction (Aldin River, Gabrovnica, Papratna). Even worse is the fact that in the villages that have inhabitants, the age structure is unfavourable to such an extent that the planning of any industry, including tourism, remains virtually impossible.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldina Reka</td>
<td>12</td>
<td>≤ 3</td>
<td>1</td>
</tr>
<tr>
<td>Aldinac</td>
<td>26</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Božinovac</td>
<td>26</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Vidovac</td>
<td>45</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>Gabrovnica</td>
<td>10</td>
<td>≤ 3</td>
<td>1</td>
</tr>
<tr>
<td>Papratna</td>
<td>13</td>
<td>≤ 3</td>
<td>1</td>
</tr>
<tr>
<td>Ravno Bučje</td>
<td>28</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Staro Korito</td>
<td>51</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Tatrasnica</td>
<td>5</td>
<td>≤ 3</td>
<td>2</td>
</tr>
<tr>
<td>Šarbanovac</td>
<td>25</td>
<td>14</td>
<td>3</td>
</tr>
</tbody>
</table>
4.2 Central Serbia

GEOGRAPHIC FEATURES OF THE REGION OF CENTRAL SERBIA

4.2.1. Location
In regard to this study the region of Central Serbia refers to the municipalities of Valjevo, Mionica, Ljig, Gornji Milanovac and Kosjerić, and is situated in the western part of Serbia. Its natural borders are the Kolubara river valley to the north, the Zapadna Morava and Moravica river valleys to the south, Sokolska Mountain and the Drina river valley to the west and the mountains of Rudnik and Vujen to the east. The total area of this region is 2,707 km².

Administratively, this region is located within three districts - Kolubarski (Valjevo, Mionica and Ljig), Moravički (Gornji Milanovac) and Zlatiborski (Kosjerić).

4.2.2. Landscape
The dominant feature of this region is the Valjevo mountain range. This mountain range belongs to the Dinaric Mountains. It stretches to a total length of approximately 75 km, in the form of a horseshoe around Valjevo. The mountains are composed of rocks of different geological composition, which is reflected in their rich morphology. The particularly prominent parts of this mountain range are those composed of karst. The highest peak of the Valjevo mountain range is Mali Povlen, which stands 1347 m high. The following mountains belonging to the Valjevo mountain range can be identified as individual complexes: Medvednik, Jablanik, Povlen, Magleš, Maljen and Suvobor.

Table 4.2.1.

<table>
<thead>
<tr>
<th>Crest</th>
<th>Municipality</th>
<th>Region</th>
<th>Area [km²]</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mionica</td>
<td>Kolubara</td>
<td>329</td>
<td>16,513</td>
<td></td>
</tr>
<tr>
<td>Ljig</td>
<td>Kolubara</td>
<td>279</td>
<td>14,629</td>
<td></td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td>Moravica</td>
<td>836</td>
<td>47,641</td>
<td></td>
</tr>
<tr>
<td>Kosjerić</td>
<td>Zlatibor</td>
<td>358</td>
<td>14,001</td>
<td></td>
</tr>
<tr>
<td>Valjevo (grad)</td>
<td>Kolubara</td>
<td>905</td>
<td>90,301</td>
<td></td>
</tr>
</tbody>
</table>

The water flows of the rivers of this region have created numerous deep valleys, gorges and canyons. The most prominent are the Gradac and Sušica canyons, cut deep into the karst of the Valjevo area. Their steep sides slope up to 300 m above the riverbed. The meanders of the river Gradac have cut deeply into its limestone rock sides.

Smaller, but equally beautiful are the canyons of the rivers Ribnica and Skrapež. Their dimensions prevent the existence of footpaths but hikers walk through the river when the water is low. A number of cascades, small waterfalls and side springs make these river valleys attractive for tourism activities.

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The peaks of the Valjevo Mountains are smooth, curved and covered with forests. Rivers have cut deep through the mountain slopes and in doing so have created a dramatic terrain. The river valleys are covered with forest-type flora while the ridges lying in between them feature meadows and pastures.

In some places the mountain ridges are low lying, creating saddles that enable communication between the basins and valleys of the big rivers surrounding these mountains. These mountain passes feature the most important regional roads.

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Jablanica and Obnica rivers feature steep-sided gorge-like valleys with wide, passable alluvial plains.

The very intensive karst process has destroyed numerous waterways that used to flow from the Valjevo Mountains toward the surrounding basins. Only the most prominent waterways have managed to cut through the rock, forming canyon-type valleys. The waterways that disappeared into the depths of karst left dry valleys behind, the bottoms of which feature sinkholes that were, during the later geological period, filled with sediments.

### 4.2.3. Climate

The Central Serbia region has a temperate continental climate with moderately warm summers, moderately cold and long winters and mild transitional seasons. Only the highest parts of the territory (over 800 m above sea level) have the features of a sub-mountain climate, with chilly summers and harsh winters. The average temperature on Divčibare (960 m) is 7°C. The annual temperature ranges from a minimum in January and maximum in July not reaching above 18.5°C in the mountains. The terrain of the Valjevo Mountains has an exceptional influence on the movement of air masses and thus the amount of precipitation, which amounts to an annual average of 1100 mm. Wind frequency is highest in winter and lowest in spring, with the most common wind direction being north-western.

### 4.2.4. Demography and Settlements

The total area of the municipalities of Valjevo, Mionica, Ljig, Gornji Milanovac and Kosjerić is 2707 km². Compared with Southern Banat, Eastern Serbia and the Lower Danube regions, this region is characterized by a significantly greater population density. Contrary to many municipalities in Serbia, the population in Valjevo is increasing.

The largest urban complexes are located at lower altitudes, often in river basins. At higher altitudes, the settlements are sparse.

### ENVIRONMENT

### 4.2.5. Air

According to the CLRTAP data, the municipalities in Central Serbia are not exposed to dangerous emissions of sulphur dioxide and nitrogen oxides. Long-term monitoring data, the urban territories of Gornji Milanovac, Ljig, Valjevo Kosjerić and Mionica have good air quality, since the greatest daily concentrations of SO₂ and nitrogen oxides never exceed

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Area (km²)</th>
<th>Number of Settlements</th>
<th>Population 1991</th>
<th>Population 2002</th>
<th>Density (individuals/km²)</th>
<th>Population on change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valjevo</td>
<td>905</td>
<td>78</td>
<td>17 061</td>
<td>16 513</td>
<td>50.2</td>
<td>-3.2</td>
</tr>
<tr>
<td>Mionica</td>
<td>329</td>
<td>36</td>
<td>14 667</td>
<td>16 626</td>
<td>52.4</td>
<td>-6.6</td>
</tr>
<tr>
<td>Ljig</td>
<td>279</td>
<td>27</td>
<td>15 236</td>
<td>14 001</td>
<td>39.1</td>
<td>-8.1</td>
</tr>
</tbody>
</table>

Table 4.2.2.
Central Serbia

4.2

because of the barren dam, which is on the list of absolute priorities for clean-up and control. In July 2011, the cement production plant Titan was granted the first integrated license (IPPC certification) in Serbia, as prescribed by the Law on Integrated Environmental Pollution Prevention and Control.

Conclusions: Whilst the region enjoys a high quality air environment, a monitoring system in the urban areas is required as well as continuous efforts to reduce and mitigate the impacts of temperature inversion in the valleys on the levels of pollution.

4.2.6. Water

The Valjevo Mountains are rich in water, both surface and subterranean. Surface waterways, in the form of streams and small rivers, run down the mountain slopes where they form larger waterways that cut through the karst,
forming the already mentioned gorges and canyons. The largest waterway in the northern part of the region is the Kolubara River, created by the confluence of the Jablanica and Obnica rivers, with its major tributaries of the Gradac, Ribnica and Ljig. From the southern slopes of the Valjevo Mountains run the rivers Skrapež (with its main tributary Ražana), Kamenica, Čemernica and Dičina.\(^5\)

Subterranean water surfaces in the form of rich karst springs. Standing out for its beauty is Taorska Vrela (springs), situated on the southern slopes of mount Povlen. At the water’s exit from the cave, there are large amounts of limestone sediments in the form of tufts, over which the water flows in cascades.

The River Gradac is an underground river that surfaces again 10 km upstream of its confluence with the Kolubara River, at the Zelenci and Kolovrat springs. Underground waters also come to the surface from the Petnička and Degurička caves.

As a consequence, the region of Central Serbia is rich in thermo-mineral springs. The Vrujci and Ljig spas are the most important with regard to tourist sites.

**Vrujci Spa** is located at the foot of the mountains of Šuvobor and Maljen, in the valley of the river Toplica. The thermal water in Vrujci (28 °C) contains potassium, magnesium and selenium. With a spring yield of 300 litres per second, Vrujci is probably the most recognised spa in Serbia. The spa is suitable for the treatment of chronic rheumatism, high blood pressure, anaemia, kidney and urinary tract stones, gynaecological and eye disorders.

**Ljig Spa**, just like Vrujci Spa, is located at the foot of Šuvobor Mountain, at an altitude of 160 m to 280 m. The Spa complex stretches along the river Ljig, close to the main road between Belgrade and Podgorica. Spa Ljig has multiple mineral water springs with a temperature of 32.5 °C, whose medicinal properties have been known since ancient Roman times. The mineral water is used both for drinking and bathing. In Ljig Spa skin diseases, diseases of the bone-joint system, neuropsychiatric diseases, gastrointestinal diseases and peripheral blood vessel disorders are treated.

The upper flows of the rivers Kolubara, Skrapež, Gradac and Dičina have excellent water quality. However, these rivers are polluted downstream of the main urban areas. Water quality varies from class II/III for the river Kolubara to class II for the lower flows of the rivers in its basin, while the upper flows of this and the other mountain rivers are in high I and I/II class quality. The main pollutants are the wastewaters from industrial facilities and households, inadequate use of agro-chemicals and uncontrolled waste disposal. Adhering to the EU Water Framework Directive and the new Law on Waters adopted in 2010, Serbia has created a pilot project for bringing the waterways of the Kolubara basin up to a good water quality standard. The polluters have been identified and protection measures proposed. The projected year for the achievement of the status of good water quality is 2029\(^6\).
4.2.7. Soil
The area of the municipalities of Gornji Milanovac, Valjevo, Kosjerić, Mionica and Ljig is mainly composed of karstified limestone, gneiss, dolomite and serpentine rocks. Fertile soils (smonitzas, fluvisols and eugleys) cover the plains, hilly regions and valleys. Lime dolomite black soils, lithosols and rendzinas, rankers and district cambisols, district cambisols, luvisols and calcocambisols dominate in the higher mountains.

The soil is threatened by landscape degradation and pollution in the impact zones of the open mines of cement resources; the mining of magnesite and lead-zinc ore and the open mining and processing of masonry stone in the municipalities of Kosjerić and Gornji Milanovac. The land is directly (through the disposal of resources and industrial waste) and indirectly polluted (through air and water pollution) by industrial facilities in Valjevo, Kosjerić and Gornji Milanovac. In addition, the quality of the land in Central Serbia is negatively affected by inadequate agricultural practices, untreated leachate from landfills and mining, erosion and floods.

Education regarding the use of agro-technical measures is improved and appropriate to the rural population throughout the territory of this region by either NGOs such as “Moba” or third level education staff from the Faculty of Agronomy (Agronomski fakultet), the Institute for Orcharding (Institut za voćarstvo) and the University of Belgrade Faculty of Agriculture (Poljoprivredni fakultet univerziteta u Beogradu) as well as some municipal agricultural services.

4.2.8. Waste
In the municipalities of Ljig, Valjevo, Mionica, Kosjerić and Gornji Milanovac waste collection and disposal is the responsibility of the public utilities run by local government. Waste generation and collection in these municipalities is presented in the following table.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Population covered by waste collection</th>
<th>Population covered by waste collection (%)</th>
<th>Waste generation (t/year)*</th>
<th>Waste collection (t/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ljig1</td>
<td>12730</td>
<td>3873</td>
<td>30.4</td>
<td>4048</td>
<td>1232</td>
</tr>
<tr>
<td>Valjevo1</td>
<td>90301</td>
<td>69532</td>
<td>77.0</td>
<td>28.716</td>
<td>22111</td>
</tr>
<tr>
<td>Mionica1</td>
<td>14263</td>
<td>2619</td>
<td>18.4</td>
<td>4.536</td>
<td>833</td>
</tr>
<tr>
<td>Kosjerić2</td>
<td>12083</td>
<td>5030</td>
<td>41.6</td>
<td>3.842</td>
<td>1600</td>
</tr>
<tr>
<td>Gornji Milanovac3</td>
<td>44438</td>
<td>31838</td>
<td>71.6</td>
<td>14.131</td>
<td>10124</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>173.815</strong></td>
<td><strong>112.892</strong></td>
<td><strong>65</strong></td>
<td><strong>55.273</strong></td>
<td><strong>35.900</strong></td>
</tr>
</tbody>
</table>

*Based on the average waste generation per capita

Table 4.2.2: Generating and collecting of waste in the region
1 Kolubara District; 2 Zlatibor District; 3 Moravica District
Source: Ministry of Environment and Spatial Planning, campaign „Clean up Serbia“
Unfortunately, collected waste is disposed of in inadequate landfills (the landfill in Valjevo is located on the bank of the Kolubara river), except in Gornji Milanovac where a sanitary landfill was constructed with the help of the Norwegian Government.

A regional waste management plan\(^7\) for eleven municipalities (Valjevo, Ub, Mionica, Lajkovac, Ljig, Osečina, Koceljeva, Vladimirci, Lazarevac, Obrenovac and Barajevo) has been adopted and all the necessary documentation has already been provided for the construction of a regional sanitary landfill in “Kalenić” with a recycling yard. The landfill will be located in the vacant open coal pit in the Kolubara lignite basin. This facility is expected to satisfy the waste disposal needs of all of the municipalities of the Kolubara district (Valjevo, Ljig, and Mionica among others), all of which will participate in its construction. The European Union, through the IPA fund, will help the construction of that landfill which will be constructed in accordance with the highest standards. This work should start by 2013.

The regional waste management plan\(^8\) for these nine municipalities (Arilje, Bajina Bašta, Čačak, Čajetina, Ivanjica, Kosjerić, Lučani, Požega...)

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Number of Settlements</th>
<th>Number of Cleaned Sites 2009-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ljig</td>
<td>27</td>
<td>61</td>
</tr>
<tr>
<td>Valjevo (grad)</td>
<td>78</td>
<td>102</td>
</tr>
<tr>
<td>Mionica</td>
<td>36</td>
<td>53</td>
</tr>
<tr>
<td>Kosjerić</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td>63</td>
<td>313</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>231</strong></td>
<td><strong>580</strong></td>
</tr>
</tbody>
</table>

Table 4.2.4:

Rural settlements have been omitted from municipal waste collection, which has resulted in the increase of local dumps or illegal landfills in most of the villages and along the roads and rivers of the region. According to existing data, almost 20,000 tonnes of waste ends up in illegal dumps every year.

Many dump sites in the region were cleaned up in the campaign “Clean up Serbia” (one day action) during the last three years, but have since re-emerged. The following table shows the results of the action in the period 2009 - 2011.

\(^7\) Ministry of the Environment, Mining and Spatial Planning, Action “Clean up Serbia”

\(^8\) Regional Waste Management Plan for 11 Municipalities in the Kolubara District, Institute of Architecture and Urban & Spatial Planning of Serbia, 2006
and Užice) has set “zero waste” as one of its long-term goals. The regional sanitary landfill “Duboko” started work in October 2011, but not to full capacity as there is not enough waste being collected. The Municipality of Kosjerić disposes of its waste at the “Duboko” landfill but due to a lack of financial allocation some municipalities have not developed transfer stations.

The figure 4.2.1. presents the regional landfills and recycling yards envisaged by the National Strategy on Waste Management in this region.

4.2.8a Recycling

This region is average in terms of waste management in Serbia, where 72% of the population is covered by waste collection. There are two sanitary landfills in Gornji Milanovac and Duboko and many dump sites. There are plans for other municipalities to dispose of waste at similar sanitary landfills. In line with developments across Serbia, recycling strategies by the municipalities within this region are currently being put in place, which include the construction of facilities and the establishment of effective collection management. Essentially the process is starting from a very low base.

Paper/ cardboard and metal fractions are separated, compacted and sold for recycling from waste generated by the municipality of Kosjerić before disposal at the “Duboko” landfill. There are no authorized waste operators in this municipality, except for a few transporters of flying ash from the thermo power plant.

In Valjevo, recyclable waste is collected by the private companies, “Metva”, “Metalprom”, “BT Sotrel” (paper, plastic, metal, batteries, etc.) and “Inos- Balkan”, a citizens association “Green Bike” and the public utility “Vidrak” (paper and PET) and shipped for recycling. Many industrial enterprises and commercial companies from Valjevo collect, separate and sell waste to authorized waste operators (i.e. the “Vujic company”, the green market “Polet”). At the landfill, tires and glass are separated for recycling.

Part of the recyclable materials from waste is separated by the Roma population, mainly iron, paper and copper.

In Valjevo the construction of a recycling yard has begun, funded by the Ministry of the Environment, Mining and Spatial Planning and the local government. Waste from Mionica will also be collected and transferred to this centre. After separation, the waste will be disposed of at “Duboko” and “Vinca” until the construction of the “Kalenic” landfill is completed.

In the municipality of Ljig primary selection has started in the town of Ljig. However, whilst bags for different types of waste (PET, cardboard/paper) are given to all households, currently, all waste, including separated waste, is disposed of at a local dump. There are also several containers for PET at some locations, but the public utility company does not collect it. Waste from the municipality of Ljig will eventually be transported to a future recycling yard in Lazarevac, before disposal at the “Kalenic” sanitary landfill. There are two authorized waste collectors in this municipality.

Regional Waste Management Plan, JKP Duboko, TCS – ID 25096, May 2011
Although primary waste separation exists in the municipality of Gornji Milanovac, containers for PET and cardboard/paper have only been placed in the town of Gornji Milanovac. Citizens also receive PVC bags for the separation of these waste types. In 2011 approximately 25,000 t of PET packaging waste and 120,000 t of paper/cardboard waste were collected. Other waste fractions are disposed of at the sanitary landfill in Gornji Milanovac, as there is no secondary waste selection. The waste from the municipality of Mionica is also disposed of at this landfill.

A list of operators authorized for waste collection, transportation and treatment in this region can be viewed in appendix no.

Due to the fact that industry is relatively developed compared to other regions, there are several successful waste collection and transportation operators. One of them is “Metva” from Valjevo. It has a permit for waste collection, transportation and treatment. It has been operating in the region for more than 10 years and has 15 employees. It has contracts with both the public and private sectors, and cooperates with other collectors and transporters of waste in the region.

4.2.8. b Waste: conclusions and recommendations

This region is average in terms of waste management in Serbia, where 72% of the population is covered by waste collection. There are two sanitary landfills in Gornji Milanovac (for two municipalities in this region) and Duboko (for one municipality in this region) and many dump sites. There are plans for other municipalities to dispose of waste at sanitary landfills.

There is no accurate data on the quantities and composition of the waste generated in the territory covered by the municipalities, as most of them are not equipped and do not measure quantity when receiving waste. It should be possible to organize waste composition measuring as part of a proper waste management system.

Generally, there is no organized system to strengthen the capacity of the local community with regard to the development of public awareness related to problems and solutions for sustainable waste management. NGOs are involved in recycling projects, but in most cases, there are no seminars in schools and kindergartens related to recycling or waste management. It is essential for local government and public utilities to include public awareness campaigns in their plans in order to adequately inform citizens and develop awareness of sustainable waste management.

Special attention should be paid to rural areas, as they have specific problems related to organic waste and some types of hazardous waste such as packaging from pesticides.

Organizing the region cluster and its activities can help with waste minimization and reuse; the level of recycling; waste collection and the
treatment and provision of a functional and updated database on recycling at regional level; the establishment and development of special training programs and the capacity building of cluster members; advocating for the health and social protection of individual collectors of recyclable materials; improving the status and the protection of the rights of marginalized social groups and increasing the influence of public opinion.

4.2.9 Biodiversity
The flatland areas of the municipalities of Gornji Milanovac, Valjevo, Mionica and Ljig are dominated by settlements, industrial complexes or arable land. The higher regions are covered with natural forest ecosystems. The greatest part of the Kosjerić municipality is covered with forests.

The altitudinal gradient, diverse climate conditions and heterogeneous bedrock and soil conditions have resulted in the development of diverse forest ecosystems. Hygrophilous forests (Alnetum glutinosae) dominate along the river banks. The hilly regions are covered with large complexes of oak forests (Quercetum fraineto-cerris, Quercetum petraeae). Belts of European beech and beech-fir forests (Fagetum montanum and Abieto-Fagetum) are distributed in the higher mountains. Relic complexes of Scots pine and black pine forests (Pinetum nigrae-sylvestris) are located on Maljen Mountain. Finally, large complexes of Tertiary forests of black hornbeam (Ostrya carpinifolia) dominate in the canyon habitats of the Valjevo Mountains. These forest ecosystems are valuable pools of biodiversity. The most important plants in this region are serpentinophytes (plants adapted to serpentine soil) such as Notholena maranthe, Asplenium cuneifolium, Alyssum markgrafii etc. Moreover, many endemic plants of the Illyric bio-geographical province are also present in this region. Most important among them are Athamanta haynaldii, Onosma stellulatum, Campanula lungulata, Arabis procurrens etc.

4.2.10 Protected Natural Areas
In Central Serbia, only 1% of the land is protected as natural heritage, which is very low compared to the rest of the country. Following Serbia’s strategy to increase its natural protected territory the entire complex of the Valjevo Mountains is expected to be designated as protected, thereby improving the situation and thus covering between 25-30% of the territory of Central Serbia. The research process and preparations for the designation study are currently being carried out by experts from the Institute for the Protection of the Nature of Serbia, and are expected to reach completion by 2014 (Suvobor, Maljen, Povlen), and 2016 (Jadovnik and Medvednik).

Currently, only two groups of protected sites can be recognized from the point of view of nature protection and tourism.

First, there is Maljen Mountain with Dvciibare located in the central part of the Valjevo Mountains, situated within the administrative boarders of Valjevo. With its long history as a tourist and recreational area, Dvciibare covers 13,000ha, at an elevation of around 900m. Within the study on the

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1 The Institute for the Protection of the Nature of Serbia, June 2012
2 Study on the Protection of the Natural Values of Dvciibare (2002), Belgrade: The Institute for the Protection of the Nature of Serbia
Central Serbia

4.2

protection of the natural values of Divcibare, made as part of the documentation for the Regulation Plan of the Divcibare tourist centre 2017, a number of specific natural values of the area were identified that should be taken into account and preserved in future sustainable tourism development plans:

- Climate – the number of sunny days, low air pressure and air quality, as well as general conditions contributing to positive health effects, position this area as a potential “air spa”
- Landscape – visual diversity, with a mixture of open areas and those covered by vegetation, scenery, valleys, individual trees and groups of trees
- Unique pit, the second largest in Serbia (after the Vlasina lake area, south Serbia), as the habitat of specific plant species
- Relic complexes of Scots and black pine forests
- Habitats and individual representatives of protected flora and fauna species
- Non material cultural heritage (legends, rituals, modern events).

Close to Divcibare are the following protected sites:

- Strict Nature Reserve “Crna Reka”, covering 13 ha, with its specific mixture of tree species (white and black pine, birch, beech, oak, etc.)
- Strict Nature Reserve “Calacki potok”, with 2.5 ha of surface and characteristic mixture of tree species (fir and beech) and groups of trees (birch) as well as individual trees (spruce, white and black pine, etc.)
- Strict Nature Reserve “Velika Pleć – Vražji Vir”, by supporting unsustainable tourism development, characteristic mixture of tree species and especially the “Vražji Vir” waterfall, protected as a natural monument and
- Strict Nature Reserve “Zabalac”, covering 11 ha, with a significant birch tree complex, what remains since a fire in 1928.

Existing documents and tourism plans should be reviewed to ensure that due consideration is given to the above list and reconsideration should be made of the current objective to build huge recreational infrastructure in this area, which might neglect and negatively impact on its potential by supporting unsustainable tourism development.

The second mountain complex within the Valjevo Mountains is the massif Suvobor, covering its eastern slopes and located within the administrative territory of the Gornji Milanovac, Mionica and Ljig municipalities. Within the wider vicinity of Suvobor there are some important protected areas, such as the landscape of exceptional beauty, the Ovcar – Kablar gorge as well as Ovcar Spa. Two more spas are situated nearby – Donja Trepca Spa and Vrujci Spa.

Within the territory of Suvobor, there are a few protected sites:

- Mala Bezdan cave, protected as a natural monument
- Ribnicka cave has been protected as a
national monument since 1977, with the protected surrounding of Ribnicka Church and the old school in Ribnica.

- Rajac Mountain – protected as a landscape of exceptional beauty, first designated in 1963, covering around 1.200 ha\(^3\).

In the area of Rajac and Suvobor mountains, part of the Valjevo mountain complex, are a number of established IBA areas (with 100 bird species), PBA and EMERALD areas.

**Landscape of exceptional beauty Rajac Mountain** (12 km\(^2\)) includes a number of rises, plateaus and karst depressions. The specific mild climate, diversity of landscape and vegetation, as well as variety of cultural monuments make the area unique and valuable for both its own sake and from the perspective of its sustainable tourism potential. Within this area there are a number of prohibited activities, such as construction, landscape-changing and other similar activities, e.g.; lumbering, larger-scale exploitation works, modification of the plant populations of meadows and pastures, and introducing foreign tree species. These measures are aimed at maximising the potential for preservation. There is a small mountaineers’ house and motel available for tourists.

In addition to this natural heritage, there are also significant examples of cultural heritage in the northern part of the Suvobor area, such as the remains of monasteries in Slavkovica, Ba and Ribnica.

The management responsibility for Rajac has been assigned to the Valjevo Forest Unit of the PE Srbijasume. According to its representative (Dragic Tomic), there are no adequate accommodation facilities for tourists in this area, and no visitors’ fee is charged at all. Cooperation with local tourist organizations has been estimated as “difficult, since they view us as competition, rather than as partners”. Rural tourist activities in the Rajac mountain area are obviously more in the hands of the local tourist organization in Ljig than of this unit.

Within the unit, there is no person (at the moment) in charge of tourism specifically, but Mr. Tomic has been very active in establishing and running the local Association of Households, whose members provide rural tourism services in the wider area of the Valjevo mountains. Through this association there are a number of traditional events and activities organized, such as the Days of Mushrooms and herbal plants, aimed at promoting the potential of rural tourism. The association was established in 2005 and besides the promotion of rural tourism and organising events, its members also work on the long-term development of the capacities of local people to improve rural tourism in the Valjevo mountain area (www.domaciniva.org.rs).

One more protected area in the territory of Valjevo has an important place in Serbian and local natural heritage – the **Gradac River Gorge** (12.7 km\(^2\)), which has also been designated as a landscape of exceptional beauty. High water quality, around 70 well-explored caves, the meanders of the Gradac River cutting deep into the limestone rock and the medieval monastery of Ćelije represent only some of the assets of this protected area, the management of which is entrusted to the Environmental Society Gradac (**Ekološko društvo „Gradac”**).
SOCIO-ECONOMIC CONTEXT - PRESSURES ON THE ENVIRONMENT

4.2.11 Energy

Energy consumption: Central Serbia no longer has conventional power plants, but they are located in the surrounding regions. Of particular concern is the thermal power production company Termoelektrane "Nikola Tesla" which is the largest electrical power producer in Serbia, but also a major polluter of the environment. Depending on the wind direction, this pollution can and does reach the territory within the region of Central Serbia.

The energy sources used are electricity, solid fuels, coal, oil and wood. Wood is increasingly used for heating homes. The infrastructure for natural gas distribution is not developed, except in Gornji Milanovac and sustainable energy sources are used only by a small number of households.

Figure 4.2.2 Small hydropower plant building potential
Source: Renewable energy sources, Ministry of Mining and Energy

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According to the representative of this NGO (one of very few managing protected areas in Serbia) there is potential for the development of rural tourism in the Valjevo Mountains. They do not consider that they are participating or regarded equally in tourism planning and decision making at municipal level, and while cooperation with decision makers is ongoing, progress is slow.

The main threats from tourism to environmental protection in this area, as recognized by the “Gradac” NGO representative, are the building of ski slopes and lifts in Divcibare as well as illegal waste disposal in the Gradac river area. The level of cooperation with local people in regard to promoting the potential of sustainable tourism development in association with these specific developments is considered to have been unsatisfactory and in their opinion, fundamental steps need to be taken in order to involve the local population in planning as well as to increase their awareness about sustainable principles and the opportunities offered by a collective, holistic approach to sustainable tourism development.
### Table 4.2.5 Renewable energy source potentials in Central Serbia

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Solar Energy (kWh/m²)</th>
<th>Biomass Energy (ha)</th>
<th>Wind Energy (W/m²)</th>
<th>Geothermal Energy (MW)</th>
<th>Hydro Energy (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) daily</td>
<td>(1) woods</td>
<td>(2) yearly</td>
<td>(1) (MW)</td>
<td>(1) (MW)</td>
</tr>
<tr>
<td></td>
<td>(2) yearly</td>
<td>(2) agricult. lands</td>
<td></td>
<td>(2) number of wells</td>
<td>(2) (kW)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) (MWh)</td>
</tr>
<tr>
<td>Mionica</td>
<td>3.8 – 4</td>
<td>5 – 10.000</td>
<td>100- 200</td>
<td>&lt;3</td>
<td>2 – 5</td>
</tr>
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<td></td>
<td></td>
<td>10 – 20.000</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ljig</td>
<td>3.8 – 4</td>
<td>5 – 10.000</td>
<td>100- 200</td>
<td>&lt;3</td>
<td>2 – 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 – 10.000</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gornji</td>
<td>3.8 – 4</td>
<td>20 – 30.000</td>
<td>100- 200</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Milanovac</td>
<td></td>
<td>20 – 30 000</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kosjerić</td>
<td>3.6 – 3.8</td>
<td>20 – 30.000</td>
<td>&lt;100</td>
<td>-</td>
<td>&lt; 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 – 10.000</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Valjevo</td>
<td>3.6 – 3.8</td>
<td>20 – 30.000</td>
<td>&lt;100</td>
<td>-</td>
<td>5 – 10</td>
</tr>
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<td></td>
<td>1362,6</td>
<td>30 – 40.000</td>
<td></td>
<td>-</td>
<td>9.785</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30.937</td>
</tr>
</tbody>
</table>

**Explanation of the table**

**Solar power**

(1) Potential mean values of daily irradiated solar energy on horizontal surface (kWh/m²)
(2) Yearly values of irradiated solar energy on horizontal surface (kWh/m²)

**Biomass**

(1) Area of land under woods (ha)
(2) Area of agricultural land (ha)

**Wind**

(1) Average Energy potential of wind per year on 100m (W/m²)

**Geothermal**

(1) Potential power of geothermal sources (MW)
(2) Number of locations with geothermal springs in municipalities in Serbia

**Hydro power (small hydropower plants)**

(1) Total potential hydropower of small hydropower stations (MW)
(2) Estimated power (kW)
(3) Potential annually power production (MWh)
Central Serbia

The total energy potential of waters suitable for exploitation by small-size hydropower plants in Central Serbia is about 15 to 20 MW, which is not regarded as a significant increase in power generation. In the municipality of Kosjerić a few, small-in-size hydropower plants on the rivers Tmuša, Rogačica and Seća, with nominal power of up to 600 kW are planned for construction in 2011.

Renewables and Energy Conservation: In an attempt to reduce its environmental footprint, the cement factory Titan from Kosjerić uses energy obtained by burning solid fuel that is produced from waste from its cement production processes.

The biggest solar energy utilization potential for electricity production purposes exists in the municipalities of Ljig, Mionica and Gornji Milanovac. In these areas, the annual average daily solar energy radiation is in the range of 3.8 - 4.0 kWh/m².

In central Serbia, significant potential exists for utilising geothermal springs for energy production.

Conclusions: All forms of renewables have potential, but geothermal in particular. The degree to which renewables can replace the current status quo and support future demand is yet to be assessed.

4.2.12 Building Energy efficiency

Central Serbia is characterised by predominantly free-standing single family houses which accounted for approximately c. 90% in the Moravica District. Considering the analysed periods of construction, the prevalence rate indicated that most buildings in the region (over 93%) were built between 1946 and 1990 (periods: C – 1946-1970; D – 1971-1980; E – 1981-1990). As a consequence of World Wars I and II as well as the fact that the region was even more rural in the past, fewer than 7% of buildings were identified as dating before 1945. The most active period of construction occurred between 1946 and 1970 with approximately 35% of built houses.

With respect to the applied materials, construction types and building techniques, single-family houses in Central Serbia displayed a number of specific features which can be summarized as follows.

The main building materials used for walls are brick and clay block. The floor structure has several variations. Wooden structures are rare and found mostly in older houses, especially for loft flooring (straw and plaster underneath and planks covered with soil above – Karatavan), while later, most buildings were made with massive reinforced concrete slabs or, in later periods, semi-prefabricated clay structures. As a rule, the roof structure is almost always wooden regardless of whether the loft is inhabited or used for storage purposes only.

Thermal insulation was not used in houses built before 1980s, when its application started, albeit modestly. A significant number of houses used for dwelling do not have a finished facade, which means there is no thermal insulation. The houses which have recently been refurbished (mainly the facades) with the purpose of improving thermal performance, have thermal insulation of minimal thickness. Traditional construction
4.2 Central Serbia

solutions (rammed earth, post and petrail, logs, etc.) can be found in an insignificant number of buildings.

With regard to heating, it should be noted that the predominant solutions include individual furnaces mostly burning solid fuels, primarily wood. This is due to the poorly developed energy infrastructure in the region. There are also electric heating solutions using either thermo accumulating stoves or electric furnaces.

4.2.13 Employment

The 66% share of the working age population is slightly below the average for Serbia while the population share over age 65 is 17%, which is around the average for Serbia. The share of the economically active population (50%) and that of the professionally engaged population (41%) (36%, while the average for Serbia is 20%), and 32% of the population is listed as dependants (the average for Serbia is 34%). According to the last National Employment Service Report dated September 2010, the number of listed unemployed persons in the five municipalities of the region is 12,349.

Compared to the working-age population, the percentage of 8% is not alarming, but this is only an apparent number, since a large number of people are employed in enterprises that are being restructured.

Viewed individually by sectors, the most employees in the region were engaged in manufacturing (44%), while only 1% of the population were listed as employed in agriculture. The highest percentage of employees in the industrial sector is found in Kosjerić (5) and Gornji Milanovac (49%). The number of employees working in tourism is negligible with the only exception being Mionica with a 7% share of employees in that sector.

4.2.14 Industry

The industrial sector engages the largest share of the working population in Central Serbia. Within the industrial sector, the most developed are the metal manufacturing industry and the food industry. According to data from the Statistical Office of the Republic of Serbia, the manufacturing industry employed 14,321 persons which accounted for 44% of total employment in the region. The most developed industrial areas are found in Kosjerić, Gornji Milanovac, and Valjevo.

In Kosjerić, the best operating company is a privatized cement factory Titan (Fabrika

<table>
<thead>
<tr>
<th>Region</th>
<th>Unemployed</th>
<th>Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valjevo</td>
<td>7,481</td>
<td>18,975</td>
</tr>
<tr>
<td>Ljig</td>
<td>484</td>
<td>1,391</td>
</tr>
<tr>
<td>Mionica</td>
<td>522</td>
<td>1,355</td>
</tr>
<tr>
<td>Kosjerić</td>
<td>661</td>
<td>1,566</td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td>3,201</td>
<td>8,948</td>
</tr>
<tr>
<td>Region</td>
<td>12,349</td>
<td>32,235</td>
</tr>
</tbody>
</table>

Table 4.2.4 Registran broj nezaposlenih
Source: For unemployed, NSZ, for employed RZS.
Industry of this region, in addition to the mentioned cement factory, consists of companies such as Krušik, Gorenje, Austrotherm and Valy from Valjevo and Metalac holding, Swislion-Takovo, and Zvezda Helios from Gornji Milanovac.

The food production sector, which was larger in the past, supported by companies such as Srbijanka from Valjevo, is undergoing a privatization process. Their successful return to business is important for the people from the Valjevo Mountains, as they support fruit production, which is prominent in this region. Along with the food production industry, textile, construction and footwear production industries have also declined and are going through a consolidation and privatisation process.

4.2.14.a The Mining and Chemical Industry
Several companies deal in quarrying and the processing of rock. These are Granit-Peščar from Ljig, non-metallic ores (Rudnik nemetala) from Valjevo, the Kosjerić quarry (part of the Titan Cement Factory), and a diabase mine from Kosjerić, which is yet to start its operations. In addition to causing pollution in the form of noise and airborne particles, rock quarrying also has a detrimental impact on the landscape. This has had an adverse effect on the villages of Slavkovica and Ba, in which Granit-Peščar operates its open pits, as these villages are trying to develop the business of rural tourism. A remediation programme needs to be put in place so that these pits, when exhausted, are not left to blight the landscape forever.

In Kosjerić there are two companies (Kofeniks-chem and Irkom LLC) engaged in the production of paints, varnishes, wood protection agents and hand washing products. The production of paints and varnishes is also conducted by Zvezda-Helios from Gornji Milanovac. This company has been involved in the illegal dumping of toxic waste that used to be discharged into the city sewer while the waste-packaging was distributed to the local people to be used for watering gardens.

4.2.15 Agriculture
The land structure of central Serbia is fairly homogeneous. Agricultural land in the region accounts for 64% of the total area. Only Kosjerić stands out with a slightly smaller share of 55%.

The structure of agricultural areas is dominated by meadows and pastures (45.4%), followed by arable land (42.57%) and permanent crops (12.03%). A significant proportion of arable land is found in the municipalities of Mionica (60%), and Ljig and Valjevo (50%), while Kosjerić and Gornji Milanovac are distinguished by a high share (60%) of meadows and pastures in the total area.
Plums and raspberries are treated as Serbia’s brands by the Ministry of Agriculture, which plans for further investments in new orchards and fields sown with these fruits. The Valjevo Mountains, which dominate the region of Central Serbia, represent a prominent fruit-growing area. With the deterioration of Valjevo’s food-processing industry, fruit growing also started to decline significantly. A new impetus for orchard plantations has taken place, driven by prune and raspberry exports. This will, no doubt, be a contributing factor in the survival of the villages and rural populations in the mountainous areas of this region. In addition, an important step in this direction is the establishment of the Centre for Organic Orchardry (Centar za organsko voćarstvo) in Valjevo. The rebirth of orchardry and the environmental protection of the Valjevo Mountains could have an exceptionally favourable influence on the development of rural tourism in general and the improvement of its eco-ethno offering in particular.

The concept of organic food production is slowly spreading across the region. In the village of Ježevica (the municipality of Kosjerić), an experimental household for organic food production has been formed where agricultural land. Orchards are equally present in all the municipalities of Central Serbia, while vineyards are very rare in this region.

Most of the arable land is cultivated with cereals (45.75%) and fodder crops (31.56%). Vegetables are also very well represented (12.89%), while industrial crops are grown in negligible quantities.

**The agricultural population in Central Serbia accounts for 35,658 people, or approximately 20% of the total population of the region.** The largest share of the agricultural population is found in Mionica (45.2%) and the lowest in Valjevo and Milanovac (15%). Of the total agricultural population, about 70% is active while about 30% is dependent. Almost all of the active agricultural population are private farmers.

With Serbia’s entry into the European Union, agriculture will see a number of changes. Not least of which will be a number of support structures which should help to underpin the industry, and enable the agriculture sector to develop and diversify in years to come.

**Fruit production is quite well developed,** especially in Valjevo and Gornji Milanovac. Plum production in 2008 amounted to 48,813 tons, and particularly high yields were recorded in Gornji Milanovac (24.4 tons per hectare). Central Serbia is famous for its production of raspberries. Over 10% of the raspberry production in Serbia comes from Kosjerić. This area is also known for the collection and production of mushrooms.

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Figure 4.2.3 Areas covered with forests
4.2 

Central Serbia

The largest part of the afforested area (61%) is located within the territory of Kosjerić. According to the same source, felled timber amounted to 75,659m³ of broadleaved (of which, on average, 22% is technical wood) and 3061m³ of coniferous wood (of which 59% technical).

The Valjevo Mountains offer a good natural environment for the development of hunting-related tourism. Located within this territory are a number of rich hunting grounds managed by local hunting associations.

Sport fishing is well developed on the Gradac River. This short, but exceptionally pure river is rich in trout, but also in grayling and chub. Considering that this is a protected natural area, only fly-fishing is allowed, and even that only on a catch-and-release basis. The game-warden service looks after the enforcement of the fishing regulations.

### 4.2.16 Forestry, Hunting and Fishing

Central Serbia has about 86,000 ha of forests; most are located in the municipalities of Valjevo and Gornji Milanovac. The wood stock is dominated by broadleaved species of which the most prominent is beech.

According to the most recent data from the Statistical Office, at the end of 2008, only 56ha had been afforested in this region, 5 hectares of which with broadleaved species.

<table>
<thead>
<tr>
<th>Hunting Ground</th>
<th>Area</th>
<th>Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valjevo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Magleš</td>
<td>70.000</td>
<td>Roe-deer, wild boar, rabbit, pheasant and</td>
</tr>
<tr>
<td>– Jelina breza</td>
<td>13.000</td>
<td>partridge</td>
</tr>
<tr>
<td>Mionica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Ribnica</td>
<td>32.900</td>
<td>Roe-deer, wild boar, rabbit, pheasant and</td>
</tr>
<tr>
<td>Ljig</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Rajac</td>
<td>19.000</td>
<td>Roe-deer, wild boar, rabbit, pheasant and</td>
</tr>
<tr>
<td>– Kačer</td>
<td>8.000</td>
<td>partridge</td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Takovo</td>
<td>72.000</td>
<td>Roe-deer, wild boar, rabbit, pheasant and</td>
</tr>
<tr>
<td>– Suvobor</td>
<td>7.740</td>
<td>partridge</td>
</tr>
<tr>
<td>Kosjerić</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Skrapež</td>
<td>29.400</td>
<td>Roe-deer, wild boar, rabbit, pheasant and</td>
</tr>
</tbody>
</table>

Livestock in central Serbia amounts to about 444 thousand heads of varieties of poultry, about 71 thousand pigs, 165 thousand sheep and 4 thousand goats. With about four thousand hives, Valjevo stands out in beekeeping in this region.

Producers from across the region interested in this type of production are being educated.
Conclusions: The quality of public transport is not at a satisfactory level.

TOURISM - PRACTICES AND SUSTAINABILITY

4.2.18. Tourism - Present State
During the year 2008 the project region of Central Serbia was visited by 79,555 tourists (Annex I). The number of foreign tourists amounted to only 5,638. This region’s share in total tourist turnover in Serbia in 2008 was 0.35%15. One of the reasons for this low tourist turnover is due to the limited availability and quality of accommodation. A significant portion of the hotels are of a low category, and have been neither renovated nor privatized. Other types of accommodation facilities are resorts, private households and mountain hostels. The total accommodation capacity of the region is only 4,439 beds (Annex II).

The table 4.2.6 shows the number of available beds per municipality and per type of accommodation.

The principle tourism offering in the municipality of Valjevo are the Valjevo Mountains, with many roads through unique natural surroundings. Authentic traditional buildings also represent a special attraction for rural tourism. Villages with such offering include: Bebić Luka, Stanina reka, Krčmar and Donji Taor. In its rural tourism offer the municipality of Valjevo also includes the villages of Petnica, Podbukovi, Popučke and Suvodonje. The Municipality of Mionica has a less
Mountains and hills cut across by numerous streams make the municipality of Kosjerić very attractive for the development of rural tourism. The entrepreneurial spirit of the local people and tourism authorities has made this municipality one of the best known destinations for rural tourism in Serbia. The most significant villages for rural tourism are: Mionica (three households), Skakavci (seven households), Mušići (one household), Stojići (two households), Seča reka (three households), Donji Taor (one household), Radanovci (one household) and Subjel (one household). Whilst the area attracts couples, families with children, third-age tourists, climbers and sportsmen, it is gastronomy or food tourism which the area is best recognised for.

Green meadows and slopes, and its cultural and historical inheritance in the Šumadija region make up the basis for rural tourism in the municipality of Gornji Milanovac, which is one of the most successful in this sector. Granting the mountain of Rudnik the title of

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Table 4.2.6: Number of available beds per municipality and per type of accommodation

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Hotels</th>
<th>Supplementary</th>
<th>Ethno houses</th>
<th>Rural houses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ljig</td>
<td>223</td>
<td>135</td>
<td></td>
<td></td>
<td>471</td>
</tr>
<tr>
<td>Valjevo</td>
<td>672</td>
<td>1875</td>
<td>8</td>
<td>43</td>
<td>2598</td>
</tr>
<tr>
<td>Mionica</td>
<td>276</td>
<td>690</td>
<td></td>
<td></td>
<td>1002</td>
</tr>
<tr>
<td>Kosjerić</td>
<td>80</td>
<td>69</td>
<td>30</td>
<td>147</td>
<td>326</td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td>269</td>
<td>150</td>
<td></td>
<td>545</td>
<td>1006</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1520</td>
<td>2919</td>
<td>80</td>
<td>884</td>
<td></td>
</tr>
</tbody>
</table>
For example: the municipality of Kosjerić represents one of the best examples of the development of sustainable rural tourism in Serbia. The municipality’s attitude towards sustainable tourism can be seen in the local economic development plan\(^\text{16}\) where the development of rural tourism represents a sub-goal of the target titled ‘Spatially Arranged and Preserved Environment’.

However, as is the case in the other regions in this study, there is a clear need to provide mechanisms for the local people, NGOs and protected area management organizations to become actively involved in planning and decision making for tourism development, together with other stakeholders. Cooperation between them, municipalities and local tourist organizations is one of the preconditions for the sustainability of tourism in the future. It also requires systematic work on the capacity development of all the actors within rural tourism and awareness raising programmes for the wider community. The existence of networks and associations of households providing rural tourism services indicates good potential for assuring that these preconditions for sustainable rural tourism development can be met.

The development strategy of the municipality of Kosjerić points out what the basic ecological priorities are. Among other things, it points out the need to cleanse the ecological “black spots”, the creation of a waste management strategy, the organisation of an environmental polluters register, the institutional strengthening of the local secretariat of the environment, fulfilling standards for environmental management through new investment projects, the strengthening of local ecology consciousness.

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implementing the “polluter pays” principle and using the ecological bearing capacity. Fulfilling these principles will go a long way to satisfying ecological standards for sustainable development.

The Tourist Union of the Municipality of Kosjerić was founded in 1981, and later grew into the Tourist Organization of the Municipality of Kosjerić. Tourism associations in the villages of Seča reka and Varda have successfully completed all the preparing the conditions to encourage the development of sustainable rural tourism. Some of these tasks include; developing activities around environmental management and conservation, supporting local tourism products, activities for improving tourist services, creating the conditions for the development of various tourism products, and supporting tourism education. Finally, special encouragement is given to those villages which have recognised tourism potential. Of course, this does not mean that this municipality, just like all the other municipalities in Serbia, is not facing the effects of the financial and economic crisis including a drop in the number of stayovers and visitors.

However, the implementation of sustainable tourism indicators according to the European Union (Jovičić, 2000) shows that it is not that easy to achieve these goals (Ilić, 2009). Rural tourism in Kosjerić and its surroundings is extremely seasonal dependent. Also, only a small part of local income comes from tourism. In terms of environmental indicators, there are some significant problems with waste management. Tourist satisfaction indicators on the other hand are worthwhile endeavours and these have already shown that a great number of tourists are pleased with the services provided by rural tourism in the municipal of Kosjerić. Based on data on the Central Serbia tourism industry, the existence of several different forms of tourism can be identified. Some forms have significant potential in this region, such as:

**Cultural Tourism**

Rural tourism has a long tradition in the Central Serbia region. Its beginnings date as far back as 30 years ago in the villages around Kosjerić. Even today, the tourism offering is the most complete in these villages, especially in those of the Ražan area: Skakavac, Mionica, Rosiči and Stojači.

The municipality of Gornji Milanovac is the home of the Koštunići ethno-village, well known for its preserved old character and ethno museums. Since 2000, rural tourism in the Valjevo area has developed quite intensively. The largest accommodation offering can be found in Gornji Milanovac. Accommodation facilities are located in renovated old houses, houses designed in ethno-style or in new houses or second homes.

The food, which is viewed as an important attraction of this region, is made largely (up to 90%) at the same households providing accommodation. The rest of the food is procured from the village, neighbouring households, or from the nearby town. The current tourism product in rural areas is no longer restricted to accommodation and food and includes a wider range of activities. Some households have built swimming pools, saunas, bowling grounds, mini zoos, ponds etc. In the village of Kosjerićka Mionica, there is a fitness running track. The
Central Serbia

promotion and development of tourism in the region is led by several NGOs specialized in rural tourism.

Village festivals and events are another tourism offering. These gather the inhabitants of the nearby villages, their relatives and returning guests, and the number of first-time guests is increasing. The best known events of this kind are the Mowing Contest on Mt. Rajac (orig.: Kosidba na Rajcu), Plum Days (orig.: Dani šljive) in Koštunići, Shepherd Days (orig.: Čobanski dani) and Days of Rural Tourism (orig.: Dani seoskog turizma) in the villages around Kosjериć.

Youth Tourism
During the summer months, some households offer contents created specifically for children and youth. In the area around Kosjериć, summer camps are held that teach the children about the history and culture of this area. In the village of Paštrik there is a household also involved in the protection of the genetic fund of Serbian species. This important tourist attraction, but also the Ribnica with its Šalitrena (Eng. Niter) cave are visited by organized groups of schoolchildren and archaeology students. The households offer summer programs for schoolchildren and students. The natural and cultural assets of the region have been included in excursion programs for schoolchildren and during the excursion season, a large number of pupils visit this area. Among the most visited facilities is the Petnica Research Station with Petnička cave and a nearby lake.

Mountain Tourism
The beauty of the gentle peaks and long hiking trails of the Valjevo Mountains attract many nature lovers, mountaineers and scouts. Five mountain huts (Rajac Maljen, and Suvobor) and a Scout Centre (Rajac) are located within this area.

Excursion tourism in the mountains is also very developed. Given that many villages are abandoned, the houses in them have been converted into the second homes of the residents from the surrounding cities, Belgrade and Novi Sad. Hikers visit the mountain for one-day and weekend tours. Camping in nature is a well-developed practice in the mountains of Valjevo but there is only one camp, at Divčibare. Without trying to regulate everything, if this increases surely there will negative impacts and therefore the development of proper camping facilities at various locations should provide further comfort. It also provides a way of monitoring and developing income for the conservation of walking tracks etc.

Spa Tourism
Spas in central Serbia have been developed as green oases. They are located in scenic valleys and on hillsides, surrounded by forests, pastures and orchards. Their natural landscape is complemented not only by cultivated areas, but also by the facilities necessary for a comfortable stay. Spas with the most developed tourist infrastructure and the capacity for a large number of tourists are located in Vrujuci and Ljig. In addition to hotels, accommodation is also provided by private households located in the spa centres and their neighbourhood.

Sports and Recreation Tourism
Divčibare is the closest mountain-climate tourist destination to Belgrade. This plateau, located at a height of about 1000 m, provides ideal
conditions for high altitude sports training and recreation. In addition to new hotels and private second homes, Divčibare also offers a number of sports facilities, ski, bike and hiking trails. Several accommodation facilities specialize in the recreational education of schoolchildren.

The town of Rudnik is located just below the summit of the mountain. The high quality of the natural environment surrounding this place has led to the opening of one of the accommodation facilities belonging to the Centre of Children’s Resorts and Rehabilitation Facilities (orig.: Centar decebih letovalista i oporavilištia). Several other facilities offer accommodation and food.

Rajac, part of Suvobor Mountain, is a mountainous place of preserved nature. Sports fields, walking paths and numerous workers’ resorts have enabled the development of sports and recreation tourism on this mountain.

Special Interests Tourism
Fishing on the river Gradac is well regulated. As the canyon of the river Gradac is protected, no construction is legally possible, except in places where earlier buildings already exist. One such building has been reconstructed and specializes in accommodation for fly-fishing tourists.

Although there are well-developed hunting grounds in this region, the majority of the population engaged in hunting is local. Attempts to develop hunting tourism are still at their very beginnings.

Due to the large number of canyons, gorges, cliffs and caves in the region there is significant potential for the development of adventure tourism. So far, only one association (Wild Serbia) offers this form of tourism programs. Valjevo Challenge (orig.: Valjevski izazov), a trekking race within their organization, has already become a traditional adventure event.

Mountain biking is exceptionally well developed in this region, but the adequate infrastructure for this sport is still lacking, as are special travel deals for cyclists. Information on good mountain-biking trails can be found on specialist cycling web sites.

4.2.18.b Tourism - Development Plans
Tourism development of the Central Serbia region has not been covered by any particular Master Plan. In the Tourism Development Strategy of the Republic of Serbia (Strategija razvoja turizma Republike Srbije), the region does not belong to any of the proposed clusters, despite the long-standing existence of rural tourism in this area. Tourism development in the region is particularly covered in the municipalities’ strategic development plans (general, sustainable or rural development plans).

In the Strategy for the Sustainable Development of the City of Valjevo (orig.: Strategija održivog razvoja grada Valjeva) a specific strategic objective (no. 13) is dedicated to improving the conditions for the development and promotion of tourism. Regarding the first strategic sub-goal of this objective it is important to point out the design of the Tourism Development

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17 Tourism Development Strategy of the Republic of Serbia (orig.: Strategija razvoja turizma Republike Srbije). Horwath Consulting, Zagreb and the School of Economy of Belgrade University, 2005

Strategy of the City of Valjevo (until 2012), and the adoption of development regulation plans for tourist destinations and the areas attractive in this sense (Gradac, Petnica, Divčibare, Povlen, reservoirs Rovni, etc.). The second sub-goal is related to the formation of a unified and diverse offer, at the levels of the city and the region, where the establishment of two very important tourist destinations - Divčibare and the Valjevo-Podrinje Mountains, is especially important for this study. In the third sub-goal - staff training in tourism - the plan is to establish a Centre for the Development of Environmentally Sustainable Tourism (orig.: Centar za razvoj ekološki održivog turizma). The construction, expansion and modernization of accommodation facilities represent the fifth sub-goal of this objective. It emphasizes the need to increase the accommodation facilities in hotels and private households partaking in rural tourism, as well as the completion of the convention centre in Divčibare.

A feasibility study for a new tourism product, Divčibare, which will contribute to the implementation of the tourism development of Divčibare mentioned in local development strategies, will be funded by the EU (in the amount of 80,000 EUR) as part of the RSEDP2 program. The strategy will include the whole territory of Divčibare which extends across the four interested municipalities. The development of rural tourism is the backbone of the tourism development strategies set out in the strategic plans of Kosjerić, Gornji Milanovac, Mionica and Ljig (Annex III). Further work on the standardization and improvement of accommodation facilities is planned, as well as on improving the supplementary tourism offering. The planned interventions in infrastructure development (both general and tourism-related) do not have any great impact on the environment and the ethno-appearance of the region and are related to ethno-appearance of the region and are related to ethno-appearance of the region and are related to ethno-appearance of the region.

The Municipalities of Mionica and Ljig cite their important strategic goal as the improvement of the existing offer in spas, and the affirmation of unused thermal springs. The municipality of Gornji Milanovac plans to invest in a sports and recreation centre in the village of Rudnik, primarily in the construction of an outdoor swimming pool and jogging trail. In addition, the plan is to encourage the development of hunting tourism by building accommodation facilities for hunters.

For the purpose of the water supply of Valjevo, Mionica and the downstream municipalities, a dam has been under construction (Stub-Rovni) since 1989. After its completion, a lake in the upper course of the river Jablanica will be formed. Because of the need to protect the water quality in the lake’s coastal area, there are future plans for the development of organic farming and sustainable tourism.
4.2.18.c The Pressures of the Tourism Sector on the Environment

The most developed mode of tourism in this region is rural tourism. Considering the length of the development of rural tourism in the region and the monitoring of the good practices of the households, there has been no great negative impact on the environment. The impact is primarily related to the creation of local, garbage dumps. In some parts of the region (the villages around Ražane) this problem has been solved through the introduction of the organized collection of solid waste. Other villages are waiting for the implementation of solid waste management plans.

The lack of communal infrastructure has had a greater impact on the environment, exerted during major events - when visitors gather in great numbers. At the meeting of the Ravna Gora Movement on Mt. Rajac up to 30,000 people visit this area. The temporary installation of portable sanitation units and additional garbage containers would be required at such meetings.

The greatest impact on the environment occurs at Divčibare. Until the adoption of the General Regulation Plan of the Divčibare Tourist Centre (orig.: Plan generalne regulacije za turistički centar Divčibare) the construction of buildings was carried out according to the old and imprecise plan, or illegally. Objects that are not built under the new plan will not be legalized and will be destroyed. Some of the activities planned in this document have already been implemented or are underway (ski slopes with ski lifts, the convention centre). The plans include the building of a reservoir lake, shopping, sports and wellness centres, a ski resort with hotels, a convention centre, a complex dedicated to health tourism and a weekend-oriented complex. The feasibility study is expected to be completed for the new tourism product, Divčibare, based on what has already been built and planned, development of the entire territory of Divčibare (not only the municipality of Valjevo). However, based on thus far performed activities and plans, it can be concluded that the natural environment of Divčibare will be significantly altered. The protection of individual natural complexes and the prohibition of construction within them would in part manage to preserve the natural appearance of this plateau.

Petnica cave near Valjevo was redeveloped for tourism visits. It was devastated soon after renovation and only the concrete segments (paths and stairs) managed to resist destruction. The legal protection of this site and reconstruction in compliance with contemporary standards would improve the tourism offer of Valjevo. Parts of the cave (exit hall) have been changed and turned into a restaurant terrace. Further construction in and around the cave should not distort its natural look. Legal protection would be very important for the conservation of the other natural attractions of the region (Taorska Vrela springs, Povlenske kugle, etc.).

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**4.2.19 Conclusions and Recommendations:**

All the following topics and their development are important indicators and contributors to the future sustainable success of the region in general and to sustainable tourism development in particular:

**Landscape** – This region is dominated by typical karst topography, which is in a relatively good environmental condition. **Recommendations:** Any future development needs to take into consideration the unique characteristics of karst and this region’s valuable natural landscape. The EU Landscape Directive could provide the supports for this.

**Demography** – Compared with Southern Banat, East Serbia and the Lower Danube regions, this region is characterized by significantly greater population density. Contrary to many municipalities in Serbia, the population in Valjevo is increasing. Whilst still experiencing a decline in the rural population and the selective characteristics which it entails, there seems to be a relatively broad spectrum of economic activities with potential as well as tourism growth, to support efforts
to reverse this phenomenon in the future. **Recommendations:** Exercise a holistic approach to the development of rural tourism, focusing on empowering women, upgrading skilling, and improving environmental awareness as well as the opportunities inherent in sustainability.

**Waste & Recycling** - This region is average in terms of waste management in Serbia, where 72% of the population is covered by waste collection. There are two sanitary landfills in Gornji Milanovac (for two municipalities in this region) and Duboko (for one municipality in this region) and many dump sites. There are plans for other municipalities to dispose of waste at sanitary landfills. **Recommendations:** Put in place a system to collect accurate data on the quantities and composition of waste generated in the territory covered by the municipalities.

Establish the necessary structures to enable private sector involvement in the waste management system and the development of public-private partnerships.

Establish a system to strengthen the capacity of the local community and NGOs with regard to the development of public awareness related to the problems and solutions for sustainable waste management.

Investigate the opportunities, in collaboration with FEEE, to establish a Green Schools Programme.

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2 Waste operators (public utilities) must report annually to the Agency for Environmental Protection on waste composition and management, but only 30 out of 174 reported in 2012 (for 2011)
Special attention should be paid to rural areas, as they have specific problems related to organic waste and some types of hazardous waste such as packaging from pesticides.

Consider the development of regional clusters to help with waste minimization and reuse; the level of recycling; waste collection and treatment and the provision of a functional and updated database on recycling at regional level; the establishment and development of special training programs and the capacity building of cluster members; advocating for the health and social protection of individual collectors of recyclable materials; improving the status and protection of the rights of marginalized social groups; increasing the influence of public opinion.

**Biodiversity** – The greatest concentrations of biodiversity are found at higher altitudes and within forest ecosystems. The plane areas are dominated by agriculture, industrial complexes and urban sprawl. **Recommendations:** Ensure that all relevant development plans include requirements to assess any impact on biodiversity and to carry out EIAs as well as SEAs as prerequisites. Encourage the further designation of protected space to support the conservation and preservation of this biodiversity and to reach the EU target for protected space in the region (not just nationally).

**Protected Areas** – In Central Serbia, only 1% of the land is protected as natural heritage, which is very low compared to the rest of Serbia (approx. 6%). **Recommendations:** Progress with the national strategy to increase the amount of natural protected territory and designate the entire complex of the Valjevo Mountains, thereby improving coverage to between 25-30% of the Central Serbia territory.

Existing documents and plans for **Maljen Mountain** should be revised to reconsider current objectives to build huge recreational infrastructure in protected areas. A holistic approach should be adopted so as not to neglect and negatively impact on its potential to become a centre for sustainable tourism rather than an urbanized recreational spot with spoilt and diminished natural and cultural value.

Endorse the EU Landscape Directive.

Comprehensive management plans should be developed with constructive stakeholder engagement forums and capacity building included for managers and the local community.

**Air** – The region boasts a high quality air environment on the whole, but does experience some pollution in urban areas. **Recommendations:** A monitoring system in the urban areas is required as well as continuous efforts to reduce and mitigate the impacts of temperature inversion in valleys on the levels of pollution.

**Water** – This is a resource which is not in short supply but is negatively impacted by insufficient water purification, waste water management and accompanying infrastructure. **Recommendations:** In order to benefit the communities involved as a whole and any future tourism development prioritise the upgrading of water management and infrastructure; establish a comprehensive water monitoring system; create a community awareness programme to
support this by targeting the main pollutants and maintain progress through the Water Frameworks Directive.

Soil – Generally of a high quality for agriculture but this quality is negatively affected by inadequate agricultural practices, untreated leachate from the landfills and mining, erosion and floods. Education on the use of agro-technical measures is made available to the rural population throughout the territory of this region by either NGOs or academic staff. 

Recommendations: Develop remedial action programmes for all mining activity.

Establish remedial programmes for opencast mining, increase the number of IPPC license holders, further facilitate the progress being made in education in this area.

Support the effectiveness of training and environmental awareness raising

Employment – The number of unemployed persons in the five municipalities of the region is 12,349. This represents a percentage of 8% but this is only an apparent number, since a large number of people are employed in enterprises that are being restructured. Viewed individually by sectors, most employees in the region were engaged in manufacturing (44%), while only 1% of the population were listed as employed in agriculture. The highest percentage of employees in the industrial sector is found in Kosjerić (5%) and Gornji Milanovac (49%). The number of employees working in tourism is negligible with the only exception being Mionica with a 7% share of employees in that sector. The most developed industrial areas are found in Kosjerić, Gornji Milanovac and Valjevo. 

Transport – The region is well served with a road network although many rural roads are not in good condition. A main railway route runs through the area and the nearest airport is Nikola Tesla, located about 110 km from Valjevo, Ljig and Mionica, about 150 km from Gornji Milanovac and about 160 km from Kosjerić. Public transport is regarded as unsatisfactory.

Recommendations: Consider the options for developing public/private partnerships in the provision of public transport.

Encourage the development of a more reliable train schedule.

Review the options for running public transport on renewables.

Energy – Renewables and Conservation: The energy sources used are electricity, solid fuels, coal, oil and wood. Wood is increasingly used for heating homes. The natural gas distribution infrastructure is not developed, except in Gornji Milanovac and sustainable energy sources are used only by a small number of households. The renewables with potential include small-scale hydro, solar, geothermal and biomass energy forms. Conservation in the form of building heat efficiency is just beginning to be assessed and the requirements identified.

Recommendations: Further identify the feasibility of all forms of renewables to contribute to energy supplies either to the grid system or to local clusters.

Consider the feasibility of stimulating demand towards reaching economies of scale by committing public transport to adopt renewables.
The main conclusions of the conducted research on sustainable tourism and rural development in the region would be:

Central Serbia, like other regions, has a significant age-structure problem in the villages, especially in mountain locations. Providing opportunities which will entice young people to live in them is a priority activity for municipal and state administration. However, this can only be accomplished with comprehensive rural development planning. This includes agricultural subsidies, assistance in the establishment of new plantations (especially fruit), the reconstruction and construction of infrastructure (transport and utilities), grants for opening small businesses, the reconstruction of schools and health stations and support for tourism development in rural households.

Recommendations: M. Jovanović, an interviewed host and one of the founders of rural tourism in Serbia, sees the solution in affordable credits for the development of tourism complemented with a respect for the specificities of rural tourism. Soft loans for tourism development, especially for young people in rural areas, are seen as a possible solution by the majority of thus active households. The biggest problem they see is in equalizing rural tourism with the traditional forms of commercial tourism, which implies unrealistic infrastructure, hygienic and technical requirements upon rural tourism businesses.

Proper standardization of the accommodation and food offer in rural households is required as a gauge to the quality of the offering and should be orientated toward foreign tourists.

Industry – Engages the largest share of the working population in Central Serbia. The most developed are metal manufacturing and food. Along with the food production industry, the textile, construction and footwear production industries have all declined and are going through a consolidation and privatisation process.

Agriculture - Accounts for 35,658 people, or about 20% of the total population of the region. The largest share of the agricultural population is found in Mionica (45.2%) and the lowest in Valjevo and Milanovac (15%). Of the total agricultural population, about 70% is active while about 30% is dependent. Almost all of the active agricultural population is private farmers.

Recommendations: With the deterioration of Valjevo’s food-processing industry, fruit growing also started to diminish significantly. The new impetus orchardry has been given by prune and raspberry exports may be favourable for the survival of the villages and rural population of the mountainous areas in this region.

In addition, an important step in this direction is the establishment of the Centre for Organic Orchardry

4.2.20. Conclusions and Recommendations for tourism development in Central Serbia

Further development of tourism in the region provides good prospects for the development of rural, spa, sports and recreation tourism, and special interest tourism (hunting, cycling, and adventure tourism). Most of these types of tourism are related, or may be, to the preserved nature and protected natural resources.
All households have highlighted the need for additional tourist attractions to entice visitors to travel to rural areas. Positive developments in this regard do exist (swimming pools, running tracks, walking trails, sport courts) but are still insufficient in quantity.

**Recommendations:** In collaboration with professional associations coordinate the improvement and expansion of marked trails and design hiking, mountain biking and canyoning information. Train locals as guides, and create this within a sustainable tourism programme for development.

Given that all promising forms of tourism in the region are related to untouched nature and the ethno-character of the landscapes, special attention should be paid to their protection. Current protected natural areas amount to only 1% of the territory and this is unacceptable since it does not satisfy EU standards of 10%. All municipalities have proposed the protection of certain local natural complexes in their plans.

**Recommendations:** Special emphasis should be given to Povlen Mountain with Taor Springs (orig. *Taorska vrela*) and Povlen Balls (orig.: *Povlenske lopte*), Hill City (orig. *Brdo grad*) above Kosjerić, the canyon of the Ribnica River with its Nitric (orig.: *Šalitrena*) cave, Petnica cave with its direct surroundings, Rajac, the future reservoir lake behind the Stubo-Rovno dam, and also some parts of Divčibare in order to avoid the urbanization seen on Zlatibor and Kopaonik. The development of rural, sports and recreation and special interests modes of tourism depends on the adequate protection of nature.

The greatest threat to the environment from tourism development exists on Divčibare. The future Feasibility Study for the new tourism product, Divčibare, would have to take into account all the natural characteristics of the plateau and try to protect its main comparative advantages in relation to the surrounding tourist destinations - clean air and preserved nature (meadows and forests). Excessive construction will most certainly expel rural households from this part of the traditionally livestock-oriented mountain of Maljen.

The initial stage of training the local population in organic food production is positive. The new Serbian Government Decree on financial support for organic production of field and vegetable crops, orchards and vineyards, as well as for organic livestock production, will positively affect the increase of this type of production in the region. Organic production opens up prospects for new forms of rural tourism.

The LTO as well as the rural households have indicated the need for the continuing education of households to provide tourist services and communicate with foreign tourists.

The existence of developed networks and associations of households providing rural tourism services offers great potential for assuring one of the preconditions for the development of sustainable rural tourism. **Recommendations:** Utilise these networks and associations to create a coordinated and inclusive approach to sustainable tourism training and a collective voice and regional platform for its development.
Within Southern Banat, two distinct terrain types can be clearly distinguished that differ from the classic lowland landscape. First is the Vršac Mountains complex in the far northeast region, while the other - Deliblatska Peščara (Deliblato Sands) with Crni Vrh, the Zagajčka hills and Dumača - occupies the central position.

The Vršac Mountains are the only mountainous area in the region of Southern Banat and are part of the old land core of the Balkan Peninsula (Island Mountains). They stretch in an east-to-west direction, to a total length of 19 km, with a maximum width of 8 km. They are significant merely for the fact that the highest point of Vršac Mountains, Gudurica Peak (Gudurički vrh - 641 m) also represents the highest altitude point in Vojvodina. Favourable air currents provide excellent conditions for paragliding.

The geographical features of the region of Southern Banat are detailed in the table below:

<table>
<thead>
<tr>
<th>Crest</th>
<th>Municipality</th>
<th>Region</th>
<th>Area [km²]</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kovin</td>
<td>South Banat</td>
<td>District</td>
<td>730</td>
<td>36,802</td>
</tr>
<tr>
<td>Vršac</td>
<td>South Banat</td>
<td>District</td>
<td>1,324</td>
<td>54,369</td>
</tr>
<tr>
<td>Alibunar</td>
<td>South Banat</td>
<td>District</td>
<td>602</td>
<td>22,954</td>
</tr>
<tr>
<td>Bela crkva</td>
<td>South Banat</td>
<td>District</td>
<td>353</td>
<td>20,367</td>
</tr>
</tbody>
</table>
4.3 Oxygen, the largest European continental sand area, is the relic of geomorphological processes from the Pleistocene and represents the bulk of the geological and biological diversity of the Pannonia Plain. Created by the Aeolian process, it is elongated in the direction of the prevailing south-westerly winds. It covers 300 km² and its prominent dune terrain is today covered with grass, shrub or forest vegetation, so the dune dynamics and the spreading of sand have been stabilised. There is a distinct lack of surface water which has produced the typical characteristics of sand, steppe and forest ecosystems. The Zagajička hills and Dumača are the elevation in the northeast part of the Deliblato Sands and rise to approximately 100 m. Despite the low altitude they feature very steep sides, thus breaking the lowland landscape monotony.

This is clearly a unique landscape which potentially needs careful management in the future.

4.3.3 Climate

The climate is continental, with very cold and windy winters and hot, humid summers with low precipitation. Yearly variations in temperature are very high as temperatures range between 42 and -32.6 °C. Average winter temperature is above 1 °C. Cumulative yearly precipitation is below 600 mm and winter is the driest season of the year.

Southern Banat experiences a several degrees colder winter, and several degrees warmer summer than Central Serbia. The climate of Deliblato Sands differs slightly from the rest of the area with lower humidity and cooler nights in summer. Southern Banat is a very windy area; its winter is dominated by the southeast wind Košava.

The increasing incidence of extreme hydrological events (floods and droughts) that may be associated with climate change, has caused serious damage in Serbia, over the last three decades. Two severe floods occurred in Serbia in 1979 and in 1999. More recently, the frequency of floods in Serbia (and neighbouring regions) has significantly increased. Severe floods occurred in the two consecutive years; 2005 and 2006.

The Municipalities of Sečanj, Žitište, Bela Crkva and Plandište were severely flooded in 2005. The network of soil drainage canals partially prevents flooding but nevertheless, some parts of the Bela Crkva municipality around rivers Nera and Karaš are still prone to flooding. At the same time, they contain some valuable habitats which are currently being considered for protective status.

The municipality of Vršac is implementing a regulation plan of the Mesić Stream, along 9 km of its course, aimed at the prevention of flooding of the town’s suburbs in the future.

4.3.4 Demography and Settlements

The area of Southern Banat covers 2485 km². Population density is low (ranging from 38 to 68 individuals per km²). As in many other municipalities in the province of Vojvodina, this region is faced with the problem of population decline.
Sparse settlements of this region indicate the historically low intensity of urbanisation pressures on environment.

ENVIRONMENT

4.3.5. Air
According to the CLRTAP (Program on Conduction of Convention on Long-Range Trans-Boundary Air Pollution) data, provided by the Hydro-Meteorological Service of the Republic of Serbia, the municipalities of Southern Banat are exposed to significant emissions of sulphur dioxide and nitrogen oxides from the neighbouring regions (Industrial and petro-chemical complexes in Pančevo, ironworks in Smederevo and the thermal power plants Kostolac 1 and 2).

However, due to the favourable direction of prevailing winds, the territories of all four municipalities have relatively good air quality. The greatest daily concentrations of SO₂ and nitrogen oxides within the urban territories of Vršac, Bela Crkva, Alibunar and Kovin are usually below permissible limits.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Area (km²)</th>
<th>Number of settlements</th>
<th>Population 1991</th>
<th>Population 2002</th>
<th>Density (individuals/km²)</th>
<th>Population change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alibunar</td>
<td>602</td>
<td>10</td>
<td>24 930</td>
<td>22 954</td>
<td>38.1</td>
<td>-7.9</td>
</tr>
<tr>
<td>Vršac</td>
<td>800</td>
<td>24</td>
<td>54 55</td>
<td></td>
<td>68</td>
<td>-0.3</td>
</tr>
<tr>
<td>Bela Crkva</td>
<td>353</td>
<td>14</td>
<td>21 845</td>
<td>20 367</td>
<td>57.7</td>
<td>-6.8</td>
</tr>
<tr>
<td>Kovin</td>
<td>730</td>
<td>10</td>
<td>36 924</td>
<td>36 802</td>
<td>50.4</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

Recognised potential local air polluting industries in Vršac (Hemofarm, Fresenius Medical Care Serbia, Komobrix Oil), and those in Gaj (Hemofarm Antibiotics, Kovin municipality) are considered low.

In Vršac, the industrial centre of the region, there are several air quality control points. Analysis of measurement results indicates there is no major air pollution caused by industrial production.

4.3.6. Water
This region is characterised by its arid centre – the Deliblato Sands. In this part of the territory, there is no surface water, but the stone beneath the sand represents a large atmospheric water collection area, making it rich in groundwater. The height of sand bed and its inclination towards Danube enables groundwater to move to the south and form wells at the edge of the sands. Therefore, the Deliblatska Peščara is a significant resource of good quality groundwater.

Natural water flows in this region are dominated by the Danube, which also marks its southern border. The Danube’s flow is significantly slowed here, due to the Đerdap (Iron Gate) dam, constructed in the gorge bearing the same name. On the left bank of the Danube, there are a number of smaller branches in its course and a lesser number of river islands. The Danube shore of the Deliblato Sands is characterized by high, sharply cut loess sections. The lower courses of the Karaš and Nera rivers that descend from the Carpathians in neighbouring Romania, run along the east part of the region. The Karaš’s flow is partly cut with Danube-Tisa-Danube canal and partly unregulated so it often floods the surrounding soil in some parts of its flow. The Nera’s flow is characterized by flash flooding which is particularly prominent in spring when the snow is melting in the Carpathians.

Two significant artificial hydrological facilities are important for this region. The Danube-Tisa-Danube (DTD) canal system, located near the village of Grebenc, connects with the lower course of the river Karaš and is fundamental to irrigation of this arid part of Vojvodina. The canal system was designed to be navigable for smaller river transport and recreational boats. In addition, gravel excavation has created nine artificial lakes in the vicinity of the Bela Crkva. The largest of these lakes is Glavno (Main) and is located at 700 m from the town centre. The lakes are suitable for recreation and picnics, and are rich in fish. However, the polluted groundwaters flowing into the lakes are causing eutrophication.

The Danube, Karaš and Nera are the most important rivers of this region. Artificial lakes and the Danube-Tisa-Danube network of canals provide additional sources of surface water.

The predominant hydrological characteristic of this region is the second groundwater-bearing layer. One of the two most important sources for regional water supply systems in Vojvodina is the groundwater reservoir along the Danube, between Kovin and Dubovac. However, plans to establish a mining tailing pond and a thermal power plant in this area, would most likely, impact severely on the capacity and quality of this water source.

On the alluvial plains, the groundwater layer is at depths of 2-11 m. However, the quality of this underground water is poor. The groundwater on river terraces is somewhat deeper (10-20 m), and the water is of better quality than on the alluvial plains. Underground water in the regions of sands is found at great depths, almost everywhere, at least 30 m below the topographic surface.

The hydrological situation differs between the municipalities, from no surface water (river or lake) whatsoever in the municipality of Alibunar, up to nine lakes and a dense river network within the municipality of Bela Crkva.

It must be noted that surface and ground waters are not of acceptable water quality. The Danube water quality is in class III due to massive upstream discharge of untreated wastewaters from the cities of Belgrade, Pančevo and Smederevo, with Kovin adding its primary-treated wastewater. The River Nera, flowing from Romania, is periodically of lower water quality class, with Bela Crkva adding its untreated wastewater to it.

The DTD canal system has low, III class water quality with Vršac adding its untreated wastewater to the Vršac canal. The first water-bearing layer in all Southern Banat is polluted
with faecal bacteria, ammonia, nitrates, iron etc. The main water polluters are uncontrolled usage of agrochemicals, uncontrolled waste disposal and wastewater from households and industry. During the summer, Bela Crkva’s lakes are periodically of water quality that is too poor for any use (due to the level of faecal bacteria)\(^4\). The source of this pollution is fast urbanization of the lakes’ surroundings coupled with inadequate wastewater disposal infrastructure.

### 4.3.7. Geology and Soil

A great variability of different soil types characterises Southern Banat. Arenosols and eutric cambisol on sand represent the dominant soil types at Deliblato Sands. Massive layers of aeolian sand and the unique dune terrain are the consequences of geological processes that occurred during the Pleistocene. Other parts of the region are covered by chernozem on loess, halomorphic soils and fluvisol. The dominating soil types within the region of the Vršačke Planine Mountains are rankers and distric cambisols.

The main threats to soil in Southern Banat involve Aeolian erosion, the salinisation process, flooding and uncontrolled waste disposal, as well as the uncontrolled usage of agro-chemicals and industrial disposals.

In order to minimize the adverse effects of the chemical treatment of crops, all municipalities feature training programs for farmers, on the use of modern agro-technical measures. In Vršac, the Agricultural School (orig.: *Poljoprivredna škola*) trains interested residents in sustainable agricultural production as part of their extracurricular activities. However, not all of the interviewed households providing meals for tourists practice this type of production, or buy from organic food manufacturers.

### 4.3.8. Waste Generation, Collection and Disposal

In the municipalities Vrsac, Alibunar, Kovin and Bela Crkva waste collection and disposal are the responsibility of public utilities that are established by local government.

In the following table data on waste generation and collection are given.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Number of Settlements</th>
<th>Number of cleaned sites 2009 -2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alibunar</td>
<td>10</td>
<td>46</td>
</tr>
<tr>
<td>Bela Crkva</td>
<td>14</td>
<td>83</td>
</tr>
<tr>
<td>Vršac</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td>Kovin</td>
<td>10</td>
<td>133</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>285</strong></td>
</tr>
</tbody>
</table>

Due to the fact that some settlements are omitted from waste collection about 4000 t (12%) ends up at illegal dumpsites. The Deliblato Sands Special Nature Reserve is affected by a few smaller illegal and even legal landfills that are not constructed according to standards. The biggest problem is the waste, especially PET bottles, brought by wind and waves on shores of Dubovac and Stevanove ravnice by the Danube. Some of these sites were cleaned up in the

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Waste in Kovin municipality is disposed of at several inadequate landfills. It is estimated that the total area of landfills in the Kovin municipality is about 25 ha.

Waste from municipality Vrsac is disposed of at a remediated landfill. The location for the construction of a new waste disposal site is to be determined shortly. Medical waste is treated in the local hospital and over the last two years, illegal dumps in 16 out of 22 villages have been rehabilitated, in cooperation with the public utility services.

The Municipalities of Vrsac, Alibunar, Bela Crkva and Plandiste signed a contract on joint waste management but a regional plan for waste management is not yet complete. It is planned that the regional landfill will be located in Vrsac, beside the existing landfill (however, because of the vicinity of the airport this location has not been confirmed yet).

In the Alibunar municipality waste is disposed of at an inadequate landfill that is located beside the regional road Vrsac – Bela crkva and which residents of the village of Crvena crkva claim has had a negative impact for many years - plastic bags, paper and other waste in the orchards, vineyards, in their yards and on the Vrsac road. A protocol on cooperation between the municipality of Alibunar and the private enterprise “Rinova System” was signed in 2011. This public/private partnership is focused on the construction of a plant for waste separation and remediation of existing landfills.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Population covered by waste collection</th>
<th>Population covered by waste collection (%)</th>
<th>Waste generating (t/year)*</th>
<th>Waste collection (t/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alibunar1</td>
<td>19780</td>
<td>14853</td>
<td>75.1</td>
<td>6290</td>
<td>4723</td>
</tr>
<tr>
<td>Bela Crkva1</td>
<td>17285</td>
<td>9899</td>
<td>57.3</td>
<td>5497</td>
<td>3148</td>
</tr>
<tr>
<td>Vršac1</td>
<td>51217</td>
<td>50970</td>
<td>99.5</td>
<td>16287</td>
<td>16208</td>
</tr>
<tr>
<td>Kovin1</td>
<td>33725</td>
<td>33725</td>
<td>100.0</td>
<td>10725</td>
<td>10725</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>122.007</strong></td>
<td><strong>109.447</strong></td>
<td><strong>89.7</strong></td>
<td><strong>38.798</strong></td>
<td><strong>34.804</strong></td>
</tr>
</tbody>
</table>

Table 4.3.4: Waste generation and collection in Southern Banat, (i) Banat district
Source: Ministry of Environment and Spatial Planning, campaign “Clean up Serbia”

*Based on the average waste generation per capita

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6 Regional Waste Management Plan for the municipalities Smederevo and Kovin, July 2010
The municipality of Kovin has signed a contract on joint waste management with the municipality of Smederevo 2 which includes the construction of a sanitary regional landfill in Segda-Jelen Do, Smederevo territory. Construction and management of the regional centre for the collection, selection, and disposal of municipal solid waste is entrusted to the company Porr Werner and Weber (contract was signed in March 2012).

The National Strategy on Waste Management in this region envisages construction of sanitary landfills and a recycling centre.

### 4.3.9. Recycling

There is primary selection of PET packaging waste in all municipalities, but the number of containers is not sufficient. In the municipality of Vrsac, containers for PET are placed in town and containers for selection of paper, PET and metal waste are placed in all schools. Before disposal at the landfill in Vrsac, waste is selected and compressed for transportation.

A list of operators authorized for waste collection, transportation, and treatment in this region can be viewed in appendix no. 4.3.1.

<table>
<thead>
<tr>
<th>Year</th>
<th>PET collected (t)</th>
<th>Number of collectors</th>
<th>Public utilities</th>
<th>Private collectors</th>
<th>Total of newly employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>2500</td>
<td>50</td>
<td>15</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>2800</td>
<td>73</td>
<td>16</td>
<td>57</td>
<td>46</td>
</tr>
<tr>
<td>2010</td>
<td>2700</td>
<td>66</td>
<td>18</td>
<td>48</td>
<td>57</td>
</tr>
<tr>
<td>2011</td>
<td>4000(^1)</td>
<td>98</td>
<td>20</td>
<td>77</td>
<td>158</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>200</td>
</tr>
</tbody>
</table>

![Image of recycling network](image)

**Table 4.3.5**

Source: “Greentech” prezentacija na seminaru o zelenoj ekonomiji u organizaciji „Ambasadori životne sredine“ Beograd, Maj 2012

\(^1\) Estimation, \(^2\) Capacity for PET recycling to flake is 7,200 t/yearly
The waste collecting network in Serbia is underdeveloped and recyclers do not have enough material for recycling (i.e. “Greentech”, uses 70% of its capacity). The Ministry of Environment, Mining and Spatial Planning estimated (2011) that 7,000 people are involved in the recycling industry and that more than 10,000 workplaces will be created by the construction of recycling yards over the next two years.

**4.3.10. Conclusions and recommendations**

The waste collection situation in this region is better than in the rest of Serbia. Waste management in the municipality of Vrsac is the best in the region: where primary and secondary separation of waste takes place, almost all the territory is covered by collection, and waste is disposed of in the remediated landfill. In the other municipalities in the region waste is collected and disposed of in inadequate landfills that do not meet basic standards. Hazardous waste is disposed of in landfills, except in the municipality Vrsac. There are illegal dumpsites all over the region, but within the territory of Vrsac illegal dumpsites in almost all villages have been removed.

Currently, accurate data does not exist on the quantities and composition of waste generated in the territory covered by the municipalities (except Vrsac). It should be possible to organize waste management monitoring and reporting by the competent institutions.

Public utilities do not pay for waste disposal and do not have any interest in changing the situation. In addition they operate at a loss, as the price of communal services is within the social provision category. One of the main drivers of sustainable and proper waste management is ensuring sufficient funding for operating expenses. It is necessary to harmonize the level of fees for waste collection to ensure sustainable services. Bearing in mind the sensitivity of the issues related to public utility services and the poor economic situation, a new pricing system should gradually be introduced by the municipalities.

Public utilities do not have proper equipment, enough containers for waste collection, funds for remediation of non-sanitary landfills. In order to sort out all these problems, private sector involvement in waste management systems and development of public-private partnerships in this field are possible.

Generally, there is no organized system to strengthen the capacity of the local community and develop public awareness related to problems and solutions for sustainable waste management. NGOs are involved in projects on recycling, but in most cases in schools and kindergartens, there are no seminars related to recycling or waste management. It is essential that local government and public utilities include public awareness campaigns in their planning, in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have specific problems related to organic waste and certain kinds of hazardous waste like packaging from pesticides. Improved organisation of the region cluster and its activities can help in waste minimization and increased reuse. The areas requiring attention include; the level of recycling; waste collection...
and treatment and creation of a functional and updated database on recycling at the regional level; the establishment and development of special training programs and capacity building of cluster members; advocating for health and social protection of individual collectors of recyclable materials; improving the status and protection of the rights of marginalized social groups; increasing the influence of public opinion.

Local communities could prepare projects on remediation of polluted protected areas, sites and rivers, and apply for funding from available funds.

### 4.3.11. Biodiversity

Around 80% of the area of Southern Banat is arable land. Fragments of natural ecosystems are preserved, primarily in the Deliblato Sands and in the Vršačke Planine Mts. Ecosystem diversity is high, since this region is a mixture of steppe vegetation (communities of Festucetea vaginatae class), halophilous vegetation on salty soils (Festuco-puccinellietea), forest-steppe complexes (Aceri tatarici-Quercion), termophilous forests (Quercion pubescenti-petraeae), and broad-leaved shade forests (Fagion). The richness of the flora and fauna of this region is protected in two large protected areas.

### 4.3.12. Protected Natural Areas

Around 16% of the land in this region is protected as natural heritage, which is above the average level for Serbia as a whole. The most important areas are the Special Nature Reserve Deliblato Sands, the Landscape of Exceptional Beauty Vršačke Planine Mountains, Special Nature Reserve ‘Kraljevac’ and Special Nature Reserve ‘Straza’.

Deliblato Sands Special Nature Reserve – situated in Southern Banat, represent the largest remaining European continental sands. The specific consequences of geological processes from the distant past makes this Aeolian sand unique in comparison to other sands of the Pannonian Plane. It is also known as the “European Sahara”, making it one of the important centres of biodiversity in Europe and the main steppe area in Serbia (Ibid.)

Its surface is 348 km². Specific relief and semi-steppe climate have contributed to the creation of its characteristic forest ecosystems. The area is the habitat for more than 900 species of flora (with the Banat peony among the relics and endemics) and 234 fauna species (such as the Imperial Eagle and the Steppe Falcon).

The boundaries of this protected natural area include a section of the Danube, which is an important gathering place for waterfowl. This is the only stable nesting place in Serbia for one of the globally threatened species, the pygmy cormorant (Phalacrocorax pygmaeus) as well as the nesting place for many other natural rarities.

Part of the Deliblato Sands is protected as the Ramsar site - Wetland Labudovo Okno (Eng.: Swan area), the most important migratory stopover site for wetland birds in Serbia. It encompasses the watercourse and the banks of the Danube, three river islands, flooded meanders of the Karaš River, and the mouth of

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4.3 Southern Banat

This protected area is managed by the PE “Vojvodinasume” – Forest unit Banat, with headquarters in Pancevo.

The main tourist infrastructure consists of the Education centre and Youth Village “Cardak”, and six developed walking trails. Both natural and cultural factors provide real potential in making this area attractive for tourists. However, according to a recent study on ecotourism in protected areas in Vojvodina, only 10% of accommodation capacity is being used in the high season, and not more than 500 out of an average 6000 visitors pay the visitor fee at the entrance. Both the study and the interview with representatives from the protected area management, no revenue is collected from tourism and revealed a very low level of employment (1 person annually), though among the twenty employees, 90% come from the local community.

Despite the negative demographic trends, and an aging population, the area’s potential for rural tourism is considerable. The traditional cattle and pig breeding has survived in most of the villages, along with the production of authentic local food, authentic village architecture and the above-mentioned cultural heritage.

The lack of staff, especially rangers leaves many opportunities for unrestricted access to valuable areas and resources of the protected area, resulting in breaches of the local regulations and the law. It is this which causes most of the problems, while protected area management has identified many of the improvements necessary; Better organized access/visitor management

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Study developed within the EU funded Project „Support to local socio economic development through eco tourism development in protected areas“; Nature Conservation Movement of Sremska Mitrovica, 2012.
and monitoring, and capacity building among the villagers, enabling them to participate more in management and tourism development are some of tasks and opportunities for improvement.

The lack of sustainable tourism, investments, joint promotion of the protected area and participative involvement of local inhabitants and communities in its management have also been identified by the recently implemented SEE European project called Natreg - Signalization and non-formal education - educational courses for the formulation of tourism and business policies of various stakeholders in the SNP Deliblato sands, Establishing of traditional product shop in the SNR Deliblato sands, Waste management in the SNP Deliblato sands – fighting a plastic menace and Waste management in SNP Deliblato sands – elimination and remediation of waste dump sites. (http://www.natreg.eu). The implementation of this project would improve opportunities and raise the quality of rural tourism development in this area.

Vršačke Planine Mts (44 km2, with 1017 species of flora and 150 faunal species).

The mountain is situated in south-eastern Banat, and is the highest mountain massif in Vojvodina (641 m ASL).

The most important group of plants in this area comprises endemic relics and rare species such as Minuartia hirsuta subsp. frutescens, Helleborus purpurascens, Doronicum hungaricum, and bellflowers (Campanula grossekii and Campanula sphaerotix).

Many of the species of insect, amphibian, reptile, bird, and mammal, are natural rarities and thus nationally and internationally significant. The bird fauna is a particular natural asset. In total 130 species of bird inhabit the Vrsacke Planine Mts., of which 90 are nesting species. Among the most significant are the Ural owl (Strix uralensis), short-toed eagle (Circaetus gallicus), and collared flycatcher (Ficedula albicollis). Due to its ecological and geological value; the Vršacke Planine Mountains are also designated as an Object of the Geo – heritage of Serbia (GH), an Important Plant Area (IPA), an Important Bird Area (IBA) and a potential Emerald area.

Rich cultural heritage includes the authentic architecture in surrounding villages, as well as in the town of Vrsac itself. Traditional wine cellars contribute significantly to its tourism attraction (more in the chapter 4.3.20), while its owners are connected through the local association of wine producers.

The Vršac Mountains Landscape of Exceptional Beauty is managed by the Public enterprise Varoš, established in 1997, with its headquarters in Vrsac. The enterprise is financed by the municipality and besides its communal function; a focus on protected area management should be their main responsibility. However, according to information provided by the responsible person at the PE (Orhideja Strbac), it has not received financial support from the municipality for the past 4 years. Responsibility for the tourist information centre has been transferred to the local tourist organization, which is not.

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functioning at all. Financing of the protection and development activities here is provided through NGOs or initiatives of individual experts, through donor funded projects.

Fees are not collected from visitors and no data is kept on the number of visitors or frequency of visits. At the PE Varos there is no person in charge of promotion or tourist activities. In cooperation with the local tourist organization, they have managed to prepare and distribute promotional material (leaflets and maps), but other initiatives (creating of local souvenirs, branding traditional products, etc.) have remained unsupported. The best cooperation in this field exists between the PE Varos protected area management unit and local environmental NGOs (“Avalon”, GEA”, etc.).

The obvious gap between the willingness of the management unit of PE Varos to cooperate with local inhabitants and promote their heritage and traditional products on one side and a lack of financial and other forms of support from the local authority and tourist organization on the other, remains the main obstacle and point for improvement in order to develop local tourism in this (protected) area, based on sustainable principles.

**Socio-Economic Context - Pressures on the Environment**

### 4.3.13. Energy

The most common energy sources are electricity from the national grid, natural gas and solid fuels. The municipality of Kovin is significant as it is the location for the extraction of natural gas at the gas field Mramorak, located in the north-eastern part of Kovin and is connected to the gas supply pipeline system of Pančevo. In addition, this area has been approved to be used by the Petroleum Industry of Serbia (Naftna industrija Srbije) for research purposes. The use of gas in households in Southern Banat is widespread. In Vršac two thirds of households use gas. Gas infrastructure is well developed in Kovin and Alibunar too, while in Bela Crkva it is nonexistent.

Air pollution caused by the use of solid fuel has been detected in Vršac, during windless winter days. Given the frequency of wind in the region, the number of such days is low.

One of the priorities is to increase the energy production from renewable sources. These sources are very rarely used, even though there is a considerable potential. This applies primarily to energy production from biomass. It is estimated that about two thirds of the waste products of farming (cereals, soybeans, corn, sunflower, sugar beet leaves) is ploughed-over or used for feeding the livestock, while one third is left for energy-related use. From this remaining third, about 60% can realistically be used for energy production; however, this potential is...
4.3 Southern Banat

not exploited. The municipalities of Ković and Vršac have the greatest potential in this regard (about 40,000 t); Alibunar has the potential of about 35,000 t, and in Bela Crkva about 10,000 t of farming by-products are suitable for energy production.

Southern Banat is known for its geothermal springs that can be used for heating. The greatest possibility for this type of energy production is found in the municipality of Alibunar, where this water is used for the open recreational swimming pool. The company Niš Naftagas found the water with high content of radioactive iodine at a depth of 600 m during drilling in 1986. Other such waters still exist within the Deliblato Sands.

The greatest potential for use of wind energy in the whole Serbia is found in the region of Southern Banat. This has been recognised for some time and a wind-powered well has been in operation in Šušanj since 1903. The Wind Atlas of AP Vojvodina (Atlas vetrova AP Vojvodine), a study from 2008, emphasizes that this region is the area in which the exploitation of wind energy is fully cost-effective (average annual wind speeds above 6 m/s, especially on Vršački Breg). Given that, with the use of modern technology it is possible to achieve cost-effectiveness even at speeds of 3 m/s, the potential of Southern Banat is great. The average wind energy in Southern Banat, at an altitude of 100 m in April, is over 375 kWh/m². While the wind power at the same height in the hotter months exceeds 500 W/m².

Nevertheless, there are no large scale wind farms in this region. The installation of several wind turbines is planned, of which Koševo 1 and Koševo 2 in Vršac municipality are under construction. The planned capacity of these wind turbines is 117 MW. The Company Electrawinds-S from Belgrade, owned by the Belgian companies Electrawinds SA and Greenco SA, plans to build two wind farms in the Southern Banat municipality of Alibunar. Wind farm projects in Alibunar and Malibunar have been completed and the investor is now waiting for the necessary construction permits. Only a small number of households use small wind turbines for their own use.

The only municipality in Southern Banat in which a location for construction of a small hydropower plant has been identified is the municipality of Bela Crkva. The energy potential is 1,220 kW, and the possible production is 8,190 MWh. On the river Nera, there were small hydropower plants operating until the last century but they are now no longer in use. Increasing the participation of renewable energy in overall energy production and consumption has significant potential and should reduce pollution in locations where conventional power is produced. Of particular importance to this region’s air quality would be the scaling back at the conventional power plant in Kostolac in the Southern Banat region, as the reduction of pollution would have a significantly positive impact. The direct impact of this production lies in reducing dependence on imported energy. In addition to the existing power plant in Kostolac the main threat for this region’s environment is the proposal to construct another power plant in Ković. Its construction is related to the restoration of the operation of a coal mine in this city, but is also dependent on the agreement of local authorities on the development priorities of this municipality.
4.3.14. Building energy efficiency

According to the survey 93.2% of the total number of residential buildings are single family houses with the majority (84.47%) being detached houses. The analysis of the construction periods in Vojvodina revealed that most buildings (81%) were constructed between 1919 and 1980 (periods: B–1919-1945; C–1946-1970; D–1971-1980). In comparison with other regions in Serbia, Vojvodina has a greater number of buildings dating prior to 1919 than those built in the past two decades. This data can partly be explained by the socio-economic circumstances of the past twenty years as well as by a great number of preserved old buildings still used as dwellings.

Although, free-standing houses account for the highest percentage of the buildings it should be noted that row houses can be found in all periods of construction, which is not typical of

Table 4.3.6

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Solar energy (kWh/m²)</th>
<th>Biomass energy (ha)</th>
<th>Wind Energy (W/m²)</th>
<th>Geothermal energy (MW)</th>
<th>Hydro energy (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) daily</td>
<td>(1) woods</td>
<td>(2) yearly</td>
<td>(1) (MW)</td>
<td>(2) (MW)</td>
</tr>
<tr>
<td></td>
<td>(2) yearly</td>
<td>(2) agricult. lands</td>
<td></td>
<td>(2) number of wells</td>
<td>(3) (kW)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kovin</td>
<td>3.8 - 4</td>
<td>10 - 20 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>30 - 40 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vršac</td>
<td>3.6 - 3.8</td>
<td>5 - 10 000</td>
<td>&gt; 300</td>
<td>&lt; 3</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1424.75</td>
<td>40 - 50 000</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Alibunar</td>
<td>3.6 - 3.8</td>
<td>1 - 5 000</td>
<td>&gt; 300</td>
<td>&lt; 3</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>30 - 40 000</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Bela crkva</td>
<td>3.8 - 4</td>
<td>1 - 5 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>1220</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>10 - 20 000</td>
<td></td>
<td>-</td>
<td>8190</td>
</tr>
</tbody>
</table>

**Solar power**
(1) Potential mean values of daily irradiated solar energy on horizontal surface (kWh/m²)
(2) Yearly values of irradiated solar energy on horizontal surface (kWh/m²)

**Biomass**
(1) Area of land under woods (ha)
(2) Area of agricultural land (ha)

**Wind**
(1) Average Energy potential of wind per year on 100m (W/m²)

**Geothermal**
(1) Potential power of geothermal sources (MW)
(2) Number of locations with geothermal springs in municipalities in Serbia

**Hydro power (small hydropower plants)**
(1) Total potential hydropower of small hydropower stations (MW)
(2) Estimated power (kW)
(3) Potential annually power production (MWh)
Thermal insulation was used in the houses built in the past twenty years whereas it was sporadic in older buildings. Some brick houses built after 1945 were additionally insulated while rammed earth or adobe houses built before that period remained un-insulated. This can be explained by good accumulation characteristics of such building materials which provide natural internal humidity regulation in buildings so that there is no need for additional insulation.

In Vojvodina, predominant solutions for heating of single-family houses are individual furnaces using solid fuels, mostly wood. In older buildings (up to 1945), there used to be a tradition of building tall, adobe masonry stoves, built along the wall adjoining the kitchen or the utility room from where the fire was maintained since outside access to these rooms was usually provided. In older rural homes without masonry stoves, heating mainly depends on wood burning range cookers. The majority of more modern houses also use individual furnaces for heating; the most common fuel is wood, followed by coal, while gas is not used so much due to its price, although there is a well developed gas distribution network both in urban and rural areas.

4.3.15. Employment

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4.3.15. Employment

The share of working-age population of 67% is slightly above the Serbian average, while the share of population over 65 years of age is 17%, which is at the average. The share of economically active (45%) and professionally engaged population (35%) in all municipalities is at the average level for Serbia.

Only 18% of the population are income recipients (the average for Serbia is 20%)
and 37% of the population are listed as dependants (average for Serbia is 34%). In this regard, the most unfavourable situation is in the municipality of Kovin. According to the latest report of the National Employment Service, dated September 2010, in the region of Southern Banat there were 15,556 registered unemployed. If we observe the ratio of the number of unemployed to the number of economically active people, the highest share of unemployed is found in Bela Crkva (23%), and the lowest in Kovin (14%).

The industrial sector engages the largest share of working-age population of the Southern Banat region. The manufacturing industry employed 16,577 people, which is 33% of total employment force in the region. The hotel and catering industry in Southern Banat employed a total of 199 persons, which is only 0.7% of total employment force of the region. The largest number of employees is found in the municipality of Vršac (90 persons); while the largest share of employed in the hotel and catering industry in total employment is recorded in the municipality of Kovin, 1.35%.

4.3.16. Industry
Within the region of Southern Banat it is mainly the food processing industry and the pharmaceutical industry in Vršac which are the most developed. The most important and developed in the region of Southern Banat is a complex of pharmaceutical industry (concern “Hemofarm” – Vršac and Fresenius Medical care Serbia). The chemical industry Brixol that manufactures household cleaners is also located in Vršac. The food industry is based on a strong raw material base, which is produced at the local level. Food processing plants include grain-milling, fruit and vegetable processing, milk and meat processing and the manufacturing of sugar, confectionary products, beer and wine, starch and starch products and animal fodder.

Viticulture is especially widespread in the area of Vršac, where a famous wine producer company Vršački Vinogradi has vineyards spread over a total area of about 1,700 ha. Given the long tradition of viticulture and wine production (especially white wine), there are also a number of smaller growers and wine producers with their own cellars which have been increasing over time (e.g. Selecta).

The confectionery industry is located in the municipality of Vršac and is represented by a factory with a long tradition of chocolate and candy production (concern Swisslion-Takovo and Bambi-Banat).

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4.3.16.a Mining and chemical industry

Southern Banat region has some deposits of oil, gas and natural thermo-mineral water. In the municipality of Kovin, the public company NIS NAFTA GAS has set up an exploration area. In addition to that, in Kovin there are two clay brick production sites (factory A.D. Naša Sloga) and there are several sand extraction sites in the Danube river bed. In Vršac, mineral deposit exploitation sites currently mine for kaolin and silica. The former coalmine in the municipality of Kovin is undergoing privatization (one unsuccessful privatization was attempted in 2007). If its operation is restored, the construction of a thermal power plant is planned.

The most developed industry in the region of Southern Banat is the processing complex of chemical industry, manufacturing for the pharmaceutical industry. The most important is the manufacturing concern “Hemofarm” – Vršac, which is the owner of several subsidiary companies in Serbia and overseas. “Hemofarm” is Vojvodina’s first pharmaceutical factory and was founded in 1960. The chemical industry Brixol that manufactures household cleaners is also located in Vršac.

It is envisaged that a “Technology Park” project in Vršac will allow for the arrival of major international pharmaceutical companies. The idea of the local authorities is to build on Vršac’s leading position in the pharmaceutical industry in Serbia. However, potential environmental problems are posed for the region if the wastewaters of these industries and the storage
of solid waste from the production process, are not properly managed. Best practice in this regard should be a requirement of all participants in the ‘Park’ as well as facilitated by the appropriate construction of industrial facilities.

4.3.17. Agriculture

Together with industry, agriculture is the strongest motor of economic growth and development for the South-Banat region. It is the backbone of the agro-industrial sector, which is one of the most productive in the economic structure of the region. There is significant potential for agricultural development as agricultural land makes up 76.2% of the total surface area of the region. The largest share of agricultural land is found in the municipality of Alibunar (85.3%), while the least share is present in the municipality of Kovin (64.8%).

The agricultural land structure is dominated by arable land (83.65%), followed by meadows and pastures (13.33%) and permanent crops (1.95%). Alibunar and Kovin stand out with the share of arable land amounting to 90% of total agricultural land. Since the land structure in the municipality of Vršac is suitable for viticulture, there is an above-average share of vineyards (about 3% of agricultural land), while in Bela Crkva; above average is the share of orchards (3%) as is the share of meadows and pastures (20%).

The arable land is mainly cultivated with cereals (65.64%) and industrial crops (29.96%). The municipality of Alibunar stands out for the large proportion of cereals on arable land (70%), while Vršac stands out for its high share of industrial crops (35%).

The agricultural population in the Southern Banat region is estimated at 22,339, or 17.3% of the total population of the region. The largest share of agricultural population is present in Alibunar (27%) and the lowest in Vršac (11%). Of the total agricultural population, about 60% is economically active while about 40% is dependants. About 87% of the economically active agricultural population is private farmers. There are about 15,325 farms in the region of Southern Banat. The average size of arable land held by agricultural households is about 4.5 ha.

Wheat production in 2008 amounted to 92,761 tons and the average yields per hectare ranged from 4 tons from family farms in Bela Crkva, to 5.6 tons in companies and cooperatives in Kovin. Maize production is much higher and in 2008 amounted to about 350,000 tons. Average yields per hectare reach 6.8 tons in companies and cooperatives in Alibunar. Of industrial crops, the most common is sunflower, while in Kovin significant quantities of sugar beet are produced with yields that reach more than 50 tons per hectare. Of fruits, mostly grown are cherries, apples and peaches. Since the highest number of sunny days in a year is found in the municipality of Bela Crkva, it is distinguished by the quality and sweetness of its fruits.

The southern Banat region has about 267 000 poultry of various types, about 47 000 pigs, 23 000 sheep and 7000 goats. With about 5000 beehives, Vršac stands out in the area of beekeeping.

However, agriculture too can have significant negative impacts on the environment, depending largely on the manner of growing crops and raising domestic animals. Improper

\[13\] Agricultural population includes people working in agricultural production (producers for the market) private farmers (producers for their own needs), manual labour in agriculture and all their dependants.

use of agro-chemicals affect products affects the quality of soil and water, underground and surface, and thus the quality of utility water. Unregulated removal of waste from agricultural production processes also leads to significant environmental pollution. The main problem of highly developed agricultural production is reduction of biodiversity in the region. Growing monocultures over large areas does not leave much room for other wildlife. Therefore, protected natural areas are of great importance for this region but also for Serbia as a whole.

**4.3.18. Forestry, hunting and fishing**

The Southern Banat region, with less than 5% of the area covered by forest, is among the least forested areas of Serbia. The greatest level of forestation, 8250 ha total, is found in the municipality of Vršac. Lumbering amounted to 36,787 m³ of broadleaved (of which 26% was technical wood) and 24,264 m³ of coniferous wood (of which 52% was technical wood).

Maintaining the forests in the Deliblato Sands is of great importance for its environment as it is for the agriculture in its neighbourhood. Forested areas prevent spreading of sand to the surrounding arable land. Large fires (the last one happened in 2007) destroy the soil’s humus layer and prevent the re-planting of trees. Fighting fires is the most important protection factor for this fragile ecosystem.

Areas covered with forest and steppe vegetation enable the development of hunting. These hunting grounds are managed by the public company JP Vojvodinašume, or the local hunting associations.

![Figure 4.3.2](image)

Thanks to the potential of its rivers (Dunav, Karaš and Nera), Danube-Tisa-Danube canal and the Kraljevačko Jezero Lake, the region abounds in possibilities for development of fishing, but improvements in water quality will be needed to encourage aquatic biodiversity.

**Table 4.3.7**

<table>
<thead>
<tr>
<th>Hunting ground</th>
<th>Area</th>
<th>Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vršački ritovi - Vršac</td>
<td>910 ha</td>
<td>Waterfowls, rabbit, pheasant, quail, (in lesser amounts) roe-deer</td>
</tr>
<tr>
<td>Vršačke planine - Vršac</td>
<td>6032 ha</td>
<td>Deer, wild boar, pheasant</td>
</tr>
<tr>
<td>Deliblatska peščara - Kovin</td>
<td>33610 ha</td>
<td>Deer, wolf, wild boar, mallard, wild goose</td>
</tr>
<tr>
<td>Southern Banat - Kovin</td>
<td>46234 ha</td>
<td>Deer, rabbit, pheasant, quail, turtledove</td>
</tr>
<tr>
<td>Srednji Banat - Alibunar</td>
<td>52444 ha</td>
<td>Deer, wild boar, rabbit, pheasant, partridge</td>
</tr>
</tbody>
</table>
4.3.19. Transport and Infrastructure
The road network of Southern Banat is 447 km long, with 135 km of main, 131 km regional and 181 km local roads. The entire road network, including all local roads, is of the modern pavement type and is in good condition.

The most important route is the main road E-70 which goes from Belgrade via Pančevo, Vršac and Alibunar, leading to the state border with Romania. Also very important is the main road 24, which runs from Pančevo via Kovin and Smederevo, to the corridor 10 and E-75 highway to Niš. Regional roads connect Bela Crkva and Kovin, Alibunar and Vršac. All cities of the region are linked by bus lines. The average distance of towns of the region from Belgrade is about 70 km (Alibunar – 56 km, Bela Crkva – 96 km, Vršac – 86 km and Kovin – 50 km).

Through the territory of Southern Banat runs an important railroad from Belgrade via Pančevo, Alibunar and Vršac and leads to the state border with Romania. Since 2012, passenger trains on this route (Belgrade – Timisoara, Romania) run twice a day, every day of the week. Vršac is also connected with Bela Crkva by railroad but there is no passenger traffic and Kovin is not covered at all by the railway network.

The distance of the Nikola Tesla airport from Alibunar and Kovin is about 70 km, from Vršac about 100 km and from Bela Crkva about 120 km. There is an international airport in Vršac used by the Vršac Flight Academy, for training, sport, air taxi and agricultural purposes.

TOURISM – PRACTICES AND SUSTAINABILITY-

4.3.20. Tourism - present state
Of all the four selected regions, Southern Banat is the least visited by tourists, domestic or otherwise. In 2008 it was visited by 19,488 tourists\(^5\), which accounts for only 0.85% of Serbia’s tourist turnover for that year (Annex I). Less tourist traffic compared to other regions is a consequence of both its size and its accommodation capacity. The region currently has 1,630 beds spread across various categories (Annex II).

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This table shows the amounts of available beds per municipality and per type of accommodation.


There are numerous natural and cultural assets favourable for tourism development in the Southern Banat region. Analysis of these assets identifies several complexes of high tourist value, the most prominent being the Vršac Mountains, Deliblatska Pescara (Deliblato Sands) and Bela Crkva Lakes. Based on the tourism industry data in the region of Southern Banat several different types of tourist offering exist already and other forms of tourism have significant potential.

**Cultural tourism**

Wine tourism is among the most developed types of tourism. Due to favourable climatic conditions, good quality soils and the strong inclination of the region’s population towards viticulture, the Vršac Mountains piedmonts are known for their vineyards, both within the country and abroad.

In recent years, in addition to the most renowned winery - Vršački Vinogradi (Vršac Vineyards), small wineries of the region have also being promoted as destinations on Wine Routes (orig.: Putevi vina), through a promotional campaign by the Tourist Organization of Serbia (TOS). The most visited wine cellars are located in Vršac, Gudurica and Veliko Središte. Tours of vineyards and wine-maturing cellars as well as wine tasting in renovated old cellars are being offered. Some wineries offer food in the form of traditional snacks with the wine. National gastronomic cuisine is offered by a restaurant in Gudurica and by a number of restaurants in Vršac.

The Vršac Mountains are popular for tourism. One of the symbols of Vršac Mountains, the Tower of Vršac (Vršačka kula), is located on one of its peaks. It was built in the XV century. The Tower should be completely restored by 2013. Two churches - the Church of Saint Theodore (crkva Svetog Teodora) and the Crkvica (meaning, literally, Little Church) and two monasteries - the Mesić monastery and a monastery in the village of Malo Središte are located in these mountains.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Hotels</th>
<th>Supplementary</th>
<th>Ethno houses</th>
<th>Rural houses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alibunar</td>
<td>448</td>
<td>100</td>
<td></td>
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<td>548</td>
</tr>
<tr>
<td>Vršac</td>
<td>310</td>
<td>504</td>
<td></td>
<td>10</td>
<td>824</td>
</tr>
<tr>
<td>Bela Crkva</td>
<td>276</td>
<td>690</td>
<td>36</td>
<td></td>
<td>1002</td>
</tr>
<tr>
<td>Kovin</td>
<td>138</td>
<td>130</td>
<td>201</td>
<td></td>
<td>469</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>896</td>
<td>734</td>
<td>0</td>
<td>211</td>
<td>1841</td>
</tr>
</tbody>
</table>

Table 4.3.9. Number of available beds per municipality and per type of accommodation

Source: Dijagnostički izveštaj održivog ruralnog turizma u Srbiji, Spanish MDG Achievement Fund Joint Programme, 2011.
Over the centuries different communities have lived together in Southern Banat (Serbs, Hungarians, Romanians, Germans, Czechs and many others) so that basically, in every town, like Vršac or Bela Crkva, many different churches can be found: Serbian orthodox, Romanian orthodox, Roman Catholic, Protestant and even Russian orthodox (in Bela Crkva).

The Village of Dubovac is located in the southern part of the Deliblato Sands, in the place where the sands reach the Danube's banks. The village is located around a branch of the Danube, and features accommodation in privately-operated apartments and a number of restaurants which offer traditional food, while boat rental and sailing takes place on the backwater.

Organized tourism is found in the villages of Skorenovac and Deliblato. An Association is providing rural eco-tourism in Skorenovac which includes accommodation and food, together with an active vacation with participation in preparation of the traditional winter-storage food products. Households are beginning to orientate toward foreign tourists, predominantly from Hungary, who share the same mother-tongue as the inhabitants of Skorenovac.

Beer brewing is present in Vršac where it has a very long tradition. Vršačka pivara brewery was built in 1742 and is the oldest brewery in Serbia still working, unfortunately on a small scale. Within the brewery there is a restaurant where one can drink non-pasteurized beer. In addition, there is a small private brewery “Kruger & Brent” which has become a sort of a trademark for the village of Ritiševo near Vršac.

The tourism experience is enhanced by numerous events spread throughout the year. The best known being the Vintage Days (orig.: Dani berbe grožđa) in Vršac and the Flower Festival (orig.: Karneval cveća) in Bela Crkva, but also events such as The 1st of May Rise at Daybreak (orig.: Prvomajski uranak), Beekeepers’ Gathering (orig.: Sabor pčelara), Golden Hook (orig.: Zlatna udica), Banat Fox Hunt (orig.: Hajka na banatsku lisicu), Art Colony (orig.: Likovna kolonija) and others.

**Sport and Recreation Tourism**

On the Vrsacke planine Mts., there are well maintained hiking and biking trails. On rocky outcrops, visitors can practice alpine and free climbing. Due to favourable air currents, Vršac Mountains are famous for their paragliding take-off site visited by both domestic and foreign fliers. In 2011, the plateau in front of Vršac’s Tower held the World Cup in precision landing paragliding. Next to Red Cross’s facility (mountaineers’ home) not far away from the Tower there are entirely new courts for basketball and handball and a playground for children. There is also a possibility to hire horses for a horse riding.

In Vršac and Alibunar there are newly built swimming pools, SPA centers and tennis courts.

A number of roads in Southern Banat are marked for cyclists; bike paths were built around the lake at Bela Crkva. Some internet sites for cycling enthusiasts feature suggested cycling tours of the Deliblatska peščara Sands.

Recreational classes and summer schools focused on sports and environmental education.
Anglers have at their disposal the full length of the Danube and especially its branches, as well as the DTD canal system and rivers Nera and Karaš. On the edge of the Deliblato Sands, in the village of Deliblato, is the Special Nature Reserve Kraljevac where sport fishing is permitted.

Internet sites for cycling enthusiasts feature suggested cycling tours of Deliblato Sands. However, there are no established formal structures or infrastructure to support in this kind of sports activities as yet.

4.3.20.a Tourism - Development Plans

Tourism of the Southern Banat region is included in the Tourism Development Strategy of Banat, and the municipalities’ local development strategies (Annex III).

Development of wine tourism in Gudurica is the priority of tourism development in Vršac. The plan is to expand the accommodation facilities and restaurants with ethnic cuisine. However, owners of small wineries are not provided with any support structures from the state. Therefore this development may take some time.

The local development strategy of Vršac includes more investment in the city so that it becomes a major weekend destination along with surrounding villages, aimed at strengthening event-oriented tourism.

The Development Strategy of the Municipality of Bela Crkva includes the creation of a detailed

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4.3 Southern Banat

are held in the Youth village Čardak in the Deliblato Sands and in the Red Cross’s facility on Vršac Hill.

In the region of Southern Banat, tourism is most developed in the vicinity of Bela Crkva. The nine Lakes of Bela Crkva (orig.: Belocrkvanska jezera) is visited by tourists all year round. In summer, they use the beaches. Most lakes feature a well equipped beach (showers, toilets) and the Glavno (Eng.: Main) lake has a fenced swimming pool for children, concrete pier, ramps and diving boards. The lakes are also used for training in sailing and diving. Several diving associations from Serbia offer weekend diving tours on these lakes throughout the year.

**Special Interests Tourism**

In the Deliblato Sands, near Banatski Karlovci, there is the tourist destination of Devojački Bunar (Eng.: Maiden’s Well). It currently houses about 1,200 weekend homes, but there are also hotels and conference, sports and wellness facilities.

Bird-watching has potential but is yet to be developed.

Hunting tourism in this region is well developed. There are five well-known hunting grounds, marketed to both foreign and domestic hunters. The majority of hunting grounds feature their own accommodation facilities, or the accommodation services are provided by nearby hotels and private households. Hunting grounds of this area have their own game breeding and hunting centres.

Southern Banat

regulation plan for the marina on the Danube, near Banatska Palanka in the Municipality of Bela Crkva.

Kraljevac is a globally important habitat of protected bird populations (IBA). The construction of a research base, following the example of Zasavica, a visitors’ centre and the bird-watching infrastructure is planned.

All local development plans emphasize the importance of building new accommodation facilities, renovation of the old ones and standardization of their quality.

There appears to be the real risk of wasting these opportunities if the obvious potential for tourism development is not planned in a holistic fashion. It is doubtful whether any of the offerings current and suggested have the necessary draw to attract tourists on their own. But rather, collectively, the South Banat region could present itself as a destination with multiple options and clusters all interconnected.

4.3.20 b Pressures of Tourism Sector on the Environment

Tourism in the region is still under development and the sector appears not to have had any major impact on the region’s environment.

The largest influence on the natural environment is exerted by hunting tourism. However, the game is cultivated and the hunting is controlled, though there are problems with poachers.

This also applies to organized fishing. Anglers fishing on the open waters of the Danube, Nera and Karaš are obliged to have daily or seasonal permits. The problem of over-fishing is related only to the illegal net and electrical power generator-based fishing and is not related to tourism.

Illegal construction threatens the natural assets and environmental appearance of the landscape in many places. This is particularly true in Bela Crkva and Dubovac, where in addition to impaired landscape, unruly wastewater drainage leads to pollution of the lakes.

4.3.20 d Sustainable Tourism in the Region

Given that many of the tourism attractions with the most potential for further development are strongly connected to the special nature reserves, wine routes, and a good quality environment it is realistic to suggest that sustainable tourism development and rural tourism in particular is promising. However, the fact that Southern Banat has a poorly developed economy means that tourism development will start from a low base. In order for Vršac Mountains, Deliblato Sands and the banks of the rivers Karaš, Nera and Danube to reach a status as eco-destinations, it is necessary to work on improving the coordination between all stakeholders. The development of small businesses will contribute to reducing unemployment, increasing incomes and be a significant contributor to rural development.

The possibilities for ecotourism development in the region have been studied in projects which include; Protected Natural Resources and Eco-Tourism of Vojvodina (orig.: Zaštićena prirodna dobra i ekoturizam Vojvodine) and Gudurica – The Eco-Rural Tourism Destination (orig.: Gudurica – destinacija eko-ruralnog turizma)\(^7\).
4.3 Conclusions and Recommendations:

The following environmental issues and their management and or development are important indicators and contributors to the future sustainable success of the region in general and to sustainable tourism development in particular.

**Landscape** - The landscape of this region is unique but its ecosystems are quite fragile. As a consequence of this and its location in regard to the history of this part of Europe, the area has developed an interesting cultural heritage with its own special dynamics.

**Recommendations:** Any spatial development plans need to take this into account when considering both opportunities and management.

**Demography** - Population density is low (ranging from 38 to 68 individuals per km²). As in many other municipalities in the province of Vojvodina, this region is faced with the problem of population decrease.

**Recommendations:** Waste and Recycling - The waste collection situation in this region is better than in the rest of Serbia. Waste management in the municipality of Vrsac is the best in the region, almost all the municipality is covered by collection, and waste is disposed of in the remediated landfill. In the other municipalities in the region waste is collected and disposed of in inadequate landfills that do not meet basic standards, and hazardous waste is disposed of in landfills. Illegal dumpsites are all over the region, but within the territory of Vrsac illegal dumpsites in almost all villages have been removed. Proper waste management needs...
sufficient funding for operating expenses, to invest in equipment, develop a comprehensive service and finance remediation.

**Recommendations:** Establish a system to collect, monitor and assess accurate data on the quantities and composition of waste generated and recycling in the territory covered by the municipalities.

Re-examine the current situation whereby public utilities do not pay for waste disposal, operate at a loss, as the price of communal services, and thus the community does not pay for collection. A new pricing system should be introduced by harmonizing the level of fees for waste collection to ensure sustainable services, bearing in mind any sensitivity of the issues related to public utility services.

Urgent need to investigate opportunities for private sector involvement in waste management system and development of public-private partnerships in this field.

It is essential that local government and public utilities include public awareness campaigns in their plans, in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have specific problems related to organic waste and some kinds of hazardous waste.

Organizing regional cluster(s) for economies of scale and to help in waste minimization and reuse; recycling; waste collection and treatment will be important advances in environmental management.

The establishment and development of special training programs and capacity building of cluster members; advocating for health and social protection of individual collectors of recyclable materials; improving the status and protection of the rights of marginalized social groups; increasing influence of public opinion are all important to the long-term viability of sustainable waste management.

Local communities could prepare projects on remediation of polluted areas, sites and rivers, and apply for funding from available funds.

**Biodiversity** - Ecosystem and species diversity is high, since this region is a mixture of steppe vegetation, halophilous vegetation on salty soils, forest-steppe complexes, thermophilous forests, and broad-leaved shade forests. The richness of this region’s flora and fauna is protected in two large protected areas and a few smaller. Maintaining forests in the Deliblato Sands is of great importance not only for its environmental value, but also for the protection of agriculture in its neighbourhood. Forested areas prevent the spread of sand to the surrounding arable land. Large fires destroy the soil’s humus layer and prevent the re-planting of trees. Fighting fires is the most important protection factor for this fragile ecosystem.

**Recommendations:** Ensure a comprehensive regional system is put in place to encourage and develop;

- biodiversity conservation,
- sustainable agriculture techniques,
- fire protection and training

Improved biodiversity awareness for all.
Southern Banat

**Protected Areas** - Around 16% of the land in this region is protected as natural heritage, which is above the average level for Serbia as a whole. The most important natural areas are Special Nature Reserve Deliblato Sands and Landscape of Exceptional Beauty Vršacke planine Mts.

**Recommendations:** Develop comprehensive and inclusive management plans.

- Ensure management plays a significant stakeholder role in water management programmes.
- Establish holistic tourism development plans and
- Put in place management training as part of a national plan and regional plans for conservation and tourism management.

**Air** – Whilst there is a credible threat of air pollution from surrounding regions, due to the favourable predominant wind direction, all four municipalities have good air quality. The greatest daily concentrations of SO2 and nitrogen oxides within the urban territories of Vršac, Bela Crkva, Alibunar and Kvin are usually below permissible limits.

**Recommendations:** Continued focus on monitoring to ensure that any pollution threats are identified with time to react.

Encourage and support switch to renewable energy to reduce domestic use of solid fuels.

**Water** - Surface and ground waters are not of acceptable water quality. The Danube water quality is in class III due to massive upstream discharge of untreated wastewaters of the cities of Belgrade, Pančevo and Smederevo, with Kvin adding its primary-treated wastewater. The River Nera, flowing from Romania, is periodically of lower water quality class, with Bela Crkva adding its untreated wastewater to this. The DTD canal system has low, III class water quality with Vršac adding its untreated wastewater to Vršac canal. The first water-bearing layer in all Southern Banat is polluted with faecal bacteria, ammonia, nitrates, iron etc. The main water polluters are uncontrolled usage of agrochemicals, uncontrolled waste disposal and wastewater from households and industry. Bela Crkva’s lakes are, during the summer, periodically of water quality that is lower than required (due to the level of faecal bacteria). The source of this pollution is fast urbanization of the lakes’ surroundings coupled with inadequate wastewater disposal infrastructure.

**Recommendations:** A comprehensive assessment of water management needs to be completed and actions taken to remediate the situation. The success of sustainable rural tourism development could be determined by improving this situation since this is a vital component of any rural development infrastructure.

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Sonja Banko: Švadac

Regional Green Agenda – Vršac, Plandište, Bela Crkva (orig.: Regionalna zelena agenda – Vršac, Plandište, Bela Crkva). Environmental Center Stanište (orig.: Ekološki centar Stanište), 2010
Soil - A great variability of different soil types characterises Southern Banat. The main threats to soil in Southern Banat involve Aeolian erosion, salinisation, flooding and uncontrolled waste disposal, as well as the uncontrolled usage of agro-chemicals and industrial disposals. 

Recommendations: Establish training programs for farmers, on use of modern agro-technical measures to minimize the adverse effects of chemical treatment in agriculture. Take lead from Vršac, Agricultural School (orig.: Poljoprivredna škola), which trains interested residents in sustainable agricultural production. A more comprehensive approach needs to be adopted which is more inclusive of the current farming community as part of the vision for farming in this region in the future.

Employment - The industrial sector engages the largest share of working-age population of the Southern Banat region. The manufacturing industry employed 33% of total employment force in the region. The main industries being food processing, chemicals and pharmaceuticals, mining of minerals, oil and natural gas.

Transport - a main branch of the railway network crosses the region to the Romanian border, a good quality road network is in place and airports are in close proximity.

Energy - The most common energy sources are electricity from the national grid, natural gas and solid fuels. Deposits of natural gas, coal and potential oil exist in the region but increasing the participation of renewable energy in total energy production and consumption has significant potential. In particular biomass, geothermal and especially wind. Benefits include reduced pollution with the scaling back at the conventional power plant in Kostolac and reduced dependence on imported energy.

Recommendations: Complete comprehensive feasibility studies for all renewables identified to have potential.

Identify approaches for development including all aspects of ownership, grid adaptation, financing etc.

Investigate opportunities to develop small-scale renewable power plants e.g. for rural communities.

Industry - Food processing industry and the pharmaceutical industry in Vršac which are the most developed. In recent years, despite good potential, agricultural productivity has been low and the existing capacities within the processing industry have not been effectively utilized. The principal problems within the food-processing industry are the lack of capital, lack of investments and a narrow market. One of the limiting factors is the unfinished process of privatization. Chemical and pharmaceutical industries dominate the industrial sector and mining industries are on the increase.

Recommendations: Create structures to support privatisation

Put in place robust mechanisms to ensure remediation of mining sites and environmental management of works.

Review plans for re-opening coal mining and the possibility of a new thermal power station in light of renewable potential and potential pollution and land degradation.

Improve wastewater management for all industrial plants operating in this region.
4.3 Southern Banat

**4.3.22. Conclusions and Recommendations for tourism development in South Banat**

Several conditions must be met for the successful development of tourism, together with its sustainability components. The following considers only the most important ones:

Better coordination, cooperation and management of stakeholder engagement and public participation.

Development of tourism in the region has had a positive reaction from most stakeholders; local government and private investors, citizens living off the land in villages and the NGO sector. Cooperation between each of these stakeholders is at different levels, but is generally unsatisfactory.

The highest level of cooperation is found between small tourist businesses and municipal tourist organizations. In the majority of cases, the help provided by MTOs is based on promotional activities and less often on training in conducting business within the tourism sector. Local NGOs, during implementation of their projects related to tourism offer development or environmental protection and receive help from the local communities, in the form of food and accommodation.

The least developed level of cooperation is found between the large public enterprises that manage protected natural resources and their neighbourhood. This cooperation is somewhat unsatisfactory.

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**Agriculture** - Significant potential for agricultural development as agricultural land makes up 76.2% of the total area of the region. The largest share is found in the municipality of Alibunar (85.3%), and least share is in the municipality of Kovin (64.8%). Agriculture is dominated by arable land (83.65%), followed by meadows and pastures (13.33%) and permanent crops (1.95%). Alibunar and Kovin stand out with the share of arable land amounting to 90% of total agricultural land. Land in the municipality of Vršac has well developed viticulture, while in Bela Crkva, large areas are covered by orchards. Arable land is mainly cultivated with cereals (65.64%) and industrial crops (29.96%). Improper use of agro-technical chemicals has affected the quality of soil and water, underground and surface, and thus the quality of utility water. Unregulated removal of waste from agricultural production processes has also led to significant environmental pollution. The main problem of highly developed agricultural production is the reduction of biodiversity in the region. Growing monocultures over large areas does not leave much room for other wildlife. Therefore, protected natural areas are of increasing importance for this region but also for Serbia as a whole.

**Recommendations:** Sustainable rural development strategy needs to ensure the mitigation of current agricultural pollution problems.

Encourage small-holdings to identify additional income generators so as to retain the cultural and social dynamics of the region.

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better in the area of Vršac Mountains than in the Deliblato Sands.

Specific work on implementation of planning documents. Too much planning and too little work on implementation of plans is forcing people to seek other sources of income, beyond the tourism sector. Private investments in tourism infrastructure development made on the basis of strategic plans are still not making any significant profit. Recommendation: It is necessary to actively involve residents in the development of planning documents. Need to establish stakeholder engagement opportunities. Planned construction of tourism infrastructure. Construction of tourism infrastructure is not systematized which can lead to destruction of natural and ethno ambient. Recommendation: Develop a coordinated, inclusive and holistic approach to construction of infrastructure. By combining the concept of sustainable construction and old construction methods, it is possible to protect the old architecture and meet all the needs of modern accommodation. Standardization of accommodation and food will provide a better and more compact tourist offering. Recommendation: Training of LTOs and the population for providing quality services is a prerequisite for the development of rural tourism, but also the general tourism in the region.

Use of available resources. Although the region of Southern Banat is primarily an agricultural one, most restaurants purchase food at hypermarkets in the cities, even the ones in Belgrade. This situation will not attract tourists who want to enjoy the environment and authentic local cuisine, especially those who expect to get organically grown food. Recommendation: Better connections between the farmers and the caterers are necessary. In addition, training in organic farming practices would have to be extended to the entire region. All interviewed households and restaurants that provide food and lodging only use two forms of energy - electricity and solid fuel (wood). Therefore, despite the great potential for use of alternative energy sources their usage is only slight. Recommendations: Municipal aid programs for introduction of sustainable energy sources would greatly contribute to improving this situation. These programs should be accompanied by training on the economic and environmental viability of switching to use of this type of energy.

Development of existing and construction of new tourist destinations. Special nature parks make no money from the activities carried out by the visiting tourists. The only exception is hunting. Unfortunately, the proceeds from the hunters are not directed to improvement of the tourism offer of SNPs, except for the maintenance of game stocks. Recommendations: Improve the tourist offer in these locations and then charge it where appropriate. Construction of marked walking and cycling paths, gazebos, ethnic sites, facilities for bird watchers and the establishment of stables are just some of the ideas for this purpose. All this has to be accompanied with clean and well maintained public hygiene facilities (toilets and baths), planned parking lots and different types of accommodation (campsites, resorts, rural households, hotels) and food. Only under these conditions can SNPs become eco-destinations.

Festivals in the region which are related to the agricultural tradition and use resources from the rural environment, provide excellent opportunities for additional revenue, but also for
the promotion of local rural values. The danger lies in their possible conversion into fairs, which are already present in large numbers in Serbia, and where goods would be sold that would be of lower quality and would be manufactured outside of Serbia. Recommendations: It is necessary to restore the old glory of festivals and create an opportunity to develop repeat business from tourist clientele. Famous specialties of local cuisine, a large number of ethnic communities, and multiculturalism should also be utilized, for development of rural tourism outside of the SNPs. This is especially true for the villages involved in wine tourism, given that the offer of accommodation and food in them is negligible. The cooperation of local people with businesses that invest in the construction of these facilities would enable the creation of new jobs, but also the supply of local products to tourists.

Some hunting areas provide their own lodging and catering facilities for hunters. Where this is not the case, it is possible to establish cooperation with local people interested in providing these services. This is especially true of fishing tourism, which is not yet developed. Recommendations: Investigate opportunities with local stakeholders for development.

General infrastructure development. Southern Banat has the same problems with infrastructure as the rest of Serbia. Primarily it is important to build a regional landfill and a recycling centre, and then begin organized collection of waste from all households in the region. Also important is the solution of the situation with waste water, by building waste water collectors and purifiers for urban areas and finding alternative ways for smaller rural complexes. Most respondents of the survey cited the problem of “wild”, non-sanitary landfills and discharge of municipal wastewater into waterways. In order to protect tourist sites, both old and new, from the potential negative impacts of tourists it is necessary to conduct environmental impact assessment studies and determine the maximum tourist load for all sites. This is particularly true for protected natural areas. SNR Deliblato Sands has produced such a document.

Protected area management and sustainable rural tourism opportunities – As mentioned above, there is significant potential for the sustainable use of natural and cultural resources, as well as of involvement of local people in tourism development in and around protected areas in this region. The main precondition for development is better mutual cooperation with the local community, which could be initiated by protected area management bodies amongst others. Even where there is willingness to do so (especially in the Vrsacke Planine Mts. Area), there is lack of support of local authorities and policy toward protection and tourist development. The main areas of improvement are visitor management, increasing the local population’s capacities and the capacities of protected area management staff for sustainable development, and especially for rural tourism as one of the naturally most promising aspects of economic development in this area. Existing cooperation with the NGO sector (especially in Vrsac) and recently implemented international projects (Deliblato sands) open realistic opportunities for improvement, targeting capacities of both staff of protected area management bodies and local population towards more sustainable tourism development.

Repeat business tourism has the following advantages: increased spend per visit, can support the development of a critical mass which justifies further tourism development. Festivals can act as hubs of tourism activity for the duration.
**Recommendations:** Clearer definition of responsibilities within the PE Varos for protected area management and more solid support by local and provincial - national governments to both the protected areas presented in this region are necessary steps in this process.

Develop on the conclusions and recommendations made in “Natreg - Signalization and non-formal education – educational courses for the formulation of tourism and business policies of various stakeholders in the SNP Deliblato sands, Establishing of traditional product shop in the SNR Deliblato sands, Waste management in the SNP Deliblato sands – fighting a plastic menace and Waste management in SNP Deliblato sands – elimination and remediation of waste dump sites. (http://www.natreg.eu)
GEOGRAPHICAL FEATURES OF LOWER DANUBE REGION

4.4.1. Location
Three prominent natural borders characterize this region. The northern and eastern borders are marked by the Danube. The western border lies on the Morava River, while the southern border lies along the northern slopes of the mountains of Deli Jovan, Mali Krš and the Homolje Mountains.

The municipalities of Požarevac, Veliko Gradište and Golubac belong to the administrative district of Braničevo, while Majdanpek and Kladovo belong to the administrative district of Bor.

4.4.2. Landscape
The Lower Danube Region spreads across three natural complexes: the rim of the Panonian basin, the Carpathian Mountains of Eastern Serbia and the rim of the Vlach-Pontian basin.

The Velika Morava basin, Braničevo and Stig represent parts of the Panonian basin rim belonging to this region. Its terrain is dominated by the alluvial planes of the lower stretches of the rivers Velika Morava, Mlava and Pek, and the Danube to the north. It is a combination of flatlands and hilly terrain. The specific features of the terrain morphology include three lesser sands of fossil dune terrain, of which the largest

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Table 4.4.1.
The Carpathian Mountains of eastern Serbia run from the river Danube to the north and spread through the entire region. Their key landscape form is the Đerdap Gorge (orig.: Đerdapska klisura), also known as the Iron Gate. The Iron Gate is the largest breakthrough-gorge in Europe. Along its length of over 90 km lie four gorges and three valleys. The narrowest part of the Đerdap gorge is Mali Kazan with a width of only 150 m. The limestone cliffs rise steeply above the Danube, which gives the gorge an attractive look.

Along its flow through the Đerdap Gorge, the Danube receives a number of right-sided tributaries. The most attractive and in the morphological sense the most interesting is the Boljetinska River canyon. The canyon is significant from the perspective of geo-heritage protection, because the complete period of the Cenozoic period can be observed in this location1.

The southern side of the Đerdap Gorge is comprised of the Golubac Mountains and the Miroč Mountain. The Miroč Mountain is a limestone plateau with its highest peak, Veliki Šrbcac at 768 m. The flows of almost all the rivers within the central part of this mountain sink underground and then re-emerge in the form of springs along the banks of the Danube. Underground water has carved long caves and pits. Miroč is rich in underground karst formations of which the most known is Nemacki Ponor (German Sink, 3422 m) and Buronov Ponor (Buron’s Sink, 2925 m). Several deep pits are also present on this mountain: Rakin Ponor (orig.: Raka’s Sink, 285 m), a pit in Lanište (272 m) and Faca Šora (266 m)2. Speleological sites are not adapted for tourist visits and are therefore accessible only to well trained, experienced speleologists. The only cave adapted for tourist visits in this region is Rajkova Pećina (Rajko’s Cave), near Majdanpek. It is protected by law and has the status of a Natural Monument3.

Of the specific morphological features of this terrain, the most interesting is the natural stone bridge Šuplja Stena (Hollow Rock) over the Prerast River near Majdanpek. It reaches up to a height of 34 m and a width of 9 m. As it represents a part of the geological heritage of Serbia, it is protected by law. Another protected natural site is the tufa formation near the monastery of Tumane. Waterfalls and tufa tubs caused this site to receive the status of a Landscape of Outstanding Natural Beauty.

The Rim of the Vlach-Pontian basin occupies the north-eastern part of Serbia. It is a narrow strip of low land near the Danube. The natural attractions in this part of the Lower Danube Region include the valley of the Matka River near Sip - a former branch of the Danube, near Kladovo and the fossil sands in this key-shaped part of the Danube.

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1 Protected Natural Resources in Serbia. Institute for nature conservation of Serbia. Belgrade. 2007
2 Academic Speleological-Alpinistic Club (orig.: Akademski speleološko-alpinistički klub), ASAK; www.asak.org.rs
3 Protected natural resources in Serbia, Zavod za zaštitu prirode Srbije, Beograd, 2007
4.4.3. Climate
The climate is temperate-continental, with significant seasonal and annual temperature variations, accentuated by altitude and modified mountain climate features in the hinterland. During January, temperature ranges from -7 to -1ºC, and during July from 22 - 25ºC, with mild and sunny autumns. The strongest wind is the south-eastern (blowing from Carpathians, known as Košava) during the autumn and winter.

The climatic features of the environment of Đerdap Lake are somewhat different from that of the rest of the region, but this influence is limited to a narrow coastal area and has a microclimatic significance.¹

4.4.4. Demography and Settlements
The total area of the municipalities of Požarevac, Veliko Gradište, Golubac, Majdanpek and Kladovo is 2755 km². Požarevac and Veliko Gradište are municipalities with dense populations. The population density of other municipalities is much lower.

According to the latest estimates of the Statistical Office of the Republic of Serbia, dated June 30, 2008, the territory of Donje Podunavlje is populated by 152,790 inhabitants, which is 6% less than at the time of 2002 census. The largest population decline of 12% was noted in the municipality of Majdanpek, while only in the municipality of Požarevac has the population not undergone significant change. The average population density is below the national average with only 58 inhabitants per km², which classifies this region as a rural area.

The distribution of settlements indicates that the Danube banks are under the greatest urbanisation pressure in the area.

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<td>Veliko Gradište</td>
<td>344</td>
<td>26</td>
<td>22,969</td>
<td>20,659</td>
<td>60.1</td>
<td>-10.1</td>
</tr>
<tr>
<td>Golubac</td>
<td>368</td>
<td>24</td>
<td>10,882</td>
<td>9913</td>
<td>26.9</td>
<td>-8.9</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>932</td>
<td>14</td>
<td>26,952</td>
<td>23,703</td>
<td>25.4</td>
<td>-12.1</td>
</tr>
<tr>
<td>Kladovo</td>
<td>629</td>
<td>23</td>
<td>26,714</td>
<td>23,613</td>
<td>37.5</td>
<td>-11.6</td>
</tr>
</tbody>
</table>
ENVIRONMENT

4.4.5. Air
The Požarevac municipality is exposed to significant emissions of sulphur dioxide and nitrogen oxides from the thermal power plants (Kostolac 1 and 2). Particulate matter pollution in the Majdanpek, Požarevac and Veliko Gradište municipalities is associated with mining activities in New Moldava (Republic of Romania). The Industrial zone of Turnu Severin is also an important polluter in this region.

The greatest daily concentrations of SO$_2$ and nitrogen oxides do temporarily exceed daily permissible limits in Kostolac. Other settlements of the region have much better air quality.

4.4.6. Water
The Danube is one of the most important European rivers and it is also a part of Pan-European Transport Corridor No 7. It is an integral part of the trans-European navigation system Rhine - Main - Danube, which, with its 3,505 km of waterways, connects the Atlantic Ocean with the Mediterranean Sea, linking the west and the east of Europe. On its course through Serbia, the river flows past numerous natural and cultural assets along the banks that lie within the territory of the Lower Danube region.

In addition to the Danube, there are several more major rivers in the Lower Danube region. Flowing through almost the entire region is the Pek River. It is known for the gold that can still be found in the sediments of its flow, attracting adventurers involved in gold prospecting.

The largest reservoir (artificial lake) in Serbia, Đerdapsko, was created in a gorge, after the construction of the Đerdap 1 (Iron Gate 1) hydropower plant. Since that construction, the rapid waters of the Danube have been slowed down along this section, and it is now a peaceful river, suitable for navigation. Another artificial lake, Silver Lake is located two kilometres from Veliko Gradiste. It is actually 14 km long and on average flows as a 300 m wide branch of the river Danube.

The Danube and its tributaries represent the main sources of surface waters for the region. Although the water quality of the Danube tributaries is excellent, all the municipalities’ water is directly impacted by the open pits at the Kostolac lignite basin, the mining in Majdanpek, the fly ash barren (near the Danube) in Kostolac, power stations, commercial, industrial and agricultural wastewaters, water transport, and indirectly, by pollutants in the air and soil as well as cross order pollutants carried in the Danube waters.

The Danube’s water quality ranges from class II to III/IV. Some of its tributaries (Veliki Pek and Mali Pek rivers and the Šaški stream) are polluted with wastewaters from copper mines and flotation landfill, thus reducing the water quality to a lower class. In addition, based on water quality monitoring in the tributaries of the Danube, the water accumulation at HE Đerdap I (Kladovo municipality) meets the prescribed water quality of class II. Silver Lake usually meets the required water quality, but periodically falls into class II due to tourism.

Table 4.2.2: Waste generation and collection in the region

| Source: Ministry of Environment, Mining and Spatial Planning |
pressures and wastewaters from agriculture and second homes around the lake.

4.4.7. Soil

This region is mainly composed of karstified limestones, gneiss, andesite, dacite, and other rocks. Deposits of loess and sand are present in the Danube Bend. Fertile soils (smonitzas, fluvisol and eugleys) are distributed on the plains, hilly regions and valleys.

Arenosols and eutric cambisol on sand has a fragmented distribution. District cambisols, luvisols, luvisols and eutric cambisols dominate at higher altitudes.

Soil is directly threatened by degradation from open coal pits and other excavation for minerals (in Kostolac and Majdanpek) and pollution from thermal power plants in the Kostolac lignite basin (the worst coming from the fly ash landfill) and copper pollution in from the mining basin at Majdanpek (the worst from disposal of mining by-products and the tailing pond in Valja Fundata). Furthermore, the soil is affected by drought and erosion, and the uncontrolled application of agrochemical substances, while the hilly and mountain areas of the municipalities remain largely unaffected by soil pollution.

4.4.8. Waste

In the municipalities of Golubac, Pozarevac, Kladovo and Majdanpek, waste collection and disposal is the responsibility of the public utilities established by local government.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Number of settlements</th>
<th>Number of cleaned sites 2009-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golubac</td>
<td>24</td>
<td>49</td>
</tr>
<tr>
<td>Požarevac</td>
<td>27</td>
<td>213</td>
</tr>
<tr>
<td>Veliko Gradište</td>
<td>26</td>
<td>62</td>
</tr>
<tr>
<td>Kladovo</td>
<td>23</td>
<td>61</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>14</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>450</td>
</tr>
</tbody>
</table>

Table 4.2.4:

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Population covered by waste collection</th>
<th>Population covered by waste collection (%)</th>
<th>Waste generation (t/year)*</th>
<th>Waste collection (t/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golubac¹</td>
<td>8161</td>
<td>4770</td>
<td>58.4</td>
<td>2595</td>
<td>1517</td>
</tr>
<tr>
<td>Požarevac¹</td>
<td>74070</td>
<td>51649</td>
<td>69.7</td>
<td>23554</td>
<td>16424</td>
</tr>
<tr>
<td>Veliko Gradište¹</td>
<td>17559</td>
<td>17559</td>
<td>100.0</td>
<td>5584</td>
<td>5584</td>
</tr>
<tr>
<td>Kladovo²</td>
<td>20635</td>
<td>17203</td>
<td>83.4</td>
<td>6562</td>
<td>5471</td>
</tr>
<tr>
<td>Majdanpek²</td>
<td>18179</td>
<td>15991</td>
<td>88.0</td>
<td>5781</td>
<td>5085</td>
</tr>
<tr>
<td>Total</td>
<td>138.604</td>
<td>107.172</td>
<td>77.3</td>
<td>44.076</td>
<td>34.081</td>
</tr>
</tbody>
</table>

* Based on the average waste generation per capita
Veliko Gradiste’s local government has transferred responsibility for waste management to a private operator (the contract was signed in 2009 for 25 years).

The collected waste is disposed of at inadequate landfills. In Veliko Gradiste, the tourist destinations “Jaz” and “Beli Bagrem” are threatened because of a dumpsite in the village of Pozezeno. The River Pek has been polluted by illegal dumpsites and waste that has accumulated in the river bed. There is evidence that local operators dispose of waste at illegal landfills.

There are many illegal landfills all over the region. Even in the protected areas of Ribnica (Majdanpek municipality) and Brnjica (Golubac municipality) two illegal landfills exist.

Some of these sites have been cleaned up in the campaign “Clean up Serbia” (an annual, one-day campaign), which has taken place over the past three years, but the sites fall back into use. The following table presents the results of the campaigns in 2009 - 2011.

An estimated 10,000 tonnes of waste arrives at illegal dumps. The construction of sanitary landfills and a recycling centre is planned by the National Strategy on waste management (See the figure 4.4.1 below).

An agreement to combine the waste management of all municipalities in the Branicevski district, except Veliko Gradiste, and including the municipality of Majdanpek (Borski district) has been signed. This Regional Waste Management Plan, when adopted, should result in a clearer definition of the locations of the landfill and transfer stations. Funds are expected to be provided from the European Union.

The Municipality of Kladovo will dispose of waste at the future regional sanitary landfill “Halovo 2” in Zajecar (see the section on the east Serbia region).

The Municipality of Veliko Gradiste will dispose of waste at the future regional sanitary landfill in Smederevo.

4.4.8. a Recycling

The construction of two recycling centres are planned in the region – in Pozarevac and Majdanpek. The primary selected waste from households will be adequately prepared and stored for further processing in the recycling industry. The collection and separation of specific waste streams such as electric and electronic waste, tires, batteries, waste oil, etc will also be organized.

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5 May, 12, 2011 http://www.danas.rs/dodaci/branicevo/niko_nece_opstinsko_smecce_59.html?news_id=215168

6 Ministry of Environment, Mining and Spatial Planning, Action “Clean up Serbia”
A list of authorized operators in the region is presented in appendix no. 4.4.1.

Five to ten people will be employed in these enterprises, in addition to the current employees of the public utilities.

The primary selection of PET packaging waste is organized in towns, and partly in villages. There are containers for the primary selection of plastic, paper and metal waste in the municipality of Veliko Gradiste.

The company EVA is the biggest waste operator in the municipality of Kladovo. It operates in the municipalities of Kladovo and Zajecar and collects PET packaging waste, paper/cardboard, plastic and metal. It received support from the IFC Recycling Linkages Project to prepare a business plan and feasibility study for the collection and treatment of plastic. The treatment of waste refers only to the compacting of paper/cardboard, plastic and PET packaging waste. EVA has 10 employees. The company organized the collection of plastic and PET packaging waste by placing 200 wire containers in Kladovo and Zajecar and some in surrounding villages. The towns are fully serviced, but the villages are not, and the number of containers to cover these villages is not sufficient. In 2011 about 150 t of PET packaging waste was collected, compressed and sold to the PET recycler “Brzanplast”.

Containers for paper/cardboard waste are placed only in retail and wholesale establishments. The owner of the company EVA has stated that public awareness is not high enough and that the paper waste in public containers is not “clean” enough (a similar problem with the plastic waste from public containers is the presence of other waste components). In 2011 about 400 t of paper/cardboard waste was collected and sold to recyclers in Belgrade and Cacak. Since the industry in this region is not developed, the share of the waste collected from industry is only 10% (i.e. from “Gorenje”, brewery “Zajecarska pivara”, the cable factory “Zajecar”).

4.4.8 b Waste: conclusions and recommendations

On average, the situation regarding waste collection in this region is a bit better than in Serbia generally. However, waste is collected and disposed of to inadequate landfills that do not meet basic standards. Hazardous waste is disposed of in landfills. Illegal dumpsites exist all over the region, even in the protected areas.

There is no accurate data on the quantities and composition of the waste generated in the region. It should be possible to organize the measuring of waste composition each season (according to the rulebook) in order to organize a proper waste management system and to more clearly establish where the responsibility for the management, control and raising of public awareness lies among the competent public institutions.

A characteristic of public utilities is that they work at all communal services, not only waste, which significantly reduces the efficiency and effectiveness of waste collection and treatment, and creates dependence on local policy and

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7 Agency for Environmental Protection, http://www.sepa.gov.rs/

8 Waste Management Plan of Municipality Pozarevac, December, 2008; Waste Management Plan of Municipality Majdanpek, December 2010
disposal and do not have an interest in changing the situation. In addition, they operate at a loss, as the cost of communal services is categorized as a social service. One of the main drivers of sustainable and proper waste management is ensuring sufficient funding for operating expenses. It is necessary to harmonize the level of fees for waste collection to ensure sustainable services. Bearing in mind the sensitivity of issues related to public utility services and the poor economic situation, a new pricing system should be gradually introduced. In the municipality of Veliko Gradiste the price for this service is three times higher than in other municipalities, as a private company manages waste collection, transportation and disposal. Citizens have organized protests and required lower prices.

Public utilities do not have proper equipment, enough containers for waste collection, or the funds for remediation of non-sanitary landfills. In order to sort out all these problems, there is a strong need for private sector involvement in the waste management system and the development of public-private partnerships in this field. The example that the municipality of Gradiste provides shows that this kind of partnership is not always the solution. The private partner did not fulfil its obligation, it disposes waste at illegal landfills and citizens are unsatisfied with the quality of its services. Increasing the capacities of public utilities regarding this kind of cooperation can assist in better decision making.

Generally, there is no organized system to strengthen the capacity of the local community and the development of public awareness related to the problems and solutions for sustainable waste management. NGOs are involved in projects on recycling, but in most cases in schools and kindergartens, there are no seminars related to recycling or waste management. It is essential that the plans of local government and public utilities include public awareness campaigns in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have unique problems related to organic waste and certain kinds of hazardous waste, such as the packaging of pesticides.

Organizing the region cluster and its activities could improve in waste minimization and reuse; level of recycling; waste collection and treatment and the provision of a functional and updated database on recycling at the regional level; the establishment and development of special training programs and the capacity building of cluster members; advocacy for the health and social protection of individual collectors of recyclable materials; the improvement of the status and protection of the rights of marginalized social groups; and the increased influence of public opinion.

Local communities should prepare projects on the remediation of polluted protected areas, sites and rivers, and apply for funding from available sources.
4.4.9 Biodiversity

Large portions of the Požarevac and Kladovo municipalities are covered by either settlements, industrial complexes, or arable land. The other municipalities are mostly covered by forests ecosystems. Within valleys and along the river banks, hygrophilous oak forests (Quercetum pedunculiflorae) dominate. Dominating the ecosystems within the Đerdap national park are different variants of oak forests (Quercetum fraineto-cerris, Quercetum petraeae), and relic forest communities (Syringo-Carpinetum orientalis, Junglandetum s.lato etc). More than 50 mixed forest and shrubby communities are registered, of which 35 are categorized as relic. The rich flora and fauna of this region is protected at the Đerdap National Park.

The great geological and soil heterogeneity, as well as the gorge’s unique microclimate has led to Đerdap Gorge becoming a major refuge area for ancient European plant and animal species. The territory of the National Park is inhabited by more than 1,100 plant species, among which are Tertiary relics, such as Corylus colurna, Juglans regia, Syringa vulgaris, Taxus baccata, Tilia argentea, Tilia caucasica, Acer intermedium, Ilex aquifolium, Celtis australis etc. Tulipa hungarica is stenoendemic species. The richness of the flora is reflected in the rich vegetation as well, primarily the forest vegetation.
4.4.10. Protected Natural Areas
Among the areas protected in this Region, the Đerdap National Park is the largest and the most important from the perspective of both its natural and cultural values.

The National Park was protected in 1974, and covers an area of 63,000 ha. The protected Đerdap Gorge complex stretches for almost 100 kms and includes four smaller gorges, among which Veliki Kazan is the most beautiful, and where the water is deepest – 90 m.

More than 150 bird species have been identified here, such as the golden eagle (Aquila chrysaetos), the short-toed eagle (Circaetus gallicus), the white-tailed eagle (Haliaetus albicilla), the black stork (Ciconia nigra), and the grey heron (Ardea cinerea). The most attractive mammal species are the brown bear (Ursus arctos), otter (Lutra lutra), Eurasian lynx (Lynx lynx), wild boar (Sus scrofa) jackal (Canis aureus), red deer (Cervus elaphus), roe deer (Capreolus capreolus), chamois (Rupicapra rupicapra) and other species.

In addition to its natural values, the beauty of its landscape and unique geomorphology, this Park contains a rich cultural heritage, which includes the archaeological site of Lepenski Vir, a prehistoric culture (7 000 / 6 000 years B.C.) discovered before the construction of the first Iron Gate dam. From the Roman period, the most valuable preserved monument is Tabula Traiana, marking the remnants of a road constructed in the times of the Roman Emperor Traian.

Ramsar, IPA, IBA, PBA and EMERALD areas, as well as important geo–heritage sites also lie within the area of Đerdap National Park.

The special nature reserve Mala Vrbica, and the natural monuments Rajkova Pećina (cave) and Beli Izvorac (spring) are in the process of being protected, and the protected area of a natural bridge, Šuplja Stena, is being expanded.

Đerdap National Park is a candidate for the UNESCO MaB list, and together with the archaeological site of Lepenski Vir a candidate for the UNESCO World cultural and natural heritage list.

SOCIO-ECONOMIC CONTEXT - PRESSURES ON THE ENVIRONMENT

4.4.11 Energy
The Lower Danube Region is the second most important electricity production area in Serbia. The most important producers of electricity are the hydropower plant Đerdap I and the thermal power plants Kostolac A and Kostolac B. The largest is the hydro plant Đerdap I with 1,026 MW. It is followed by Kostolac B, with a total capacity of 700 MW, and Kostolac A with 310 MW.

Construction of the hydroelectric power plant on the Danube and formation of the large Đerdap Lake has caused a significant change in the environment of its shoreline. These are reflected in permanent changes in the water ecosystem of the lake as well as in its shoreline.

Internet web site of the Public Company „HE Đerdap”: www.djerdap.rs
ecosystem. The degradation of water quality in the reservoir is largely a result of excessive inputs of organic matter and waste from the upstream part of the basin. A large part of these pollutants, due to the reduced water flow, accumulate at the bottom of the lake.

In order to protect the reservoir and the shoreline, the Public Company HE Đerdap has built a network of canals, pipelines and pumping stations. In addition, an active programme of monitoring, measurement and analysis of the impact of water slowdown and the environment is in place.

Table 4.2.5: Lower Danube, Renewable energy sources potentials

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Solar Energy (kWh/m²)</th>
<th>Biomass Energy (ha)</th>
<th>Wind Energy (W/m²)</th>
<th>Geothermal Energy (MW)</th>
<th>Hydro Energy (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) daily</td>
<td>(1) woods</td>
<td>(2) yearly</td>
<td>(1) (MW)</td>
<td>(1) (MW)</td>
</tr>
<tr>
<td></td>
<td>(2) yearly</td>
<td>(2) agric. lands</td>
<td></td>
<td>(2) number of wells</td>
<td>(2) (kW)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) (MWh)</td>
</tr>
<tr>
<td>Požarevac</td>
<td>3.8 - 4</td>
<td>1 - 5 000</td>
<td>200 - 300</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kladovo</td>
<td>3.8 - 4</td>
<td>20 - 30 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>3.8 - 4</td>
<td>&gt; 40 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>2 - 5</td>
</tr>
<tr>
<td>Veliko Gradište</td>
<td>3.8 - 4</td>
<td>1 - 5 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Golubac</td>
<td>3.8 - 4</td>
<td>10 - 20 000</td>
<td>&gt; 300</td>
<td>-</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

Table 4.4.5: Renewable energy source potentials in Lower Danube

Explanation of the table

Solar power
(1) Potential mean values of daily irradiated solar energy on horizontal surface (kWh/m²)
(2) Yearly values of irradiated solar energy on horizontal surface (kWh/m²)

Biomass
(1) Area of land under woods (ha)
(2) Area of agricultural land (ha)

Wind
(1) Average Energy potential of wind per year on 100m (W/m²)

Geothermal
(1) Potential power of geothermal sources (MW)
(2) Number of locations with geothermal springs in municipalities in Serbia

Hydro power (small hydropower plants)
(1) Total potential hydropower of small hydropower stations (MW)
(2) Estimated power (kW)
(3) Potential annually power production (MWh)
4.4 Lower Danube

In addition to prominent changes in the ecosystem, the accumulation has also contributed to hydro-morphological changes in this part of the Danube. As a result, some historical monuments have been moved from their original locations, such as the archaeological site Lepenski Vir.

The Public Company power plants and Kostolac Mines (orig.: Privredno društvo termoelektrane i kopovi Kostolac) also belong to the group of major polluters of the air and soil of the region. Each year, the power plants burn more than 7,000,000 tons of coal, which produces 1,600,000 tons of ash and slag. These products are deposited in the ash dump which covers an area of 250 ha. Coal combustion in the air amounts to 4,000,000 m³ of flue gas per hour. In addition to prominent changes in the ecosystem, the accumulation has also contributed to hydro-morphological changes in this part of the Danube. As a result, some historical monuments have been moved from their original locations, such as the archaeological site Lepenski Vir.

Wood is increasingly used for heating homes. The natural gas distribution infrastructure is not developed. Planning documents for gasification exist only for Požarevac.

In regard to renewable resources in the Lower Danube region, significant potential exists for harnessing wind energy.

In the Municipality of Veliko Gradište, Golubac and Kladovo the average wind energy at an altitude of 100m in April reaches 375 kWh/m². Slightly less wind energy is available in Majdanpek, ranging from 75 kWh/m² to 225 kWh/m² in the northern part of the municipality, along the Danube. With a wind power potential which, at an altitude of 100 m, in the heating season reaches up to 500 W/m², the municipalities of Požarevac and Veliko Gradište stand out, while the lowest average wind power is recorded in Majdanpek (300 W/m²).

Within the Lower Danube region no significant potential exists for small hydropower plants (SHP). The total energy potential of the waters of the Lower Danube region that could be exploited by small hydropower plants is only about five megawatts. The Municipality of Majdanpek stands out with six identified locations for the construction of small hydropower plants, while in Požarevac and Veliko Gradište there are no such locations.

4.4.12 Building energy efficiency

The region is predominantly rural, with a great number of villages and only 20% declared as urbanized towns.

The entire region is characterized by a continental climate, with average winter temperatures around 0 °C and summer temperatures around 20 °C. The exception is Negotinska Krajina, where the specific geographic position and the impact of the surrounding mountains have caused changes to the continental climate and created a distinctive local climate characterized by extremely high or low annual temperatures.

More than 90% of the buildings were built between 1941 and 1990, a period of prosperity and development in almost all inhabited areas in the region. The highest construction rates were in the post-war period, 1946–1970 (35.45%), following the comprehensive renewal and reconstruction of the rest of the country. On the other hand, specific socio-economic
factors in the country contributed to a marginal rise in the number of households in the last two decades, when less than 10% of the houses were built. This is a result of the substantial migration of the local population in the last 30 years [2].

The analysis of the data indicated a great disproportion among the types of housing: single-family houses account for 93% of the buildings with 98.65% of these freestanding houses, clearly the type that prevails in the region. The analysis of housing types also shows that most of them are smaller free-standing low-rise buildings with a relatively compact base and form.

Despite thermal regulations and severe winters, most buildings still have no thermal insulation as the part of the envelope, or it is insufficient, so that there is absolutely no compliance with the current regulations and standards regarding thermal comfort and protection.

Most buildings have their own heating system, mainly individual stoves using solid fuel (wood, coal), while not many houses have a central heating system with individual furnaces. A few single-family units in the zones of major cities use the district’s central heating system.

4.4.13 Employment

The working-age population share of 65% is slightly below the Serbian national average, while the share of population over age 65 is 17%, which is equivalent to the Serbian average.

According to the most recent National Employment Service Report (Nacionalna služba za zaposljavanje) dated September 2010, the number of registered unemployed persons in the five municipalities of the region is 9,561.

Compared to the working population, the percentage of 10% unemployed is not alarming, but it should be noted that this is only an apparent figure since a large number of persons are currently employed in enterprises that are being restructured.

Viewed individually by sector, the public sector employed the largest percentage of employees in the region 28%. Industry employs 22% of the region’s workforce, due especially to such employment in Majdanpek and Kladovo. The region of the Lower Danube is not agricultural, which is confirmed by the fact that only 3% of the population is employed in this sector. Tourism employs about 2% of the population.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Unemployed</th>
<th>Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veliko Gradište</td>
<td>1010</td>
<td>1708</td>
</tr>
<tr>
<td>Golubac</td>
<td>497</td>
<td>751</td>
</tr>
<tr>
<td>Požarevac</td>
<td>3930</td>
<td>16,624</td>
</tr>
<tr>
<td>Kladovo</td>
<td>1937</td>
<td>3738</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>2187</td>
<td>3920</td>
</tr>
<tr>
<td>Region</td>
<td>9561</td>
<td>26,741</td>
</tr>
</tbody>
</table>

Table 4.4.4 Registered number of unemployed
Source: Za nezaposlene NSZ, za zaposlene RZS.
4.4 Lower Danube

4.4.14 Industry

Previous economic development drivers in the region were the copper mine Majdanpek and the Processing industry Majdanpek (IPM). Both companies are undergoing a process of restructuring and both belong to the RTB Bor holding group, comprised of the parent company RTB Bor and eight subsidiaries that are not completely owned by the parent company.

Industrial production in the region has failed to recover from the sharp drop in investments during the nineties. This is especially true of the manufacturing industry in the municipalities of Veliko Gradište and Požarevac, which is primarily based on the processing of agricultural products. Successfully privatized enterprises are in a significantly better position. These are the health-food production concern Bambi, the transport company Litas, the bread-making company Žitostig and the road company Požarevac. All these companies are located in the municipality of Požarevac.

4.4.14 a Mining Industry

The industrial development of the municipality of Majdanpek has been, from the mid-1950s, based on the development of mining and the related metal-processing industry. The copper mine Majdanpek Ltd. (Rudnik bakra Majdanpek d.o.o. - RBM) has been producing copper, magnetite, lead and zinc concentrates as well as providing manufacturing services. RBM has two research and exploitation fields: the research and exploitation field Vlaole - Jasikovo – at Čoka Marin and the research and exploration field Majdanpek.

Since its opening in 1961 until now, the mine has produced 1,325,000 tons of copper concentrate, over 80,000 kg of gold and 415,000 kg of silver, with a total value greater than 4,000 million dollars. Unlike the period until 1990, when the mine development was characterized by intensity, high productivity and competitiveness, there has been a decline in production volume and reduced equipment, technology and research investments, which is reflected by the decline of business results. RBM currently employs 952 workers, but employment has been continuously decreasing in the last ten years.

RBM entered into a restructuring process in late 2004 and during 2006 and 2007, two attempts for its privatization by tender failed. The first contract was signed in 2006 with Romanian CUPROM but was terminated for contempt of sales standards. The same situation occurred in 2007 with the Austrian ATEK. In 2008 and 2009, two public calls were enacted for selection of a strategic partner for the RTB group, but both attempts failed and currently, a new strategy towards privatization is being considered. As the economy of Majdanpek essentially relies on the RBM, it is in the interest of local development for the Majdanpek copper mine to be privatized separately from the whole of the RTB Bor group. This is supported by the fact that the reserves of copper ore in Majdanpek are estimated at more than 100 million tons.

The privatization of the mines in Majdanpek and restoration of their production would strengthen local industry but would also restore the previously existing problem for the environment. Therefore, any future owner should be contractually obliged to protect the environment and the population of Majdanpek.
4.4.15 Agriculture
Agricultural land makes up about 51% of the total area of the Lower Danube region. A higher percentage of agricultural areas is found in the Municipalities of Požarevac and Veliko Gradište, where the share of agricultural land is about 75% of the total land. Agriculture thus plays a more important role in the economic structure of Veliko Gradište and Požarevac than in the other municipalities of the region. In Majdanpek, agricultural land barely exceeds 20% of the total area of the municipality.

The agricultural population of the Lower Danube counts 21,414 people, or 14.6% of the total population of the region. The largest share of the agricultural population is found in Veliko Gradište (42.3%). Of the total agricultural population, about 68% is active while about 32% is dependent. Over 95% of the active agricultural population is private farmers.

There are 18,017 registered farms in the Lower Danube region. The average size of arable land held by agricultural households is about 2.9 ha.

Most of the arable land is cultivated with cereal crops (57.66%), followed by fodder crops (16.58%) and vegetables (11.49%), while the presence of industrial crops is very low.

Various fruits and vegetables are grown in this region. In Kladovo, 6670 tons of grapes were produced, which is almost 60% of production for the entire region.

The livestock of the Lower Danube region amounts to about 266 thousand heads of various poultry, about 73 thousand pigs, 40 thousand sheep and 7 thousand goats.

4.4.16 Forestry, hunting and fishing
The Lower Danube Region is one of the most densely forested areas of Serbia with more than 60% of the area covered by forests. With a total of 132,000 ha of forests, this region represents 7% of the total forested area of Serbia. In the municipality of Majdanpek over 80% of the territory is forested, which qualifies this municipality as the most densely forested municipality in Serbia. According to data from the Statistical Office, at the end of 2008 as much as 61% of forested areas of the region were located in Majdanpek.

The Đerdap sector of the Danube was particularly known for its abundance of fish, especially sturgeon and beluga, which spawn here. The dam designers overlooked this during the construction of the dam which has stopped their natural movement upstream to the area where they spawn. Consequently, the attractiveness of the Danube, when it comes...
to fishing, has been diminished significantly, as well as decimating the caviar industry, for which Kladovo was internationally renowned. Today there is only one private company in the municipality of Negotin, Phoenix, engaged in breeding these fish.

Whilst the fishing industry still makes an economic contribution to the region, it is believed that the river Danube, the river Poreč and the gulf of Poreč, do still have potential for increased development, by playing an important role in expanding and improving the tourism offering in the region.

The region is characterized by rich hunting potential of species characteristic of the area (deer, wild boar, hare, pheasant and partridge). The number of hunters who visit these hunting grounds is continuing to rise, especially in the municipality of Majdanpek. The hunting grounds are managed by the Đerdap National Park, the Public Company Srbijašume and local hunting associations –members of the Hunting Association of Serbia (orig.: Lovacki savez Srbije).

4.4.17 Transport
The road network of the Lower Danube region is 1,172 km long, with 306 km of highway, 293 km of regional roads and 573 km of local roads. About 70% of the road network has modern pavement, while 30%, primarily local, is poor quality roads.

The most important route is Highway 25-1, leading from Požarevac along the Danube, through Veliko Gradište, Golubac, Donji Milanovac to Kladovo. Kladovo is also connected with Negotin by the highway E-752. The most important regional road runs from Majdanpek to Požarevac. The towns of the Lower Danube region are connected by regular bus lines. The average distance from Belgrade is about 150 km (80km from Požarevac, 100km from Veliko Gradište, and 192 km from Majdanpek, 120 km from Golubac, and 240 km from Kladovo).

There are two major rail routes in the Lower Danube region. Požarevac is connected by rail with railway corridor 10, and there is also a railway from Požarevac to Majdanpek. From Požarevac there are three departures a day for Belgrade and seven each for Smederevo, Mala Krsna, Majdanpek and Zaječar.

River traffic is very important for the Lower Danube region, as the river Danube runs through the entire region. This is especially true regarding international freight traffic.

Nikola Tesla Airport is situated about 90 km from Požarevac, 120 km from Veliko Gradište, 140 km from Golubac, 190 km from Majdanpek and about 260 km from Kladovo.

4.4.18a Tourism – Present State
In 2008, 95,474 tourists visited the Lower Danube region, accounting for only 4.21% of that year’s total tourist turnover for Serbia (Annex I). Most tourists are from Serbia, while foreign tourists accounted for only 7.4% of the turnover. Unlike in 2007 when the total number
Lower Danube

Previously, investments were directed toward Viminacium and Lepenski Vir. In Viminacium (12 km from the Požarevac city centre), until recently, the only part accessible to tourists was a roofed Roman necropolis, presented as a guided tour. Today, in addition to the cemetery, there is an outdoor archaeological park making the site much more attractive to visiting tourists. The proximity of the coalmine at Drmno does not directly threaten the archaeological site, but it does threaten its wider environment in which there are still a large number of unexplored mining locations.

The Archaeological site Lepenski Vir is located in the Iron Gate gorge. On this site, remnants of religious architecture were found, dating from period of 6500 to 5500 BC. Since July 2011, the site has been covered by a new protective roof.

According to the data on the tourist industry in the Lower Danube region, several distinct modes of tourism exist. These modes are:

Cultural Tourism
Along the Serbian bank of the Danube, lie already recognized cultural-historical tourist attractions. They include the archaeological sites Viminacium and Lepenski Vir and the fortresses Ram, Golubac, Diana and Fetislam. The largest number of visitors to these tourist locations were primary and secondary schoolchildren on field trips (educational tourism). Other visitors were members of organized groups, families or individuals in transit.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Hotels</th>
<th>Supplementary</th>
<th>Ethno houses</th>
<th>Rural houses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golubac</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td>120</td>
</tr>
<tr>
<td>Kladovo</td>
<td>672</td>
<td>778</td>
<td>6</td>
<td>48</td>
<td>832</td>
</tr>
<tr>
<td>Majdanpek</td>
<td>590</td>
<td>196</td>
<td></td>
<td>196</td>
<td>982</td>
</tr>
<tr>
<td>Požarevac</td>
<td>383</td>
<td></td>
<td></td>
<td>72</td>
<td>455</td>
</tr>
<tr>
<td>Veliko Gradište</td>
<td>444</td>
<td>609</td>
<td></td>
<td></td>
<td>1053</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1537</td>
<td>1583</td>
<td>6</td>
<td>316</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.4.7: Number of available beds per municipality and per type of accommodation

Source: Diagnostic of rural tourism in Serbia: Four target regions diagnostic report. Spanish MDG Achievement Fund Joint Programme, 2011


![Master Plan of the Tourist Destination Lower Danube (orig.: Master plan turističke destinacije “Donje podunavlje). School of Economy of the University of Belgrade. 2007](#)
near Požarevac, the Golden Buck (orig.: Zlatna bućka) – sports fishing competition in Tekija and the Lilac Fest (orig.: Jorgovan fest) – a folk festival in the village of Miroč.

Rural tourism offers year-round tourism. This includes mountain, eco and ethno-tourism, hunting tourism, and the production of eco-food and ethno-craft products. Accommodation facilities are available in the villages of Rudna Glava, Crnajka, Golubinje and Obljaga Mare. Local government funds are available for this development, but the number and quality of accommodation do not yet meet private accommodation standards.

In the hotels of Donji Milanovac the most common mode of tourism is conference tourism.

**Sports and Recreation Tourism**

With a varied year-round offering, the primary location in this region is Đerdap National Park, which includes nautical tours, cycling, hiking, hunting and fishing.

Boating by private boat or yacht is one of the most developed forms of nautical tourism in the region. The Lower Danube region has developed significant infrastructure for this type of tourism in the form of anchorage (Kostolac, V. Gradište, Golubac and D. Milanovac) and docks (Ram, V. Gradište, Požežena and Kladovo). Some of the moorings and docks offer water, power and refuelling services, while the restaurants provide food for tourists. Related to this type of nautical tourism are the Đerdap International Sailing Cup and the Danube International Tourist Regatta, held each year in July and August, respectively. The Danube also offers boat cruising tours, with two boats for this purpose on Šrebrno Jezero (Silver Lake) and one in Kladovo.

Dockings for cruise ships that run along river Corridor VII did not exist until recently. With the completion of a marina in D. Milanovac in 2010, an opportunity is provided for the development of this type of tourism in the region, further enhancing the offering to foreign tourists. In 2010, there were 64 cruiser dockings in D. Milanovac, with a total number of 10,531 tourists.

The most popular tourist resort, but also a large weekend settlement, is Srebrno Jezero (Silver Lake). Part of the lake shoreline is arranged in the form of a sandy beach. Much of the lake has retained its natural appearance and is used by anglers. The lake is rich in all kinds of freshwater fish. Sport fishing is possible only with a paid license. The use of motor boats is prohibited. The development of tourism on the lake has led to the construction of hotels, restaurants, private villas and rental cottages. The leader in the construction of accommodation facilities and the accompanying tourist infrastructure is the company Silver Lake Investment.

For a vacation near the Danube, rooms and apartments are available in D. Milanovac, Tekija and Kladovo. In the weekend settlements of Vinci and Usije near Golubac, more than 2000 second homes have been built where hikers and tourists spend the entire summer.

The Youth camp Đerdap is well equipped with sports infrastructure and is primarily directed toward young athletes and student field trips. For its reconstruction, investments have been made by the Ministry of Sport and Youth.

Through the Đerdap Gorge passes a part of a major international cycling route EuroVelo 6, which connects the Atlantic to the Black Sea.
The bicycle path by the Danube is marked in its entirety throughout Serbia. In Đerdap Gorge, the bike path is also located on the Romanian side. Maps are available with markings of tourist attractions, activities and infrastructure available to cyclists. A few households and two camps specialize in catering to cyclists. TOS has, in its publication titled Discover the Danube in Serbia, introduced two interesting one-day cycling routes: Ram - Srebrno Jezero - Golubac 42 km long and Lepenski vir – Tekija 61 km long.

Hunting tourism in the region is highly developed. The mountainous landscape and rich forests characterize this region, providing ideal conditions for hunting. The most developed is hunting of big deer and roe deer, wild boar and small bird game. Hunting in NP Đerdap is carried out in natural conditions, where the game is much more circumspect, which provides hunters with the opportunity to enjoy an authentic hunting experience.

Given that the region lies along the Danube River, fishing tourism is highly developed. The Danube in the Đerdap Gorge is rich in fish and used by both professional and recreational fishermen. Both categories must pay a license fee. For recreational anglers the permit costs 46 EUR annually, or 10 EUR per day. Serious anglers from Serbia have built their own accommodation facilities in the form of second homes along the Danube. These cottages are also rented out to other anglers. For foreign tourists, there are also accommodation facilities in households. Fishing is conducted from the shore or from boats.

The mountainous hinterland of the Đerdap Gorge provides opportunities for hiking and trekking, by bike or jeep. Within the Đerdap NP nine hiking trails are marked. Lengths vary between 2 and 20 kilometres. The most vivid is the path through the Brnjica river canyon, which is characterized by remarkable plant and animal wildlife. Shorter trails in the park lead to landscaped gazebos, which offer good views of the Danube Gorge.

Mountain biking trails are marked on the maps, and indicate where they branch off the main road. In addition, the surrounding mountains offer adventurers a large number of unregulated dirt roads that cut through the mountains in all directions. These roads are used by cyclists as well as by four-wheeler enthusiasts, making jeep tours through Miroč or the mountains around Majdanpek a common occurrence.

**Special Interest Tourism**

Special interest tourism includes caving, adventure tours, exploration tours, tours of geological heritage (there is a variety of karst landforms) with functional integration with other forms of tourism.

Near Majdanpek, Rajko’s cave has been adapted for tourist visits. It is among the best equipped and maintained caves in Serbia. Within this site, there is a restaurant, a parking lot and a gift shop. Other caves in the region are not used for tourism.

The Đerdap National Park offers bird watching with the help of a trained guide (ornithologists). There are no specially tailored offers regarding this type of tourism yet.
4.4.18 b Tourism - Development Plans

The future development of tourism in the region is represented by two Master Plans - Master Plan of the Tourist Destination Lower Danube\(^6\) and the Master Plan of Cultural-Historic Route, “Way of the Roman Emperors (Felix romuliana)” \(^7\), and by local strategic development plans (Annex III).

MP Lower Danube gives priority to the development of nautical tourism, short holiday tourism, special interests tourism and cruise tours. The development of nautical tourism is directed toward stops of international tourists on river cruise boats. They will offer a unique blend of natural beauty and the wild world of the Đerdap NP, cultural and historical monuments, places with landscaped riverbanks and preserved architecture. According to this master plan, the potential for the commercialization of sports, conferences, rural and event-oriented tourism is not as great.

Following the adoption of the Master Plan, the National Tourism Development Corporation has established the priorities for investments in tourism in the region\(^8\). These are the fishing village of Tekija, an international port with a promenade and a harbour in Donji Milanovac, the fort of Golubac, the Golubac hotel on the Danube, the new city hotel in D. Milanovac and the themed nautical centre in Poreč bay.

Current investment in the renovation, conservation and presentation of the archaeological site Lepenski Vir includes completion of works on a pier for tourist boats, an anchorage for yachts and boats, as well as an ethnic village to accommodate tourists.

At Srebrno Jezero (Silver Lake), the Silver Lake Investment Company has already started investing in the construction are two high class hotels - Danubia Park Hotel (4-star) and Luxury Hotel (5-star), as well as luxury apartments and villas, sports and recreational facilities with dedicated courts, moorings on the bank of the Danube, a commercial zone on the lake, a promenade, groomed river banks, ponds and more. An emphasis has also been placed on golf courses that will cover dozens of hectares and will fully meet professional golfing standards\(^9\). This is the first private sector master plan within the tourism sector in Serbia. The MP Lower Danube includes the construction of this resort as an objective.

The Master Plan of the Cultural-Historic Route “Way of the Roman Emperors (Felix romuliana)” aims to connect several cultural attractions. Within the territory of the Lower Danube region are the following sites from the route: Viminacium Traiana, Diana, Trajan’s Bridge and the museum in Kladovo. Investments are planned in all of these locations. With the exception of Viminacium, other points on the Roman emperors’ route through this region do not feature basic tourist infrastructure. In Viminacium, plans for construction include a hippodrome for chariots, an amphitheatre and a channel that would facilitate ships’ access to the site, straight from the Danube. Trajan’s Tablet should get, in addition to the basic infrastructure, a stone stairwell for access to the table and a...
panoramic elevator. Trajan’s Bridge will get, in addition to a tourist information centre, a laser hologram providing a 3D view of the former appearance of the bridge over the Danube. The total value of all planned investments in this region is 4.3 million EUR.

The Master Plan Lower Danube also plans for investments in the renewal of downtown urban settlements along the Danube, as well as in the city buildings’ facades that can be seen from the water. In addition to the above, to boost the rural tourism offer, investments in the villages of the region are planned.

**4.4.18c Pressures of the Tourism Sector on the Environment**

The current state of the tourism sector is such that, with the present tourist turnover, it does not exert any particular pressure on the environment. The impact coming from tourists is combined with the impact exerted from the local population and is primarily related to water and soil pollution due to insufficiently developed municipal infrastructure (sewage and garbage). A special issue is the one of cottages that were built illegally and which, in addition to their adverse impact on the look of the landscape, do not have the proper public utility infrastructure.

The greatest investment and the most significant change in the area is the construction at Silver Lake Resort. Given that this is an exclusive convention, sports and recreation tourist centre, a special emphasis in planning was dedicated to the protection of nature. Silver Lake Investment Consortium is planning to run for the role of manager of waters, in order to protect the water as the most important resource of its tourist offer.

Other tourism investments in the region and which are, according to the plan, accompanied by the construction of the corresponding municipal infrastructure, should not have a significant negative impact on the quality or appearance of the environment.

**4.4.19 Sustainable Tourism in the Region**

The Đerdap National Park occupies 23% of the territory of the Lower Danube region and extends along the entirety of the Đerdap Gorge. It has a recognised environmental protection status and the natural-cultural characteristics of the Park attract tourists inclined toward preserved nature.

Some potential for sustainable tourism in the Park already exists (walking and biking trails, look-out points, bird watching observation posts and the availability of trained guides) but these are still insufficiently developed and not integrated into the general tourism offer. For tourists who want to enjoy this authentic environment, there are a number of accommodation facilities with fewer beds located in the villages within the territory of the Park.

A Strategy for Sustainable Tourism Development in Đerdap National Park establishes the priority of the joint action of all stakeholders related to the National park, along
In the interview mentioned above, it was stated that local residents are “involved in providing accommodation whenever needed.” It was also noted that the potential for sustainable tourism in surrounding villages exists but that it is not yet adequately functioning as sustainable tourism.

In respect to the development of tourism within the management of this National Park, clearly one of the main challenges is the systematic and organized involvement of local residents in tourism plans and development. Currently, there is no planned capacity development program projected for this target group in the Park management documents. The research results previously mentioned, confirm that managers of protected area consider the lack of environmental awareness of the local community to be one of the main issues preventing efforts to run the area in a more sustainable fashion. It is clear that actively involving communities in decision making and in conducting activities is recognised as significantly important, and this is further endorsed by a representative of the PE NP Djerdap who was one of the respondents to this study. Having in mind the lower education levels of population of this region and the lack of development opportunities, the development of the capacities of the local community and all its stakeholders is vital to a sustainable future. Sustainable rural tourism should play an important role in this process.

Cooperation with LTO exists, but mainly in terms of promotion and outreach and not in terms of the planned joint development of rural tourism in and around the Park area. Of course,
the perennial problem of funding is evident here, as it is for other protected areas in Serbia, but the issue needs to be addressed.

At the strategic level – as recognized by the Sustainable Tourism Development Strategy (PE NP Djerdap and Young Researchers, 2010), within documents such as the National Tourism Strategy (2006), there is no mention of “sustainable tourism”, a fact that doesn’t help promote and build capacities for this activity in practice at all levels and by the various stakeholders.

Clearly the potentials of the PE NP Djerdap to play a significant role in improving local capacity is significant. Some of the actions include:

Cooperation with national experts and scientific institutions may strengthen the capacities of the Park staff and their vision of sustainable rural tourism, which can contribute to their more competent and systematic work with local communities and stakeholders.

As (the only) Serbian representative in the Carpathian network of protected areas, they are involved in projects and activities related to the implementation of the Carpathian Convention.

As an active member of the Europarc Federation, the PE NP Djerdap, together with the national institutions (the Ministry for Environment Mining and Urban Planning and the Institute for the Protection of Nature) and the National Tourist Organization, hosted last year (June 28 – July 1, 2011), the meeting on “Sustainable Tourism in Protected Areas – Building Bridges, Seeking Solutions”, under the umbrella of the Federation’s ‘Sustainable Tourism Charter. Some of the workshops and discussion within the session were devoted to motivating local businesses and communities to get involved in tourism development – as a mechanism of social cohesion and local development. Contributing to the implementation of the EU Strategy for the Danube Region, the PE NP Djerdap is involved in the Danube Competence Centre (DCC), established as an association of members from the public, private and non-government sectors, to contribute to the development of the sustainable tourism sector in the Danube region through initiating and implementing relevant projects, building capacities of the tourism stakeholders and promoting high-quality standards of tourism services/products. DCC is the main implementing partner in the regional project supported by the German Federal Ministry of Economic Cooperation and Development (BMZ), working through its agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on the enhancement of cross-border tourism cooperation in the Middle and Lower Danube regions/communities of Croatia, Serbia, Romania, Bulgaria, Moldova and Ukraine.

Other involvement of the Park management in international cooperation, has contributed to improvements in staff competences through seminars and workshops, such as Training for eco tourism held in Japan (through the Japanese Agency for International Cooperation JICA or the workshops organized by the partners (UNDP) of this, Sustainable Rural Tourism Development Project – on Leader principle and methodology and the role of LAGs.

24 http://www.carpathianparks.org
25 www.carpathianparks.org
26 http://npdjerdap.org/pdf/VII_European_Charter_Network_Meeting
Increased awareness and capacity of the Park staff through the activities of cooperation mentioned above should lead to their more strategic and effective role in involving local community in sustainable rural tourism activities in this Region.

Conditions for the development of sustainable tourism also exist outside of the national park, especially for ethnic and rural tourism, in the villages of the municipalities of Majdanpek and Kladovo. Because of the large number of interesting speleological formations, especially on the mountain Miroč, organized visits of foreign speleologists to the non-adapted caves would have potential. For the time being, they are visited only by Serbian cavers who are sometimes accompanied by their foreign guests.

Education programs designed to meet the needs of the local population and tourist organizations for the sake of the development of sustainable rural tourism is needed across entire region.

Tourism in Požarevac is based mainly on the cultural life of the city. Several buildings have been built on Tulba Hill near Požarevac to promote the architecture traditional to this part of Serbia. Revitalization in parts of the city and further construction of traditional buildings could serve to support the further development of tourism.

The tourism offering of the Municipality of Golubac is focused on the Danube, the Iron Gates (Danube), Đerdap National Park, the Fortress of Golubac and numerous historic monuments. Rural tourism is not very developed, although it has excellent potential...
due to the possible demand associated with cycle routes and the National Park. Currently the village of Dobra, for example, has only one household with tourist accommodation. Guests are mostly bicyclers who ride through this part of the Iron Gates.

Tourism in the municipality of Veliko Gradište is focused on the river Danube and Silver Lake (an ox bow lake). Private accommodation, as well as other accommodation facilities, mainly accommodates water tourism, so it cannot be classified as a classical rural tourism offer.

The City of Majdanpek has a rich tourist offering and good tourist organization. Advertising campaigns are better than in many other municipalities of this region. The village of Rudna Glava stands out in rural tourism since it has five households in its offering. Also, there are the villages of Obljaga Mare, Golubinje and Crnajka. The area includes excellent nature resources such as the geo-morphological values of limestone relief and the Iron Gates (Danube).

The municipality of Kladovo organizes its offer around Đerdap National Park and a rich historical inheritance that includes Trajan Board, the remains of Trajan’s Bridge, Fetislam Fortress and Đerdap Hydroelectric Power Station. The Brza Palanka ethno complex is situated in Brza Palanka, near the Danube boardwalk. It includes a permanent exhibition which contains kitchenware, tools, folklore costumes and other trails of material culture. The village of Petrovo Selo was founded by pilgrims in the 19th century. It is a characteristic Miroč settlement with a preserved ambient identity, but it is not used for tourist development purposes.

The municipality of Negotin has ten villages within its rural tourism offering. These are: Rajac, Rogljevo, Braćevac, Tamnić, Popovica, Šarkamen, Čubra, Sikole, Kovilovo and Radujevac. Their offer is enriched with natural assets. The most significant are forms of limestone relief, the mountain of Deli Jovan and the Danube banks. Rajačke Pivnice has the greatest rural and ethno-tourism potential with a unique architectural complex of wine cellars.

4.4.20 Conclusions and Recommendations:

The following environmental issues and their management and or development are important indicators and contributors to the future sustainable success of the region in general and to sustainable tourism development in particular.

Landscape - The landscape plays an integral part in the identity, economic activity and attraction of this region. Three prominent natural borders characterize this region. Its northern and eastern borders are marked by the river Danube. The western border lies on the river Morava, while the southern border lies along the northern slopes of the mountains of Deli Jovan, Mali Krš and the Homolje Mountains. The Lower Danube Region spreads across three natural complexes: the rim of the Pannonian Basin, the Carpathian Mountains of Eastern Serbia and the rim of the Vlach-Pontian basin. The Danube River, one of Europe’s most important rivers, courses through the Lower Danube region, with numerous natural and cultural assets including cave systems, gorges, lakes and remnants of historical settlements. In addition
to the Danube, there are several more major rivers in the Lower Danube region such as the River Pek. The Lower Danube Region is one of the most densely forested areas of Serbia with more than 60% of the area covered by forests. With a total of 132,000 ha of forests, this region represents 7% of the total forested area of Serbia. **Recommendations:** As awareness grows of the need to protect and conserve the natural and cultural assets of this region, there is an increasing demand to create holistic and inclusive structures so that more of the population can benefit from this landscape in a sustainable fashion and so that natural and cultural assets are given the protection they deserve.

**Demography** - High levels of rural-urban migration have and are continuing to take place. The largest population decline of 12% is noted in the municipality of Majdanpek, while only in the municipality of Požarevac has the population not undergone significant change. The average population density is below the national average. The distribution of settlements indicates that the Danube banks are under the greatest urbanisation pressure. **Recommendations:** Rural Development Plans need to be comprehensive in their approach and not only put forward actions to reverse this migration, but also stimulate economic activity in rural areas that is sustainable over the long-term.

**Waste and Recycling** - On average, this region is a marginally better than in Serbia generally in terms of waste collection. Two recycling centres in the region – in Požarevac and Majdanpek are planned. Waste, however, is collected and disposed of to inadequate landfills that do not meet basic standards. Hazardous waste is disposed of in landfills. Illegal dumpsites exist all over the region, even in the protected areas, and no accurate data exists regarding the quantities and composition of the waste generated in the region. Public utilities service all communal services, not only waste, which significantly reduces the efficiency and effectiveness of waste collection and treatment since there is a dependence on local policy and monopoly. Without competition there is no drive to improve services.

Public utilities do not pay for waste disposal and do not have any interest in changing the situation.

Public utilities operate waste management at a loss, as it is priced as a communal service, within the social category. **Recommendations** - One of the main drivers of sustainable and proper waste management is ensuring sufficient funding for operating expenses.

Harmonize the level of fees for waste collection to ensure sustainable services. Bearing in mind the sensitivity of issues related to public utility services and the poor economic situation, a new pricing system should be gradually introduced.

Public utilities lack proper equipment, enough containers for waste collection, and the funds to remediate non-sanitary landfills.

A strong need exists for private sector involvement in the waste management system and for the development of public-private partnerships. Careful consideration should be given to the experiences of the municipality Gradiste in this regard.
Generally, there is no organized system to strengthen the capacity of the local community and the development of public awareness related to problems and solutions for sustainable waste management. NGOs are involved in projects on recycling, but in most cases in schools and kindergartens, there are no seminars related to recycling or waste management. It is essential that local government and public utilities include in its plans public awareness campaigns, in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have unique problems related to organic waste and certain kinds of hazardous waste such as the packaging of pesticides.

Organizing the regional cluster and its activities can help in waste minimization and reuse; the level of recycling; waste collection and treatment and the provision of a functional and updated database on recycling at the regional level; the establishment and development of special training programs and capacity building of cluster members; advocacy for the health and social protection of individual collectors of recyclable materials; improve the status and protection of the rights of marginalized social groups; and increase the influence of public opinion.

Local communities should prepare projects on the remediation of polluted protected areas, sites and rivers, and apply for funding from available sources.

**Biodiversity** - The region is predominantly rural, with a great number of villages, of which only 20% have been declared as urbanized towns, mostly those located along the Danube shoreline. More than 50 mixed forest and shrubby communities have been registered, of which 35 are of relic character. The rich and unique flora and fauna of this region is protected in National Park Đerdap. **Recommendations**: Protection of biodiversity cannot be left to the sole responsibility of National Parks, as islands surrounded by an increasingly depleted environment. A comprehensive strategy, supported by national policy, needs to encourage the protection of biodiversity and the enhancement of diversity in all activities that engage with the natural environment.

**Protected Areas** - Djerdap National Park is the largest and the most important from the perspective of both its natural and cultural values. **Recommendations**: Clearly the potential of the PE NP Djerdap to play a significant role in improving local capacity is significant. Some of the actions include:

Cooperation with national experts and scientific institutions, may strengthen the capacities of the Park staff and their vision of sustainable rural tourism, which can contribute to their more competent and systematic work with the local community and stakeholders.

The only Serbian representative in the Carpathian network of protected areas, this organization is involved in projects and activities related to the implementation of the Carpathian Convention.

As an active member of the Europarc Federation, PE NP Djerdap participated in the meeting on “Sustainable Tourism in Protected Areas – Building Bridges, Seeking Solutions”, under the umbrella of the Federations’ Sustainable Tourism Charter. Some of the workshops and discussion

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Because of the large number of interesting speleological formations, especially on the mountain Miroč, organized visits of foreign speleologists to the non-adapted caves offer particular potential. For the time being, they are visited only by Serbian cavers who are sometimes accompanied by their foreign guests.

Education programmes designed to meet the needs of the local population and tourist organizations in order to develop sustainable rural tourism is needed throughout the entire Region.

**Air** – Pollution is an issue but not a major concern. In fact, there appear to be no formal structures to measure or abate the situation. **Recommendations:** Put in place a comprehensive monitoring system covering the entire region or at least its hotspots.

**Water** – The Danube and its tributaries represent the main sources of surface waters for the region, unlike the other regions of this study which rely heavily on groundwater. Although the Danube tributaries have excellent water quality, all municipalities’ water is directly impacted by mining and waste water pollution from industrial and urban sites. Construction of the hydroelectric power plant on the Danube and the formation of the large Đerdap Lake has caused a significant change in the environment of its shoreline. These are reflected in permanent changes in the water ecosystem of the lake as well as in its ecosystem. The degradation of the water quality in the reservoir is largely a result of excessive inputs of organic matter and waste from the upstream part of the basin. A large part of these pollutants, due to the reduced water

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29 www.carpathianparks.org

flow, accumulate at the bottom of the lake. **Recommendations:** Consideration should be given to analyzing all facilities and activities which directly and indirectly impact the quality of all water systems in the region and develop a programme to reduce, mitigate, abate and prevent pollution in the near future. Overcoming these issues, possibly with the support of the EU Water Frameworks Directive, will provide confidence to the tourism industry as well as support for the expansion of tourism products.

**Soil** - Soil is directly threatened by degradation from open coal-pits and mineral resources excavation (in Kostolac and Majdanpek) and pollution from thermal power plants in the Kostolac lignite basin (the worst comes from the fly ash landfill), as well as from copper pollution in the mining basin Majdanpek (the worst comes from disposal of the mining by-products and the tailing pond Valja Fundata). Furthermore, the soil is affected by drought, erosion, and the uncontrolled application of agrochemical substances, while the hilly and mountain areas of the municipalities remain mainly unaffected by soil pollution. **Recommendations:** Similarly to water, a comprehensive programme to identify hotspots and put in place remedial actions as well as soil conservation programmes are needed. These can be supported by a number of EU programmes.

**Employment** – The working-age population share of 65 % is slightly below the Serbian national average, while the share of population over age 65 is 17 % and is equivalent to the Serbian average. By sector, most employees in the region were engaged in the public sector – 28%, industry employs 22%, these figures particularly reflecting employment in Majdanpek and Kladovo. The region of Lower Danube has no significant agricultural sector at 3% employed. Tourism employs about 2%.

**Recommendations:** Supporting the development of sustainable rural tourism will provide this area with a number of advantages, not least of which is the opportunity to reduce rural-urban migration and to expand the rural economic base, as well as to support structures for environmental conservation.

**Transport** – The region is relatively well served by a number of forms of transport. Unlike the other regions, river transport has an important role. **Recommendations:** The region has the capacity to develop a number of forms of sustainable tourism transport, such as additional cycle routes, river transport and walking trails between towns. Integrating public transport and aligning it where possible with tourism needs would be a significant step forward.

**Energy** - The Lower Danube Region is the second most important electricity production area in Serbia. The most important producers of electricity are the hydropower plant Đerdap (Eng.: Iron Gate) I, and the thermal power plants Kostolac A and Kostolac B. Both have caused significant environmental impacts. Wood is being increasingly used for heating homes and natural gas distribution infrastructure is not developed. Significant potential exists for harnessing wind energy, but there is only scope for a few small-scale hydroelectric plants. **Recommendations:** Establish comprehensive pollution control, carbon management and environmental management systems.

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**Industry** - the economic development of this region, from the mid-1950s, has been largely based on the development of mining and the related metal-processing industry of copper, magnetite, lead and zinc concentrates as well as providing manufacturing services. Industrial production in the region failed to recover from the sharp drop in investments during the 1990s and mining has failed to remain competitive. This is especially true of the manufacturing industry in the municipalities of Veliko Gradište and Požarevac, which are primarily based on the processing of agricultural products. Successfully privatized enterprises are in a significantly better position and include companies involved in health-food production, transport, and bread-making amongst others. All these companies are located in the municipality of Požarevac.

**Recommendations**: With the increasing international demands for the inclusion of environmental performance, all future industry and privatisations need to incorporate environmental governance and international best practice.

**Agriculture** - Agriculture plays a more important role in the economic structure of Veliko Gradište and Požarevac than in the other municipalities of the region. In Majdanpek, for example, agricultural land barely exceeds 20% of the total area of the municipality.

**Recommendations**: Like all rural areas of Serbia, this region could benefit from a comprehensive approach to rural development that includes and coordinates the agricultural population in sustainable rural tourism so as to expand income generating possibilities.

**Forestry, Hunting & Fishing** - The Lower Danube Region is one of the most densely forested areas of Serbia with more than 60% of the area covered by forests. With a total of 132,000 ha of forests, this region represents 7% of the total forested area of Serbia. Fishing already contributes to the economy and hunting grounds are established both within the National Park and on private lands. **Recommendations**: All three of these activities need to ensure that they follow international best practice in regard to sustainability. Not only to ensure long-term viability and economic contribution, but also to be able to open and expand markets as well as attract visitors.

**4.4.21 Conclusions and Recommendations for sustainable tourism development of the Lower Danube**

The main elements of the development of sustainable tourism in this region are related to encouraging greater numbers of transit tourists to stop in the area, improving the infrastructure at tourist sites, further developing good quality accommodation facilities, and marketing and promotion of tourism.

The construction of additional docks for tourist boats on the International waterway Pan-European Transport Corridor No. 7, and broadening the offering for cruise tourists is a priority. Attracting tourists who cruise on the Danube for a shorter or longer period of stay would have a positive impact on the overall development of small business in the region. It would directly stimulate the opening of restaurants, shops with souvenirs and a variety
of other goods, tour guide services, and bring an increased demand for products from the surrounding villages. Construction of new accommodation facilities could significantly contribute to the reduction of unemployment in the region. Recommendations:

Consider impacts of cruise tourism by analysing and comparing experiences of states facing similar issues and make plans to mitigate negative impacts.

Establish mechanisms to support local produce production.

Attempts to attract tourists for longer stays apply to the transit tourists coming on the Đerdap main road, by car or by bicycle. Car camping is available only at Šrebrno Jezero (Silver Lake). Deployment of several well equipped camps would increase the supply, competition and choices. In addition, the infrastructure for the bike route EuroVelo 6 is not developed sufficiently, but beyond the need for good signage and maps, the persistent problem is that bicycle route uses the main highway, and that road itself does not meet the required quality. Recommendations: This should be part of a comprehensive infrastructure improvement plan.

Investment in infrastructure has increased over the past decade but there is a lot that needs yet to be done. Recommendations: Particular attention should be paid to the construction or improvement of the support infrastructure, such as car parks, toilets, info desks, info publications, signalling and souvenir shops. This needs to be done as part of a comprehensive infrastructure improvement plan to negate a piecemeal approach and include the considerations of all stakeholders.

Development of accommodation facilities should not only be directed toward building new ones. The existing facilities to a large extent do not meet the standards of accommodation and therefore should be improved and graded. Increasing the number of rural households who want to be involved in rural tourism, especially in the territory of the national park and its vicinity, would set a strong base for sustainable tourism development. Recommendations: Commence the development of community focus groups to establish issues in regard to the development of rural tourism and set up an action plan.

The region is extremely rich in preserved nature. The development of tourism based on protected areas and sustainable activities in them should be a priority for the national park. Also important is the better promotion of existing and future tourism. Recommendations: The establishment of (currently non-existent) cooperation between the National Park and tourist operators in the region is a priority for the formation of a unified and coordinated tourism offering so that the NP can act as a catalyst/driver for sustainable tourism development.

Existing cooperation with national and international organizations in the field, as well as investment in tourism infrastructure (visitor centre, trails) within the NP Đerdap and its vicinity provides a strong basis for further work of the PE management and staff. Recommendation: Put in place arrangements for ongoing strategic improvement of partnerships with local stakeholders on rural
tourism development. An organized program of their capacity improvement, including such staff skills as writing project proposals and managing projects are some of the mechanisms to contribute to this process.

Most of the caves and sinkholes of the region are located in the NP Đerdap. Recommendation: it would be desirable for the development of caving tourism to follow the example of sustainable caving tourism in NP Aggtelek in northern Hungary.

The concept of organic production of food is neither sufficiently known nor entirely clear to local food producers. Recommendation: Specific training of farmers, but also the demand for these products and local produce in general from local hotels and restaurants, would provide an additional opportunity to increase production.

The level of tourism skills, whilst increasing, needs further support. Recommendation: Education programmes designed to meet the needs of the local population and tourist organizations oriented towards the development of sustainable rural tourism is needed across the entire Region. This could be part of a national or regional initiative.

The potential for sustainable tourism development in surrounding villages exists, but is not yet adequately expressed or considered in current plans. Recommendations: assess the opportunities, requirements and approaches necessary to maximize this opportunity.
4.5 Eastern Serbia

GEOGRAPHICAL FEATURES OF THE REGION OF EASTERN SERBIA

4.5.1. Location

The region of eastern Serbia used in this study is much narrower than the eastern region of Serbia as it is usually defined. This study is limited to the municipalities bordering Bulgaria and Romania, namely Negotin, Zaječar, Knjaževac, Pirot and Dimitrovgrad. Towards the east, the border with Bulgaria extends along the mountain ridge of Stara Planina, the lower flow of the Timok River and partly along the Danube. The southern slopes of the mountain Miroč create its northern border, while the western border lies along the mountains of Deli Jovan, Tupižnica, Tresibaba and the eastern part of Suva Planina. The entire surface of the region is 5075 km², while the official data on population given in the table below are from 2002.

The municipalities of this region belong to three different administrative districts – Bor, Zaječar and Pirot.

Table 4.5.1

<table>
<thead>
<tr>
<th>Crest</th>
<th>Municipality</th>
<th>Region</th>
<th>Area [km²]</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pirot Crest]</td>
<td>Pirot</td>
<td>Pirot</td>
<td>1,232</td>
<td>63,791</td>
</tr>
<tr>
<td>![Dimitrovgrad Crest]</td>
<td>Dimitrovgrad</td>
<td>Pirot</td>
<td>483</td>
<td>11,748</td>
</tr>
<tr>
<td>![Knjaževac Crest]</td>
<td>Knjaževac</td>
<td>Zaječar</td>
<td>1,202</td>
<td>37,172</td>
</tr>
<tr>
<td>![Zaječar Crest]</td>
<td>Zaječar</td>
<td>Zaječar</td>
<td>1,069</td>
<td>58,547</td>
</tr>
<tr>
<td>![Negotin Crest]</td>
<td>Negotin</td>
<td>Bor</td>
<td>1,089</td>
<td>43,551</td>
</tr>
</tbody>
</table>

4.5.2. Landscape

Within eastern Serbia, the most prominent geographical features are Stara Planina (Old Mountain) and the valley of Timok. It also includes a special complex consisting of the Deli Jovan, Sto, Tupižnica and Tresibaba mountains, the Knjaževac and Zaječar basins and the Nišava river valley.

Stara Planina Mountain dominates the terrain of the region, extending from Dimitrovgrad in the south to Vrška Ćuka in the north, and covering 100 km. It forms the final section of the Balkan mountain range that stretches from the Black Sea along the entire length of Bulgaria.

The terrain of Stara Planina is much dissected, and the numerous mountain streams enrich the landscape features. A number of peaks exceed 1700 m. The highest peak is Midžor at 2169 m.

In the basin of the Nišava River there is another large gorge, created by the Jerma River on its way through the Vlach Mountains. The Nišava passes through several straits itself as it flows through this region.

In the northern part of the region, special attention should be given to the Zamna River that, descending from the slopes of Deli Jovan, has cut a canyon through the limestone. The Zamna river bed features large erosive hollows, which gives it an especially attractive look.

The Zamna River and the nearby Vratna River, flow through a narrow limestone bed, creating several unique formations – natural stone bridges were formed in places where the river once ran underground, caused by ceiling collapse of the short flow-through caves. Three such formations along the Vratna River particularly stand out for their beauty. The highest of these bridges rises more than 20 m above the river and is about 15 m wide.

The region of Eastern Serbia features many areas of limestone, but they are not as rich as in other parts of Serbia (Kučaj, Beljanica, Rtanj). However, karst erosion has formed Underground terrain formations, and in the Zamna river valley a number of caves, some of which are over 1000 m long, contain rich natural cave decorations. The icy caves of Tupižnica are interesting because the low temperatures in them persist even during the summer months. The most interesting speleological feature in this part of Serbia is the recently discovered gigantic hall in the Odorovačko karst field. Speleological research of this cave is still underway.
4.5.3. Climate
Given the meridian direction of the region and the features of its terrain, this region belongs to two climatic complexes. The first climatic complex includes the Timok valley from Knjaževac to Negotin. This is the most continental area of Serbia, with the highest average temperature of 23.2°C being recorded in Negotin. This climatic region is characterized by frequent anticyclones, which cause the snow cover in winter to be retained longer here than in other parts of the country. Annual precipitation ranges between 600 to 700 mm.

The other climate complex includes Stara Planina where the mountain range rises to 1200 and 1800 m, it is covered by a cold belt with a snowy boreal mountain climate average annual temperatures from 4 to 7°C and 950-1100 mm of precipitation. Above the tree line, where the range rises to between 1700 and 2000 m, there is a transitional sub-alpine zone with mean annual temperatures from 2.5 to 4°C and 1000-1150 mm of rainfall.

Several floods in the municipalities of Zaječar and Knjaževac occurred in 2010. Detailed analyses are required to relate the sudden floods of Beli Timok and Crni Timok (and other rivers in Serbia) to climate change.

4.5.4. Demography and Settlements
The municipalities listed below occupy an area of 5080 km². Problems of population decrease are common to all these municipalities. This is a consequence of both a low birth rate and a high emigration rate. The development of rural tourism may contribute to efforts aimed at reversing this unfavourable process by generating rural economic opportunities.

Sparse settlements within this region indicate limited pressure on the environment from urbanisation. In fact deserted villages are becoming common place and the dominance of the natural environment is a potential driver of rural tourism development in the future.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Area (km²)</th>
<th>Number of Settlements</th>
<th>Population 1991</th>
<th>Population 2002</th>
<th>Density (individuals/km²)</th>
<th>Population change(‰)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knjaževac</td>
<td>1202</td>
<td>86</td>
<td>43 551</td>
<td>37 172</td>
<td>30.9</td>
<td>-14.6</td>
</tr>
<tr>
<td>Negotin</td>
<td>1089</td>
<td>39</td>
<td>50 139</td>
<td>43 418</td>
<td>39.9</td>
<td>-13.4</td>
</tr>
<tr>
<td>Zaječar</td>
<td>1069</td>
<td>42</td>
<td>71 076</td>
<td>65 969</td>
<td>61.7</td>
<td>-7.2</td>
</tr>
<tr>
<td>Dimitrovgrad</td>
<td>483</td>
<td>43</td>
<td>13 334</td>
<td>11 748</td>
<td>24.3</td>
<td>-11.9</td>
</tr>
<tr>
<td>Pirot</td>
<td>1232</td>
<td>72</td>
<td>67 113</td>
<td>63 791</td>
<td>51.8</td>
<td>-4.9</td>
</tr>
</tbody>
</table>
ENVIRONMENT

4.5.5. Air
The municipalities in Eastern Serbia are exposed to emissions of sulphur dioxide and nitrogen oxides from neighbouring regions (mainly from the industrial complex in Bor). However, the available data for the period 1995-2009 indicate that the urban territories of Negotin, Knjazevac, Pirot, Dimitrovgrad and Zaječar have good air quality, since the greatest daily concentrations of SO₂ and nitrogen oxides have never exceeded daily permissible limits. The air quality in rural areas surrounding these cities is even better.

4.5.6. Water
The Danube and Timok Rivers, along with the tributaries of Crni and Beli (Black and White) Timok, are the main rivers of this region. Rich karst springs and pure rivers are characteristic of this mountainous region of eastern Serbia. The total length of the Timok River, from its source to its confluence into the Trgoviški Timok, to its confluence into the Danube is 201 km.

Most of the streams that flow down Stara Planina descend on a steep gradient, are torrential in character and possess significant erosive power. More than 57.5 percent of the Trgoviški Timok's basin is affected by medium and strong erosion.

The river Nišava flows through the southern part of the region. It is the largest tributary of the Južna (South) Morava. During its course through the Pirot valley, the Nišava is channelled and protected from flooding by means of embankments. The waters of its left tributary, the Jerma, have in part been artificially redirected to the basin of the Vlasina River for hydropower.

Zavojsko Lake, near Pirot, was created by damming the river Visočica after a large landslide created a natural dam that was later reinforced. The water from the lake is now used for electricity production.

Several thermal springs are located in this Region. The most famous are those in Gamzigradska Banja (Spa), and Zvonačka Banja but there are also some located near Knjaževan (Rgoška Banja) and Pirot (Dag-banjica). The water temperature of these thermal springs ranges from 28 to 42 °C.

The Danube, the Timok and their tributaries of Crni Timok and Beli Timok are the main rivers of this region. While powerful karst springs and pure rivers are characteristic of the mountainous region in east Serbia, the main rivers, Timok with its tributaries and Nišava, are polluted downstream where they pass through larger urban territories.

Significant volumes of groundwater are present only in the area’s valleys and basins. In the Timok basin, there are several horizons of artesian groundwater, which feed artesian wells at depths of 210 m in Negotin and 110 to 320 m in Zaječar. A smaller artesian basin exists in the valley of the Beli Timok (there is an artesian well 320 m deep in Minicevo). The water in all the artesian wells is of good quality, but they are limited in that the outflow is not able to satisfy demand.

The water quality in the river valleys of the municipalities of Negotin, Zaječar and Knjaževac are of an acceptable water quality. The water from the Danube falls in the quality range of from class II to class III. While the quality of parts of the Timok, Trgoviški, White Timok and Nišava rivers range from II/III to beyond-classification. Of particular concern is the Grlište River (Zaječar) which has been polluted by the Lasovacka and Lenovačka rivers, as well as by surrounding soil erosion, uncontrolled use of agro-technical measures on arable land and unplanned construction of second homes on the lake’s shores. In the mountains most rivers are in the high I and I/II water quality classes (The Crni Timok upstream of Zaječar and the watercourses in the mountain areas upstream of Pirot, Dimitrovgrad and Knjaževac). Downstream of the larger villages, the river water quality deteriorates to class IIa or IIb, while the Temštica river drops to the III class downstream from the Temštica village. It is clear that water management, especially waste water management, is in need of review as all urban conurbations mentioned appear to significantly reduce the quality of the water that passes through its municipality.

Acknowledgement of the need to deal with the situation has seen the first waste water treatment plant being installed in Pirot.

### 4.5.7. Soil

The Carpatho-Balkan Mountains with the Timok Basin are mainly composed of marls, sands, shales, karstified limestones, gneiss, andesite, dacite, and other rocks. Deposits of loess and sand are present in the so-called Danube Bend. Fertile soils (smonitzas, fluviosols

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>Population covered by waste collection</th>
<th>Population covered by waste collection (%)</th>
<th>Waste generation (t/year)*</th>
<th>Waste collection (t/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pirot¹</td>
<td>57911</td>
<td>39804</td>
<td>68.7</td>
<td>18416</td>
<td>12658</td>
</tr>
<tr>
<td>Dimitrovgrad¹</td>
<td>10056</td>
<td>8636</td>
<td>85.9</td>
<td>3198</td>
<td>2746</td>
</tr>
<tr>
<td>Zaječar²</td>
<td>58547</td>
<td>36830</td>
<td>62.9</td>
<td>18618</td>
<td>11712</td>
</tr>
<tr>
<td>Knjaževac²</td>
<td>30902</td>
<td>18538</td>
<td>60.0</td>
<td>9827</td>
<td>5895</td>
</tr>
<tr>
<td>Negotin³</td>
<td>36879</td>
<td>15917</td>
<td>43.2</td>
<td>11728</td>
<td>5062</td>
</tr>
<tr>
<td><strong>Ukupno</strong></td>
<td><strong>194.295</strong></td>
<td><strong>119.725</strong></td>
<td><strong>61.6</strong></td>
<td><strong>61.786</strong></td>
<td><strong>38.703</strong></td>
</tr>
</tbody>
</table>

*Based on the data on average waste generation per capita

Table 4.5.2: Waste generation and collection in Eastern Serbia

(Pirot District, Zaječar District, Bor District

and eugleys) are distributed in the plains, hilly regions and valleys. Lime dolomite black soils, lithosols and rendzinas, rankers and distric cambisols dominate in the higher mountains. Soil is threatened by pollution from mining in the municipalities of Zaječar and Negotin (alluvial coastal farmlands of the Veliki Timok, lying downstream of the confluence of the Bor and Krivelj rivers), by industries of the municipalities of Negotin, Zaječar and Knjaževac, by erosion and drought, and by uncontrolled usage of agrochemicals in the plains and lower hill areas.

Table 4.5.3

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Number of Settlements</th>
<th>Number of cleaned sites 2009-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pirot</td>
<td>72</td>
<td>131</td>
</tr>
<tr>
<td>Dimitrovgrad</td>
<td>43</td>
<td>42</td>
</tr>
<tr>
<td>Zaječar</td>
<td>42</td>
<td>139</td>
</tr>
<tr>
<td>Knjaževac</td>
<td>85</td>
<td>86</td>
</tr>
<tr>
<td>Negotin</td>
<td>39</td>
<td>435</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>251</strong></td>
<td><strong>833</strong></td>
</tr>
</tbody>
</table>

4.5.8. Waste

In the municipalities of Pirot, Zajecar, Dimitrovgrad, Knjaževac and Negotin waste collection and disposal are the responsibility of public utilities established by local government. It is a characteristic of all municipalities in the region, and of most municipalities in Serbia, that there are no weighbridges at landfills. All data regarding quantities and waste composition are based on the assessment of average waste generation per capita. The table 4.5.2. provides data on waste generation and collection in these municipalities.

Hazardous waste is disposed into landfills without any controls. These landfills do not meet basic sanitary and technical conditions, and with no removal of landfill gas, gas explosions and fires are not uncommon. For example, the landfill in Negotin has been in use since 1959 without any pollution control measures and the landfill in Knjaževac is located just 700 m from the town centre and operates without any mitigation sanitary measures.

Rural settlements are not included in from waste collection, which results in local dumps or illegal landfills in most villages and along roads and rivers of the region. According to the data presented above, almost 23,000 tonnes of waste ends up every year at illegal dumps.

Many of these sites were cleaned up in the campaign “Clean up Serbia” (a one-day annual event) conducted over the last three years, but the sites have reappeared. In the table 4.5.3. the results of the campaigns during 2009 - 2011 are presented. The worst conditions are in the Knjaževac and Negotin municipalities where, in each, over 100 dumpsites exist.

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6 Ministry of Environment, Mining and Spatial Planning, Action “Clean up Serbia”

As the best solution for waste disposal, according to the National Waste Management Strategy and the Law on Waste Management ("Official Gazette RS", 36/09 and 88/10), the formation of regional sanitary landfills has been recommended and a regional sanitary landfill should cover the needs of 200,000 inhabitants. A regional waste management plan for the municipalities of Zajecar, Boljevac, Bor, Kladovo, Majdanpek, Negotin, and Knjazevac was adopted in November 2009.

As Zajecar has a central position in the region, it was decided to construct a landfill there, where the landfill "Halovo 2" will receive waste from the municipalities of Zajecar, Negotin and Knjazevac. Six transfer stations will be constructed. As part of the waste management plan, it was agreed that, the disposal and waste separation plant at the landfill should start simultaneously. Landfill construction will be completed by 2014, and after that all dump sites should be cleaned and remediated.

Waste from the municipalities of Pirot and Dimitrovgrad (and also from Bela Palanka and Babusnica) should be disposed of at the sanitary landfill "Muntina Padina". This landfill has been constructed according to the highest standards and all necessarily equipment has been purchased. Although completed recently, it still cannot be used because the municipal leaders Pirot, Babusnica, Dimitrovgrad and Bela Palanka, even after more than a year of negotiations, have not yet finally agreed on how it will be managed.

The construction of a transfer station in Dimitrovgrad will begin after the waste management assessment for the municipality is completed.

The following figure 4.5.1 presents the regional landfills and regional recycling yards that are envisaged by the National Strategy on Waste Management (2010) for this region.

**4.5.8.a Recycling**

At the landfill "Halovo", the public utility separates out waste tires and sells them to the cement factory "Holcim" which uses them as an energy source.

At the landfill "Halovo 2" in Zajecar, plastic, paper/cardboard, construction waste, bulky household waste, electrical and electronic waste, (collected by public utility or brought by citizens), waste tires, batteries, and hazardous domestic waste will be separated. Waste will be compacted and sold to recycling companies. The composting of garden waste is predicted as well.

The separation plant at the landfill “Muntina Padina” has been constructed according to the highest standards and all necessary equipment has been purchased. Although completed recently, it still cannot be used because the municipal leaders Pirot, Babusnica, Dimitrovgrad and Bela Palanka, even after more than a year of negotiations, have not yet finally agreed on how it will be managed.

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8 Regional Waste Management Plan for Municipalities Zajecar, Boljevac, Bor, Kladovo, Majdanpek, Negotin I Knjazevac, University of Novi Sad, Department for environmental protection, November 2009

9 Project on Solid Waste Management, Feasibility Study Pirot, Final Report - Municipal Infrastructure Agency Support Programme, November 2010
4.5.8.b Waste: conclusions and recommendations

The situation regarding waste collection in this region is one of the worst in Serbia. Only 60% of waste is collected, and it is disposed of to inadequate landfills that do not meet basic standards. Illegal landfills exist all over the region. The municipalities of Negotin and Knjazevac head the list with the highest number of illegal dumpsites.

It would seem that the level of waste collection in Serbia is directly linked to the level of industrial activity. As this region is one of the poorest in Serbia, there is almost no industry, and a network of collectors has not developed. The only collections are oriented to metal and textile waste.

There is no accurate data on the quantities and composition of waste generated in the territory covered by the municipalities. It should be possible to comply with legal requirements and install an thorough data collection process which then informs the establishment of a proper waste management system that would be implemented through the controls and pressure of the competent institutions.

A characteristic of the public utilities is that they work at all communal services, not only waste. The fact that local policy is not structured to promote competition leaves waste management as a monopoly with the typical characteristics of inefficiency. For example, the problem of the landfill “Munitna Padina”, is that while functional, it is not operating because the municipalities involved cannot find a way to cooperate after more than a year of negotiations. Public utilities do not pay for waste disposal.
and do not have any interest in changing the situation (the public utility in Negotin separately collects PET packaging and then dispose of it). In addition they operate at a loss, as the cost of communal services is categorised as a social service. One of the main drivers of sustainable and proper waste management is ensuring sufficient funding for operating expenses. It is necessary to harmonize the level of fees for waste collection to ensure sustainable services. Bearing in mind the sensitivity of issues related to public utility services and the poor economic situation, a new pricing system should be gradually introduced.

Public utilities do not have proper equipment, enough containers for waste collection, or funds for the remediation of non sanitary landfills. In order to sort out all these problems, there is a strong need for private sector involvement in the waste management system and the development of public-private partnerships in this field.

Generally, there is no organized system to strengthen the capacity of the local community and to development public awareness related to the problems and solutions for sustainable waste management. NGOs are involved in projects on recycling, but there is limited evidence of public awareness campaigns or schools programmes. It is essential that local government and public utilities in its plans include public awareness campaigns, in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have unique problems related to organic waste and to certain kinds of hazardous waste, such as the packaging of pesticides.

Organizing the region cluster and its activities could improve waste minimization and reuse; the level of recycling; waste collection and treatment and the provision of a functional and updated database on recycling at the regional level; the establishment and development of special training programs and the capacity building of cluster members; advocacy for health and social protection of individual collectors of recyclable materials; the status and protection of the rights of marginalized social groups; and the increased influence of public opinion.

Local communities could prepare projects on remediation of polluted protected areas, sites and rivers, and apply for support from available funds.

4.5.9 Biodiversity
The plain regions, as well as the large valleys are all used either for settlements or for arable land. Natural ecosystems primarily occupy the hilly and mountainous regions. Large areas of Eastern Serbia are covered by natural forests; termophilous forests (Quercion pubescenti-peae), and humid forests (Fagion). Meadow vegetation (vegetation classes Festuco-Brometea and Molinio-Arrhenatereta) has a fragmentary distribution within this region. Alpine meadows that belong to the vegetation classes Juncetea trifidi dominate at higher altitudes of Stara Planina Mt.

4.5.10. Protected natural areas
The rich flora and fauna of this region is protected within two large complexes. Stara Planina Nature Park is 486 km² and has 1190 floral species, of which 116 are endemic, as well as a rich fauna. The Jerma River Gorge is 68 km² and has 901 floral species, 77 of which are endemic, and a rich fauna as well.

*Nature Reserve Jerma* includes two distinct mountains, Greben Mountain and Vlaška Planina Mountain, as well as the largest section of the Jerma River, a tributary of the Nišava. Jerma is a unique complex of valleys and limestone gorges with cliffs more than 700 m tall, along with numerous caves, pits and boulders. The limestone massif Asenovo Kale, 1032 m high, dominates the entire area.

Of the 901 plant species recorded so far in the Reserve, 77 species are endemic or sub-endemic (*Pulsatilla montana* subsp. *bulgarica*, *Centauraea nyssana*, *Parietaria serbica*, *Eryngium serbicum* etc). Tertiary relics are also numerous, particularly among tree species that build a rich forest and shrubby communities.

Jerma Gorge is a habitat of global importance due to the existence of relic endemic pseudoscorpions (*Roncus strabor*, *Roncus sotiroyvi*), noble crayfish (*Astacus astacus*), stream frog (*Rana graeca*), crested newt (*Triturus cristatus*), golden eagle (*Aquila chrysaetos*), rock partridge (*Alectoris graeca*), Eurasian lynx (*Lynx lynx*), otter (*Lutra lutra*) and many other species.

*Stara Planina Mt.* is part of the Balkan mountain range, with one third lying in Serbia and two thirds in Bulgaria. The entire surface of the Nature Park is 142 219.64 ha, and it enters the administrative boundaries of four municipalities: Zajecar, Knjazevac, Pirot and Dimitrovgrad.

Its unique geological structure provides good examples of fluvial and karst erosions, which have led to the creation of genetically diverse relief features. Among its significant geo-heritage sites are the valley of the Bigar Stream, Babin Zub as well as the caves, Paklestica and Vladikine Ploce.

Stara Planina has one of the richest regions of flora in Serbia, with around 1190 identified plant species. In addition, it is one of the most important centres of Tertiary endemic relic and glacial relic species. The unique species of Stara Planina include *Campanula calycialata*, a local endemic of this mountain, and *Senecio pancicii*, a central-Balkan endemic, which in Serbia is present only on Stara Planina. Among the various forest and herbaceous communities, particularly interesting are the communities of mountain peat bogs in Jabučko Ravniste, Babin Zub, and in the region of Arbinje.

Numerous groups of animals are also present. To date, 116 species of butterflies, 18 species of amphibians and reptiles, 213 species of birds and 30 species of mammals have been identified. Stara Planina is the habitat for the long-legged buzzard (*Buteo rufinus*), the skylark (*Alauda arvensis*) and the woodcock (*Scolopax rusticola*). Contributing to the cultural heritage of this area are monuments and remnants dating from the prehistoric, antique and Roman periods, from medieval times (monasteries of typical architecture, with fresco paintings and preserved surrounding) as well as traditional houses built during the end of 19th and beginning of the 20th century.
Along with the Jerma River Gorge, Stara Planina is proposed as part of the EMERALD network. Potentially valuable areas for nature protection include the mountains of Tupižnica (35 km²) and Deli Jovan (partially in Eastern Serbia). At Stara Planina, as well as in other parts of Eastern Serbia IPA, IBA and PBA areas have been established, as well as Geo heritage (GH) sites.

The Nature Park Stara Planina has been under protection since 1997, and managed by the PE “Srbijasume” (Belgrade), through its forest units in Boljevac, Knjazevac, Zajecar and Pirot. Significant aspects of traditional life and food production can still be found here, providing a sound justification for its protection, beyond the values of its natural and cultural heritage.

Beginning this year (2012), within the PE Srbijasume, a special working unit has been established in order to manage this protected area, with 23 “guardians” (rangers), two chief rangers and the Head of the unit.

Although not included in the Management plan, tourism activities in this Park are present in different forms: organized mountain biking tours, hunting and fishing, international camps, rafting on Visocica River as well as organized visits of interested tourists to surrounding villages. Following the activities projected by the Management Plan, a number of walking trails have been built, connecting villages with surrounding tourist attractions (mountain peaks, rivers, caves, etc). Opportunities to use local capacity to develop and provide accommodation to support these identified activities, for those tourists interested in further experiencing local life.

According to information provided by representatives of the Park’s management body, there are villagers currently providing accommodation at acceptable standards, who mainly cooperate with local tourism organizations. The Park provides information and accommodation contacts on request. Within the process to qualify this area as a UNESCO MAB Biosphere Reserve, the Park staff is collecting contacts of all local people providing accommodation and food, so that the information is available to tourists in a more organized way. The establishment of the “Vrelo” visitor centre (at the end of the last year) should improve the opportunity to provide accurate and quality information to visitors. At this time, such information is provided by the rangers, who are knowledgeable about the sites and activities within the territory of the Park.

There is mutual cooperation between the Park management and local NGOs. This includes cooperation with the Stara Planina Society for Protection of the Environment which has posted information boards, and signs as well as charting educational mountain trails in several villages. As part of its awareness-raising activities, Park staff provide open air workshops for high school students from the local community. They also work with the NGO Grlica, which deals with promoting and maintaining traditional crafts in particular, the production of the famous Cilim carpets from this part of Serbia (mainly in Pirot). Promotional material has been developed presenting local products as well as natural and cultural beauties, in order to improve the appeal of this area to tourists.

Waste operators (public utilities) must report annually to the Agency for environmental protection on waste composition and management, but only 30 out of 174 reported in 2012 (for 2011)
With a focus on rural tourism development, workshops were organized with the Association of Cattle Breeding, in order to improve their members’ capacities to provide tourism services.

The national NGO, Civic Initiatives and the local NGO GEA, have collaborated to develop public/private cooperation in order to prevent the further creation of illegal dumps in the towns and villages of this area.

In cooperation with the Local Tourist Organization, park managers are preparing documentation for the official nomination of Stara Planina Nature Park into the UNESCO MAB Biosphere Reserve.

The recently initiated Project STAR (implemented by the Ministry of Agriculture, Forestry and Water Management) includes a plan to organize the grazing of local indigenous breeds at high mountain pastures, in order to demonstrate to local people and stakeholders how important it is from the point of view of ecosystem maintenance, as well as to aid the local economy and tourism. Another part of the project focuses on training Park rangers to develop their visitor guiding skills. However, this has not yet taken place, and currently the only training for staff is provided by the central management Srbijasume unit from Belgrade.

The changing demographic structure and depopulation have put pressure on efforts to maintain the authentic characteristics of this area – such as, traditional life and food production in local villages. According to statistical data, the average age of inhabitants of the territory of the four municipalities is 44.2 years and this is a continuing trend. The sustainable tourism development of the area could offer a response to such trends. On the other hand, a current proposal to build a huge ski centre here would most likely not only damage the natural value, but would most likely alter traditional, but also damage traditional patterns of life, as well as possibly be illegal. Local community capacities need to be strengthened so that they become increasingly aware of the consequences of such projects and to be ready to make decisions about further development. Increased awareness of sustainability in all four municipalities to underpin local concerns would also benefit communities in dealing with future situations similar to this. But raising the awareness and the competencies of local authorities and the Park staff – especially rangers would be among the most important factors to contribute to the sustainability of tourism development and to the entire development of Stara Planina.

Stara Planina NP might be considered as a role model in terms of the cooperation between NGOs in recent years. The support provided by the STAR project (through the Ministry of Agriculture) as well as the initiative to designate it internationally as a biosphere reserve – which also strongly promotes cooperation between local communities and PA management, as well as other stakeholders suggests that cooperation is working here.

However, recent commercial tourism activities have been supported by the National Government and include the development of the ski centre. Given the large and invasive infrastructure facilities which are already having an environmental impact and the increased risk
of the erosion and the compromise of existing decrees for its protection, Stara Planina is at risk as a role model for sustainable tourism.

**SOCIO-ECONOMIC CONTEXT - PRESSURES ON THE ENVIRONMENT**

### 4.5.11. Energy

Energy production in the region of Eastern Serbia is based on both conventional and sustainable energy sources. Both types of production are related to hydroelectric power.

The major producers are Đerdap II (270 MW) and Pirot HPP (80 MW), both belonging to the company Hidroelektrane Đerdap. For the purpose of construction of these reservoirs settlements were displaced and new road infrastructure was established. The construction of the reservoir Zavoj, near Pirot, reduced the flow of the Visočica and Temštica downstream of the dam. New plans include water transfer from Temštica into the lake, which could lead to ecological problems due to the drying-up of the downstream flow of the river, to the mouth of Visočica during the summer.

In the region, there are 19 small hydropower plants, two of which are state-owned. These are HPP Gamzigrad and HPP Sokolovica, with joint power of 5 MW.

The region of Eastern Serbia is characterized by high potential for the building of small hydropower plants and thus the possibility for increasing the share of energy obtained from renewable sources. The total energy potential of rivers in the region that can be utilized by small hydroelectric power plants is about 65 MW.

The greatest potential for use of solar energy for electricity production is present in southeastern Serbia, in the municipalities of Pirot and Dimitrovgrad. In these areas, the average daily solar radiation energy on a horizontal surface exceeds 4.2 kWh/m². In Knjaževac, Zaječar and Negotin daily solar radiation energy is in the range of 4 to 4.2 kWh/m².

The potential for wind energy utilization varies widely among the Eastern Serbia municipalities. The greatest potential exists in the municipality of Negotin, on Deli Jovan and in the northern parts of the municipality, towards Kladovo, along the Danube. In this area, the average wind energy per year at the altitude of 100 m in April reaches up to 225 kWh/m². In other parts of Negotin, as well as in Knjaževac and Zaječar (excluding Tupižnica that has extremely high potential), wind energy ranges from 75 to 150 kWh/m², while in Pirot and Dimitrovgrad there is the least potential for wind power use (less than 75 kWh/m²).

### 4.5.12. Energy efficiency

Southeast Serbia is a sparsely populated part of the country with an absolute prevalence of rural over urban settlements. Only 20% is recognised as urbanized.

The whole region is characterized by a continental climate, with average winter temperatures around 0 °C and summer temperatures around 20°C. In contrast, the areas around Niš and Leskovac are characterized by a steppe climate.

More than 90% of the buildings were built between 1941 and 1990, which was a period
<table>
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<th>Municipality</th>
<th>Solar energy (kWh/m²)</th>
<th>Biomass energy (ha)</th>
<th>Wind energy (W/m²)</th>
<th>Geotherm. energy</th>
<th>Hydro energy (MW)</th>
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<td>5-10.000</td>
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<tr>
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<td>100-200</td>
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<td>Negotin</td>
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<td>20-30.000</td>
<td>200-300</td>
<td>-</td>
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<td>30-40.000</td>
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</table>

Table 4.5.5 Renewable energy source potentials in Eastern Serbia

Explanation of the table

Solar power
(1) Potential mean values of daily irradiated solar energy on horizontal surface (kWh/m²)
(2) Yearly values of irradiated solar energy on horizontal surface (kWh/m²)

Biomass
(1) Area of land under woods (ha)
(2) Area of agricultural land (ha)

Wind
(1) Average Energy potential of wind per year on 100m (W/m²)

Geothermal
(1) Potential power of geothermal sources (MW)
(2) Number of locations with geothermal springs in municipalities in Serbia

Hydro power (small hydropower plants)
(1) Total potential hydropower of small hydropower stations (MW)
(2) Estimated power (kW)
(3) Potential annually power production (MWh)
of prosperity and development in almost all inhabited areas in the region. The highest construction rates were in the post-war period, 1946–1970 (35.45%), along with the comprehensive renewal and reconstruction of the country. On the other hand, specific socio-economic factors in the country contributed to a marginal rise in the number of households in the last two decades, when less than 10% of the houses were built due to substantial migration in the last 30 years.\footnote{Jovanović Popović Milica: Atlas porodičnih kuća Srbije, Arhitektonski fakultet Univerziteta u Beogradu, 2012.}

Analysis of data indicated a great disproportion among the types: single-family houses accounted for 93% of the buildings and 98.65% of them are freestanding houses, so it can be said they have absolute prevalence in the region. The analysis of the types clearly shows that most of them are smaller free-standing low-rise buildings with a relatively compact base and form.

The applied building techniques, constructions and building materials used in single-family houses in East Serbia display a number of specific features which can be summarized as follows. The use of traditional building techniques such as post and petrail technique with wattle and daub infill was characteristic of a significant number of the houses in rural areas built before 1950. The main building material used for walls was brick 25-38 cm thick. Starting in the 1950s, hollow clay blocks were used for building walls, slowly replacing heavy massive brick walls. Floor structures vary greatly in type and materials used. Older houses (by 1950) had wooden floor structures, often with earthen infill, while more recent buildings used reinforced concrete slabs as well as semi-prefabricated constructions with hollow clay infill.

Despite the thermal regulations and severe winters, most buildings still have no thermal insulation as the part of the envelope or it is insufficient so that there is absolutely no compliance with the current regulations and standards regarding thermal protection.

Most buildings have their own heating system, mainly individual stoves using solid fuel (wood, coal), while not many houses have a central heating system with individual furnaces. A few single-family units in the zones of major cities use the district central heating system.

The region of Southeast Serbia has a rich history. For centuries, main European roads have traversed this area, connecting western and central parts of the continent with its eastern and southern lands, as well as with Asia. Hence, the region has been uninterruptedly settled since prehistory through classical antiquity to the modern age.

Out of the total number of analyzed buildings in Southeast Serbia, 93.47% belonged to the category of single-family housing, predominantly free-standing (86.19% out of total) and 49.8% of them are in rural areas.

The analysis of the heating solutions revealed that the houses mostly used a variety of individual stoves or at best a system of central heating with individual furnaces. Solid fuel, mainly wood, is used for heating in most cases.

4.5.13. Employment

According to the most recent National
Employment Service (Nacionalna služba za zapošljavanje) Report, dated September 2010, the number of listed unemployed persons in the five municipalities of this region is 23,062.

All municipalities except Negotin, (where the number is 9%) recorded a high average share of unemployed persons (17%) within the total working-age population.

Viewed individually by sectors, the largest share of employees in the region was engaged in manufacturing (35%). The highest percentage of employees in the industry sector is found in Pirot (50%) and Knjaževac (48%). The trade sector employs about 9% and agriculture only 3% of the population. The number of people working in tourism is modest (1%), while the only municipality that stands out in this respect is Dimitrovgrad with 8% of employees in the tourism sector.

4.5.14. Industry
The industrial sector engages the largest share of the working age population within the Eastern Serbia region. According to data from the Statistical Office, the manufacturing industry employed 13,225 people, which makes up 35% of the total employment force in the region. The largest number of employees in this sector is found in the municipality of Pirot (7,325), and the lowest in Dimitrovgrad (only 78).

The companies Tigar AD and Tigar Mh from Pirot are the most significant companies in the region industry. From 2003, operating as a joint venture between Tigar and Michelin, investment was made in increasing production and meeting EU standards. This also applies to the adoption of environmental protection (ISO 14001). NGOs from the region used to complain of a lack of containment within the Tigar Corporation system and poor public awareness of the corporation’s impact on the environment.

In Pirot, a recently privatized clothing company Prvi Maj operates, along with several smaller companies working in the field of trade, tourism, food and construction. Most of these companies are state-owned and are expecting privatization.

The chemical products company Prahovo is also privatized. The new owner is a Greek company Neochimiki L.V. Lavrentiadis which, with the purchase of this company, also inherited its unresolved environmental pollution problems, the most prominent being a landfill with more than 2 million tons of phosphogypsum which has been in use without treatment for decades and is threatening the surrounding farms.

As with many parts of Serbia, industries, once government owned, are hoping for privatisation and significant injections of investment. These include bankruptcy and is expecting a buyer. The situation is similar with the automotive and agricultural machinery factory and the cheese factory Džersi from Knjaževac. In this city, business achievements can be attributed to the slaughterhouse Stokoimpeks, which is licensed to export meat to the EU.

In early 2011, an agreement was signed between the Government of Serbia and the Slovenian company Gorenje to build a new factory in Zaječar. The value of the initial investment is 2.9 million EUR. The largest investments in new fixed assets in the manufacturing industry were recorded in Knjaževac - 286 million RSD. The total amount of investments until 2009 was...
4.5.15. Agriculture
Agricultural land in Eastern Serbia covers 60.4% of the total area of the region. The structure of the agricultural land is almost the same in all municipalities of the region, with deviations not greater than 5%.

Agricultural areas are dominated by meadows and pastures (51.52%), followed by arable land (43.51%) and permanent crops (4.93%). Municipalities with the largest arable land share are Zaječar (65%) and Negotin (55%). Fruit growing is uniformly developed throughout the region, while in its development of vineyards Negotin stands out somewhat compared to other municipalities of the region. In Dimitrovgrad, over 80% of agricultural land is covered by meadows and pastures, while in Pirot this share is about 65%.

The arable land is mainly cultivated with cereal crops (44.29%) and fodder crops (25.79%). In Eastern Serbia, about 17.5% of agricultural land is uncultivated land and nurseries. Negotin stands out regarding the cultivation of cereal crops (over 55%), while industrial crops are also grown in significant quantities (around 8%). To conclude, the soil is not polluted with pesticides nor artificial fertilizers used in intensive agriculture, which is why the arable land in the region is suitable for organic agriculture.

The agricultural population in Eastern Serbia accounts for 19,956 people or 9.7% of the total population of the region. The largest agricultural population share is recorded in Negotin (23.9%) and the lowest in Pirot (3.9%). Of the total agricultural population, about 73% are active, while about 27% are dependants. About 95% of the active agricultural population are private farmers.

The Local Economic Development Strategy of Pirot6 set forth considerations of the problems of agricultural production that are applicable to the entire Eastern Serbia region. The problems are primarily related to the small size of holdings, predominantly natural production without specialized commodity holdings and a large percentage of elderly people in the agricultural population.

A positive example of sustainable and organic farming is the Agricultural Cooperative in Arbilje, with about 30 members. On 15 ha of land, the organically grown products are exported to the EU. Current market demand is greater than the cooperative can produce. The problems posed in replicating such an example include the high expense of certificates and artificial insemination. In addition, the lack of people in villages, poor infrastructure and the difficulties in the adaptation of older returnees from the cities slow down the possibility for rapid progress of this type of production7. Also required is the additional training of farmers.

Viticulture in Eastern Serbia dates back probably to the period of the Roman Empire, even though there are no written records of this. However, based on the names of a number of locations in these rural districts, the cultivation

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7 Report from the workshop within the Green Info Network project (orig.: Zelena info mreža). EkoForum. 21 Nov., 2009
of wine in this region has certainly been present for centuries.

In Negotinska Krajina there is almost no village where wine was not the dominant agricultural activity until the 1980’s. The villages of Rajac Rogljevo, Smedovac, Mihajlovac and Veljkovo, were unique in that each household had large areas of vineyards.

In the area of the Knjaževac municipality, vines have been cultivated for centuries, as evidenced by stone representations found at an archaeological site near the village of Ravna. Larger vine-growing areas were planted after Turkish rule in the mid nineteenth century when wine became one of the major export items. The most respected wines of this region were from Knjaževec, Stipina, Debelica and Koželj, especially in the assortment of white wines.

The most famous active wine cellar in the Knjaževac municipality with recognised tourism development potential, in Eastern Serbia is situated in the village of Potrkanje. The winery “Jović” is a multi-generational family wine cellar with tradition. Vineyards growing grapes which are processed in the winery are located in the centre of Knjaževec vineyard area. A special attraction of this cellar is its authentic product, sour cherry fruit wine - “Višnjica”.

4.5.15 Forestry, Hunting and Fishing

The eastern Serbian region is covered with about 155,000 ha of forests, which amounts to 8% of the total forest area of Serbia. The wood stock is dominated by broadleaved species, and the most prominent one is beech.

According to data from the Statistical Office of the Republic of Serbia, at the end of 2008 only 192 ha in this region had been afforested, and of that, 27 ha with with the broadleaved species. The largest part of the afforested area (41%) was located in the municipality of Pirot. According to the same source, lumbering amounted to 76,968 m³ of broadleaved (of which the technical wood share averaged 13%) and 21,704 m³ of coniferous wood (of which the technical wood share averaged 37%).

Lakes Zavoj and Grlište provide possibilities for fishing, while the areas suitable for hunting include Tupižnica, Tresibaba, Vidlič, Vratna and Stara Planina. All hunting areas in the region are equipped with hunting lodges to accommodate hunters. Hunting areas are managed either by local hunting associations or the Public Company Srbijašume.

4.5.17. Transport

The road network of the Eastern Serbia region is 1,888 km long, with 267 km of highways, 702 km regional and 919 km of local roads. About 75% of the road network is of modern pavement type, while the poor quality roads are primarily local.

The most important route is Highway E-80 leading from Niš, across Dimitrovgrad and Pirot, to the state border with Bulgaria, part of
Corridor 10. In choosing the valley route option for the construction of this highway, through the valley of Nišava, the Ministry of Infrastructure of RS has denied the local authorities’ wish for a roundabout, mountain route option. One of the main reasons supporting the mountain option was to protect arable land in the valley. However, because of this decision of the Ministry valuable mountain habitats would not be destroyed

Negotin and Zaječar are connected by Highway E-771 while Zaječar and Knjaževac are connected by a regional road. All cities in the region are connected by regular bus lines. The average distance from Belgrade is about 300 km (Negotin – 300 km, Zaječar – 236 km, Knjaževac – 280 km, Pirot – 309 km and Dimitrovgrad – 330 km). The planned construction of a highway through eastern Serbia would significantly improve its current poor transport connections to the rest of the country. The reconstruction of the Paraćin-Zaječar highway, currently in progress, is similarly important.

The most important railway is Niš-Pirot-Dimitrovgrad-Bulgaria. Pirot and Dimitrovgrad there have two departures and two arrivals to and from Belgrade each day and one for Sofia and Istanbul. Also important is the railway from Niš via Knjaževac, Zaječar and Negotin to the port of Prahovo. Traffic on this railway is

### Hunting ground

<table>
<thead>
<tr>
<th>Hunting Ground</th>
<th>Area</th>
<th>Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotin</td>
<td></td>
<td>Rabbit, pheasant, roe-deer, fallow-deer, mouflon, wild boar and plain deer</td>
</tr>
<tr>
<td>Zaječar</td>
<td>30000 ha</td>
<td>Roe-deer, wild boar, rabbit, pheasant, partridge</td>
</tr>
<tr>
<td>Knjaževac</td>
<td>12900 ha</td>
<td>Deer, roe-deer, wild boar, rabbit, pheasant, partridge</td>
</tr>
<tr>
<td>Pirot</td>
<td>80000 ha</td>
<td>Wild boar, rabbit, partridge</td>
</tr>
<tr>
<td>Dimitrovgrad</td>
<td>39700 ha</td>
<td>Roe-deer, wild boar, rabbit, pheasant, partridge</td>
</tr>
</tbody>
</table>

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conducted several times a day.

A significant amount of freight transport for the municipality of Negotin is conducted via the Danube.

The nearest airport is the airport Constantine the Great (Konstantin Veliki) in Niš. It is located about 55 km from Knjaževac, 70 km from Pirot, 100 km from Dimitrovgrad and Zaječar, and about 140 km from Negotin. The average distance of these cities from Nikola Tesla Airport is 300 km.

**TOURISM - PRACTICES AND SUSTAINABILITY**

Table 4.5.7. Number of available beds per municipality and per type of accommodation


<table>
<thead>
<tr>
<th>Municipality</th>
<th>Hotels</th>
<th>Supplementary</th>
<th>Ethno houses</th>
<th>Rural houses</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimitrovgrad</td>
<td>214</td>
<td>8</td>
<td>28</td>
<td></td>
<td>250</td>
</tr>
<tr>
<td>Pirot</td>
<td>465</td>
<td>104</td>
<td>4</td>
<td>101</td>
<td>674</td>
</tr>
<tr>
<td>Knjaževac</td>
<td>346</td>
<td>114</td>
<td>134</td>
<td></td>
<td>594</td>
</tr>
<tr>
<td>Zaječar</td>
<td>424</td>
<td>345</td>
<td></td>
<td>103</td>
<td>775</td>
</tr>
<tr>
<td>Negotin</td>
<td>316</td>
<td></td>
<td></td>
<td></td>
<td>419</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1765</td>
<td>563</td>
<td>12</td>
<td></td>
<td>372</td>
</tr>
</tbody>
</table>


**4.5.18 Tourism – Present State**

Tourism in this region is weaker than that found in the Lower Danube region, but it does have the capacity to develop a rich and varied tourism product. In 2008, the region was visited by 79,555 tourists, which represents 3.51% of total tourist turnover in Serbia. Accommodation facilities include hotels, motels, private accommodation, mountain huts and student residences with a total of 2,362 beds. Categories of hotel accommodation do not meet EU standards as they are built and labelled according to the old national categorizations. Many of them are in the process of privatization and reconstruction. Whilst they have been included in tourism listings, not all are fully functional. In addition, rural households who have applied to the MTO to be registered as accommodation providers in rural tourism have undergone local categorization criteria that do not meet EU standards in full.
One of the greatest advantages for rural tourism development within the municipality of Zaječar is Stara Planina. This kind of tourism is still developing but in the villages of Mali Source and Nikolićevo tourists can find food and accommodation.

The municipality of Knjaževac has a rural tourism offering based on country household accommodation. This includes accommodation in 11 households. The number of beds within households varies from six to thirty. Visitors can enjoy the company of their hosts and local food, and they can experience wilderness first hand.

The municipality of Pirot is well known for its national traditions (handmade carpets, homemade cheese, traditional architecture etc.) and some elements of these values are included in the current rural tourist offering. A substantial number of villages take part in providing food and accommodation - 16 of them in 2011. The most interesting villages in terms of the diversity of the tourism product available are those on Stara Planina, at the village of Rsovci in particular. This municipality’s commitment to the concept of rural tourism can be seen in its updated information and detailed web site about this kind of tourism.

Dimitrovgrad is the most Southern municipality of this region. Again, its close proximity to Stara Planina is one of the key advantages in its rural tourism offer. Rural tourism is recognised by the authorities as a key component for the sustainable development of this region, with nature preservation and cultural inheritance as two of its major goals, as well as viewing it also as a means to prevent the process of depopulation. According to official data, there are 11 households in various villages which currently provide accommodation and food.

From the data on the tourism industry of the Eastern Serbia region, several distinct modes of tourism can be identified, as follows:

**Mountain Tourism**

Mainly on Stara Planina which has a diverse range of year-round tourism products in both the winter and summer seasons (hiking and excursion tours, horseback riding, mountain biking, hang gliding and paragliding, bus-safaris, etc.) and also offers rural, hunting and eco-tourism.

The first ski trails and two lifts at the Stara Planina Mountain were built and put into operation in January 2007. Until the commissioning of the Stara Planina ski resort, the most common visitors were mountaineers, who used the mountain lodge and hotel services at the site of Babin Zub. The first phase of construction of accommodation facilities is in progress at Jabučko Ravnište, with one hotel completed.

Vlach Mountain with its Jerma River Gorge and Poganovo monastery are frequent destinations for hikers, student excursions and pilgrims on their visit to the monastery.

**Cultural Tourism**

The primary attractions consist of Roman heritage; stretching from Gamzigrad to Ravna (Felix Romuliana and Timacum Minus) and includes medieval fortresses and sacral objects, with some participation of the ethno-assets of small local communities. The archaeological site of Felix Romuliana has been on UNESCO’s World Heritage List since
4.5

Eastern Serbia

2007. Intensive research and restoration is in progress at this site, with the help of funds received from the Ministry of Culture of the Republic of Serbia and the Republic of Germany. In the village of Ravno near Knjaževac, ongoing excavations at the site of Timacum Minus, in the vicinity of an ethno-archaeological park, are also taking place.

The cultural tourism product is complimented by the wine-routes of Negotin and Knjaževac, the wine growing region Timok, together with pimnice, - the traditional wine making, storage and tasting facilities of Rogljevo and Rajac, provides numerous opportunities to attract tourists to stop. In these villages, old architecture is protected by law and about one fifth of the former number of vineyards are still active. The tourism offering includes tasting, buying wine and spirits, as well as food.

Rural tourism in the region is slightly more developed in the municipalities of Pirot and Knjaževac than in the rest of the region. In recent years, efforts have been made to standardize and classify accommodation facilities. The comparative advantages of these rural households include; preserved nature, local foods (e.g. cheeses from Pirot) and traditional crafts (Pirot rugs). Currently, guests are mainly hikers and tourists in transit who are interested in products and souvenirs from villages around Pirot.

**Spa Tourism**

The utilization of thermal mineral springs for tourism in the region is fairly low. Ganzigradška Banja is directed towards medical rehabilitation. The Sports and Rehabilitation Centre Rgoška Banja is in the process of privatization. The former hotel Mir in Zvonačka Banja has been privatized, but, despite its existence in the tourist offer of TOS, which has had a negative impact on the surrounding villages because their development was dependent on the Zvonačka Banja spa.

**Special Interest Tourism**

Special interest tourism in the form of speleological (caving) activities, adventure tours, exploration tours, mountain biking and bird watching exist but are carried out mainly in a haphazard manner by specialized associations and societies. Tourism products focused specifically on these types of tourism have not yet been established. Currently, there are no marked trails or proper bird-watching lookout posts.

4.5.18a **Tourism - Development Plans**

In the region of Eastern Serbia there are several different plans for tourism development, as follows: MP Lower Danube, MP The Way of the Roman Emperors (Felix Romuliana), Development Plan of Tourism on Stara Planina and the Tourism Promotion and

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20 Master Plan of the Tourist Destination Lower Danube (orig.: Master plan turističke destinacije „Donje podunavlje). School of Economy of the University of Belgrade.

21 Master Plan of Cultural-Historic Route Way of the Roman Emperors (Felix Romuliana) (orig.: Master plan kulturnoistorijske route „Put rimskih careva (Felix Romuliana)”). School of Economy of the University of Belgrade

22 Development Plan of Tourism on Stara Planina with Pre-Investment Study and Physical-Technical Features of the Ski Center (orig.: Plan razvoja turizma na Staroj planini sa preinvesticionom studijom i fizičko-tehničkim karakteristikama skijališta). Horwath and Horwath Consulting Zagreb, 2007
Development Programme of Pirot. In addition, the development of tourism is addressed in all local economic development strategies (Annex III).

The MP Lower Danube includes the municipality of Negotin. The plan proposes investment in a new wine resort, so far non-existent in Serbia, to be located in the villages of Rogljevo, Rajac and Smedovac. It is also proposed that the entire village of Rogljevo be turned into a high class wine resort. In addition to wine tourism, the renewal of the hotel Inex in Negotin is a priority.

The MP Way of the Roman Emperors anticipates investing in infrastructure at the sites of Felix Romuliana and Timacum Minus. The largest planned investment in Romuliana is a centre for visitors with an interpretation centre. The construction of an ancient Roman labyrinth and a technology park are envisaged and considered to complement the tourist offer. It is also proposed to relocate an old house from Stara Planina to the village of Ravni, which would serve as an info-centre for the Ravni ethno-archaeological park.

However, the most controversy, both from professionals and the public, in regard to tourism development in the region centres on the Tourism Development Plan for Stara Planina, in which the Government has adopted a Mountain Tourism Development Program of the Area of Stara Planina. This program outlines the development of a ski centre, with 40 ski lifts, 30 ski runs and two large tourist complexes. This development would be capable of serving 30,000 skiers and require a 260 and 300 million EUR investment in its construction. The site of Jabučko Ravnište, where work is already in progress, is the proposed central point of the ski centre. The plan includes, besides the ski and accommodation infrastructure, sports, recreation and spa centres, the construction of roads and public utility infrastructure.

It would appear that this Plan has been developed purely on a commercial basis, with the values of natural heritage mentioned only as resources to be exploited for the sake of intensive tourism development. Stara Planina has protection status and Serbia and Bulgaria have agreed to joint international cooperation in maintaining that protection. However, it appears that the conservation and protection obligations undertaken by both countries are not acknowledged in any of the documents relevant to the resort’s development.

The tourism Promotion and Development Program of Pirot has identified excursions, youth tourism, ecotourism, rural tourism and recreation as the base line of its tourism product. The local economic development strategy of this municipality partly follows the recommendations of the Tourism Promotion and Development Program of Pirot, but it also links with the development of tourism on the Stara Planina Mountain according to the ski area development plans.
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Sector on the Environment

According to the conservation zoning scheme of the Nature Park Stara Planina, incorporated in its designation study and the Decree officially adopted by the Government of Serbia in 1997, the construction outlined in the Development Plan should not be possible. However, political pressures and changes in management, particularly in the Institute for Nature Protection of RS, accompanied by changes to the protection zones and obtaining the positive environment impact assessment have enabled this plan to proceed. It has been put forward that the adoption of the Mountain Tourism Development Programme and the Spatial Plan for Stara Planina are not in compliance with the Law on Environmental Protection and Regulation of the Stara Planina Nature Park. Both professional experts and the public are against the plans of these documents and have signed a petition requesting the withdrawal of Mountain Tourism Development Program. These actions have met with little success and construction has continued.

The commissioning into operation of the first ski trails on Babin Zub proceeded after the publication of plans that regulate the development of tourism. The first two ski slopes are indicators of the impact on the environment of Stara Planina. Due to unprofessionally conducted works undertaken in places where the forest was cleared for ski slope construction, erosion has resulted in the creation of a ravine, over 2 m deep. Remedial actions, dealing with these consequences is still ongoing, and the material costs of this intervention have significantly increased investment costs.

The site of Jabučko Ravnište was a high-mountain peat-bog, very important for the conservation of biodiversity on the mountain. It was located in the first zone of protection, which was changed in the most recent Stara Planina protection plan. The construction works at this site destroyed it irretrievably. Because the ground is unstable, the foundation of the hotel started to sink partly. If the development of mountain tourism on Stara Planina is compared to the only true ski centre in our country, Kopaonik, the prospects for environmental protection are not regarded as promising. In the NP Kopaonik, the construction of a winter tourist centre has brought into question its status as a protected natural area. New plans to expand its capacity only further complicate the situation. The same can be expected in Stara Planina, especially when it comes to illegal construction and the pollution of water and land. Following the adoption of the Programme of Development of Mountain Tourism, but even before that, massive amounts of land on the mountain and its foothills were bought from local residents. It is expected that when the ski resort is up and running the construction of cottages will start even without the permission of the relevant services. The progress of this development suggests that government, both national and regional, is not giving due attention to environmental concerns. This lack of state commitment to sustainability is of deep concern to future tourism development and will likely impact the ease of sourcing future investment. It is highly probable that the investment returns originally envisaged from this ski tourism development will not be realised as a result of the amount of remedial work required both environmentally and socially. It is also inevitable that the environmental conditions which the area experienced before interference cannot be reinstated and this will have a bearing on the

Statement of Dr. Ljilana Amidžić, former director of ZZZP RS, newspaper Večernje novosti, 16 Dec. 2007.
area’s recognised conservation status.

4.5.18c Sustainable Tourism in the Region
Currently, there is not much sustainability in the tourism of the region. Rural tourism in the municipalities Knjaževac, Pirot and Dimitrovgrad is the closest to being sustainable but is still underdeveloped.

Significant potential for Sustainable Tourism Development does exist. But the Mountain Tourism Development Programme of the Area of Stara Planina, which does not recognize it, could limit this potential. If the Mountain development plan lives to its full potential, the development of sustainable tourism will have to be confined to the mountains of Tupižnica and Vlah Mountain.

4.5.18d Conclusions and Recommendations: The following environmental issues and their management and or development are important indicators and contributors to the future sustainable success of the region in general and to sustainable tourism development in particular:

Landscape - Eastern Serbia’s landscape plays an integral part in the identity, economic activity and attraction of this region. The most prominent are two morphological structures, Stara Planina (Eng.: Old Mountain) and the valley of Timok. In addition to these is a special complex consisting of the mountains Deli Jovan, Sto, Tupižnica and Tresibaba, the Knjaževac and Zaječar basins and the valley of river Nišava. Recommendations: With the introduction of EU law, the Landscapes Directive will become an integral element in the protection, conservation and sustainable use of all Serbia. For this region, the Landscapes Directive will become an important pillar in support of protecting one of the fundamental elements of rural tourism, particularly because the landscape is under severe pressure from non-sustainable development.

Demography - Sparse settlements within this region indicate a low intensity of urbanisation pressure on the environment. Many villages have been completely deserted. Maintaining the authentic characteristics of this area – such as traditional life and food production in local villages– has been under pressure from the changing demographic structure and depopulation due to emigration. According to statistical data, the average age of inhabitants of the territory of the four municipalities is 44.2 years, with a continuing negative demographic trend present. At the education level, around 90% of people have a primary and secondary school education. Recommendations: Rural Development Plans in combination with sustainable tourism development plans need to be comprehensive in their approach and not only put forward actions to reverse this migration but also to stimulate the economic activity in rural areas that are sustainable over the long-term and in which rural tourism can play a decisive role.

Waste and Recycling - The situation regarding
waste collection in this region is one of the worst in Serbia. Only 60% of waste is collected and disposed to inadequate landfills that do not meet basic standards. Illegal landfills are found all over the region, i.e. municipalities Negotin and Knjazevac are at the top of the list with the highest number of illegal dumpsites. Waste collection is strongly connected to industrial activities as waste quantities are high and the quality of waste fractions is the best. As this region is one of the poorest in Serbia, there is almost no industry and the network of collectors is not developed. The only collections are oriented to metal, and textile waste. There are no accurate data on the quantities and composition of waste generated in the territory covered by the municipalities. It is possible to organize waste composition, have a comprehensive data collection process and organize a proper waste management system by the responsible institutions. A regional waste management plan for the municipalities of Zajecar, Boljevac, Bor, Kladovo, Majdanpek, Negotin, and Knjazevac was adopted in November 2009. There is primary selection of PET packaging waste in towns, but not in the villages of the region.

**Recommendations:** - One of the main drivers of sustainable and proper waste management is ensuring sufficient funding for operating expenses.

Harmonize the level of fees for waste collection to ensure sustainable services. Bearing in mind the sensitivity of issues related to public utility services and poor economic situation, a new pricing system should be gradually introduced.

Waste recycling should be incorporated in regional waste management plans, along with the establishment of a comprehensive recycling education programme.

Public utilities do not have proper equipment, enough containers for waste collection, or funds for the remediation of non-sanitary landfills.

Strong need exists for private sector involvement in the waste management system and for the development of public-private partnerships. Careful consideration should be given to the experiences of the municipality Gradiste in this regard.

Generally, there is no organized system to strengthen the capacity of the local community and the development of public awareness related to problems and solutions for sustainable waste management. NGOs are involved in projects on recycling, but in most cases in schools and kindergartens, there are no seminars related to recycling or waste management. It is essential that local government and public utilities include in its plans public awareness campaigns, in order to adequately inform citizens and to develop awareness of sustainable waste management. Special attention should be paid to rural areas, as they have unique problems related to organic waste and to certain kinds of hazardous waste, such as the packaging of pesticides.

The organization of regional clusters and its activities can help in waste minimization and reuse, the level of recycling, waste collection and treatment and the provision of a functional and updated database on recycling at the regional level.

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27 Waste operators (public utilities) must report to the Agency for environmental protection on waste composition and management yearly, but only 30 out of 174 reported in 2012 (for 2011).

28 Regional Waste Management Plan for Municipalities Zajecar, Boljevac, Bor, Kladovo, Majdanpek, Negotin I Knjazevac, University of Novi Sad, Department for environmental protection, November 2009.
level, the establishment and development of special training programs and the capacity building of cluster members, advocacy for health and social protection of individual collectors of recyclable materials, the improved status and protection of the rights of marginalized social groups, and an increased influence from public opinion.

Local communities should prepare projects on the remediation of polluted protected areas, sites and rivers, and apply for funding from available sources.

**Biodiversity** The plain and hilly regions, as well as the large valleys are all used either for settlements or for arable land. Natural ecosystems occupy primarily the hilly and mountainous regions. Large areas of Eastern Serbia are covered by natural forests; termophilous forests (*Quercion pubescenti-petraeae*), and humid forests (*Fagion*), as well as arid rocky habitats. Meadow vegetation (vegetation classes *Festuco-Brometea* and *Molinio-Arrenatereta*) has fragmentary distribution within this region. Alpine meadows that belong to the vegetation classes *Juncetea trifidi* dominate at the higher altitudes of Stara Planina. Protected Areas - two large complexes. Stara Planina Nature Park (486 km², with 1190 plant species of flora, of which 116 are endemic, and rich fauna) and The Jerma river gorge (68 km², with 901 species, 77 endemic species and rich fauna) proposed for protection. **Recommendations:** Ensure that all relevant development plans include requirements to assess any impacts on biodiversity and carry out EIAs as well as SEAs as prerequisites.

Encourage the further designation of protected space to support the conservation and preservation of this biodiversity and to reach the EU target for protected space in the region (not just the national target).

**Air** – Due to the limited development of heavy industry, there is no recognized threat from air pollution and rural air is considered of high quality. **Recommendations:** This does not mean that a comprehensive monitoring system is not needed.

**Water** - The Danube, Timok and the tributaries of Crni Timok and Beli Timok are the main rivers of this region. Strong karst springs and pure rivers are characteristic for mountainous region in east Serbia. The main rivers, the Timok with its tributaries and the Nišava, are polluted downstream of the larger urban territories. The water quality in the municipalities of Negotin, Zaječar and Knjaževac Valley Rivers do not meet acceptable water quality standards. Water from the Danube is in a quality range from class II to III, in parts of the Timok, Trgoviški and White Timok and Nišava rivers, the quality also ranges from II to III to beyond-classification. Of particular concern is the Grlište (Zaječar), which has been polluted by the Lasovačka and Lenovačka rivers. Surrounding soils erosion, uncontrolled use of agro-technical measures on arable land and unplanned construction of second homes on the lake’s shores, if not the primary source of pollution are compounding the situation. In the mountains most rivers are in the high I and I/II classes of water quality (Crni Timok, upstream of Zaječar, and the watercourses in the mountain areas upstream of Pirot, Dimitrovgrad and Knjaževac). It is
clear that water management, especially waste water management, is in need of review as all urban conurbations mentioned appear to significantly reduce the quality of the water that passes through their municipalities. **Recommendations:** As with other regions mentioned in this report, it is hoped that the EU Water Frameworks Directive will provide the catalyst and structures to deal with these issues in a timely fashion.

**Soil** - Soil is threatened by pollution from mining in the municipalities of Zaječar and Negotin (alluvial riverine farmlands of Veliki Timok downstream from the confluence of Bor and Krivelj rivers), by the industries of the municipalities of Negotin, Zaječar and Knjaževac, by erosion and drought, and by uncontrolled usage of agrochemicals in the plains and lower hill areas. **Recommendations:** Encourage the development of comprehensive pollution mitigation programmes for all identified sources. Ensure an effective monitoring and policing programme is put in place. Assess the feasibility for cleaning and reinstating damaged areas and establish an action plan to carry this out. Establish an environmental health and safety education programme.

**Employment** - Viewed individually by sectors, the largest share of employees in the region was engaged in manufacturing (35%). The highest percentage of employees in the industry sector is found in Pirot (50%) and Knjaževac (48%). The trade sector employs about 9% and agriculture only 3% of the population. The number of people working in tourism is modest (1%), and the only municipality that stands out in this respect is Dimitrovgrad with 8% of employees in the tourism sector. **Recommendations:** Clearly an increase in investment is required in traditional industries to make them competitive as well as new investments to generate a broader economic base. Sustainable rural tourism has the potential to play a significant role but must be supported by a comprehensive regional development plan.

**Transport** – This region has identified that the planned construction of a highway through eastern Serbia would significantly improve its current poor transport connections to the rest of the country. For the same reason, the reconstruction of the Paracin-Zaječar highway, currently in progress, is important. Other modes of transport, such as public road transport and rail need to be further improved in order to provide comprehensive access options. **Recommendations:** The economic potential of this region, in particular tourism, will only be accomplished with a comprehensive and integrated transport system that enables ease of access. This should be considered from a sustainability perspective and include a significant element of public transport.

**Energy** - The region is dominated by buildings built between 1941 and 1990 (90%). Single-family houses account for 93% of the buildings and 98.65% of them are freestanding houses, of which 49.8% are rural. Despite the thermal regulations and severe winters, most buildings still have no or insufficient thermal insulation. There is absolutely no compliance with current regulations and standards regarding thermal comfort and protection. Domestic housing mostly uses a variety of individual stoves or at best a system of central heating with individual furnaces. Solid fuel, mainly wood, is used for
heating in most cases.

**Recommendations:** Energy efficiency should be targeted as a priority, along with education and support structures by municipalities to enable a cost effective retro-fit programme.

**Industry** – This sector, whilst employing the majority of people in the region, has been dominated by a couple of large industries that have been in decline for some time and have left a considerable environmental pollution legacy that needs to be resolved. Privatisation and some inward investment is occurring but at a slow pace.

**Recommendations:** Coordinate the development of a comprehensive development plan and identify the needs to attract inward investment. Tourism could play an important role in this programme.

**Agriculture** - Agricultural land in Eastern Serbia covers 60.4% of the total area of the region. The structure of the agricultural land is almost the same in all municipalities of the region, with deviations not greater than 5%. The Local Economic Development Strategy of Pirot set forth considerations of the problems of agricultural production that are applicable to the entire Eastern Serbia region. The problems are primarily related to the small size of holdings, predominantly natural production without specialized commodity holdings and a large percentage of elderly people in the agricultural population. Organic farming is developing through the Agricultural Cooperative in Arbilje which is supplying products for export into EU. However, current market demand is greater than the cooperative can produce, certificates and artificial insemination are expensive and more fundamentally, the lack of people in villages, poor infrastructure and difficulties in adaptation of older returnees from the cities are slowing down the progress of this type of production.

**Recommendations:** Careful consideration needs to be given to balancing the cultural integrity within the rural community and the introduction of alternative agricultural approaches. A comprehensive rural development plan needs to be put in place within which agriculture is but one, albeit major, element, and education another.

**Viticulture** - This region is recognized for its cultivation of wine, which has had a presence here for centuries. A number of vineyards are trading successfully but many need investment and to be moved out of state ownership. The viticulture tourism potential is already recognized and plans have been released for its development. As in other countries with a recognised viticulture industry, success as a wine farm is the priority, but tourism can provide a significant side industry contribution. The success of wine tourism can often takes place in parallel or act as a catalyst for the development of good quality local produce, restaurants and other forms of tourism. In essence wine tourism can act as a cluster attraction.

**Recommendations.** Encourage new finance into viticulture by creating the necessary incentives to attract investors.

**Forestry, Hunting & Fishing** – The eastern Serbian region is covered with about 155,000 ha of forests, which amounts to 8% of total forest area in Serbia. Lakes Zavoj and Grlište provide possibilities for fishing, while the areas...
A provides an excellent basis to protect the Stara Planina mountain architecture during the planning of future construction.

Further work on the development of rural tourism in the region, particularly in municipalities within the vicinity of Stara Planina, may soften the impact of the planned highly developed mountain tourist centre. Recommendations: Restrictions need to be considered which discourage the sale of rural family houses, whose intended purpose would certainly be changed by the future owners, as the preservation of the ethnic ambience, rural look and the spirit of residents of this area are important. Many areas of Europe have had to contend with this issue, and it is not an easy one to resolve.

Recommendations: Consideration should be given to applying a strategic environmental assessment to this development, if it is not too late. This should bring to light many of the direct and indirect impacts of the development and allow for remedial as well as mitigating actions to be put in place, if the development is still considered viable and can incorporate sustainability.

The legal power of decrees and regulations in relation to the status of protected areas exist and should be used to prevent further violation of the environment and to promote the principles of sustainability while developing tourism in the future. Recommendation: The nomination of Stara Planina for the UNESCO MAB Program and its designation as a Biosphere reserve would help this process, since development and monitoring of tourism as well as other activities here would be under internationally established standards.

It would likely promote and place appropriate

suitable for hunting are Tupižnica, Tresibaba, Vidlič, Vratna and Stara Planina. All hunting areas in the region are equipped with hunting lodges to accommodate hunters. Hunting areas are managed either by local hunting associations or the Public Company Srbijašume.

Recommendations: All three of these activities need to ensure that they follow international best practise in regard to sustainability -- not only to ensure their long-term viability and economic contribution, but also in order to open and expand markets as well as attract visitors.

4.5.19 Conclusions and Recommendations for tourism development of Eastern Serbia

The backbone of tourism development in the region of Eastern Serbia is mountain tourism on Stara Planina. Planned capital investments to build the largest winter ski resort in the Balkans could to some extent positively impact the development of the rural countryside around the ski centre. Unfortunately, the same cannot be said for the social and environmental impacts. Recommendations: Continued efforts need to be made to include environmental and sustainability considerations into these development plans.

Further efforts need to be made to quantify the potential benefits from rural tourism and the impact of the Stara Planina Plans on such potential.

At the symposium of the Serbian Urban Planners Association, titled Strategic and Methodological Approaches to Promote the Tourism Potential of the Serbian Village, held in 2007, projects for the reconstruction of old and construction of new family buildings on Stara Planina were presented. These pilot projects provide an excellent basis to protect the Stara Planina mountain architecture during the planning of future construction.
focus on the advantages of this area, such as its traditional ways of life, its food production and its potential for agriculture development.

Improved and functioning coordination between institutions in charge (PE Srbijasume with its local units, Ministry for Environment, Mining and Urban Planning, Ministry of Agriculture, Ministry of Economy and Regional Development, The Institute for the Protection of Nature of Serbia, national and local tourist organizations and municipalities), NGOs, donors and implementers of internationally funded projects –

Encourage the creation of the necessary support structures required to improve economic opportunities through sustainable rural tourism activities which could help prevent migration from this Region and improve capacity within the community to create a broader economic base.

Sustainable mountain tourism, which combines accommodation in village houses and mountain huts with sport and recreation content, can be developed on the mountains of Tupižnica and Vlach Mountain. Recommendations:

Focus efforts to develop this in line with sustainability principles.

This could play a significant role in efforts to halt the non-sustainable developments on Stara Planina.

Restoration of Zvonačka Banja spa and the renewal of tourism traffic will provide impetus to the survival of surrounding villages, whose population has already been heavily impacted by migration.

Recommendations: Determine viability, support (local, municipal, national etc) and access to finance (public/private).

Create a holistic development plan

Following the latest trends of spas in Europe, the development of spa tourism in the region should consider increasing the versatility of spa resorts so that it can act as the central attraction within a cluster with the capacity to draw a broad range of tourism types and broaden the seasonality of the location. Therefore, beyond their medical purpose, spas in the region should also develop their advantages to attract sport and fitness, events and conferences and other types of tourism likely to enjoy their facilities and surroundings.

Sustainable and organic farming by the Agricultural Cooperative provides a potential platform for creating a connection between agriculture and tourism.

Recommendations: Engage and support the cooperative to potentially serve as a platform for networking and training for rural tourism development.

Maintaining one of authentic characteristics of this area – traditional life and food production in local villages – is under pressure from the realities of the larger demographic structure and the depopulation of its inhabitants. Recommendations:

Coordination is required between rural development planning initiatives, environmental management and rural tourism development to energise and instil optimism, as well as provide support in order to limit the justification for rural – urban migration.

31 Sabinović M., Beljić M. (2010). Thermal Water of Rgoška Banja, as the Basis for Development of Spa Tourism in Knjaževac Area (orig.: Termalne vode Rgoške banje kao osnov razvoja banjskog turizma Knjaževačkog kraja). Glasnik SGD, sv. 90
This study utilised all documents that cover the topic of rural and tourism development and environmental protection available in Serbia. Geographically speaking, the analyzed documents either relate to the whole of Serbia, to certain regions, or have a local character. As mentioned in the introduction, a very noticeable problem posed was the different divisions into regions for the purposes of the study which do not correlate with the official administrative divisions of Serbia. Considering the regional development documents, efforts were made to isolate plans concerning primarily the municipalities that belong to the study-based regions.

**Analysis of documents and their implementation was performed in two phases. The first was a desk study** which identified all the documents important for the topic of the study (strategic and development plans, urban plans, impact analysis, etc.). The analysis of these documents produced a list of questions for interviews with local institutions, by municipalities. The results of this analysis, together with the responses from the questionnaires, have been incorporated into this study. The biggest problems during the interviews were formulaic, stereotype answers provided by almost all municipalities. For example, to the question of how is the money spent from the municipal environmental fund, the response in nearly all of the municipalities reads the same – ‘according to plans and programmes for which the consent of the Ministry has been given’. More detailed responses were difficult to obtain.

In the analysis of documents related to tourism development, we had considerable help from the document *Analysis of Inclusion of Tourism in Local Development Strategies* developed under a joint UN program.

Given that the results of analyses and interviews are given in the text, what we want to particularly highlight here are some of the conclusions relating to the planning and the legal documents analyzed in the study, as well as their implementation. The goal here is to praise the successfully developed documents and draw attention to the inconsistencies that may affect the future of rural and sustainable development.

- At the National level strategic and planning documents related to rural development, tourism development and environmental protection have been published. They define actions and solutions that should be implemented within a specified period, be it at the level of Serbia or some of its lesser territorial units. Work on the implementation of these activities has been started only in part.
- When it comes to the realization of tourism development plans in Serbia, we realize that started are those that are perceived to be viable from an economic perspective (e.g. Stara Planina Ski Centre), but which are not necessarily the most compatible with international best practice in regard to sustainability.
- Analysis of these documents shows that they are not always clear on what priorities for action are, or, what is important to realize first.
5. Policies and Policy Implementation
Mechanisms

• Some of the conclusions presented in these documents, but also in regional and municipal documents, do not entirely grasp economic and social reality of the observed area. To put it simply - the wishes are set much higher than the realistic possibilities for development (either general or tourist) permit.

• The economic conditionality of application of certain planned activities is high and it is especially evident in the implementation of LEAP. Most respondents praised the produced document (LEAP) but responded negatively to questions about its application. The reason lies in the economic obstacles for the plans' implementation; therefore, they await “better” times.

• A positive is that some regions or municipalities have adopted plans for tourism development. Some have even developed separate sustainable tourism development plans. But unfortunately many of these are base on “wishful thinking”. Objectivity and expert analysis would have to take precedence in the preparation of these plans to bring the best parts into reality.

• Only the larger municipal centres have made all important strategic and planning documents. Smaller municipalities have either created only some of such documents or they are still in draft form.

• The declarative nature of environmental protection issues has already been mentioned. Documents which protect certain areas are indeed created to international standards, but they lack adequate implementation as well as monitoring of such protection and the impacts on the environment.

• In addition to the legislation, there are special services set up in municipalities to care for the environment. The situation on the ground is quite different. Numerous incidents, highlighted in the press do not speak in favour of the quality of these services and the law of enforcement.

• A major problem in the application of legal provisions is the lack of agreement over the jurisdiction for a given problem. Most of the local and state institutions have declared their non-jurisdiction responsibility for many environmental problems, which raises the question as to who should care about such issues. Part of the problem lies in the lack of by-laws that should resolve this dilemma.

• When it comes to the realization of large projects that deal with important issues of sustainable development (e.g. construction of regional landfills) it often comes to breaking the time and budget framework presented in the planning documents. The reason for this lies not only in the changing global economic situation but also in poor project design.

• Spatial plans are not followed strictly. Some are outdated and are awaiting modernization. Others are not respected in their entirety, or undergo subsequent changes to accommodate “new reality”.

• Finally, we should mention discrepancies among multiple planning documents pertaining to the same territory. While some want to protect their territory and only develop sustainability, others see development only in commercial terms.
Sustainable tourism development in rural Serbia must overcome many challenges in order to harness the full potential that these areas are recognised to contain. Based on the desk study and interviews with the key players in rural development and in tourism in the four selected regions of South Banat, Lower Danube, Eastern Serbia, Central Serbia, the following sets out the main challenges and opportunities for sustainable rural tourism development.

**Challenges**

**The demographic snapshot of the village.** The population is declining in many villages located far from urban centres or in the border areas. More importantly, reproductive rates have been in serious decline in these areas over the last 50 years (V. Nikitović, demographer). This is because villages are experiencing the emigration of mostly young men and women of childbearing age, leaving the aging population behind. In the last 10 years, in 370 villages in Serbia, not a single child has been born (M. Vukmirović, director of the Statistical Office of RS).

**Sustainability of rural life.** The mass exodus is caused by the hardships of rural living, as well as by the poor living conditions there. Due to the collapse of the cooperative form of farming, households have switched to independent production. Many households have not managed to adapt to this fundamental change and have failed to achieve decent living standards. To compound this situation, many of the villagers used to work in the factories located in cities. Agriculture was their second occupation. Closure or failed restructuring of these factories has forced workers toward life off the land. Unprepared to deal with modern farming they either sell their land and move to the cities or neglect it. They work only as much land as they need for their personal needs.

**The structure of ownership of agricultural land.** The challenge for small farmers and the environment is particularly pronounced in Vojvodina. By acquisition of land from the former major agricultural cooperatives and a large number of households, major businesses have become the owners of significant agricultural areas. While some of them plan to actually engage in agricultural production most wait for the central government’s permission to sell land to foreign companies. Many of these international agro-companies will, guided only by the desire for profit, establish a system of industrial agriculture that utilizes water, fuel and pedagogical layer in an unsustainable way if legal structures are not rigid enough. Industrial agriculture also contributes to environmental pollution from excessive utilization of chemicals, including water pollution, land depletion and reduction of biodiversity.

**Poor infrastructure in the villages.** Until the nineties, maintenance of infrastructure in villages was regularly performed. Rural schools and ambulance stations were in operation, maintenance was ongoing on the road network and electricity supply system. However, even then, many villages in the mountainous areas still lacked electricity, telephone, or an asphalt road access.

Today the picture is significantly worse. Schools have been abandoned or have students in single digit numbers. Dispensaries were moved to towns or work two hours a week and roads are
Challenges and Opportunities for Sustainable Tourism Development in Rural Areas

poorly maintained. Organized collection of waste does not exist in villages that are remote from urban settlements. Local stores supply only the most basic foods, without much choice, quality and at much higher prices.

*Non-differentiated offering in rural tourism.* Rural households providing tourist services are primarily oriented toward providing accommodation and meals for tourists. Based on these offerings, domestic tourists are attracted to the countryside primarily for good and healthy food. Additional activities tourists arrange for themselves (walking, cycling). Households which have included some additional facilities (e.g. swimming pools) have increased traffic during the summer up to 100%. The lack of different offerings is particularly obvious for some specialized activities such as bird watching, mountain biking, rock climbing, caving, canoeing or fishing.

*Lack of familiarity with modern trends in tourism.* The rural population that has engaged in tourism activity is not professionally trained to provide services to tourists. This leads to differences in understanding of the concept of rural tourism, quality standards and sustainability. LTOs have started training the population but the results are not yet apparent.

*Standardization of accommodation facilities.* Differences in the understanding of rural tourism and its requirements are causing a wide range of quality levels in regards to accommodations and meals. Standardization and categorization of these areas of tourism activities is inevitable. However, the rulebook adopted in late 2010 on the minimum technical and sanitary-hygienic conditions did not consider the reality in the field. Most households will not be able to meet these high standards that much resemble the ones in the commercial tourism industry. If specifics of rural tourism are not taken into account, some of the households will resort to providing illegal services or will leave the tourism sector. A comprehensive approach is necessary to not only inform tourism practitioners in all aspects of the industry but also support structures are needed to up-grade the accommodation stock.

*Construction without recognition of traditional architecture.* Modern buildings that were built in recent decades in the studied regions have not fully respected or ignored completely traditional architecture. This has led to architectural pollution of villages and loss of ethno looks for many of them. The dominant traditional looks have only been retained in those villages which are partially or completely abandoned.

*The gap between the regulations and the actual situation in the field.* Activities that may cause environmental pollution are covered by legislation or soon will be. Unfortunately, the actual situation in the field is different. Industrial and municipal wastewaters end up in rivers. Despite the campaign of cleaning up Serbia, illegal dumps reappear. Toxic waste ends up in the sewer. Citizens supplement shortfalls in their budgets by illegal lumbering. Agricultural households producing food for sale have limited knowledge of agricultural chemicals and consequently much of the produce carries large amounts of residue. In most cases, they
form a separate hotbed for personal use and the remainder of their land is treated without the expert supervision. This leads to doubts about the quality of food produced, even in the traditionally pure rural areas.

The reasons for the existence of these activities which threaten the environment come down to discrepancies in regulations at all levels, and ambiguity in the division of responsibilities among institutions as well as in underdeveloped infrastructure⁶.

More than any other human activity, tourism depends upon the quality of the environment, which is why regard must be given to the links between the two as vitally important. Development inevitably brings changes; tourism development also results in change which can be positive or negative. The globalization of tourism has lead to the development of many studies and assessment which, based on experience, analyze the relationship between tourism and environmental resources. The influences of tourism on the environment are quite complex; tourism influences not only the ecological components of the milieu, but its socio-cultural and economical features.

Only the analysis of all three components brings a realistic picture of the real impact of tourism on a destination. Along with noting and forecasting the consequences, it is necessary to put in place responses which would minimize further damage or stimulate the development of positive influences.

Since natural heritage is one of the basic resources of rural tourism, and the fact that it is put under strong pressure from tourism development, one of the keys to success is recognizing all the potential impacts and mitigating against the negatives. The landscape is of capital value when it comes to tourism development; however, in spite of this common fact, its vulnerability to tourism influences is seldom analyzed. Realization of land usage and building tourism infrastructure changes landscapes. Under this influence, notable metamorphosis happens to the settlements compared to what they were before the tourism development. Apart from looking at it through the prism of landscapes, the environment needs to be regarded through all its components. There are various negative influence of tourism to flora and fauna. Tourism disrupts natural habitats and sometimes leads to species loss. Water pollution is common in tourist destinations, and unfortunately this could happen in rural tourism as well. Air is polluted with the intensification of traffic brought upon by the tourism development. And waste management is a constant issue as well as energy use.

Declarative approach of the State to nature conservation. In Serbia, approx. 6% of the territory is protected. Pursuant to the requirements of European legislation, this percentage would have to be, in the years to come, increased to 10%. However, the real problem is that of genuine desire to protect certain natural resource and then respect its protection. An excellent example is the largest protected natural asset in Serbia, the Nature Park Stara Planina, with 114,332 ha in size. Changes in the levels of protection to accommodate commercial tourism and the
Challenges and Opportunities for Sustainable Tourism Development in Rural Areas

Construction of ski trails, lifts, tourist complexes and weekend resorts do not prescribe to the principles of sustainable tourism. Sustainable tourism should be the only form of tourism allowed in protected natural areas because it has a positive impact on both the nature and the local economy.

It is important to mention also, that environmental protection by the state should work in consultation with local people. This would prevent protests and unpleasant events as witnessed with the expansion of protection area of the Nature Park Mokra Gora.

Lack of understanding of the meaning of protection by local population. The largest number of interviewed households advocated the protection of their environment. This is a positive sign but it carries with it the fear of not knowing the exact meaning of this term. This, despite all the well-being it brings with itself, also brings certain rules and restrictions for local residents. This is especially true of illegal lumbering, illegal collection of fruits and medicinal herbs, poaching, illegal construction, or improper disposal of waste. Despite modern approaches to participation, local populations are not informed or involved in the management of protected areas and do not feel any degree of ownership when it comes to preserving heritage.

General population attitudes towards nature. Increased environmental pollution in the areas of isolated and mountain villages is not occurring for several reasons. The reasons are not related to a higher degree of awareness of the need for environmental protection but rather to the low population density of these areas and lower waste production per capita. Due to the lack of sewage and the organized collection of waste, the waste products end up on illegal dumps and in rivers. A particular problem is the one of solid waste that remains in the river bed or floats downstream. General awareness of environmental issues in most of the village areas is low, and traditional knowledge of their ancestors contributing to sustainable living in the past has been neglected not only by them but by the wider community.

The inaccessibility of protected area managers for cooperation. Cooperation of the managers of protected natural resources, local institutions, local population, and the NGOs is not always at desirable levels. Managers develop their own tourism development strategies, which may not be compatible with the plans of LTO and municipal institutions, or with the wishes of local people through collaboration. This discrepancy makes the development of tourism, particularly sustainable, difficult in some regions of Serbia.

The system of financing protected areas poses an additional problem. Unable to pay all the operational and maintenance costs, protected natural asset administrations have in some case decided to obtain additional revenue through the sale of resources (forests, stone, gravel, etc.). These activities in many cases exceed the legally permitted sanitary cutting or cleaning of gravel from the anti-torrent water gate areas.

Greater support of governmental institutions in terms of financing and capacity development, should foster protected area managers’ activities in involving local population in decision making, working on awareness raising as well as joint economic development harmonized with sustainability principles.
Challenges and Opportunities for Sustainable Tourism Development in Rural Areas

process of accession to the EU, Serbia will be obliged to nominate areas for this ecological network and then adequately manage it. Like any EU member state, Serbia will have to ensure that its protected areas are in good condition and to report regularly to the European Commission. Through targeted financial supports protected areas (not necessarily national parks) can play a part in reducing the trend of a declining level of traditional agriculture, population decline in rural areas and increase use of public transport as a result of employment outside those areas. In Germany, farmers who traditionally produce fruit in areas that are managed in this way achieve the price of their products which is three times the price of fruit products manufactured in a conventional, intense way. This reflects the increase in social demand for food produced in healthy environments. In Denmark, 250 farmers have successfully changed the unsuccessful practice of intensive agriculture by transition to cultivation on salty marshes in Vardetal, a Natura 2000 protected area. In this way, the future of farmers and the protection of the brines of this region are now insured. In recent years, financial support to environmental protection activities in rural areas

Table 6.1: Short review of rural tourism development taking in consideration different segments

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Opportunities

The nature of rural areas in Serbia. Due to the depopulation of remote rural areas and the protection of individual natural entities in rural areas of Serbia, the natural environment is not yet significantly affected by the activities of people. The four studied regions of Serbia are extremely rich in specific forms of relief such as natural bridges, canyons, gorges, caves and sinkholes. The richness of biodiversity of flora and fauna, together with beautiful landscapes represent attractions for all lovers of nature. Planned protection of additional natural resources will further contribute to the conservation of nature and the increase of attractiveness of these areas for tourists. All this provides a strong basis to develop rural tourism which is unique to Serbia and thus a competitive advantage over neighbouring countries.

Natura 2000. Natura 2000, the European network of protected areas, encourages people to work in harmony with nature. It supports the development of sustainable land use methods. Natura 2000 is therefore flexible and is a modern instrument for protection of European natural heritage. In the process of accession to the EU, Serbia will be obliged to nominate areas for this ecological network and then adequately manage it. Like any EU member state, Serbia will have to ensure that its protected areas are in good condition and to report regularly to the European Commission. Through targeted financial supports protected areas (not necessarily national parks) can play a part in reducing the trend of a declining level of traditional agriculture, population decline in rural areas and increase use of public transport as a result of employment outside those areas. In Germany, farmers who traditionally produce fruit in areas that are managed in this way achieve the price of their products which is three times the price of fruit products manufactured in a conventional, intense way. This reflects the increase in social demand for food produced in healthy environments. In Denmark, 250 farmers have successfully changed the unsuccessful practice of intensive agriculture by transition to cultivation on salty marshes in Vardetal, a Natura 2000 protected area. In this way, the future of farmers and the protection of the brines of this region are now insured. In recent years, financial support to environmental protection activities in rural areas
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has increased significantly and now represents the main source of income for farmers as custodians of the landscape and natural heritage.

**National rural development.** The Rural Development Strategy of Serbia advocates for “alive” and advanced villages in the near future. The concept is based on the case made for commercial agriculture and family farms, as well as small and medium enterprises. This kind of village is sustainable, it suggests, because it takes care of the natural environment, a critical asset for the rural population. Village living standards and quality of life would match those in more advanced parts of Serbia. Part of the strategic objectives will be achieved through subsidies from the EU. The National Agency for Regional Development and the Serbian Chamber of Commerce help small businesses in the use of these subsidies. The development of small enterprises in rural areas includes the establishment of tourism offerings in rural households, or the establishment of specialized small tourism businesses (for offer in special interests tourism).

**Employment and resettlement of the village.** Through such activities it is possible to retain the rural population, especially young people. However, improved living conditions in rural areas and opportunities for earnings in agriculture or small business would also enable the return of population from urban areas to the countryside. Returnees may be from the contingent of the unemployed but also from groups of highly educated citizens.

**Organic farming and sustainable agriculture.**

Intensified training of interested households for engagement in organic production will make further impacts on rural development. This impact is significant already in the small number of activities established. New opportunities will open for product placement in the European market, and improvements in the supply and quality of food accessible to rural tourism households, which protects the environment is realistic in the future. National agricultural policy should include organic farming, alternative approaches to agriculture and have an overriding focus on embedding sustainability into all agricultural production.

**Integrated river basin management.** According to the European Water Framework Directive, which is implemented through the Law on Waters of the Republic of Serbia, concerns the future the management of watersheds and sub-sheds will become integrated. This form of management provides protection of water flows against all types of pollution and bringing with it a much improved water quality. Water quality and clean streams are a prerequisite for the development of all types of tourism, especially nautical.

**Regional waste landfills.** By 2014, planned is the completion of 12 regional waste landfills, which should replace the current 164 registered non-sanitary municipal landfills. The construction of landfills, transfer stations and covering the whole territory of Serbia with organized waste collection service will solve a big problem of “wild” landfills and the pollution of rivers.

**New energy sources.** Research into alternative energy sources in Serbia and the potential of certain regions to produce energy from renewable sources was the subject of several studies.

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Sustainable tourism is based on the integral and complex principle which emphasizes equally five components: protecting the environment, affirmation of the social integrity, preserving the cultural identity of local people, optimal fulfilling of tourists’ needs and making economic profit.

If we relate such concepts with rural tourism, we can conclude that the basic goals of sustainable rural tourism are the following:

**Protecting the environment** - Preserving protected natural resources, national parks in the first place, and then all parks of nature, resorts and natural monuments from all direct and indirect negative impacts should be priority and consistent objective. Rural tourism should serve as the stimuli for founding new protected areas, since Serbia does not have enough at present. This process, also known as tourist environment protection, implies that tourism trade business encourages and supports environment protection programs. It is already present in some countries which base their tourism offering on eco and rural tourism. Almost every rural tourism region in Serbia has a network of protected areas. In South Banat it is a Special Nature Resort of Deliblato Sand, Ramsar area and Swan crater. In the Lower Danube region, it is Đerdap National Park. Tourism offerings in general, as well as rural tourism offerings in Eastern Serbia are largely based on the Old Mountain natural resort, which, it is hoped, will be proclaimed as a biosphere reserve (MaB). There are several small protected areas in Central Serbia and they are vital to tourism. The biggest and most important is Rajac Mountain Park of Nature. Rural tourism offerings must be designed in such a way as to support environment protection.

Apart from protected natural resources, unprotected natural areas should be emphasized as well, especially those which stand out as ecosystems, or which have rich biodiversity. Furthermore, environmental protection needs to be applied to preventing the growth and spreading of illegal dumps, protecting cultural heritage etc. Appropriate sustainable tourism will also help resolve numerous environmental problems such as: water resources pollution, soil erosion caused by construction works, pollution caused by inadequate use of chemical materials in agriculture, public utilities works in villages and their vicinity, by improving general awareness of the environment.

and analysis. Based on these studies, plans were made, some of which are currently in the process of implementation. Reduction of Serbian dependence on energy obtained from non renewables will significantly reduce the pressure on the environment. Also, educating the population about the possibilities of using wind energy, water, solar and geothermal energy will reduce individual use of energy from conventional sources.

**Education of LTOs and local population on provision of tourist services.** A comprehensive and systematic education programme is vital to ensure greater understanding what sustainable tourism really is, of the needs of tourists, and standards required, the opportunities as well as realistic expectations. Education has already shown positive results in TO Majdanpek. Employees in this sector are trained at seminars and professional education trips abroad, and acquire certifications for positions laid out by the Law on Tourism (8 tourist guides with a national license). They then educate providers of lodging and food at certified training seminars. This system of education should become a standard for all tourist regions in Serbia.
According to the manual “Managing Tourism and Biodiversity”, sustainable tourism should:

- Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity;
- Respect the socio-cultural authenticity of host communities, conserving their built and living cultural heritage and traditional values, and contributing to inter-cultural understanding and tolerance;
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

These important segments of sustainable tourism should be taken into account in making sustainable tourism development plans in Serbia. In addition, research conducted to understand the cooperation between large tourism companies and protected natural areas have shown that, in addition to successful collaboration, there are many limiting factors. These are related to the need to put in place structures which enable profits contributions to be invest in additional protection of PNA to offset impacts of tourism. In addition to environmentally conscious companies, there are a number trying to avoid their ethical responsibility to society and the environment. Thus it follows that the best for sustainable tourism development is co-operation with local residents and small businesses. The establishment of sustainable tourism in highly rural and protected parts of Serbia would lead to significant benefits, as follows:

**Benefits:**

**Business Opportunities.** Sustainable rural tourism in the form of, event, sports and recreation and special interest tourism would open the possibility for a large number of new jobs. Providing accommodation and meals in households and small, specialized motels, conducting tours, making souvenirs, traditional items (carpets, sweaters, wooden furniture, etc.) and foods (sausages, prosciutto, ham, jams, etc.) are just some of the professions and products that serve to meet the tourist demand. All these new jobs would bring in funds much needed for sustaining the life of the village. In addition, increasing the number of users of food services would increase demand for local agricultural products, which would further strengthen the rural economy.

**Investment and funds.** A return of life into some villages that are on the verge of demographic survival would mean the possibility for investments in new business. These are, in the first place, sustainable and economically viable agricultural activities such as fruit growing (especially in the region of Central Serbia), wine production (Lower Danube Region and Eastern Serbia), livestock-farming (Eastern and Central Serbia), bee-keeping and others. The establishment of small businesses to provide tourist services could attract investments from home and abroad.

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9 Forging Links Between Protected Areas and the Tourism Sector. How Tourism can Benefit Conservation. UNEP 2005
Potential Benefits From the Promotion of Sustainable Tourism in the Region

Research into the current state of tourism in these four regions of Serbia has also given some quantitative indicators of rural tourism. The level of investments in accommodation with kitchen and restaurant-based food ranges between 10,000 and 100,000 EUR per investment (the average investment being about 30,000 EUR). Experienced hosts estimated 70% of the profit of rural tourism coming from accommodation and food. Occupancy in rural tourism is low, ranging between 7 and 10%. This means that a household with 15 beds per year can earn about 4,500 EUR. If, with the expanded tourism offering, occupancy is raised to 25%, revenue of about EUR 15,000 would justify the amount invested. It should be noted that additional expenditure (rural groceries, souvenirs) accounts for 50% of spending by tourists in rural tourism. Thus, the annual income of a medium-sized rural household is at the level of income that is currently experienced by raspberry growers with 4 hectares of cultivated land, which is a positive indicator for investments in this type of business.

Environmental Protection. Since preserved and protected natural areas are a main attraction for most activities of tourists in sustainable tourism, its conservation represents an important factor in any development plan at both the local and the regional level. Maintaining the conservation status and attempts to expand its range to an even greater number of areas will provide added security when investing in sustainable tourism. The mutual rapport between nature and small business has a significant impact on the full and actual protection of the environment as well as the viability of any rural tourism industry. Because of the interdependence of sustainable tourism, local residents do not appear only as beneficiaries of the services of nature but also the perpetrators of its protection. The positive effect of creating new jobs in the local economy does not have a strong negative impact on the environment, which is especially important for protected natural areas. Part of the funds invested in the development of sustainable tourism should be directed towards the protection of nature.

Local development and poverty reduction. Economic development based on sustainable tourism, of rural areas in Serbia will contribute to improving living conditions. This applies both to the development from scratch and the reconstruction of old infrastructure in the villages. New jobs will allow for retaining and supporting the return of a portion of the population and thus can revive local services such as schools and medical centres. Institutes for organic production, experimental crop fields, veterinary and agricultural stations will attract new experts in this area, which is of great importance for further development.

The general development of rural areas will reduce the current poverty experienced and provide the means for a large number of people who have no way of gaining employment or of attaining a decent standard of living. Agricultural development is essential for rural areas, but with it goes the investment in small businesses and the tourism sector to broaden the rural economy.

Participation of local people in the development process includes several basic methods. These are: passive participation – local people are only informed about development projects; participation through consultations – experts hear out local people, but do not have to act according to their suggestions; bought participation – local people participate in exchange
for some stimulation; interactive participation – local people participate in joint analysis and action plan development; self-activation and networking – local people participate through initiatives independent from external factors. Through sustainable tourism local people participate interactively and through self-activation and networking processes. Unfortunately, contemporary levels of organization in tourism in most regions show inadequate level of consultations of local people about rural tourism development.

**Preservation of cultural identity of local people** – Cultural sustainability implies preserving cultural habits of communities which provide tourist services, are quite often being modified by dominant influences including tourism. Tourism affects habits of domicile inhabitants, their lifestyle or even the dress code. Even if the society survives, its culture can be significantly altered. The smallest amount of tourism can influence local culture, however changes it brings are not easily identified and their progress is not easily seen. This is the reason why this issue is so important for rural tourism. Efforts to address this issue are taking place globally and in all cases an individual and local approach is often the best. Change is inevitable. It is finding a way to manage this change which is required so that a locale does not become subservient to tourism but rather retains control.

Taking this into consideration, all differences and similarities of cultural heritage of rural regions in Serbia must be careful analyzed and monitored. South Banat is a multinational community, so tourism should help preserve the integrity and cultural heritage of minorities ( Hungarians, Romanians and Roma) by promoting and preserving their culture and local customs. Eastern Serbia is well known for its specific beliefs, Vlasi minority and sacral heritage (monasteries). These elements have to be included in the tourism offering of this region, but in such a way as to keep the unique characteristics of this region. Western Serbia has to preserve its numerous manifestations, to provide a permanent character for them and to increase traditional elements in their offering. The harvest on Rajac Mountain, for example, which takes place in July, is often advertised as a traditional manifestation. However, places which sell products with no connection to traditional culture whatsoever, or the choice of music program are not in compliance with organizers desire to create this manifestation consistent with tradition.

**Optimal fulfillment of tourist needs.** If a tourists returns to a destination after his/her first visit, this shows his/her satisfaction with the offer. How tourists feel can be tested with questionnaires which provide objective picture of their satisfaction. Research shows that tourists are very satisfied with the tourism product in country households in Western Serbia. The best segments of this are wild nature, silence and peace associated with the rural setting. Tourists point out the warm hospitality of local hosts as a great advantage. Tourists are quite happy with the simple offering of this region (walks in nature, sightseeing, etc). Unfortunately, segments of the tourism product are below internationally recognised sustainable level in other regions. In South Banat rural tourism is found only in the village of Skorenovac. Hungarian tourists who visit this place are mostly quite happy with its offering. One of the reasons is the contact with local Hungarians and the opportunity to learn something about their own culture. In Eastern
7. Potential Benefits From the Promotion of Sustainable Tourism in the Region

Serbia, there are numerous problems which should be overcome. Tourists are not satisfied with the quality of roads, information, the lack of additional content and activities, and also the lack of professionalism of local hosts which is not the same as their natural hospitality.

The first segment which should be improved is providing more content in the offering which would make staying in the country more compelling and encourage longer stays. Currently itineraries and theme routes are not well presented in this region which is not the case in developed European countries. In Austria, for example, cheese roads are very popular and they are seen as a vehicle to increase quality. The offer includes at least five specialties based on different cheeses. Restaurant menus often include the names of cheese manufacturers, thus branding local agricultural products. German offerings (Sächsische Schweiz) include small theme hotels for bicyclers only. Almost every developed European region and rural tourism country insists on tourists’ satisfaction analysis. That is not the case in Serbia. It is necessary to design quality theme routes. They could include contents like local food (Central Serbia and South Banat), visiting archaeological sites (Lower Danube), karsts forms of relief and other forms of geo-heritage (Lower Danube and Eastern Serbia), examining interesting plants and animal species (Eastern Serbia). But, most importantly, a system needs to put in place to measure satisfaction and to provide the basis for constant improvement.

Financial income benefit. Sustainability in this sense is understood as the level of financial income which is made through tourism turnover. The indicator of financial turnover made on one destination is the relationship between tourist stay-overs and the number of beds. Apart from Central Serbia, other regions often do not fulfil economic viability, since they do not have enough guests for months, sometimes even over the course of the entire year (especially Eastern Serbia and Lower Danube). It is interesting to analyze the prices of services in country households. The lowest prices are in Eastern Serbia where they vary from 5 to 15 Euro for bed and breakfast service. In Central Serbia prices vary from 10 to 15 Euro for bed and breakfast service. If we compare these prices with European offerings, it is obvious that they are within range, since the prices there vary from 10 Euro (Eastern Europe) to 30 Euro (Western Europe). Reasons for such a small turnover could be found in the non-developed offering; a lack of popularity of rural tourism on the domestic tourism market; poor advertising and general poverty in villages, where it is more obvious than in urban areas.

Employment. Tourism, as an industry, has one of the easiest opportunities to entry. Limited educational standards are required to gain entry and experience counts more than academic qualifications. It is clear the all four regions are not areas where educational attainment is high and this should not be considered a barrier.

Social change. Results of field studies suggest that part of the tourism village households are headed by women. Men are either working in towns or primarily on farming tasks, therefore the main role in the management of tourism is played by women. This is an important indicator, having in mind that the majority of the unemployed, especially in rural areas, are women. Their activation in the financial contribution to the household also improves their social status.
Tourism influences cultural heritage and the society as well. The smaller and the more isolated the local community is, this influence could be more intense. Tourism could significantly influence rural communities because these are normally more isolated from global tourism development. Commercialization of traditional values is one way of affecting social and cultural values, as local heritage changes so that the tourists could consume it easier.

Cultural expression is thus becoming more an element of mass tourism. It is causing a disruption of tradition, local dialect, changes in local music, food, architecture and family relations (Fennell, 1993). Religious rituals, customs and festivals are shortened, “abridged” and somewhat filtered so that they would fulfill tourists’ expectations. The consequences are not necessarily negative. Tourism also influences social and cultural gains. The most widely accepted opinion is that with the help of tourism people of different nations and cultures meet and spread cultural and ethnic tolerance. They bring different ways of thinking which sometimes could be a moment where people bond, not divide.

The current level of development of rural tourism in Southern Banat, Lower Danube, Eastern Serbia and Central Serbia does not influence the environment negatively. However, one should not forget that one of the main problems of assessments of tourism influence is that assessment often begins only once something has been developed, so it is difficult to form a base line analysis of changes monitoring (Holden, 2000). That is why it is important to recognize potential changes before they even occur. National agencies should recognize this as an opportunity to put in place the necessary structures so that impacts can be pre-assessed, tracked and efforts made to mitigate and limit negative ones.
All four regions have to contend with, both directly and indirectly, the pollution legacy of the past, whether this is air, soil or water. However, in general, the current state of the environmental in the four regions has not been negatively impacted by current tourism activity in any meaningful way and there is a strong basis upon which to develop sustainable rural tourism. This is not to say that there are not specific instances where tourism development is taking a path which is clearly not a sustainable one. In addition, many ancilliary services, fundamental to the sustainability of tourism development, have not yet reached a level of activity which either curtails and mitigates against pollution or achieves a standard comparable internationally and adopts sustainability parameters to ensure against future risk.

In consideration of the current issues facing sustainable development in Serbia, the promotion of rural sustainable tourism certainly has the capacity to make a significant contribution to overcoming many of them. As a consequence, the endorsement of sustainable rural tourism as a driver of sustainable development in Serbia should be encouraged.

The following environmental issues and their management and or development are important indicators and contributors to the future sustainable success of the regions in general and to sustainable tourism development in particular:

**Landscape** - plays an integral part in the identity, economic activity and attraction of all four regions tourism assets. The introduction and adoption of the EU Landscapes Directive will become an integral element in the protection, conservation and sustainable use of all Serbia. It will become an important pillar in support of protecting one of the fundamental elements of rural tourism.

**Demography** – Urban - rural migration and its impacts are well documented. For example; the changing demographic structure and depopulation have placed rural communities under pressure to maintaining the authentic characteristics of traditional life and food production in local villages. The decimation of rural communities is a serious consideration for the implementation of sustainable rural tourism development. On the other hand it is hoped that rural tourism development can be a significant contributor to countering this phenomenon by slowing and even reversing the process. While urban population intensity is relatively low in all four regions and thus environmental impacts are low, many rural villages have been completely deserted. Education levels in rural areas are considerably below national averages, and national standards of environmental and tourism awareness need to be enhanced. Rural Development Plans in combination with sustainable tourism development plans need to be comprehensive in their approach to not only putting forward actions to reverse this migration but also to stimulating economic activity in rural areas which is sustainable over the long-term and in which rural tourism can play a decisive role.

**Waste and Recycling** – Waste management and recycling in all four regions is improving, albeit from a very low base. Considerable efforts in improved coordination, dialogue, efficiency,
environmental awareness and viability are required in the short-term if these issues are not to become more serious impediments to sustainable rural tourism development in the future. For example, the levels of illegal dumping could have profound environmental impacts but also contribute to a negative image of Serbia as a tourism destination. Once a destination generates a negative image not only does this travel quickly it is also difficult to expunge. Each region has basically the same issues to contend with and the recommendations put forward all revolve around the application of a coordinated approach driven by the municipalities themselves but requiring community involvement and acceptance that whilst this is a community service it has to be paid for to be effective.

Biodiversity - There can be few countries who can boast at having such a rich biodiversity within Europe. Whilst this is a genuine comparative advantage in tourism marketing terms, all efforts should be made to mitigate against its destruction. Pressures on biodiversity in Serbia are mostly reflected on forests and sensitive ecosystems (wetlands, steppes, forest-steppes, sands, continental salt-springs, high-mountain habitats). In order that tourism and its development do not become a contributor to this pressure, it is vital that strict adherence to sustainability be followed and that where potential impacts are identified, solutions implemented in mitigation. Sustainable tourism is often promoted as a vehicle to support conservation and even enhance environmental biodiversity. All efforts should be made to harness tourism to contribute in this regard. Programmes that should be considered, apart from increasing awareness of this asset nationally, could include; working holidays in conservation projects, establishing environmental policies as a prerequisite to the issuing of trading licenses to any tourism enterprise that utilises the natural environment.

Air – Despite Serbia’s relatively low level of industrial activity, the degree of air pollution remains quite high. Air quality is being degraded by outdated industries, inefficient home heating systems, and aged motor vehicles using low quality fuel. Sulphur Dioxide and particulate matter levels in industrial and urban areas often exceed permitted concentrations. In general, the capacities and resources of most municipalities to monitor air pollution are limited, and accurate data on air quality is often not readily available to the local population. Whilst rural areas are considerably better off in this regard, mountainous regions do have to contend with temperature inversions which can exacerbate the problem especially due to the inefficiency of the fuels used. A national programme for the comprehensive monitoring and reduction of air pollution needs to be established and properly financed. EU financing may be available as would the opportunity to create forms of income generation to the programme through the provision of retrofit packages in collaboration with an energy efficiency programme.

Water – Only 8% of Serbia’s available water resources originate in the country; the remaining 92% is transit water entering the country through the Danube, Sava, Tisa and other water resources. In 2004, the total annual water abstraction for household and industrial needs was 820 million m$^3$. Out of the total, 55.4% came from groundwater sources, 42% from surface waters like springs, water sources, and artificial reservoirs, and 2.7% from other public water supplies. Serbia is among the poorer regions in Europe with regard to its own specific availability of surface water at about 1,500 m$^3$ per capita per year. It is very clear therefore
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that this is a precious resource which needs comprehensive protection and management. The quantity of the wastewater discharged into waterways is constantly increasing as a result of increasing living standards, urbanization and intensification of industrial and agricultural production. Not only is the quantity of the wastewater increasing, but the number of pollutants appears to be increasing also, which is negatively impacting aquatic systems and impedes any self-purification processes. Nearly 90% of industrial wastewater is being released without appropriate treatment, the waters from agricultural areas are rich in phosphates and nitrates, and sometimes they contain insecticides, herbicides and fungicides, depending on the season. Municipal wastewater which is mostly sewage is not processed to any acceptable degree before it is released into the river system. A situation made worse during heavy rains. In rural areas there is only limited access to municipal drainage and sewage systems with most households using septic tanks. From a tourism perspective, high levels of water pollution are a significant impediment to tourism development. Septic tanks are often not adequate to deal with the increase in water demand, and the eutrophication of the fresh water river system from pollution has a considerable impact on the levels of marine activity and their quality in comparison to other countries. It is hoped that Serbian alignment with the EU Water Framework Directive will make substantial inroads into this problem. Many countries within Europe have made it obligatory to register septic tanks and to provide evidence of up-to-date maintenance reports to municipalities.

Soil – Erosion is a major cause of soil degradation and is estimated to affect up to 80% of agricultural soil in Serbia. In the central and hilly-mountainous regions, erosion is mainly caused by water. Localized pollution is associated with heavy industry and the need for a concerted effort to clean these sites has been identified. Agricultural pollution to soils has also been identified as an issue needing attention especially in areas where this is having a significant.

Employment – Much of the heavy industry which employed large numbers of people in the past are in decline. In many cases the competitiveness of these facilities will never be re-established and a new direction must be sought for employment, development, and to broaden the economic base. It has become increasingly clear tourism has the capacity to make a sizeable contribution directly and indirectly to expanding employment opportunities. The over-riding benefits of tourism include the fact that it is largely non-location specific, has a comparatively low education entry requirement, can make significant contributions to foreign exchange reserves, and can engage a broad spectrum of investors. However, tourism can be a destructive and irretrievably environmentally damaging economic sector. But, with the appropriate structures, supports and strategic plans, sustainable tourism has the potential to play a significant role in the provision of employment to Serbia.

Transport – All four regions have improving transport infrastructure. However, sustainable tourism development requires a diversity of transport options to be in place. Ideally, those with the least environmental impacts are more favourable and the use of public transport is encouraged. From this basis, it is noticeable
that those regions with rail links need to focus on service improvements in order to ensure its reliability for tourism. The road networks are improving in quality, cycle routes are increasing but from a very low base and river cruising is being targeted.

**Renewable Energy** - The estimation of renewable energy use in Serbia is between 14% and 25% of total energy production. This difference in estimation is due to lack of precise data in the field of biomass use (black market, illegal and private wood cutting). The main sources of renewable energy in Serbia are: solar energy, wind, moving water, geothermal energy and biomass. The energy potential of RES in Serbia is over 4.1 million tons of oil equivalents (Mtoe) per year, which represents about a quarter of the current primary energy consumption. Renewable energy has negligible exploitation, except the water flows in large electric power plants, because the use of renewable sources has been much more expensive than use of conventional energy sources to-date. Energy efficiency should be targeted as a priority, along with education and support structures by municipalities to enable a cost effective retro-fit programme. Each of the four regions has the potential to develop one or more renewable energy production schemes but without the necessary support structures and pricing incentives these options will not be invested in. A similar situation takes place across Europe with guaranteed prices for renewable.

**Industry** - In all four regions, there are still elements of an industrial past in which only a few enterprises have successfully negotiated their way to becoming viable and competitive. However, there are many which have not, which has lead to an element of stagnation. In the quest to promote economic development, tourism, as an industry in itself, has the capacity to make a fundamental contribution to regional development, at many levels.

**Agriculture** - Rural Serbia represents a key part of the Serbian population and resources. Currently 85% of Serbia’s territory is rural, between 44% and 55% of the population lives in rural areas and an estimated 41% of GDP comes from rural areas (primarily agriculture). The rural economy in Serbia is highly dependent on agriculture with approximately 75% of the rural population engaged in subsistence farming. However, despite the wealth of natural and cultural resources, rural areas continue to suffer from high rates of unemployment, depopulation, low economic activity and decreasing natural resource value. Furthermore, many family members are not registered as agricultural producers but assist in everyday agricultural activities. These issues are specifically related to women and the poor in general. It is estimated that women in rural areas represent approximately 74% of people being engaged in family activities without being paid. The support and funding of rural development in Serbia over the past few years has focused on improving agricultural competitiveness, consolidating land, improving market orientation and developing rural economic infrastructure. However, an increased focus has been given to the diversification of the rural economy to non-agricultural businesses and expanding the current agricultural scope to new businesses. Rural sustainable tourism has the capacity to play a significant role in these efforts to diversify the rural economy. Careful consideration needs to be given to balancing the cultural integrity within the rural communities and the introduction of alternative agricultural approaches. A comprehensive rural
development plan needs to be put in place within which agriculture is but one, albeit major, element, and education another. These steps will support rural tourism development.

**Viticulture** – Not all regions are blessed with the opportunity to develop viticulture. Those that do should consider reviewing the wine tourism development approaches taken by other countries in Europe and further afield, such as South Africa’s wine routes. In these cases tourism is seen as an additional income generator with varying degrees of importance. However, it is always viticulture itself which is of paramount importance, but the ancillary businesses which can be developed are impressive – restaurants, local foods, production tours, etc. In addition, the creation of ‘routes’ is an important method of embedding standards, targeting and attracting investment.

**Forestry, Hunting & Fishing** – In all four regions forestry contributes to the local economy. The tourism potential that accompanies forestry can be significant if well planned and managed. Hunting is also present in these regions and as a form of tourism needs to be extremely well planned and managed if it to be considered a contributor to the sustainable tourism mix. The sport fishing industry is currently dominated by domestic tourism. There is potential to expand and attract foreign tourists but this will require improved infrastructure and improved water management programmes to reach any quality standards.

When we finally look at the possibilities within rural development for sustainable tourism in the selected regions of Serbia; all the challenges, opportunities and potential benefits, some general conclusions and recommendations can be drawn. These equally apply to the four studied regions as to the whole territory of Serbia. For convenience, they have been divided into several groups, but rural development, sustainable tourism and environmental protection are inextricably linked and in many ways are mutually dependent.

**Rural Development**
Agricultural change which results in large landowners, farming at industrial, high intensity levels will have the greatest impact on rural life from a social perspective and possibly from an environmental perspective. Whilst the ideal would be to ensure the survival, replenishment and enhancement of rural life through agriculture based on small holdings, which preserves the integrity of cultural and social dynamics. To support this requires encouraging entrepreneurship and broadening the rural economic base to provide additional incomes to farming households. Tourism has an easier entry point than most industries, utilises the wealth of the countryside, can be a driver of rural development and help preserve the environment;

Fundamentally, the restoration of a viable agricultural production sector and the creation of small businesses are essential for the development of the rural areas of Serbia and are preconditions and determinant of the success of rural tourism development;

The restoration of agricultural production, creation of new rural jobs and the provision of additional subsidies in agriculture, livestock-farming and tourism will significantly contribute to reducing emigration and support the return of the population back to the villages;

Small business, tourism, management of protected natural areas and the opening of
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professional institutions (schools, ambulances, agricultural and veterinary stations) could encourage the return of university-educated population back to rural regions in particular;

Further work to establish organic agricultural production and other forms of sustainable agricultural production will have a positive impact on the rural economy through the marketing of organic products on domestic and foreign markets, but also by increasing tourism focused on quality foods and eco-food.

All efforts to develop collaborative networks, at all levels need to start. These are the keys to any community’s success, and will provide a platform for education and skills development.

**Sustainable Tourism**

Although there is a great discrepancy in the rural tourism offerings and quality among the different regions (South Banat, Lower Danube, Eastern Serbia, Central Serbia), rural tourism is only starting to develop in Serbia, unlike other European countries, where this kind of tourism is quite popular. Like all forms of sustainable tourism development, its ultimate success is predicated on the successful coordination of a diverse range stakeholders. If rural tourism is to progress sustainably, the following information should be taken into consideration:

All four regions have been identified as having genuine potential for rural tourism development but as yet it is not a significant contributor to the tourism mix and has not gathered any real momentum, especially in South Banat, Lower Danube and Eastern Serbia. This provides the opportunity to start with sustainable strategies immediately by carrying out indepth strategic environmental assessments of all the impacts, positive and negative, direct and indirect, which may accrue and develop any required responses.

All five principles of sustainability have a rich presence in the 4 regions – economic, social, cultural, ecological and tourists’ satisfaction. Which suggests that sustainable rural tourism development could be successful. The ecological component needs to be bolstered by solving the public utilities problem (especially waste management) and natural heritage conservation requires not just the application of best practice in protected areas but a comprehensive awareness campaign to inform citizens of the value and services the natural environment provides. The social and cultural components also require the appropriate structures to enable the preservation and retain the integrity of cultures, traditions and local communities. Sustainable rural tourism provides the opportunity to inject new impetus into the conservation and preservation of these important elements. It is clear that the economic component would currently be considered weak. But with the appropriate structures in place, which support diverse sustainable products and recognised quality, tourist incomes can only increase as momentum is generated. Unless well managed, tourist activities can have irreparable impact on the environment. Rural tourism encompasses a large portion of the activities in rural areas, so the list of influences could be very long. In order to minimize the negative impacts and to maximize the positive ones, it is essential to apply ecology estimation impact techniques in any rural tourism development, boundaries of their implementation, bearing capacity and ethical codex as a guarantee that all tourism participants will be conscious of every consequence that each action has on a certain location.
Tourism and its interaction with the environment comes into the focus only after some negative impact occurs. If there is no information about environment condition before tourism, it is impossible to act adequately. Therefore rural tourism and environment relationship is of greatest importance and it should be analyzed carefully.

The potential of sustainable tourism in rural and protected areas of Serbia, similar to other countries, covers a broad range of rurally focused and special interest tourism. These include; hiking, photo safaris, biking, bird watching, rafting, horseback riding, fishing, sailing yachts and boats and kayaking, canyoning, caving, etc.. It also include cultural, event-oriented, hunting and medical tourism, as well as all aspects of agritourism, food tourism and crafts;

Development of new tourist destinations, especially those related to the natural heritage, protected natural areas and wine routes have the capacity to broaden the tourism product, create clusters and hubs, create greater employment opportunities and contribute to the environmental conservation of rural Serbia. More often than not, these destinations already exist in the four regions. What is needed is a coordinated approach to development of these hubs, creating destinations with real tourism appeal, with a dynamic array of activities;

Specialization of some rural households and small businesses (hotels, hostels) for receiving and providing travel services to tourists with special interests could be assessed to identify niche markets. Paramount is to ensure that the supply of accommodation provided covers the range of demand and is of a recognised quality;

Encourage and create, through focused training in sustainable tourism, an understanding of the opportunities within tourism. E.g. activities of NGOs in training in bird watching and nature photography, support to the scouts and researchers, eco schools, creation of promotional material about hiking and mountain biking. Rural sustainable tourism development should concentrate on appealing to domestic tourism to provide the backbone and viability to the industry and help reduce seasonality;

Development of support structures and training to enable and ease entry into the industry. This would include; establishing forums, identifying specific needs, and business skills provision; a priority issue is the development and application of a standards programme which covers as many aspects of the tourism industry as possible and that satisfy international best practice. Examples of this could be Green Key, Sunflower, etc. These programmes should be tailored to enable immediate application but also take into consideration cultural and social specifics;

Direct investment in tourism infrastructure has been highlighted as a primary requirement. Bicycle and hiking trails, gazebos, observation posts, info centres, etc. all need to established. This needs to be well planned and coordinated so as to comply with and support overall strategic tourism plans;

Investment is also required in the ancillary support structures to tourism. While these are all needed for long-term and sustainable regional development in general, they are vital to the initial development and success of tourism. These include water management, pollution control and abatement, waste management and recycling, health and safety programmes,
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emphasis is made on retaining a large majority of the economic benefit locally to support rural initiatives.

Creation of a robust primary data collection programme to support tourism development is of paramount importance to any future tourism development and monitoring programme.

Development of clusters utilising amongst other assets, the protected areas, to create the critical mass and act as catalysts to both create demand and encourage investment is a distinct possibility. Cluster development has been a successful approach to tourism development in other countries. Notably these include the creation of transport hubs, greater control of environmental management issues, and the potential to create a regionally identifiable tourism product with a number of different offerings. It is this amalgam which creates the attractiveness to potential visitors which any one offering could not do on its own.

Review international examples of regional approaches to rural sustainable tourism development such as – The Green Box (Ireland), Peace Parks Foundation approach to inclusion of local communities in the benefits of National Parks.

Identifi cation and creation of portal and rural tourism development forum which is inclusive and collaborative but not a government entity. Funded/ supported/ subsidised by government would be ideal scenario.

Environmental Protection
Greater awareness needs to be generated of the value of Serbia’s environment; its diversity and the benefits accrued amongst all, and the role of the general public in its protection and
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Biodiversity management guidelines in rural tourism

Biodiversity has multiple significances for rural tourism, but it is also under strong influence of rural tourism itself. Although rural tourism is not very developed in Serbia, apart from Central Serbia region, it is necessary to create the projection of activities in order to decrease potential influence of rural tourism, especially in regions where it is expected that it might become intensified.

Rich biodiversity helps contribute to a variety habitats and a robust environment. Biodiversity can also influence the tourist offer in terms of content, thus activities like medical plants collecting, collecting fruits of nature, organizing educational ecological routes, and hunting and fishing, directly depend on biodiversity. That is why it is essential to implement planned measures and activities which would be in function of preserving the biodiversity in villages and their vicinity. These measures include the following:

- **Information gathering and estimation of the contemporary condition** – this implies gathering of primary data information about all the characteristics of an ecosystem in a rural area, about the number of plants and animal species, especially of those which are important for touristic offer;
- **Vision** – this implies defining what is desired condition, but in accordance with objective contemporary possibilities. This could mean including the biodiversity in the tourist offer of rural regions, thus focusing public eye on the biodiversity problems and organizing different actions of protection (habitats preservation, marking of ecological areas and corridors, collecting funds for various programs of protection);
- **Tasks** – they should directly support vision and goals. They should always include time frame necessary for a certain task. Examples of different tasks: the reconstruction of a damaged ecosystem in order to include it in the tourist presentation (especially if there are some ecosystems damaged during tourist presentation process); marking, creating and marking of tourist itineraries (tracks) within ecosystems preserved; designing and developing of ethical codes made for tourists, and in order to protect the environment;
- **Influence estimation** – this implies analysis of tourism development influences, which could be widespread. Overall estimation of influences is important for every tourism development and for all tourist activities;
- **Influences management** – this is important to minimize negative impacts which tourism might cause. To make it sustainable, tourism should be managed within the frame of the bearing capacity and the level of acceptable ecosystem and sites changes. It should also provide that tourist activities contribute to biodiversity preservation;
- **Improve publicly funded projects** by establishing a centralised project management function for all public works. This is becoming a standard approach across Europe.
management. Consideration needs to be given to the adoption of such schemes as the FEEE Green Schools Programme.

Strict adherence to the adopted documents on environmental protection of Serbia will need greater policing and possibly more meaningful penalties;

Review and improve current protected natural areas management systems and support the implementation of sustainable tourism within management plans;

Further protection of new areas of outstanding importance for preservation of geo-diversity, biodiversity and cultural heritage will contribute to sustainable tourism development, and enhance opportunities for surrounding areas. Considerations should be given to the development of protected area corridors to support the conservation and preservation of biodiversity.

Inclusion of protected natural areas of Serbia into the world lists or joining the protected area networks (Emerald, Natura 2000, UNESCO MAB areas etc.) will further strengthen protection of nature and access expertise;

Encourage the utilisation of protected natural areas as eco-destinations to act as catalysts for tourism hub development, and their efforts to achieve all standards for sustainable tourism;

Assess all possibilities and capacities that will be provided by regional waste landfills, regional systems for wastewater treatment and renewable energy production from sustainable sources for further environmental protection and reduction of any negative impacts;

Encourage the involvement of local people in the protection of natural and cultural resources.

Investigate the opportunities to create public–private partnership in managing protected areas, or aspects of it, and in the development of sustainable tourism activities on its and surrounding territory.

**Demography**

The size and quality of the local and regional labour force is one of the most important prerequisites for the successful development of sustainable tourism, and it is precisely the lack of personnel which appears as a key issue in all the studied regions. Extremely negative population growth has become the largest economic and geographical problem over the last decades of the twentieth century in Serbia and has been a steadily intensifying phenomenon ever since. Up until the 1960's, the growing population in Serbia was split 20% urban to a rural population amounting to 80%. Migration was largely characterised as rural–urban translocation but after 1991 these too began to experience a decrease in population as the influx of labour from rural areas began to dwindle. The 1960's marked the beginning of intensive aging and the extinction of rural villages, which, at the beginning of the twenty-first century, took on the characteristics of an epidemic by spreading rapidly to those areas of Serbia which did not suffer from labour shortages in the previous years. Today, there is no respite in migration and it is also being compounded by net emigration out of Serbia. It is hoped that rural tourism development can act as a significant driver to turn this situation around.

**Education**

It is well recognised that an improvement in
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- Sustainable development in general, and sustainable tourism and protected areas in particular should be included in the curricula of primary and secondary schools;
- Further enhancement and development of training programmes for organic farming;
- Development of educational programmes for MTOs for sustainable tourism development;
- Training of households that provide accommodation and food services, on the: sanitary-technical conditions of tourist accommodation and food, development of tourism offer, specific needs of tourists and economic benefits of sustainable tourism;

the education system, especially in rural areas is necessary if any economic development, including tourism is to help provide a higher level of qualified local people. The alternative to this is the dominance of an imported workforce (Serbian and foreign) which will inevitably alter the cultural dynamics in rural communities. Educational needs include helping local people in rural regions to manage their expectations from tourism by informing them of the realities, both the opportunities within the industry and also the potentially negative impacts.

Social integrity affirmation (box)

This segment implies that social characteristics of a local community must be preserved during the tourism development process. Any change of habits, introducing of new standards, behavioural models which are unlike traditional ones and which come from tourism, could be regarded as unsustainable tourism development. Educational programs could have a special significance in this concept (attachment). Sustainable rural tourism must pay special attention to local communities especially in South Bačka, where there are many different nationalities and minorities, and in Eastern Serbia, where communities are very sensitive to changes because of specific historical and economic circumstances. Development plans in such examples must imply that communities are able to continue their normal development even after rural tourism income is made. There could be some antagonism between local people involved in rural tourism, and those who do not participate in it and such scenario must not be allowed. Central Serbia region successfully avoided this antagonism problem. However, research shows that even there, local people are not always satisfied with their position. For example, it is often emphasized that there is not enough encouragement from the local authorities or any other authorities, for that matter (there are not enough credits, no help with household reconstruction works, and no encouragement policy). There is also the problem of lack of information and consultations about development programs strategies and plans. The half of local people questioned think that they do not have enough information about development programs. On the other hand, local people are aware of the importance of rural tourism in protecting the customs, culture and old crafts. This is especially the case in municipality of Kusjetić, which is regarded as one of the most successful in rural tourism activities in Serbia.
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- Education of people living in vicinity of protected natural areas on the benefits of protection, but also on restrictions and obligations arising from it;
- Developing skills and capacities of staff and management of protected areas for project proposals writing and project cycle management

Restoration of old crafts and training of young people for making traditional items;
Training programs in foreign languages.

All research shows that local people are ready to receive further education in rural tourism and this opportunity should not be missed.

National education programmes in sustainable tourism at tertiary level (certificate, diploma and degree levels), similar to those in other countries, need to be firmly established. E.g. Training for rural tourism officers was organized in 2007, as a part of a project designed by the Ministry of Trade, Tourism and Services. This program was designed not only for service providers in country households, but also for local authority officers, entrepreneurs and farmers. This task was given to Department of Geography, Tourism and Hotel Management, Faculty of Sciences in Novi Sad. It was implemented in two terms, on three locations for three clusters, which are recognized by Tourism Strategy of Republic of Serbia. These are: Vojvodina, Western Serbia and Eastern Serbia. The first term included rural tourism theory normative, and the second presented rural tourism experience in successful centres and destinations in Serbia and abroad. Lecturers were professors and tourism officers from the Netherlands, Slovenia, Croatia, Greece and other countries. Although this program was successful, the problem was that this was only one training project, and tourism education in Serbia has no alternative programme in place. Trossachs in Great Britain for example, organizes training programmes which include approximately 40 creative workshops every year. These activities are run by local tourism authority.

**Governance for Rural Tourism Sustainability**

Wider involvement of all stakeholders in the planning and implementation of rural development, sustainable tourism and nature conservation;
- Improved communication between the managers of natural resources, local institutions and citizens;
- Improved cooperation between the MTO and rural households interested in partaking in sustainable tourism;
- Collaborative, joint application of managers of protected natural areas, local institutions, non-governmental organizations and individuals for funds from the State, the European Union and other international funds.
- Impress the importance of cohesive, collaborative and coordinated policy development which is appropriately financed and identifies clear objectives and actions, and unambiguous channels of responsibility in any dealings with environmental, protected area management, tourism development, land use planning, education and rural development matters.
Environmental recommendations for sustainable tourism development in four regions

This report aims to provide objective and realistic supplementary recommendations for the implementation of the Master Plan, based on the report by UNEP and YRS which presents four regional environmental studies of; South Banat, Lower Danube, East Serbia and Central Serbia. Sustainable tourism sees tourism within the destination areas in terms of holistic relationships between the host areas, their communities and tourists, the tourism industry and the environment. In that context, the aim is to contribute further considerations for embedding sustainability within rural tourism development through a better understanding of the four regions in regard to the necessary components which need to be established, enhanced, or altered to maximise potential. The objective of this report is to:
• Focus primarily on the sustainability aspects of rural tourism development in the four regions.
• Utilising the approach, as set out in the Master Plan, and identify recommendations equally applicable to the four regions and Serbian sustainable rural tourism development as a whole.

NATIONAL based on the four regions

Governance & strategic planning
• Establish oversight committee of international experts to support Master Plan.
• All tourism plans to be subject to sustainability screening
• Establish appropriate planning rules, and enforcement to ensure integrity of cultural and natural heritage is retained.
• Encourage the restoration of existing rural buildings for tourism as opposed to building ‘new’ facilities where possible.

Rural development
• Restoration of a viable agricultural production sector and the creation of small businesses are essential for rural development in Serbia and are determinants of success of rural tourism.
• Ideal: ensure the survival, replenishment and enhancement of rural life through agriculture based on small holdings, which preserves the integrity of cultural and social dynamics.
• All efforts to develop collaborative networks, at all levels are necessary keys to any community’s success, and will provide a platform for education, skills development, economic development, and the improvement of community services (e.g. schools, waste management, post office, shops etc).

Sustainable tourism
• Review international examples of regional approaches to rural sustainable tourism development such as – The Green Box (Ireland),
• Review Peace Parks Foundation approach to inclusion of local communities in the benefits of National Parks.
• Creation of a portal and rural tourism development forum which is inclusive and collaborative but not a government entity. Funded/ supported/ subsidised by government would be ideal scenario to generate a meaningful voice for non-governmental entities.
Environmental recommendations for sustainable tourism development in four regions

- A robust primary data collection programme to support tourism development is of paramount importance to any future tourism development and monitoring programme.
- Sustainable rural tourism development plans need to emphasise retaining a large majority of the economic benefit locally.
- Since most of the potential types of tourism identified are dependent on preserved nature and protected natural heritage resources in particular; ensure all efforts are made to harness these resources in a sustainable manner.
- Holistic approach to rural tourism development, focusing on empowering women, up-skilling, and improving environmental awareness as well as the opportunities inherent in sustainability.

Tourism industry access
- Enforce requirement for environmental policies and management plans as a prerequisite to the issuing of trading licenses to any tourism enterprise
- Require individuals to attain prescribed sustainability training and ongoing refresher courses

Biodiversity
- Whenever possible, enable tourism to contribute to conservation and enhancement e.g. develop ‘working’ holidays concept to support conservation
- Increasing asset awareness nationally to encourage the protection of biodiversity and the enhancement of its diversity in all activities which engage with the natural environment.
- Ensure ‘hotspots’ have appropriate protection status, monitoring and policing.

- Engage in international fora to develop expertise and to identify best practices for adoption.
- Protection of biodiversity cannot be left to the sole responsibility of National Parks; as islands surrounded by an increasingly depleted environment.
- Encourage value awareness outside protected areas to prevent development of biodiversity islands.
- Strict enforcement in application of Environmental Impact Assessment and Strategic Impact Assessment.
- Encourage the further designation of protected space to biodiversity and to reach the EU target for protected space, regionally as well as nationally.
- Encourage linking protected areas with biodiversity corridors.

Landscape
- Landscape plays an integral part in the identity, economic activity and attraction of each region.
- Adoption of the EU Landscapes Directive; a key to protection, conservation and sustainable use of natural and cultural heritage.
- Improving awareness of the need to protect and conserve the natural and cultural assets is increasing demand to create holistic and inclusive structures so that more of the population can benefit from the landscape in a sustainable fashion and that natural and cultural assets are given the protection they deserve.
- A comprehensive landscape assessment would provide a valuable insight into potential impacts by many activities including tourism e.g. any future development needs to take into consideration the unique characteristics of karst geomorphology and the influences of the Danube River.
Financial incentives & structures
• Advantageous loan structures for activities which aim to promote sustainability, enhance biodiversity and its awareness, of structural benefit to sustainability e.g. Greentech
• Subsidies for sustainability improvements and retrofitting.
• Guaranteed pricing for renewable energy supply.
• Encourage public-private partnerships where possible
• Collaborative, joint application for funds from the State, the European Union and other international funds e.g. by protected natural areas management, local institutions, non-governmental organizations and individuals

Environmental support structures from tourism
• Consider tourism taxes on entry to Serbia e.g. Costa Rica
• Consider levies on tourism activities e.g. all water sports.
• Consider trading Licenses
• Consider car rental impact levies
• Consider discounts for public transport
• Hotel waste management, water management including local community.
• Working holidays based on conservation work e.g. International National Trusts Organisation.

Transport
• All options for provision of sustainable transport should be considered especially at destination level e.g.; further cycle routes, river transport and walking trails between towns.
• Focus on utilising public transport as opposed to car use
• Good signage is vital but needs rules so that it is consistent and is aesthetically in keeping.
• Review of coordinating rail, bus and air transport to ease access for tourism to regions. Integrating public transport and aligning it where possible with tourism needs would be a significant step forward
• Consider options for developing public/private partnerships in the provision of public transport.
• Encourage the development of a more reliable train schedule
• Review the options for running public transport on renewables

Education
• Sustainable development in particular, and sustainable tourism and protected areas in general should be included in the curricula of primary and secondary schools
• Greater awareness of the value of Serbia’s environment; its diversity and the benefits it provides to all, as well as opportunities for participation by the general public in its protection and management. This will support NGO’s especially.
• Consideration needs to be given to the expansion of such schemes as the FEEE Green Schools Programme as a platform for sustainability understanding.
• Tourism requires a vast array of skills. These need to be assessed and catered for in the appropriate fashion (apprenticeships, secondary and tertiary qualifications, tourism authority training programmes etc).
• All tourism education needs to ensure an understanding of sustainability.
Environmental recommendations for sustainable tourism development in four regions

**Cultural heritage & social integrity**
- Any developments must be mindful of architectural heritage.
- Identify carrying capacity to avoid tourism invasion of ‘hubs’ and loss of aesthetic value.
- Build on cultural and social characteristics without supporting ‘Disneyisation’.
- Prevent ‘McDonaldising’ at all costs.
- Cultural heritage includes monuments and remnants dated from prehistoric, antique and Roman periods, from medieval times (monasteries of typical architecture, with fresco paintings and preserved surrounding) as well as by traditionally built houses from the end of XIX and beginning of XX century.

**Waste management**
- Improved coordination, dialogue, efficiency, environmental awareness and viability are required in the short-term if these issues are not to become more serious impediments to sustainable rural tourism development in the future.
- Marginally better than Serbia generally in terms of waste collection.
- Waste collected and disposed too often goes to inadequate landfills.
- Hazardous waste is disposed to landfills.
- Illegal dumpsites are all over the four regions, even in the protected areas and
- Need system to collect accurate data to support waste management and recycling.
- Establish the structures to enable private sector involvement in waste management system and development of public-private partnerships.
- Strengthen capacity of local community and NGOs with regard to the development of public industry awareness programmes related to problems and solutions for sustainable waste management.
- Special attention given to rural areas, as they have specific problems related to organic waste and some kind of hazardous waste like packaging from pesticides.
- Harmonize the level of fees for waste collection to ensure sustainable services with a new pricing system gradually introduced.
- Identify funds for remediation of non sanitary landfills.
- Development of training programmes and capacity building within industry and in communities.

**Energy efficiency**
- Target as a priority, along with education and support structures by municipalities to enable a cost effective retro-fit programme to all engaged in tourism.
- Energy efficiency in buildings is just beginning to be assessed and the requirements identified.
- It is apparent that there is a considerable requirement for building regulation enforcement and retrofitting.

**BIODIVERSITY**
- **National**
  - A comprehensive strategy, supported by national policy, needs to encourage the protection of biodiversity and the enhancement of diversity in all activities which engage with the natural environment.
  - Protection of biodiversity cannot be left to the sole responsibility of National Parks; as islands surrounded by an increasingly depleted environment.
South Banat
- Ecosystem diversity is high, since this region is a mixture of steppe vegetation, halophilous vegetation on salty soils, forest-steppe complexes, termophilous forests, and broad-leaved shade forests.
- Ensure a comprehensive regional system is put in place for biodiversity conservation.
- Improved biodiversity awareness for all.
- Sustainable agriculture techniques are enhanced and introduced.
- Fire protection and training is kept up-to-date.

Lower Danube
- All municipalities are covered by ecosystems of natural forests.
- More than 50 mixed forest and shrubby communities have been registered, of which 35 are of relic character.
- Floristic and faunistic richness of this region is protected in National Park Đerdap.

Eastern Serbia
- Natural ecosystems occupy primarily the hilly and mountainous regions. Large areas of Eastern Serbia are covered by natural forests.
- Alpine meadows that belong to the vegetation classes Juncetea trifidi dominate at higher altitudes.
- Ensure that all relevant development plans include requirements to assess any impacts on biodiversity and to carry out EIAs as well as SEAs as prerequisites.

Encourage the further designation of protected space to support the conservation and preservation of this biodiversity and to reach the EU target for protected space in the region.

AIR National
- Establish national programme for comprehensive monitoring and reduction of air pollution.
- Police appropriate legislation.
- Develop action plans to remedy situation.
- EU financing may be available.
- Opportunity to create forms of income generation through the provision of retrofit packages in collaboration with an energy efficiency programme.

South Banat
- Credible threat of air pollution from surrounding regions of sulphur dioxide and nitrogen oxides. But due to favourable predominant wind direction, all four municipalities have good air quality.
- Continued focus on monitoring to ensure that any pollution threats are identified with time to react.
- Encourage and support switch to renewable energy to reduce domestic use of solid fuels.

Lower Danube
- Key polluters are thermal power stations, mining and the Industrial zone of Turnu Severin.
- The capacity for municipalities to monitor air pollution needs to be enhanced so that accurate data on air quality can be communicated and major polluters held to account.

Central Serbia
- A monitoring system is essential.
- Continuous efforts to reduce and mitigate the impacts of temperature inversion in valleys on the levels of pollution from mining and by encouraging alternative fuels and energy sources.
Environmental recommendations for sustainable tourism development in four regions

**Eastern Serbia**
- Due to the limited development of heavy industry there is no recognized threat from air pollution and rural air is considered of high quality.
- Comprehensive monitoring system is needed.

**WATER National**
- EU Water Frameworks Directive will make substantial inroads into problems of fresh water management, waste water treatment and conservation.
- Water-based tourism will require significant improvements in water quality for a sustainable future.

**South Banat**
- Surface and ground waters are not of the acceptable water quality
- Main water polluters are uncontrolled usage of agrochemicals, uncontrolled waste disposal and wastewater from households and industry.
- Bela Crkva's lakes water quality periodically of lower than required. The source of this pollution is fast urbanization of the lakes' surroundings coupled with inadequate wastewater disposal infrastructure.
- A comprehensive assessment of water management needs to be completed and actions taken to remediate the situation.
- The success of sustainable rural tourism development could be determined by improving this situation since this is a vital component of any rural development infrastructure.

**Lower Danube**
- The Danube and its tributaries represent the main sources of surface waters.
- Danube tributaries have excellent water quality.
- BUT, all municipalities water is directly impacted by mining, fly ash from Kostolac power stations, commercial, industrial and agricultural wastewaters, water transport, and indirectly, by pollutants in the air and soil as well as cross border pollutants carried in the Danube waters.
- Urgent requirement for implement EU Water Frameworks Directive
- Prioritise upgrading water management and infrastructure, install comprehensive water monitoring system;
- Create a community awareness programme in support
- Target main pollutants.

**Central Serbia**
- Not in short supply but is negatively impacted by insufficient purification, waste water management and accompanying infrastructure.
- Prioritise upgrading water management and infrastructure, install comprehensive water monitoring system;
- Create a community awareness programme in support
- Target main pollutants.
- Maintain progress through the EU Water Frameworks Directive.
- Water-based tourism

**Eastern Serbia**
- Main rivers and tributaries are polluted downstream of the larger urban territories.
- Water quality in the municipalities of Negotin, Zaječar and Knjaževac Valley Rivers do not meet acceptable water quality standards.
- Water from the Danube is in a quality range from class II to III, parts of Timok, Trgoviški and White Timok and Nišava river quality also range from II to III to beyond-classification.
- Particular concern is the Grlište (Zaječar) which has been polluted by the Lasovačka and Lenovačka rivers.
Environmental recommendations for sustainable tourism development in four regions

• Surrounded soil erosion, uncontrolled use of agro-chemicals are serious issues.
• Unplanned construction of second homes on the lake’s shores, if not the primary source of pollution are compounding the situation.
• In the mountains most of rivers are in the high I and I/II water quality classes.
• Water management, especially waste water management, is in need of review as all urban conurbations mentioned appear to reduce the quality of the water passing through significantly.

SOIL
National
• Complete cleanup of identified ‘hotspots’
• Coordinated approach with rural development policy to educate farmers on impacts and alternatives to artificial herbicides, pesticides and fertilisers.
• Agriculture to actively adopt Water Frameworks Directive
• Establish training programs for farmers, on appropriate use of modern agro-technical.
• Take lead from Vršac, Agricultural School (orig.: Poljoprivredna škola,
• A more comprehensive approach needs to be adopted which is more inclusive of current farming community as part of the vision for farming in the future.

South Banat
• Main threats involve Aeolian erosion, salinisation process, flooding and uncontrolled waste disposal, as well as the uncontrolled usage of agro-chemicals and industrial disposals.

Lower Danube
• Directly threatened by open coal-pits and methods of mineral resources excavation, pollution from thermal power plants.
• Affected by drought and erosion.
• Uncontrolled application of agrochemicals, while the hilly and mountain areas of the municipalities remain mainly unaffected by the soil pollution.

Central Serbia
• Threatened by landscape degradation and pollution in the impact zones of open mines of cement resources; mining of magnetite and lead–zinc ore and open mining and processing of masonry stone in municipalities of Kosjerić and Gornji Milanovac.
• Land is directly and indirectly polluted by industrial facilities in Valjevo, Kosjerić and Gornji Milanovac.
• Affected by inadequate agricultural practices, untreated leachate from the landfills and mining, erosion and floods

Eastern Serbia
• Threatened by pollution from mining in the municipalities of Zaječar and Negotin
• Erosion and drought, uncontrolled usage of agrochemicals in the plains and lower hill areas
• Encourage the development of comprehensive pollution mitigation programmes for all identified sources.
• Ensure an effective monitoring and policing programme is put in place.
• Assess the feasibility for cleaning and re-instating damaged areas and establish an action plan to carry this out.
• Establish an environmental health and safety education programme
9. Environmental recommendations for sustainable tourism development in four regions

**DEMOGRAPHY**

**National**
- Cohesive actions and inclusive of all agencies in Rural Development Plans supporting sustainable rural tourism development to maximise its potential stimulate sustainable economic activity in rural areas.

**South Banat**
- Population density is low.
- But, region is faced with the problems of population decrease and migration.

**Lower Danube**
- All municipalities of the region are characterized by one of the highest rates of emigration in Serbia.
- A significant percentage of them being of Vlah ethnicity has relocated to other European countries over the last fifty years.

**Central Serbia**
- Characterized by significantly greater population density.
- This is one of the areas in Serbia where migration started earliest. Due to the infrastructure remaining unchanged for decades.
- With the exception of the Pirot municipality, the other four all fall within the categories with the highest demographic aging, so the demographic potential of the East Serbia region, when compared to the others, is the weakest.
- Constructive coordination vital between rural development planning initiatives, environmental management and rural tourism development to energise economic growth based on sustainable principles.

**Eastern Serbia**
- Sparse settlements indicate a low intensity of urbanisation pressures on the environment.
- Many villages have been completely deserted.
- Maintaining authentic characteristics of traditional life and food production in local villages has been under pressure by the changing demographic structure and depopulation due to emigration.
- Rural Development Plans in combination with sustainable tourism development plans need to be comprehensive in their approach to not only put forward actions to reverse migration but also to stimulating economic activity in rural areas which is sustainable over the long-term and in which rural tourism can play a decisive role.

**EMPLOYMENT**

**National**
- Establish more third level programmes in tourism.
- Harness tourism to re-skill, up-skill, and empower rural communities to participate.
- Create incentives to empower rural women in particular.
- Establish incentives for out-door pursuit best practice training.

**South Banat**
- The main industries being food processing, chemicals and pharmaceuticals, and mining of minerals, oil and natural gas.
- Lack of efficiency limits competitiveness.
- Privatisation has had limited success Create structures to support privatisation.
- Put in place robust mechanisms to ensure remediation of mining sites and environmental management of works.
9. Environmental recommendations for sustainable tourism development in four regions

• Sustainable rural tourism has the potential to play a significant role but must be supported by a comprehensive regional development plan

AGRICULTURE

National
• Key role in success of rural tourism
• Empower through presenting all opportunities to supplement incomes.
• Facilitate biodiversity and environmental management through agriculture.
• Supported through EU Agricultural Policy in the future.
• Careful consideration needs to be given to balancing the cultural integrity within the rural communities, agricultural communities in particular, and the development of tourism.
• Further work to establish organic agricultural production and other forms of sustainable agricultural production
• A comprehensive rural development plan needs to be put in place within which agriculture is but one, albeit major, element, and education another

Lower Danube
• Public sector – 28%, industry employs 22%,
• Mining and the related metal-processing industry of copper, magnetite, lead and zinc concentrates as well as providing manufacturing services
• Sharp drop in investments during the nineties and mining has failed to maintain competitiveness
• Successfully privatized enterprises are in a significantly better position and include companies involved in health-food production, transport, and bread-making amongst others
• With the increasing international demands for inclusion of environmental performance, all future industry and privatisations need to incorporate environmental governance and international best practice

South Banat
• Dominated by metal manufacturing and food processing especially fruit but which have been in steady decline.
• A relatively broad spectrum of economic activities with potential as well as tourism growth, to support efforts to reverse this phenomenon in the future.

Central Serbia
• Dominated by metal manufacturing and food processing especially fruit but which have been in steady decline.
• A relatively broad spectrum of economic activities with potential as well as tourism growth, to support efforts to reverse this phenomenon in the future.

Eastern Serbia
Clearly an increase in investment is required in traditional industries to make them competitive.
• New investments to generate a broader economic base.

Lower Danube
• Not a dominate sector in this region.
• But, like all rural areas of Serbia, this region
Environmental recommendations for sustainable tourism development in four regions

could benefit from a comprehensive approach to rural development which coordinates the agricultural population in sustainable rural tourism so as to expand income generating possibilities

**Central Serbia**
- Dominated by private farmers
- Increasing focus on revitalising fruit production important
- Education programmes in sustainability; with particular emphasis on soil and water management, artificial additives, organic farming and other forms of sustainability will be important.
- Sustainable and organic farming by the Agricultural Cooperative provides a potential platform for making connection between agriculture and tourism

**Eastern Serbia**
- Agricultural land in Eastern Serbia covers 60.4% of the total area of the region.
- Problems are primarily related to the small size of holdings, predominantly natural production without specialized commodity holdings and a large percentage of elderly people in the agricultural population
- Organic farming is developing through the Agricultural Cooperative in Arbilje which is supplying products for export into EU.
- Careful consideration needs to be given to balancing the cultural integrity within the rural community and the introduction of alternative agricultural approaches.
- Wine production is well recognised, which has had a presence here for centuries.
- A number of vineyards are trading successfully but many need investment and to be moved out of state ownership.

**FORESTRY, HUNTING & FISHING**

**National**
- Forestry – sustainably managed can contribute significantly and benefit from tourism. (accommodation, trails, bird-watching, etc)
- Can support the development of renewable energy from biomass at local level.
- Hunting – potential as a niche market and permanent employment in isolated areas.
- Align current management practice with international best practice (e.g. Scotland).
- Fishing – already a sizeable domestic base but needs comprehensive planning to ensure long-term future and sustainability.
- Attain international standards a prerequisite to attracting meaningful international visitors.

**South Banat**
- Less than 5% of the area covered by forest, is among the poorest forested areas of Serbia
- Maintaining forests in Deliblato Sands equally vital to environment management and agriculture.
- Fighting fires is the most important protection factor for this fragile ecosystem.

**Lower Danube**
- One of the most densely forested areas of Serbia with more than 60% of the area covered by forests
- Municipality of Majdanpek is over 80% forested and is the most densely forested municipality in Serbia.
- The Đerdap sector of the Danube was particularly known for its abundance in fish, especially sturgeon and beluga, which spawn here.
- Construction of the dam has stopped their natural movement upstream.
Environmental recommendations for sustainable tourism development in four regions

South Banat
- Around 16% of the land in this region is protected as natural heritage, which is above the average level for Serbia as a whole.
- The most important natural areas are Special Nature Reserve Deliblato Sands and Landscape of exceptional beauty Vŕšacke planine Mts.
- Develop comprehensive and inclusive management plans.
- Ensure management plays a significant stakeholder role in water management programmes.
- Establish holistic tourism development plans.

Central Serbia
- All three activities need to review and ensure that they follow international best practise in regard to sustainability.
- Sustainable tourism will support long-term viability and economic contribution, but also open and expand markets, especially international visitors (financially significant in regards to fishing and hunting).

Lower Danube
- The National Park Djerdap is the largest and most important from the perspective of natural heritage protection.
- Cooperation with national experts and scientific institutions should be encouraged so as to strengthen capacities of the Park staff and their vision of sustainable rural tourism, which can contribute to their more competent and systematic work with local community and stakeholders.
- Similar to involvement in projects and activities related to the implementation of the Carpathian Convention, Park Staff should consider other international projects.
- The implementation of the EU Strategy for the Danube Region should be used as a spring board for further stakeholder engagement.
- Utilise membership of the Danube Competence Centre (DCC) and further develop international cooperation such as that with Japanese Agency for International Cooperation JICA and UN coordinators of this study to contribute to the development of sustainable tourism in the Danube region.
- Commit to the principles of sustainable rural tourism including involvement of local communities.

Eastern Serbia
- 8% of total forest area in Serbia
- Lakes Zavoj and Grlište provide possibilities for fishing.
- The areas suitable for hunting are Tupižnica, Tresibaba, Vidlič, Vratna and Stara Planina.
- All hunting areas in the region are equipped with hunting lodges to accommodate hunters.
- Hunting areas are managed either by local hunting associations or the Public Company Srbijašume.

PROTECTED AREAS

National
- Need to increase areas covered by protective status to attain EU average.
- Structures and policies need to be reviewed and strengthened to ensure;
- Put in place management training as part of national plan and regional plans for conservation and tourism management

- Fishing diminished significantly, as well as decimating the caviar industry, for which Kladovo was internationally renowned.
- Only one private company engaged in breeding these fish.
- Fishing industry still makes an economic contribution to the region,
- Rivers Danube Poreč and the gulf of Poreč, have potential for increased development, by playing an important role in expanding and improving the tourism offering.

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Environmental recommendations for sustainable tourism development in four regions

• Education programmes designed to meet the needs of the local population and tourist organizations for the sake of development of sustainable rural tourism could be developed in the National Park.
• Consider options for accommodation within the Park.

Central Serbia
• Only 1% of region protected as natural heritage. Very low compared to the rest of Serbia
• Progress with national strategy to increase the natural protected territory.
• Designate entire complex of Valjevo Mountains, thereby improving coverage to between 25-30% of the region.
• Plans for Maljen Mountain should be revised as to not support sustainable tourism.
• Develop constructive stakeholder engagement forums and capacity building for all.
• Nomination of the Stara Planina for UNESCO MAB Programme and its designation as Biosphere reserve.
• International conservation designations will support the development of monitoring of tourism, application of best practice and access into international knowledge network.

Eastern Serbia
• Floristic and faunistic richness of this region is protected in two large complexes. Stara Planina Nature Park and The Jerma river gorge
• Backbone of tourism development in the region is mountain tourism on the Stara Planina.
• Planned capital investments to build the biggest winter ski resort in the Balkans could positively impact the development of the rural countryside around the ski centre.
• Unfortunately, the same cannot be said for the social and environmental impacts.

• Need to include environmental and sustainability considerations into these development plans.
• Quantify the potential benefits from rural tourism and the impact of the Stara Planina Plans on this potential.
• Pilot projects provide the excellent basis for protection of the Stara Planina mountain architecture in planning of future construction.

VITICULTURE & OTHER TOURISM HUB CATALYSTS

National
• Review wine tourism development approaches taken internationally to identify best practice and ease of application.
• Ancillary businesses which can be developed are impressive – restaurants, local foods, production tours, etc.
• The creation of ‘routes’ is an important method of embedding standards, targeting and attracting investment
• Consider connecting with European ‘Cultural Routes’ where feasible

South Banat
• Protected Areas stand out as potential hubs.
• Viticulture in the area of Vršac should be targeted for tourism development

Lower Danube
• Protected Areas stand out as potential hubs.

Central Serbia
• Review international best practice regarding viticulture (and other catalysts) and sustainable tourism.
• Identify investment structures necessary to attract finance.
Environmental recommendations for sustainable tourism development in four regions

• Identify training needs to support tourism hubs.

**Eastern Serbia**
• The viticulture tourism potential is already recognized and plans have been released for its development

**ENERGY & RENEWABLES**

**National**
• All four regions have potential to develop one or more renewable energy production schemes
• Require necessary support structures and pricing incentives otherwise these options will not be invested in.
• Encourage demand by creating awareness of the benefits.

**South Banat**
• Renewable energy in total energy production and consumption has significant potential. In particular biomass, geothermal and especially wind.
• Complete comprehensive feasibility studies for all renewable identified to have potential.
• Identify approaches for development including all aspects of ownership, grid adaption, financing etc
• Investigate opportunities to develop small-scale renewable power plants e.g. for rural communities.

**Lower Danube**
• Second most important electricity production area in Serbia.
• Hydropower plant Đerdap (Eng.: Iron Gate) I, and the thermal power plants Kostolac A and Kostolac B. Both have caused significant environmental impacts.

• Wood is being increasingly used for heating homes and natural gas distribution infrastructure is not developed.
• Significant potential exists for harnessing wind energy but there is only scope for a few small-scale hydroelectric plants

**Central Serbia**
• Sources currently used are all non-renewable.
• Wood is being increasingly used for heating homes and natural gas infrastructure is not developed, except in Gornji Milanovac
• Renewables only used by a small number of households.
• Renewables potential include small-scale hydro, solar, geothermal and biomass.
• Further identify the feasibility of all forms of renewable to contribute to energy supplies either to the grid system or to local clusters.
• Consider feasibility of stimulating demand towards reaching economies of scale by committing public transport to adopt renewables

**Eastern Serbia**
• Energy production is based on both conventional and sustainable energy sources.
• Both types of production are related to hydroelectric power.
• The major producers are Đerdap II (270 MW) and Pirot HPP (80 MW),
• Characterized by high potential for building small hydropower plants
• Greatest potential for use of solar energy
• Potential for wind energy utilization varies widely among the Eastern Serbia municipalities. The greatest potential exists in the municipality of Negotin, on Deli Jovan and in the northern parts of the municipality, towards Kladovo, along the Danube
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Annex 2.2

Rural Tourism and its Sustainability Research Questionnaire
Institutions which are considered to have the most relevance to this study and ability to answer the questions were targeted with this questionnaire.
Answers to the questions should be recorded in detail. Also, any documents containing more of relevant information should be specified (e.g. Local Plans, Strategies, Reports and similar).
In cases where no data is available, that fact should be specifically stated!
The names of the persons in charge of specific areas, with all contact information (phone, email, address) are listed in the stakeholder lists.

The Area of Tourism
Questions for the Municipality tourism organization (we want to know where rural tourism is on the MTO’s priority list and how much importance is given to its economic and environmental sustainability)

- Based on information given by the Statistical Office of RS for year 2009, it was stated that the in the territory of (municipality) the total number of tourists was (number) (data is to be found in the annex to this document). Do you have the information on number of tourists engaging in rural tourism, in relation to the total number of tourists?
- What is the number of tourist agencies, in relation to their total number, that offer rural tourism programs?
- Is there any data on the number and types of companies involved in services in tourism (accommodation, restaurants and bars, transportation of tourists, travel agents in tourism)? Is there any data on the number of their employees? Can you give us the data you have?
- How many employees in your tourism organization? What is the educational profile of employees? Can you give us information that your organization has on the profit of tourism?
- What investments are being made in rural tourism? What destinations does this include? What efforts and enticements are in place or planned to encourage investors?
- What is your estimate of availability of tourist locations (regarding the quality of roads and means of transport)? Are there any initiatives for improvement of the state of transport?
- Is there any good example of rural tourism in the vicinity?
- How do you judge the current rural tourism offer? How can it be improved?
- Do you consider additional education necessary for further development of the rural tourism offer?
- What are the most prominent comparative advantages of your rural tourism offer in comparison to the rest of Serbia?
Questions for Rural households (interview is to be done with a number of households, for example, with a few households that provide accommodation, with a household that produces food, or with the one which provides meals)

Questions regarding the household and tourism offer (start with the questions about the tourism offer because there the hosts feel the most comfortable, and then start finding out more about the household and hosts’ opinions on the development of sustainable rural tourism)

- What tourism services are provided by your household?
- How did you get the idea to engage in this business?
- How long have you been involved in this business?
- What is the tourist turnover? Who are the tourists?
- What are the tourists most interested in, the type of the tourism product? What is offered to tourists in your area?
- How do the tourists find out about your offer?
- Are there foreign tourists? How do you communicate with them?
- What is the structure of your household (how many members, what are their occupations, have they completed any school/training in tourism services, do they have any previous experience in this sector)?

Questions on the economic aspects of the business (these are a bit more sensitive matters and as such they are, in order to obtain the relevant data, to be approached tactfully)

- How many household members are officially/unofficially engaged in servicing tourists?
- How many household members make their earnings from agriculture or are employed elsewhere?
- How do you judge the financial sustainability of engagement in rural tourism? Is there a possibility of earning income this way?
- How much have you invested in preparations for accepting guests? Infrastructural investments?
- What do you think still needs to be done? What is there to be done by you and what by the local and state governments?
- Have you received anything in this regard from the state and do you think that is necessary? For what would that be necessary?
- Where do you obtain food for preparation of meals? How much and in what way is food produced in your household or in the neighbourhood?
- Are you familiar with the concept of organic food production and does your offer include such products?
- How are tourists reaching you? Are there any problems regarding the traffic infrastructure?

Questions on the environmental aspects of the business (start with more global problems and then proceed to the more immediate ones in order to find out how are they being perceived and dealt with)
- Are there any protected areas (protected natural resources) in your area? Do you cooperate with their managers?
- Is there any area in your vicinity that you think should be protected? How would that influence tourism development?
- Are there any activities performed by tourists that can, in your opinion, adversely affect nature?
- Is there organized waste collection in your area? If not, where does the waste end? Do you make compost?
- What type of energy do you use? Do you use any of the alternative energy sources or methods for lowering the energy consumption?

Questions related to future development of tourism
- Based on your experience in providing tourism services, where do you see the possibilities for improvement?
- Do you cooperate with tourism organization? What of their services have you found beneficial for your business?
- Do you see any particular training that would help you in your future work?
- Do you cooperate with souvenir manufacturers? How do you judge that cooperation?
- Are you included in decision-making, especially the ones regarding the direction of future development of tourism (on the level of the Local Community and the Municipality)?
- What is the vision of tourism development in the region? What do you think would be best for your area in the decades that follow?

The Socio-Economic Area

Questions for the City administration – the Regional Development Agency or the Regional Chamber of Commerce (we want to find out, from the local government, how does it see the development of their region – e.g. industrially oriented, the kind of relationship with the agricultural households and how important to them is the environmental protection in development planning)

- Are there, at the level of your Municipality, registered any companies working in the areas of mining or chemical industry?
- Do you have any data regarding the areas of forestry, hunting and fishing? Namely, as during this research we have realized that it is very difficult to obtain any data on these areas, we are asking you to provide the data you may have or direct us to someone else who might provide it.
- Are there any realized or planned projects regarding the introduction of renewable energy sources or energy utilization efficiency improvement?
- Are there, on the territory of your municipality, any significant producers of energy from conventional sources?
- Statistical office or RS states that 1% of the population is employed in agriculture. Is there a connection of these employees with rural tourism (in the sense whether some of employed in agriculture provide food products for rural tourism)? Is this number really so low?
- Do you consider that tourism development has positive effect on production, processing and distribution of plums, raspberries, brandy, etc.? Do you have any statistical data on this connection? Is there any data
The Environment

Questions for Protected Area Manager (it is important to find out where, on the ladder of protected area management, resides the utilization of touristic attractions, particularly regarding the development of rural tourism)

- How important is tourism for your work on environmental protection?
- How many tourists visit your natural resource in a year? What is the tourist profile and their motivation?
- What are available tourism offers?
- Does income from tourism enable you to invest in environmental protection? Do you have a good example of this?
- Do you cooperate with other stakeholders (Municipality, Tourist Organization, rural households, etc.) in the area of tourism?
- Do you have the support of the Ministry of Environmental Protection, Mining and Spatial Planning in tourism development and environmental protection?
- What are your recommendations regarding the tourism development?
- Do you have any examples of good cooperation with rural households (e.g. in providing food products, souvenirs, etc.)?
- If not, do you think that there is a need for establishment of a cooperative network in this area?
have any connection with rural tourism (in the sense of gathering and spending of funds)?
- Can citizens’ associations get support (are there any open competitions) for environmental protection projects?
- Data on Municipal Environmental Impact Assessments – are there any established common practices? What are the experiences? Are there EIA cases related to tourism? Are citizens informed on impact assessment? What is the citizens’ participation?
- Can you list environmental protection projects that the Municipality is currently working on?
- What do you think on cooperation, on the level of Municipality, in the area of environmental protection?
- How much does the Municipality support the managers of protected areas?

Questions for Civil Sector Representatives
(organizations that, in their work description, have the development of rural tourism, environmental protection or the ones that provide services for rural tourism)

- Do you partake in programs directed toward the development of rural tourism? Do you conduct any such programs?
- Who do you cooperate with on such projects? Do you have contacts with State institutions?
- Do you cooperate with households that provide services in rural tourism? What is your role in this?
- What is your opinion on the state of tourism in you region? What is the share of rural tourism within the total tourist offer?

- What are the comparatively most prominent assets of rural tourism offer in your region, in comparison to the rest of Serbia?
- Do you know of any examples of threats to the environment as a consequence of development of tourism?
- Do you know of any positive examples of development of tourism?
- Is there any natural complex in your region that should be especially protected? Do you think that the acquiring of the Protected Area status will have positive influence on the development of tourism?
- How much do you cooperate with the decision makers in the area of environmental protection?
- Are you involved in designing the tourism plans in your municipality?
- What are your recommendations for rural tourism?
1. Energy Efficiency in Serbia

Although with the delay, Serbia has also taken the first steps towards improving energy efficiency of its buildings. In 2009, Law on Planning and Construction was enacted that introduced the concept of energy efficiency (Article 4) as well as the need for energy performance certificates for buildings. It was upon this law that new regulations were adopted in August 2011 stipulating energy efficiency of buildings and the procedures for energy performance certification in terms of annual energy use for heating per square meter of floor area within the thermal envelope and in terms of primary energy and CO₂ emissions. They are fully compliant with the European regulations and contain much stricter requirements for thermal protection in comparison with the previous standards.

In order to have precise data about the quality of building stock, an independent investigation was conducted.

The most accurate data on the building stock could be gathered in the National Census which is conducted every ten years. In October 2011, the National Census was conducted with strictly defined questionnaire techniques, which contained several questions pertaining to residential buildings, such as: the construction year of the apartment, the area of the apartment, the number of rooms, installation status, fuel used for heating, the construction year of the building, type of building (free-standing single-family house, free-standing duplex house, semi-detached house, terraced house with at least three attached residences each of which has its own entrance, multi-family house with 3-9 apartments, apartment block with 10 or more apartments), external wall material (rigid and soft materials).

However, the answers to these questions could not facilitate the assessment of the quality of energy performance of the buildings nor could they provide the necessary input for the choices of energy rehabilitation in order to enable the evaluation of energy savings on the national level; therefore, it was concluded that there was a need to create methodology to support the formation of a relevant national residential building stock assessment. Such an endeavor was to comprise an independent statistical survey in compliance with the rules of statistics and based on the specific architectural and urban planning parameters in design and construction of residential buildings in Serbia.

2. Developing Methodology

The methodology for creating the national typology was developed following the model adopted within the IEE Project TABULA [4] using the information gathered in the preliminary Datamine Project taking into account specificities of Serbia.

2.1. Specifics of Serbia

In the World War II Serbia suffered considerable devastation, with a great number of residential buildings destroyed, particularly in cities. After WWII, massive migrations of population took place toward more developed regions of the
country; moreover, the planned economy caused the population to abandon rural settlements and concentrate in towns.

These factors contributed to the inadequate supply of apartments and the drive toward fast massive construction. In consequence of such residential housing policies, there has been a drastic decline in the rural population on the expense of the population rise in city areas with occasional records of high residential density.

2.2. Architectural and urban planning parameters

With respect to the specific practice in Serbia, the classification as the first set of input data included seven types of buildings. (Jovanović Popović M. et al, 2010[1]) The classification was developed according to the following parameters:

• the relationship between the building and its lot, with specific construction in the housing projects where more lamella buildings with different address numbers constitute one building block on one lot,
• the location of the building with respect to the neighboring structures,
• the classification according to the number of apartments in one-family, multi-family (up to four) or collective dwellings.

Table 5

Classification scheme: building types for single-family and family houses [2]

It should be noted that such classification does not exist in our country and that this particular division was done mainly with respect to the different thermal performances of the buildings (Figure 1).
2.3. Parameters affecting thermal properties of the envelope

Thermal properties of the buildings were assessed according to the following criteria:
- The shape of the building, the ratio between the thermal envelope and the corresponding volume. Three categories of buildings were established: compact building with an approximately square ground plan, incompact ground plan and an elongated ground plan.
- The “full/empty” ratio established upon the percentage of windows on the façade yielded three categories: small percentage of windows on the façade (less than 50% of the façade surface), high percentage (more than 50%), and window ribbons (typical of the prefabricated construction of the 1970s).
- The use of loft and basement spaces was defined in four categories: no loft/basement; not used; partially used; fully used.

2.4. Construction year class

Since the year of construction directly affects the thermal properties of the envelope, this classification criterion was given particular importance.

The intersection points for the classification were chosen upon:
- The introduction of thermal regulations; (in practice, buildings were built in accordance with new regulations within approximately two years of delay, which is the period needed to design and build a house).
- Socio-political events which had decisive impact on housing development in Serbia (after World War II, the country underwent a period of impressive renewal reflected in the construction of a large number of residential buildings).
- Percentile representation of the types of residence in the total residential building
- Disappearance of mass construction (neither lamella apartment blocks nor whole housing projects are any longer built) and the rise of single apartment buildings (in cities, mostly single apartment blocks have been built by the developers since the new Building regulation plans were introduced).


2.5. The statistical sample

An independent statistical survey was commissioned to company, whose experts were the statistical methodology to create the required sample. It was
Annex 3.1.

Conducted in two steps because of the restricted recourses. (Jovanović Popović M., Ignjatovć D. et al, 2011)

2.5.1. Phase A of the survey
The first phase of the survey was conceptualized as a quantification survey that involved the observation of the residential buildings in Serbia. Data gathering was planned as follows:

- Ad hoc survey;
- Residential buildings were observed by trained enumerators;
- The territory of Serbia was divided into zones, defined by the map and the route (each was visited by an enumerator; the starting point and the route had been predefined).

The sample was defined as:

- The territory: Serbia (urban and rural, excluding Kosovo);
- The observation unit: a residential building;
- The sample size: 6000 residential buildings planned;
- The sample scope: based on the 2002 Census data, vital statistics and migration data, as well as ISM’s population estimates for 2009;
- The sample type: random, two-step, stratified for ad hoc survey.

The sampling stages:
- The polling place (approx. 200 households) chosen according to the probability proportional to size sampling (PPS);
- The building sampled upon random step from the given address; every third building from the starting point was recorded;
- Stratification was done according to the type of settlement – urban/rural – for 25 administrative districts.

2.5.2. Phase II of the survey
The second phase of the survey was planned as quantitative research with face-to-face (F2F) interviews with the residents of the chosen residential buildings in Serbia, concurring with Phase I. Data gathering was planned as follows:

- Ad hoc survey, F2F interviews with the target population;
- The interviews were held in the respondents’ households.

3. Data analysis
Based on collected data, typology of representative single family and family buildings in Serbia was prepared. (Table 6) and several data analyzed.

3.1. Types of housing
The analysis of the data yielded that the distribution of the starting points and the surveyed buildings gave a reliable description for the areas with low population density, as rural areas, in which detached houses for individual dwelling were predominant. The main conclusion was that the most common type of dwelling in Serbia is the detached single-family house, which comprises almost 90% of the total building stock (Fig 4). Therefore, it is concluded that conducted investigation gives enough reliable data for rural areas as well as for suburban areas with smaller densities. At the same time, all findings are also relevant, as general characteristics, for single family building stock in four groups of investigated municipalities.
3.2. Construction period

In accordance to the results of the National Census of 2002, the data analysis showed that the most building construction activities in Serbia took place after the World War II and lasted until the 1980s, when more than a half number of residential houses in Serbia were built. Such a large scale of construction can be attributed to the process of post-war rebuilding of the country devastated by the war. (Figure 6)


3.3. Thermal characteristics
A great number of questions in the survey addressed the thermal performances and use of thermal insulation in the building envelope. First regulations on thermal characteristic of buildings in Serbia (Yugoslavia) were issued in 1980, and later on stringent several times. But in everyday practice, especially in rural areas and when building single family houses is in question, obeying those rules and constructing by rules with necessary documentation and building permits is very rare. So, the construction principle used in building those houses is tradition and use of traditional materials. In time, of course, new materials and constructions were introduced in this practice but with significant delay compared with building in towns according to laws and regulations.

In comparison to the current regulations, it can be concluded that thermal performances of single family houses are fully insufficient. Most buildings lack any thermal insulation (84% in the walls, 89% in the roofs). However, even in house built in last decade were thermal insulation is applied as the part of the envelope, its thickness is too small and insufficient; it is mainly 5cm, and does not comply with the current regulations.

With respect to windows, buildings in Serbia traditionally have wide or narrow double-window casings with the later appearance of double glazing, while the application of one-window assemblies with a single glass is rare. Furthermore, the age of windows is substantial, with over 50% older than 30 years; thus, their quality is extremely poor and unsatisfactory.

Another indicator of the circumstances in the residential building stock in Serbia is the level of the completeness of the facade. Traveling through Serbia, one can see a great number of single-family detached houses which are not complete in the way that they have no facades; however, they serve their purpose fully and have been dwelt in for decades at times. Besides being a great esthetic imperfection, this constitutes a serious shortcoming with respect to thermal insulation and heating fuel efficiency since such walls increase energy losses, drafts, precipitation impacts, etc.

3.4. Heating of buildings
Most residential buildings in Serbia, as many as 62%, use wood fuel for heating in local furnaces; wood is often easily accessible locally and
Annex 3.1.

Although, the results of statistical investigation can be applied on all regions of Serbia, some local characteristics differ from region to region. Those local characteristics are basically developed from different historical and socioeconomic conditions as well as from traditional use of available building material and constructions and are rather significant before the WW II, especially in Vojvodina. After that period, the used building material usually is owned by the user. Other fuels, such as gas, electric power, oil and others account for less than 15% in total. The choice of fuel mostly depend on the actual price and it is common practice for tenants to switch to alternative fuel accordingly. Moreover, not all area of the residential building is heated in winter. In as many as 25% of the surveyed buildings, only no larger area than 25m² is heated; usually it is the kitchen, where the family spends most of their time.

4. Local Regional characteristic
The distribution of the municipalities, which are the subject of this study, in four regions is not identical as in statistical regions used in the survey. Exceptions and compliances are given in following table (Table 7).
built during the 1970s and 1980s, followed by the period between 1946 and 1970 (23.62%). The number of pre-World War I residential buildings is small, accounting for mere 1.05%, while approximately 10% of the buildings date from the Interbellum period [2].

The applied materials, the construction types and building techniques largely correspond to the time of construction; despite the abundance of timber, it was rarely used as the basic building material. The older buildings in rural areas most often display variations of wattle and daub. In the buildings from the first half of the 20th century, the floor structures of structures are mostly wooden. A number of the houses from this period have meanwhile been renovated so among them have satisfactory thermal characteristics.

The main energy source used in individual and family housing in the region of Western Serbia is wood. Since it is generally affordable and type of construction are the same and thermal characteristics of buildings depend mostly on climate conditions.

5. Regional specifics
5.1. West Serbia
Western Serbia covers a large and diverse territory so that the climatic conditions vary in different areas. Kolubara District (Ljig, Valjevo, Mionica) has a predominantly moderate continental climate while Zlatibor District (Kosjerić), is characterized by a mainly mountainous climate.

Out of the total number of analyzed single family buildings, 99.41% were free-standing structures. Most (48.43%) of the surveyed buildings were
in these parts, especially in rural areas, there is no particular motivation for investing in the improvement of energy performance of the buildings. While local characteristics of the architectural assemblies and materialization are obvious in older buildings, since the 1960s almost all local features of town and country houses in the region have been lost. The elements of traditional architecture (or reminiscences thereof) are sporadic, usually found in holiday homes or tourist facilities in mountain resorts. Residential buildings dating from 1970s onwards do not differ in any respect from similar structures in other parts of Serbia.

5.2. Central Serbia
Municipality of Gornji Milanovac is a part of Moravica district in the region of Central Serbia. Like in most parts of Serbia, the climate in the county is mainly moderate continental.

Central Serbia is part of Serbia with predominantly free-standing single family houses which accounted for approximately c. 90% in Moravica District. Considering the analyzed periods of construction, the prevalence rate indicated that most buildings in the region (over 93%) were built between 1946 and 1990 (periods: C – 1946-1970; D – 1971-1980; E – 1981-1990). In consequence of World Wars I and II as well as the fact that the region was even more rural in the past, there was less than 7% of buildings identified as dating before 1945. The most active period of construction occurred between 1946 and 1970 with approximately 35% built houses. [2]

With respect to the applied materials, construction types and building techniques, single-family houses in Central Serbia displayed a number of specific features which can be summarized as follows.

Main building materials used for walls are brick and clay block. The floor structure has several variations. Wooden structures are rare and found mostly in older houses, especially as the loft floor (straw and plaster underneath and planks covered with soil above – Karatavan), while later, most buildings were made in massive reinforced concrete slabs or, in later periods, semi-prefabricated clay structures. By rule, the roof structure is almost always wooden regardless of whether the loft is inhabited or used for storage only.

Thermal insulation was not used in houses built before 1980s, when its application started however modestly. A significant number of houses used for dwelling do not have the finished facade, which means there is no thermal insulation. The houses recently refurbished (mainly facade) with the purpose of improving thermal performance have thermal insulation of minimal thickness. The traditional construction solutions (rammed earth, post and petrail, logs, etc.) can be found in an insignificant number of buildings.

With regard to heating, it should be noted that the predominant solutions include individual furnaces mostly burning solid fuels, primarily wood. This is due to the poorly developed energy infrastructure in the region. There are also electric heating solutions using either thermo accumulating stoves or electric furnaces.

5.3. Eastern Serbia
The region is predominantly rural, with a great number of villages and only 20% of urbanized town-like areas.
The whole region is characterized by a continental climate, with average winter temperatures around 0 °C and summer temperatures around 20 °C. The exception is Negotinska Krajina, where the specific geographic position and the impact of the surrounding mountains cause changes to the continental climate and create a distinctive local climate manifested in extremely high or low temperatures all over the year.

The main characteristic is that more than 90% of the buildings were built between 1941 and 1990, which was a period of prosperity and development in almost all inhabited areas in the region. The highest construction rates were in the post-war period, 1946–1970 (35.45%), along with the comprehensive renewal and reconstruction of the country. On the other hand, specific socio-economic factors in the country contributed to a marginal rise in the number of households in the last two decades, when less than 10% of the houses were built due to substantial migration of the local population in the last 30 years [2].

The analysis of the data indicated a great disproportion among the types: single-family houses accounted for 93% of the buildings and 98.65% of them are freestanding houses, so it can be said they have absolute prevalence in the region. The analysis of the types clearly shows that most of them are smaller free-standing low-rise buildings with a relatively compact base and form.

The applied building techniques, constructions and materials used in single-family houses displayed a number of specific features which can be summarized as follows. The use of traditional building techniques such as post and pentry technique with wattle and daub infill was characteristic of a significant number of houses in rural areas built by 1950. Main building material used for walls was brick 25–38 cm thick. Starting in the 1950s, hollow clay blocks were used for building walls, slowly replacing heavy massive brick walls. Floor structures vary greatly in type and materials used. Older houses (by 1950) had wooden floor structures, often with earthen infill, while more recent buildings used reinforced concrete slabs as well as semi-prefabricated constructions with hollow clay infill.

Despite the thermal regulations and severe winters, most buildings still have no thermal insulation as the part of the envelope or it is insufficient so that there is absolutely no compliance with the current regulations and standards regarding thermal comfort and protection.

Most buildings have their own heating system, mainly individual stoves using solid fuel (wood, coal), while not many houses have a central heating system with individual furnaces. A few single-family units in the zones of major cities use the district central heating system.

5.4. Vojvodina

Vojvodina lies in the north of the Serbian territory and in the south of the Pannonian Plain. Having been settled since the Palaeolithic Period, the region has rich history.

Vojvodina is intersected by three large navigable rivers: the Danube, the Tisa, and the Sava,
Annex 3.1.

Vojvodina has a moderate continental climate with certain particularities. It is characterized by a wide range of extreme temperatures: the mean maximum temperature in July (the mean monthly temperature of 21.4°C) and the mean minimum temperature in January (the mean monthly temperature of -1.3°C). The precipitation rate is similar to mid-European, i.e., Danube rates, with monthly distributions fluctuating greatly. The characteristic winds of the region are Košava (a south-easterly wind), northerly and southerly winds.

According to the survey, 93.2% of the total number of residential buildings are single-family houses with the majority (84.47%) being detached houses. The analysis of the construction periods in Vojvodina revealed that most buildings (81%) were constructed between 1919 and 1980 (periods: B-1919-1945; C-1946-1970; D-1971-1980). In comparison with other regions in Serbia, Vojvodina has a greater number of buildings dating prior to 1919 than those built in the past two decades. These data can be partly explained by the socio-economic circumstances of the past twenty years as well as by a great number of preserved old buildings still used for dwelling.

Although, free-standing houses account for the highest percentage of the buildings but it should be noted that row houses can be found in all periods of construction, which is not typical of other Serbian regions. As a type, they existed even in the oldest periods of construction in rural areas, which is rare in Serbia and can be explained by planning of both urban and rural areas by the Austro-Hungarian authorities.

With respect to the applied materials, construction types and building techniques, single-family houses in Vojvodina displayed a number of specific features which can be summarized as follows. The houses in rural areas built before 1919 are made of rammed earth (clay compressed in moulds). Adobe was used at the time as an additional element in the construction of rural structures. Vojvodina abounds in high-quality loam, which affected the choice of building materials. Between the two world wars, rammed earth remained the predominant building material although the use of adobe was rising. Out of Vojvodina's present housing stock, 26% of single-family houses were built in this period, which, combined with the period before 1919, accounts for 31% of the houses built in traditional techniques using rammed earth or adobe (less frequently, fired brick). The floor structure is wooden, with the finishing layer in clay.

The period after World War II brought a change in building materials so that fired brick became predominant, only to be replaced by hollow clay
brick later. The wooden floor structure with the Karatavan was used in ground-floor houses with an uninhabited attic. After the 1970s, more modern floor types came into use, most frequently ribbed constructions with clay infill. By rule, single-family houses in the region were built with a slanted wooden roof. Tile roofing was most common, with flat at beaver tail tiles by 1945 and interlocking tiles since then.

Thermal insulation was used in the houses built in the past twenty years whereas it was sporadic in older buildings. Some brick houses built after 1945 were additionally insulated while rammed earth or adobe houses built before that period remained uninsulated. This can be explained by good accumulation characteristics of such building materials which provide natural internal humidity regulation in buildings so that there is no need for additional insulation.

In Vojvodina, predominant solutions for heating of single-family houses are individual furnaces using solid fuels, mostly wood. In older buildings (by 1945), there used to be a tradition of building tall, adobe masonry stoves, built along the wall adjoining the kitchen or the utility room from where maintaining fire was done since outside access to these rooms was usually provided. In older rural homes without masonry stoves, heating mainly depends on wood burning range cookers. The majority of more modern houses also use individual furnaces for heating; most common fuel is wood, followed by coal, while gas is the rarest although there is a well developed gas distribution network both in urban and rural areas.

5.5. Southeast Serbia
The region of Southeast Serbia has a rich history. For ages, main European roads have traversed this area, connecting western and central parts of the continent with its eastern and southern lands, as well as with Asia. Hence, the region has been uninterruptedly settled since prehistory through classical antiquity to the modern age.

Southeast Serbia is a sparsely populated part of the country with absolute prevalence of rural over urban settlements.

Generally, the climate of the region can be described as temperate continental, which is characteristic of most part of Serbia. In contrast, the areas around Niš and Leskovac are characterized by a steppe climate.

Out of the total number of analyzed buildings in Southeast Serbia, 93.47% belonged to the category of single-family housing, predominantly free-standing (86.19% out of total) and 49.8% of them are in rural areas.

Regarding the analyzed periods of construction, the prevalence rate indicated that most buildings in the region (over 80%) were built between 1946 and 1990. In consequence of the demolition during World Wars I and II and the fact that in the past the region was even more rural, there was less than 10% of houses dating before 1945.

The applied materials, the construction types and techniques of single-family houses in Southeast Serbia displayed a number of specific features which can be summarized as follows: The traditional constructions of rural houses characteristic of the region were used in wattle - and - daub or post - and - petrail buildings. Such construction types had disappeared by the 1950s.
single family houses was brick or clay blocks, introduced in the 1950s; in contrast, there are more variations in the floor structures. Wooden structures are common in older buildings, while the newer ones have concrete slabs or ribbed floors, as well as various constructions with clay infill. Starting in the 1980s, the application of thermal insulation coincided with the introduction of binding regulations in thermal protection of buildings; as it is sporadic, it can be concluded that a great number of the houses either have no or some but insufficient insulation so that they do not comply with the current stipulations regarding thermal comfort and protection.

The analysis of the heating solutions revealed that the houses mostly used a variety of individual stoves or at best a system of central heating with individual furnaces. Solid fuel, mainly wood, is used for heating in most cases.
Annex 3.2.

Solar energy
The average solar radiation in Serbia is 1400 kWh/m² and is approx 40% higher than average solar radiation in EU, with more than 2000 sunny hours per year.

Biomass energy
Since the most of the industry in Serbia is based and oriented towards agriculture, it is estimated that 67% of potential of renewable energy sources come from biomass. Total potential of biomass energy in Serbia is evaluated on 2.7 Mtoe. The most of it is from wood industry (approximately one million Mtoe) while the rest is from agriculture, livestock breeding, fruit and vine growing and industry. The main...
Annex 3.2.

agricultural land (55% of territory of Serbia) is in north part of Serbia, region of Vojvodina as well as along the rivers Sava and Danube, while the area with forests (approx. 35% of Serbian territory) is situated in southern, east and west parts of Serbia (Fig 12, Fig 13).

**Wind energy**

It is estimated that wind energy contributes only 5% to potential renewable energy sources in Serbia and that it is possible, from that source, to produce 2.3 TWh of electrical energy per year.

According to the wind map (Figure 15) there are several locations in Serbia suitable for use of wind energy. Most of them are situated in east part of Serbia: eastern part of Vojvodina and along the river Danube with Vrsac as the centre of that area, and Stara planina, Vlasina lake and Crni vrh. In these regions there are several location where average wind speed exceeds 6 m/s on 100m height.

![Wind energy map](image1.png)

**Figure 14** Average Energy potential of wind per year on 100m (W/m²) in Serbia

**Source:** www.psemr.vojvodina.gov.rs/files_for_download/vetar/Studija_Atlas_Vetrova_APV_2008.pdf

![Wind energy map](image2.png)

**Figure 15** Average Energy potential of wind in January and July on 100m (W/m²)

**Source:**
Geothermal energy

Potential of geothermal energy in an area can be presented by the density of geothermal heat flow (the quantity of geothermal heat coming through 1m² area in every second to the surface of the earth). The average values in Europe are approx. 60 mW/m² while in Serbia these values are significantly higher, over 100 mW/m². The terrain in Serbia is made of hard rocks and for this advantageous hydro geological and geothermal characteristics, in Serbia, there are approx 160 springs of geothermal water with temperature higher than 15 °C. The hottest springs are in Vranjska spa where water temperature is 96°C.

Geothermal energy contributes with 4% of total renewable energy sources in Serbia and approx. 2.3 TWh per year. On more than 50 locations the potential is estimated on 1MW. Estimated total quantity of heat in deposits of geothermal waters in Serbia is about more than twice equivalent heat quantity that can be produced through the process of burning all coal reserves.

In the period 1974-1992 in Serbia the capacity and quality of water is investigated in 113 drill holes. Exploitation for heating purposes in Serbia is in the initial stages and very modest considering the availability of resources.

Taking into account the abundance of geothermal resources at relatively small depths on almost the entire territory of the state, this potential branch of energy industry should be put on equal footing with other energy technologies.

Figure 16: Spatial plan of Serbia: Number of locations with geothermal springs in municipalities in Serbia
Source: Ministry of Environment and Spatial Planning

Figure 17: Potential power of geothermal sources in municipalities in Serbia (MW)
Source:

www.altenergija.org
Hydro power
Total hydropower potential in Serbia is approx. 27,000 GWh per year while technical potential is 18,000 GWh per year. It is mostly concentrated in few water courses like Danube and Drina, more than 50% of total sources. Out of that potential 18000 GWh per year is capacities bigger than 10 MW while, it is estimated that 1800 GWh per year can be produced in 850 mini hydropower plants whose power is up to 10 GWh per year. [12]

In Table 1, the structure of hydropower potential is presented, showing that out of remaining technically available hydropower, over 25% is potential in small hydropower plants (power up to 10 MW) [2]. In Figure 18 total hydropower potential of small hydropower plants in Serbian municipalities is presented.

Structure of hydropotential in Serbia (used potential, technically available in large water courses, small hydropower plants)

Figure 18: Total potential hydropower of small hydropower plants, municipalities in Serbia

Table 1: Structure of hydropotential in Serbia (used potential, technically available in large water courses, small hydropower plants)
## Annexes

### ANNEX 4.2.1.

U List of Authorised Waste operators in the Central Serbian region of Central Serbia

**Izvor:** Agency for Environmental Protection, www.sepa.gov.rs

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Operator</th>
<th>Permit issued for:</th>
<th>Type of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Collecting</td>
<td>Transport</td>
</tr>
<tr>
<td>Ljig</td>
<td>Dragan Vasiljkovic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MM</td>
<td></td>
<td></td>
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<td></td>
<td>Kis Stil</td>
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<td></td>
<td>Kemic</td>
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<td></td>
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<tr>
<td></td>
<td>Metva</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valjevo</td>
<td>Nik-fil</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eva</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metalprom</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inos-Balkan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mionica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kosjerić</td>
<td>5 transporters</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gornji Milanovac</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hemigum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Krov</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vuplast</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Petrovic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P&amp;C Lazovic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Papirprint</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GM Reciklaza</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ANNEX 4.3.1.
List of authorized operators in the region of South Banat

*Izvor: Agency for Environmental Protection, www.sepa.gov.rs*

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Operator</th>
<th>Permit issued for:</th>
<th>Type of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collecting</td>
<td>Transport</td>
<td>Treatment</td>
</tr>
<tr>
<td>Alibunar</td>
<td>Zoki</td>
<td></td>
<td>Rubber waste</td>
</tr>
<tr>
<td>Bela Crkva</td>
<td>SAF metal</td>
<td></td>
<td>Nonhazardous waste</td>
</tr>
<tr>
<td></td>
<td>Angrokom</td>
<td></td>
<td>Nonhazardous waste, batteries</td>
</tr>
<tr>
<td></td>
<td>Bogsì</td>
<td></td>
<td>Metal, plastic, all types of packaging, glass</td>
</tr>
<tr>
<td>Vrsac</td>
<td>ST Plast</td>
<td></td>
<td>Plastic, plastic packaging waste</td>
</tr>
<tr>
<td></td>
<td>Todorović</td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td>Ferobel</td>
<td></td>
<td>Metal, plastic, all types of packaging, glass, rubber waste</td>
</tr>
</tbody>
</table>
### ANEKS 4.3.2.

**Predloženi set indikatora održivog ruralnog turizma za Južni Banat**

<table>
<thead>
<tr>
<th>Oblast</th>
<th>Indikatori</th>
</tr>
</thead>
</table>
| **Lokalna kultura i norme ponašanja**               | • Zadovoljstvo lokalnog stanovništva obimom turističkog razvoja  
• Udeo tradicionalnih (neizmenjenih) običaja u turističkoj ponudi  
• Odnos smeštajnih kapaciteta i broja lokalnog stanovništva |
| **Lokalna arhitektura i unapređenje vizuelne morfologije** | • Procenat obnovljenih istorijskih građevina  
• Procenat građevina (u turizmu) koje ne ispunjavaju kriterijume autohtone arhitekture  
• Ocena trenutne unutrašnje i spoljašnje fizinomije i poredenje sa stanjem u prošlosti  
• Uključivanje starih građevina i objekata (interpretacija, animacija) u turističku ponudu |
| **Procenat dohotka koji se preusmerava od turizma ka zajednicama** | • Procenat lokalnog stanovništva koji je zaposlen u turizmu ili je u nekoj vezi sa turizmom  
• Procenat lokalnog dohotka koji je dobijen od bavljenja turizmom  
• Broj (procenat) prodavnica i ugostiteljskih objekata koji su u vezi sa ruralnim turizmom |
| **Učešće u turističkom planiranju**                | • Nivo i obim angažovanja lokalnih zajednica u planovima i strategijama turističkog razvoja |
| **Zaštita prirode i životne sredine**              | • Procenat posetilaca u ruralnom turizmu koji posećuju zaštićena područja u Južnom Banatu |
| **Stepen organizacije turizma**                    | • Broj udruženja i organizacija angažovanih na razvoju ruralnog turizma  
• Prisutnost strategije razvoja turizma (odnosno, ruralnog turizma)  
• Postojanje organizovanih tura, itinerera i konkretnih turističkih proizvoda sa akcentom na ruralni turizam |
| **Zadovoljstvo posetilaca**                        | • Procenat ponovljenih poseta  
• Stavovi posetilaca o turističkoj ponudi (ankete, upitnik) |
**ANNEX 4.4.1.**
List of authorized operators in the Lower Danube region

*Source: Agency for Environmental Protection, www.sepa.gov.rs*

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Operator</th>
<th>Permit issued for:</th>
<th>Type of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kladovo</td>
<td>Eva</td>
<td>Collecting</td>
<td>Plastic, paper/cardboard, metal</td>
</tr>
<tr>
<td></td>
<td>Plastika</td>
<td>Transport</td>
<td>Plastic</td>
</tr>
<tr>
<td>Veliko Gradište</td>
<td>Armagedon eko</td>
<td>Treatment</td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td>MB metal</td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td>Požarevac</td>
<td>Karplast</td>
<td></td>
<td>Plastic</td>
</tr>
<tr>
<td></td>
<td>EMA</td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td>Potis</td>
<td></td>
<td>Plastic, metal, waste tires, paper/cardboard</td>
</tr>
<tr>
<td></td>
<td>Profil</td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td>Ristić M</td>
<td></td>
<td>Metal, all kind of packaging waste</td>
</tr>
</tbody>
</table>
## ANEKS 4.3.2.
Predloženi set indikatora održivog ruralnog turizma za Donje Podunavlje

<table>
<thead>
<tr>
<th>Oblast</th>
<th>Indikatori</th>
</tr>
</thead>
</table>
| Ekološka vrednost i osetljivost zaštićenog područja (NP Đerdap)       | • Broj vrsta i endemičnih vrsta  
• Frekventnost popisa vrsta  
• Broj lokaliteta očuvanog geonasleđa  
• Broj lokaliteta i ekosistema za koje se smatra da mogu biti degradirani  
• Količina smeća i deponija u destinaciji  
• Broj vidikovaca i turističkih lokaliteta  
• Procenat staza i puteva koji su u degradiranom stanju  
• Ukupan broj posetilaca u zaštićenom području |
## Annexes

### ANNEX 4.5.1.
List of authorized operators in the region of Eastern Serbia

**Source:** Agency for Environmental Protection, www.sepa.gov.rs

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Operator</th>
<th>Permit issued for:</th>
<th>Type of waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pexim</td>
<td>Collecting, Transport, Treatment</td>
<td>Plastic and plastic packaging, Packaging, metal, glass waste</td>
</tr>
<tr>
<td></td>
<td>Kostic Dragan</td>
<td></td>
<td>Plastic, textile, plastic and textile packaging waste</td>
</tr>
<tr>
<td></td>
<td>Pirotex triko</td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td>Pro vel metal</td>
<td></td>
<td>Textile, metal waste, all types of packaging waste</td>
</tr>
<tr>
<td>Pirot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimitrovgrad</td>
<td>Dimmetal</td>
<td>Collecting, Transport, Treatment</td>
<td>Paper/cardboard/plastic packaging waste, metals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zajecar</td>
<td>Jubul</td>
<td>Collecting, Transport, Treatment</td>
<td>Metal waste</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Eko metal</td>
<td>Collecting, Transport, Treatment</td>
<td>Metal waste</td>
</tr>
<tr>
<td></td>
<td>Sirovina</td>
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<tr>
<td>Knjazevac</td>
<td>Celik komerc</td>
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<td>Metal waste</td>
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<tr>
<td></td>
<td>Bogda land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negotin</td>
<td>Veselinov</td>
<td>Collecting, Transport, Treatment</td>
<td>Metal waste</td>
</tr>
</tbody>
</table>