ENVIRONMENTAL ASSESSMENT REPORT OF

the draft Cross-Border Cooperation Programme 2021-2027 co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the draft Territorial Strategy for Integrated Measures

Contracting authority: Ministry of Regional Development and Public Works

Contractor: BT-Engineering EOOD

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Contents

LIST OF ABBREVIATIONS

NPP	Nuclear Power Plant
AMS	Automatic measuring station
AM	Motorway
RIA	Road Infrastructure Agency
GDP	Committee of the Regions
Database	Basin Directorate
DRBD	Danube Region Basin Directorate
WARBD	West Aegean Region Basin Directorate
BDS	Bulgarian State Standard
BQE	Biological quality elements
BOD_5	Biological oxygen demand – oxygen consumed per litre of sample at a constant temperature of 20°C for 5 days incubation period
HPP	Hydroelectric power plant
BW	Body of water
BCP	Border crossing point
UAT	Upper Assessment Threshold
UWWTP	Urban Wastewater Treatment Plant
EAR	Environmental assessment report
FD	Flood Risk Assessment and Management Directive 2007/60/EC
LAT	Lower Assessment Threshold
DRBM	Danube Region for Basin Management
EEA	European Environment Agency
EMF	Electromagnetic fields
EA	Environmental assessment (Strategic environmental assessment within the meaning of Directive 2001/42)
EU	European Union
RW	Railway
BDA	Biodiversity Act
WARBM	West Aegean Region for Basin Management
WA	Waters Act
PA	Protected area
WPA	Water Protection Area
ACI	Areas of Community Importance
DWPZ	Drinking water protection zones
PAA	Protected Areas Act
EPA	Environmental Protection Act
ENPA	Environmental Noise Protection Act
PT	Protected territory
AAQA	Ambient Air Quality Act

EEA	Executive Environment Agency
ABW	Artificial body of water
UAL	Used agricultural land
ICT	Information and Communication Technologies
AAQ	Ambient air quality
CSS	Conservationally significant species
CP	Complex permit
KTM	Key types of measures
MAS	Mobile automatic station
ICD	International Classification of Diseases
ICPDR	International Commission for the Protection of the Danube River
MEW	Ministry of Environment and Water
MP	Monitoring point
MRDPW	Ministry of Regional Development and Public Works
CM	Council of Ministers
SMEs	Small and medium-sized enterprises
ICP	Immovable cultural property
NIMH	National Institute of Meteorology and Hydrology
NCM	National catalogue of measures
NSI	National Statistical Institute
NEMS	National Environmental Monitoring System
NVA	Nitrate Vulnerable Areas
NCPHA	National Centre for Public Health and Analysis
OG of RS	Official Gazette of the Republic of Serbia
EIA	Environmental impact assessment
UN	United Nations
CA	Compatibility assessment (with the object and objectives of conservation of protected areas of Natura 2000 network)
PAHs	Polycyclic aromatic hydrocarbons
DDWS	Drinking and domestic water supply
GB	Groundwater body
PoM	Programme of measures
PFRA	Preliminary flood risk assessment
WWTP	Wastewater Treatment Plant
CBCP	Cross-border cooperation programme
RBMP	River Basin Management Plan
FRMP	Flood Risk Management Plan
RBM	Region for Basin Management
WFD	Water Framework Directive
RLNW	Regional landfill for non-hazardous waste

RHI	Regional Health Inspection
APSFR	Area with potential significant flood risk
RIEW	Regional Inspectorate of Environment and Water
RAMAAQ	Region for assessment and management of ambient air quality
MS	Manual sampling (for monitoring point)
RWMS	Regional Waste Management System
AAR	Average annual rate
AAV	Annual average value
DAR	Daily average rate
SPAs	Special Protection Areas
SCA	Special Conservation Areas
EQS	Environmental quality standard
HMBW	Highly modified body of water
AHR	Average hourly rate
SNM	Strategic noise maps
TSIM	Territorial strategy for integrated measures
UHF	Ultra high frequency
POPs	Persistent organic pollutants
FRM	Flood Risk Management
FPM	Fine particulate matter
EQO	Ecosystem quality objectives
RB	Red Book
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EIONET	European Environment Information and Observation Network
ha	hectare
hm	hectometre
IPPC	Integrated Pollution Prevention and Control
ISO	International Standard Organisation
IUCN	International Union for Conservation of Nature
NOISE	Noise Observation and Information service for Europe
NUTS	Nomenclature of territorial units for statistics
PAH	Polycyclic aromatic hydrocarbons
SORS	Statistical office of the Republic of Serbia
TEN-T	Trans-European Transport Network

INTRODUCTION

This document has been prepared within the framework of contract No. РД-02-29-87/16.04.2021 with subject: "Elaboration of environmental assessment report for INTERREG - IPA CB cooperation programme 2021 – 2027 between the Republic of Bulgaria and the Republic of Serbia and for Cross-border Strategy for Integrated Territorial Development to be financed under the INTERREG - IPA CB cooperation programme 2021 – 2027 between the Republic of Bulgaria and the Republic of Serbia", with identification number Interreg -IPA CBC-TA-2020-4 / Lot 1, signed between: Ministry of Regional Development and Public Works of the Republic of Bulgaria (Contracting Authority) and BT-Engineering Ltd (Contractor).

The Environmental Assessment Report (EAR) of the draft *Cross-Border Cooperation Programme (CBCP) 2021-2027 co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and* the draft *Territorial Strategy for Integrated Measures* (TSIM) has been prepared in accordance with the national legislation of the two countries transposing the requirements of *Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (Directive 2001/42/EC).* Under these requirements, the EAR has been developed as a single document which includes:

- an instructive part;
- a list of the experts and the team leader who prepared the environmental assessment report; declarations of each of the experts – in ***Appendix 1*** of the EAR a tabular list of experts and declarations is presented;
- a reference for consultations and the opinions, proposals expressed during the consultations, as well as the manner of their coverage - the reference is presented in item 12 of the EAR, and copies of the received opinions are presented in ***Appendix 2*** of the EAR;
- appendices.

The main objectives of the EAR are to integrate environmental considerations into the draft of the CBCP and TSIM in the process of their preparation by:

- an analysis of the current condition and problems of the environment, including in relation to human health in the cross-border area subject to CBCP and TSIM,
- an assessment of possible impacts, including significant ones, on the environment and human health resulting from the provisions of the CBCP and TSIM projects, motivating the choice of the most environmentally and human health-friendly alternative for their implementation;
- proposing measures to prevent, reduce and compensate as fully as possible of adverse effects and measures to monitor and control environmental and human health impacts in the implementation of the CBCP and TSIM.

A non-technical summary, in a volume of not less than 10 percent of the volume of the report, has been prepared as an independent ***Appendix 3*** to the EAR. The summary does not contain technical

terms, it is written in a language understandable to the general public and contains the necessary visual materials - maps, photos, diagrams.

The EAR shall adequately reflect and take into account any advice received as a result of the consultations held on the EAR Scope and Content Assignment with the public, stakeholders and third parties that may be affected by the implementation of the CBCP and the TSIM.

The EAR and all appendices thereto shall be made available for consultation in accordance with Art. 6 of Directive 2001/42/EC, together with the drafts of the CBCP and the TSIM.

CONTACT INFORMATION OF THE CONTRACTING AUTHORITY

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1. Description of the content of the main objectives of the CBCP and TSIM and connection to other relevant plans and programmes

1.1. Reason for drawing up the CBCP and the TSIM

*The preparation of the CBCP and TSIM is in line with the European legislation, and in particular – Regulation (EU) 2021/1060 of the European Parliament and of the Council of 24 June 2021 laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, the Just Transition Fund and the European Maritime, Fisheries and Aquaculture Fund and financial rules for those and for the Asylum, Migration and Integration Fund, the Internal Security Fund and the Instrument for Financial Support for Border Management and Visa Policy (**Common Provision Regulation**) and Regulation (EU) 2021/1059 of the European Parliament and of the Council of 24 June 2021 on specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments (**Interreg Regulation**).*

At the national level, the leading documents for preparation of the programs are:

- Draft **Partnership Agreement** containing a list of Interreg programs;
- ***Decision No 196 of the Council of Ministers****of 11 April 2019 approving the Analysis of the Socio-Economic Development of Bulgaria 2007-2017 setting out the national priorities for the period 2021-2027, the list of policy objectives to be supported during the programming period 2021-2027 and the list of programmes and leading departments for their development,* under which the Ministry of Regional Development and Public Works (MRDPW) was designated as a leading department for the development of the programmes under the *European territorial cooperation* (Interreg) 2021-2027 goal;
- ***Decree No 142 of the Council of Ministers of 2019*** *for the development of the strategic and program documents of the Republic of Bulgaria for the management of the funds of the EU for the programming period 2021-2027;*

CBCP and TSIM are funded by the European Union with funds from the Instrument for Pre-Accession Assistance.

The Ministry of Regional Development and Public Works is the MA under the bilateral Interreg programs for cross-border cooperation between the Republic of Bulgaria and the Republic of Serbia, the Republic of Turkey and the Republic of North Macedonia.

1.2. Main targets and provisions of CBCP and TSIM

A. CBCP 2021-2027 between the Republic of Bulgaria and the Republic of Turkey has a geographical scope:

- *Republic of Bulgaria: 6 NUTS III districts: Vidin, Montana, Vratsa, Sofia- region, Pernik, Kyustendil*

- *Republic of Serbia - 7 NUTS III districts: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski*

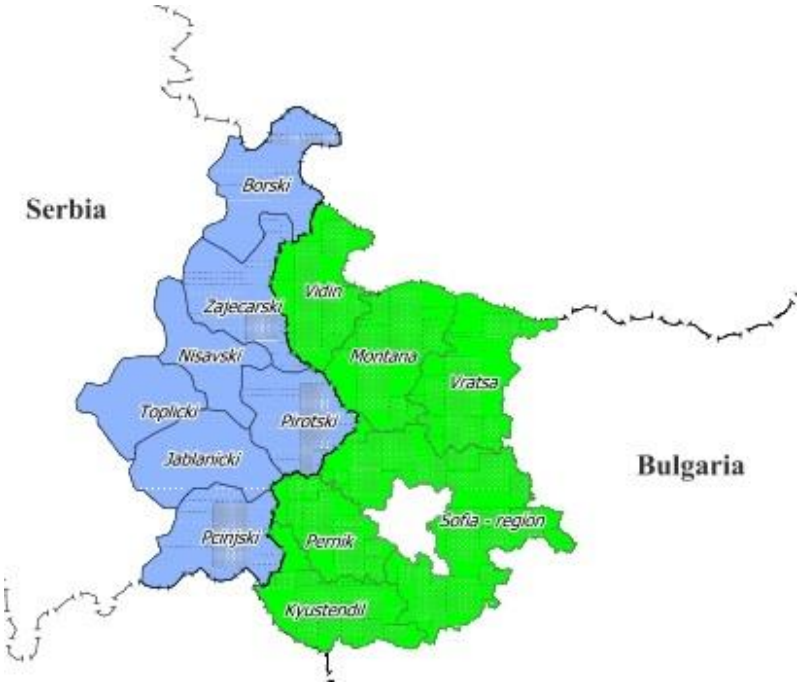


Figure No. 1.2-1 *Territorial scope of the CBCP 2021-2027 between the Republic of Bulgaria and the Republic of Serbia*

The main joint challenge for the region for cross-border cooperation is to leave the group of lagging regions and take on more advanced course of development while still facing persistent risk of poverty and income inequalities issues urged by negative demographic change, underdeveloped CBC regional value chains and entrepreneurship, low technological specialization, unattractive and uncompetitive business setting.

The objectives and provisions of the CBCP and TSIM are identified and specified on the basis of a territorial analysis of the cross-border area, the results of which show the following differences for the cross-border areas of the two countries:

- Opposite demographic trends;
- Poverty and income inequalities;
- A weak link between education and the labour market;
- Inequalities in access to healthcare;
- Disproportion in the development of competitiveness and the business environment;
- Disproportion in the development of digitalisation and innovation;
- Underdeveloped tourist infrastructure for all-season use;
- High risk of natural disasters and loss of biodiversity;
- Limited readiness for green transition;

- Prolonged tensions linked to cross-border migration.

The following have been identified as ***drivers*** of development on the basis of territorial analysis:

- Favourable macroeconomic environment;
- Potential for integration into the international tourism network;
- Good regional connectivity and multimodal transport potential.

The Programme identifies the following **Policy Objectives** (European Regional Development Fund (ERDF) and Cohesion Fund Regulation) **and related Priorities**, **Specific Objectives** and **Supported Activities/Investments**:

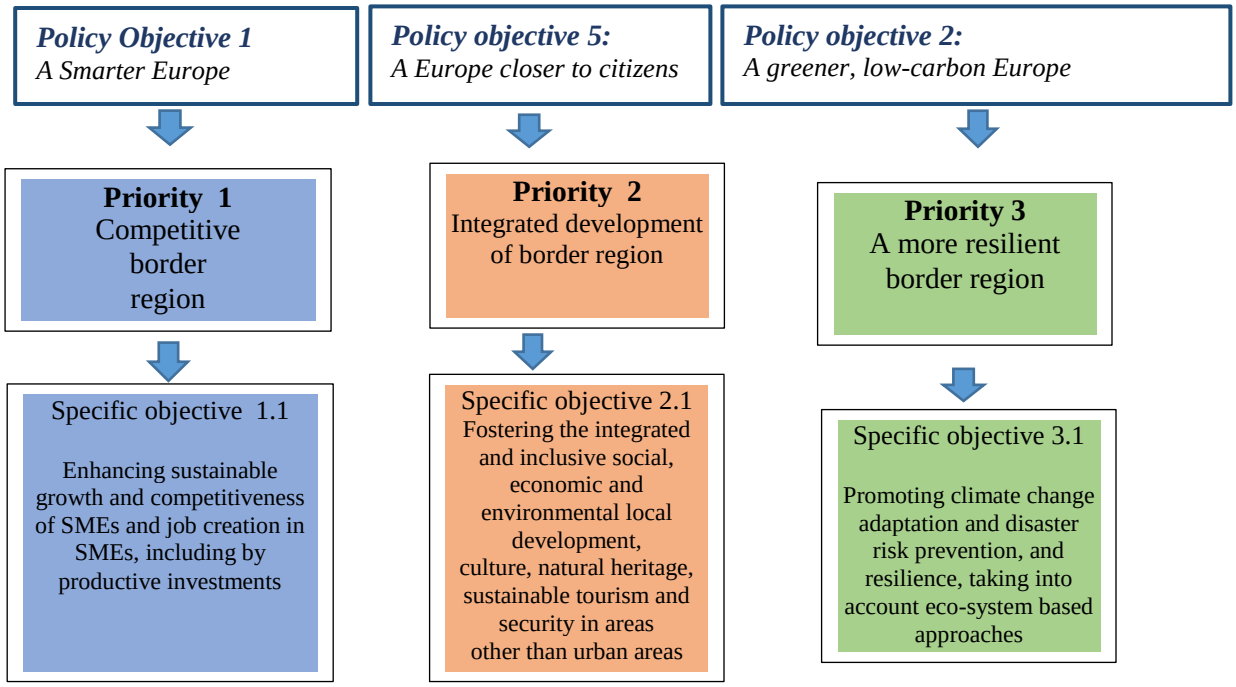


Figure No. 1.2-2 *Thematic concentration of the CBCP 2021-2027 between the Republic of Bulgaria and the Republic of Serbia*

Contents of the priorities are as follows:

Priority 1: Competitive border region

Policy Objective 1 "A more competitive and smarter Europe by promoting innovative and smart economic transformation and regional ICT connectivity"

Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments

The non-exahaustive list of actions to be supported includes

- Technological and/or organizational investments aimed at reducing the cost of production/service delivery and any other investment leading to increased enterprise competitiveness including but not limited to purchase of specialized equipment and technologies (inlc. related upskilling), monitoring systems; purchase of IT equipment, training and know-how transfer, virtual business centres, e-commerce solutions, possibilities for electronic payments, etc; Actions aimed at increasing productive capacity;
- Investments aimed at quality management for improving product/service quality, including but not limited to improvements in the design of product/service features, improvements in customer after-sales service, improvements in product guarantee, total quality management systems, and any other aspect that defines overall product/service quality level;
- Actions aimed at accessing new markets or market segments including but not limited to marketing studies, distance-spanning technologies, organisational cooperation and joint business schemes with other enterprises, company exhibition halls at company's establishment, etc.
- Marketing and promotion actions, participation in international fairs, exhibitions and other promotional events, consultation and information services, including e-marketing, communication with clients, etc.

Target groups:

Micro, small and medium enterprises (MSMEs)

Priority 2: Integrated development of border region

Policy objective 5: A Europe closer to citizens by fostering the sustainable and integrated development of all types of territories and local initiatives

Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental local development, culture, natural heritage, sustainable tourism and security in areas other than urban areas.

Priority 2, for the implementation of *Policy Objective 5 "A Europe closer to citizens by fostering the sustainable and integrated development of all types of territories and local initiatives"*, provides for the development of **Territorial strategy for integrated measures (TSIM)**, to address the measures (identified eligible support activities under the program) for specific territorial needs.

The integrated approach for meeting / addressing the needs and potentials of the territory in the developed TSIM is manifested in three main aspects:

- territory defined on the basis of achieving sustainable results in terms of common needs and development potentials;
- participation of a wide range of partners in the whole process of preparation, discussion, adoption and implementation of the strategy.
- derived package of interconnected and complementary (integrated) measures, based on close coordination of different public policies according to local specifics, meeting local needs and development potentials and bringing common benefit to partners and the region.

Through TSIM it will give priority to the support for some projects / actions / activities over others – *they are described below in the TSIM description*.

Target groups:

Civil society, local/ regional bodies and authorities, regional structures of central public authorities, NGOs, R&D, academic and training institutions, Social institutions, SMEs, other professional organizations.

Priority 3: A more resilient border region

Policy objective 2: „A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate change mitigation and adaptation, risk prevention and management, and sustainable urban mobility "

Specific objective 3.1 Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account eco-system based approaches

Under the specific objective will be funded a Strategic Project ***Strategic Project*** **„Preparation of the population for actions in case of disasters and improvement of the capacity of the professional teams for response in case of emergency situations within**

Bulgarian-Serbian cross-border region".

Project Summary: The frequency of natural disasters has been increasing in recent years. Especially since the mid-1990s, when a series of disasters caused serious material damage and casualties in many regions of the Republic of Bulgaria and the Republic of Serbia. Natural disaster risk reduction includes several strands and objectives:

- limitation of damage caused by extreme natural phenomena;
- protection of populations living in high-risk areas;

- raise awareness and knowledge and thereby improve the culture of behaviour;
- improving and maintaining the capacity of professional units to protect the population from accidents and natural disasters.

The strategic project will therefore be implemented in line with the *Strategy for a credible enlargement perspective and an enhanced EU commitment to the countries of the Western Balkans (the Western Balkans Strategy[1])*, which aims to respond to the specific challenges of the neighbourhood through joint projects to develop capacity and enhance disaster response capabilities, as well as to raise awareness. In this regard, the project aims to prepare the population and volunteers for disaster response in the cross-border region, as well as to ensure a correct and timely response of professional teams to disasters and other emergencies. The project has a complementary effect in the previous programming period (2014-2020), when the risk management capacity was improved and will lead to sustainable results.

Types of activities/investments supported by the Strategic Project:

- Optimizing the educational process in regards to the development and the implementation of a disaster response framework aiming to enhance the interface between science and policy for a stronger knowledge base for decision-making;
- Actions aimed at strengthening the institutional cooperation in the cross-border region through development of guiding and strategic documentation; exchange of information, knowledge and skills; implementation of joint field trainings, etc.;
- Development and implementation of a comprehensive preparedness programme for border communities to adequately response to natural disasters, including in-situ trainings, simulations, awareness campaigns, etc.;
- Small-scale investments in public training infrastructure and investments in specialised equipment;
- Joint development of protocols, procedures and approaches on riskprevention and rapid response management to many potential emergencies

Target groups:

National authorities for disaster management in Bulgaria and Serbia; Local protection and rescue units from Bulgaria and Serbia; Volunteer fire services from Serbia and the National Association of Volunteers in the Republic of Bulgaria; Local authorities; Children, students, elderly people aged 60 and older, business representatives; General population of the cross-border region.

[1] *https://ec.europa.eu/info/sites/default/files/communication-credible-enlargement-perspective-western-balkans_en.pdf*

B. TSIM 2021-2027 between the Republic of Bulgaria and the Republic of Serbia

The TSIM defines the **Vision** of the CBCP, **a strategic objective**, **specific objectives** (described also above under **Priority 2** of the **CBCP**) and **measures**.

Vision: Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion.

Such a vision has a reach beyond any formalised timeframe of a planning document at this level. The desired course of the vision presupposes multisector, integrated actions with a single focus - cohesion. Cohesion, understood as reduction of economic and social disparities, better connectivity and functional and spatial integration. In addition to the reduced disparities, cohesion implies preservation of cultural diversity and identities of territorial communities at every level.

Cohesion has three major components: territorial, economic and social cohesion. *Territorial* cohesion addresses cross-border cooperation and includes integrated development of cities and their interconnection into networks of cooperation, as well as preservation of natural and cultural heritage, i.e. their identity. Main tools of territorial cohesion are the elements of physical connectivity - all kinds of linear infrastructures, including telecommunication.

Economic cohesion means reducing the disparities in the major economic development indicators for the CBC region. “Competitiveness”, “knowledge-based economy” and “innovations in the SME sector” will continue to be the drivers of economic development. While these economic drivers remain prerequisites for a “smarter” and “greener” growth, further consideration should be given to the “more social” growth that creates chances for employment of unskilled workers in traditional industries like forestry or food processing.

Social cohesion is a direct result of economic cohesion and is expressed as a general improvement of living standards on both sides of the border (employment, income, consumer spending) and quality of human resources (education, healthcare, social services, culture). The goal of social cohesion, again, is to reduce the disparities in the social area and in the quality of life in the whole CBC region.

Strategic objective: To enhance growth in all its aspects

Specific objective 1: To expand and improve service provision

The problem in brief: Remote areas, disadvantaged groups of people and small businesses continue to remain under- or inadequately publicly served, which drawbacks growth efforts.

M 1.1. Expand accessibility and improve quality of services of general interest in support of social and economic growth

The accessibility, proximity, affordability and quality of public services is important to quality of life and business development. Demographic trends and rising skill shortages suggest that both countries need to invest more and better in the skills of their current and future workforce, as well as to better link education and training with labour market's needs. Furthermore, vulnerable and disadvantaged groups of people continue to have limited access to services of general interest, therefore integrated measures for service quality enhancement and active economic inclusion of vulnerable persons should be determined with priority and allowing for more digital solutions. Despite the restricted available resources, the measure needs to support elderly people from peripheral rural areas to have access to communication technologies and capability to use them in receiving distant services.

Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism (at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)

M 2.1 Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market

Among others, SMEs' needs cover framework support for digital and green transition, enhanced management and marketing competencies, creativity and entrepreneurship skills to make the regional economy competitive and inclusive. These needs can be properly addressed by utilizing and maximizing the existent business support potential by networking relevant institutions from both sides of the border and upgrading and channelling their business supporting practices.

M 2.2 Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region

Most of the cultural heritage monuments are in disrepair and need enormous investments for restoration and preservation. In the past years a lot has been invested in culture preservation but still there is a need of further conservation of cultural heritage. Further, exposure models of many sites deprive them from attractiveness instead of contributing to it. Improvements in this aspect (exposure) are needed. There is a lot to be done in digitalization too. Similar to cultural heritage, there are certain needs for providing access to and information for attractive natural complexes. Designing and building of new and rehabilitation of existing ecotrails and bikeroutes will enrich tourist supply and contribute to marketability of tourist products. Tourism mobility measures need to be addressed in a way to ensure faster and smoother movement of people and goods.

M 2.3. Improving CBC tourism marketing and branding practices

The CBC tourist products should be promoted as being the best option for tourists highlighting some of the things that make them different, or unique. Modern tourism marketing would imply wide use of the internet, websites, online adverts, email and social media platforms as ICT technologies play a key role. It is also crucial that the CBC tourism marketing keeps up with the latest trends thus creating

a diverse marketing mix and use the best methods for getting tourist messages out. Thus applying multi-sectoral inter-connected interventions, the measure will contribute to tourism industries' development.

The strategy will implement a horizontal policy in the field of green transition, which requires each supported project to contain a component related to the protection of environmental components and the search and implementation of green solutions.

1.3. Alternatives to CBCP and TSIM

The draft programme and draft strategy provided by the Contracting Authority do not contain alternatives.

1.4. Connection of the CBCP and TSIM with other relevant plans, programmes and strategies

The drafts of the CBCP and TSIM 2021-2027 are related to plans, programs and strategies:

- at European and international level;
- at national, regional and local level (falling within the territorial scope of the programme and strategy in the Republic of Bulgaria and the Republic of Serbia).

A. Plans, programmes and strategies at European and international level relevant to the CBCP and TSIM 2021-2027

- ***Territorial Agenda 2030 "A future for all places"*** [2]*(December 2020, European Commission)*

The document sets out two main objectives: **A just Europe** and a **Green Europe**, which have **6 priorities** for the development of the European territory as a whole, covering all its parts:

  - *Balanced territorial development;*
  - *Functional areas with fewer inequalities;*
  - *Integration and cooperation beyond administrative, territorial and national borders,*
  - *Healthy environment,*
  - *Circular economy,*
  - *Sustainable digital and physical connectivity.*

The Territorial Agenda 2030 is one of the main documents on which TSIM is based.

- ***The United Nations (UN) 2030 Agenda for Sustainable Development "Transforming the World"***[3] *(October, 2015, United Nations)*

[2] *https://ec.europa.eu/regional_policy/sources/docgener/brochure/territorial_agenda_2030_en.pdf*
[3] *https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E*

The programme and the 17 global sustainable development goals and the 169 specific sub-objectives identified therein are seen as a framework for national development policies, as Bulgaria is committed to achieving these goals.

In this regard, the Programme is reflected in the National Development Programme of Bulgaria: 2030, and hence in the programming documents for the period 2021-2027.

The 17 Sustainable Development Goals are (*underlined are those related to the CBCP and the TSIM, and the link is also described*):

Objective 1: Poverty eradication - through the activities under Priority 1 of the CBCP and the measures under Specific Objective 2 of the TSIM;

Objective 2: Elimination of hunger - through the activities under Priority 1 of the CBCP and the measures under Specific Objective 2 of the TSIM;

Objective 3: Good health and well-being - all three priorities of the CBCP contribute;

Objective 4: Quality education - activities related to training are foreseen;

Objective 5: Gender equality – no specific measures, but the principle is a fundamental horizontal requirement for EU-funded programmes and is tailored to the definition of eligible activities and support measures;

Objective 6: Clean water and sanitation - there are no specific measures, but the need to provide clean water and sanitation under the relevant measures and activities is taken into account;

Objective 7: Economically accessible and clean energy - there are no specific measures, but the objective is consistent in identifying territorial measures;

Objective 8: Decent work and economic growth - through the activities under Priority 1 of the CBCP and the measures under Strategic Objective 1 of the TSIM;

Objective 9: Industry, innovation and infrastructure - through activities under Priority 1 and measures under the TSIM;

Objective 10: Reducing inequalities - CBCP and TSIM aim precisely at reducing inequalities, which is the main subject of EU co-financed programmes;

Objective 11: Sustainable cities and communities - in general, the implementation of the CBCP and TSIM will contribute to the achievement of the objective.

Objective 12: Responsible consumption and production - through Priority 1 of the CBCP and Specific Objective 2 of the TSIM;

Objective 13: Climate action - strategic project under Priority 3 of CBCP;

Objective 14: Life underwater - no direct link, but the requirements for environmentally friendly approaches are integrated into the eligible measures (e.g. greener global market to measure 2.1, environmental access under measure 2.2 of TSIM, etc.);

Objective 15: Life on the ground - analogous to Objective 14;

Objective 16: Peace, justice and strong institutions - not directly relevant;

Objective 17: Partnership to meet the objectives - CBCP and TSIM are based entirely on the partnership principle.

The analysis of the relevance of the Sustainable Development Goals, which are environmental protection goals at international level - 3, 6, 7, 11, 12, 13, 14, 15 to the CBCP and TSIM, is made in ***item 5*** *of the EAR.*

- ***The strategy for a credible enlargement perspective and an enhanced EU commitment to the Western Balkan countries (Western Balkans Strategy[4])***

The strategy identifies six leading initiatives:

- Strengthening the Rule of law;
- Strengthening the security and migration commitment;
- Strengthening the support for socio-economic development;
- Increasing transport and energy connectivity;
- Digital Agenda for the Western Balkans;
- Supporting understanding and good neighbourly relations.

The strategy is directly reflected in the CBCP and TSIM through all priorities and provisions of the CBCP and TSIM, including through the strategic project under Priority 3 of the CBCP.

- ***Proposal for a Decision of the European and of the Council on a General European Union Environment Action Programme by 2030 (Eighth EU Environment Action Programme by 2030)***[5] *(European Commission, 14.10.2020, COM(2020)652)*

The Programme forms the basis for achieving the environmental and climate objectives set out in the UN 2030 Programme and its Sustainable Development Goals; its monitoring framework is the environmental and climate-related part of the EU's efforts to measure progress towards greater sustainability, including climate neutrality, resource efficiency, prosperity and resilience.

The long-term objective of the Programme is that citizens live well within the limits of our planet, in a regenerative economy where nothing is wasted, there are no net greenhouse gas emissions and economic growth is not dependent on the use of resources and environmental degradation. A healthy environment is at the heart of citizens' well-being, it ensures that biodiversity thrives and natural capital is protected, valued and restored in ways that increase resilience to climate change and other environmental risks.

The programme has 6 thematic priority objectives, for the implementation of which has also been identified favourable conditions.

The analysis of the relevance of the thematic priority objectives to the CBCP and the TSIM and their manner of compliance is made in ***item 5*** *of the EAR.*

- ***Communication from the European Commission "Clean Planet for All. A European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy"*** [6] *(European Commission, 28.11.2018, COM (2018)773)*

[4] *https://ec.europa.eu/info/sites/default/files/communication-credible-enlargement-perspective-western-balkans_en.pdf*
[5] *https://eur-lex.europa.eu/legal-content/BG/TXT/?uri=CELEX%3A52020PC0652*
[6] *https://eur-lex.europa.eu/legal-content/BG/TXT/?uri=CELEX:52018DC0773*

The long-term strategy document aims to reaffirm Europe's commitment to take the lead in global climate action and to present a vision that can deliver zero net greenhouse gas emissions by 2050 through a socially just transition in a cost-effective manner. 7 main strategic building blocks for achieving a zero-emission economy have been identified, as *an analysis of the relevance and the degree of compliance in the CBCP and TSIM is made in* ***item 5*** *of the EAR.*

- ***Communication from the European Commission: "Building a climate resilient Europe – the new EU climate change adaptation strategy"*** [7]*(European Commission, 24.02.2021, COM(2021)82)*

The strategy outlines ways in which the inevitable consequences of climate change can be addressed. Climate change adaptation actions imply the involvement of all sections of society and all levels of government in the EU and beyond. The aim is to build a climate-resilient society through more and better knowledge of their consequences and the necessary adaptation, faster development of adaptation plans and climate risk assessment, accelerating adaptation actions and supporting the strengthening of global resilience to climate change.

Analysis of the guidelines included in the document and their manner of compliance in the drafts of CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***Communication from the European Commission "Updating the new industrial strategy for 2020: Building a stronger Single Market for Europe's recovery"*** [8]*(European Commission, 05.05.2021, COM(2021)350)*

The updated strategy reinforces the priorities set out in the March 2020 Communication, published the day before the WHO declared the COVID-19 pandemic. At the same time, it is also an expression of the lessons learned from the crisis in order to boost recovery and strengthen the EU's open strategic autonomy. It proposes new measures to strengthen the adaptability of our Single Market, especially in times of crisis. The strategy addresses the need for better knowledge of our dependencies in strategic key areas and presents a set of means to address them. New measures are also proposed to accelerate the environmental and digital transition. The key importance of the circular economy as well as investment in skills is highlighted.

CBCP and TSIM align priorities by providing for measures specifically for SMEs- Specific objective 1.1: "Strengthening the sustainable growth and competitiveness of SMEs and creating jobs in SMEs, including through productive investment" (CBCP) and Specific Objective 2: Enhancing regional competitiveness, incl. in the field of tourism (at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture) (TSIM).

- ***Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240*** [9]

[7] *https://eur-lex.europa.eu/legal-content/BG/ALL/?uri=CELEX:52021DC0082*
[8] *https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52021DC0350*
[9] *https://eur-lex.europa.eu/legal-content/BG/TXT/?uri=CELEX:32021R0694*

Regulation (EU) 2021/694 establishes the Digital Europe programme for the period 2021-2027 and sets out the objectives of the programme, the budget, the forms of Union funding and the rules for the provision of such funding. With a total budget of EUR 7.588 billion, the programme will provide funding for advanced technology deployment projects in 5 key areas:

- High performance computing technologies: EUR 2.2 billion;
- Artificial intelligence: EUR 2 billion;
- Cybersecurity and trust: EUR 1.6 billion;
- In-depth digital skills: EUR 577 million;
- Implementation, best use of digital capacity and interoperability: EUR 1 billion.

Digital decision activities shall be supported under Priority 1 of the CBCP as well as under the two specific objectives of the TSIM.

- ***Communication from the European Commission "A path to a healthy planet for all. An EU Action Plan: Towards zero air, water and soil pollution"***[10]*(European Commission, 12.05.2021, COM(2021)400))*

The document sets out a vision for zero pollution by 2050: A healthy planet for all - Air, water and soil pollution has been reduced to levels that are no longer considered harmful to health and to natural ecosystems, and that respect the limits that our planet is able to cope with, thus creating a non-toxic environment. Leading initiatives have been identified to achieve the vision.

*In **item 5** of the EAR, an analysis is made of the relation of the initiatives (representing environmental protection objectives) to the drafts of the CBCP and TSIM.*

- ***Communication from the European Commission on a European Green Pact*** [11]*(European Commission, 11.12.2019,COM(2019) 640)*

According to the document, climate change and environmental degradation threaten the very existence of Europe and the world. To overcome these challenges, Europe needs a new growth strategy aimed at transforming the Union into a modern, resource-efficient and competitive economy in which:

- there are no net greenhouse gas emissions by 2050;
- economic growth does not depend on the use of resources;
- no person or region is neglected.

The European Green Pact provides an action plan for:

- increasing resource efficiency by moving towards a clean, circular economy, and
- restoring biodiversity and reducing pollution.

*An analysis of the relevance and compliance of environmental protection objectives to/in the CBCP and TSIM is made in **item 5** of the EAR.*

- ***Communication from the European Commission: New action plan on the circular economy – Towards a cleaner and more competitive Europe***[12]*(European Commission, 11.03.2020, COM/2020/98)*

[10] *https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2021%3A400%3AFIN*
[11] *https://eur-lex.europa.eu/legal-content/BG/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN*
[12] *https://eur-lex.europa.eu/legal-content/BG/TXT/?uri=CELEX%3A52020DC0098*

The plan presents a set of interlinked initiatives to establish a credible and coherent framework in the following directions for key actions (described in an appendix to the plan):

- sustainable products policy framework - part of the areas are: sustainable Product Design; Key Product Value Chains; Electronics and ICT- these strands are directly linked in the CBCP, in particular in Specific Objective 1.1*: "Strengthening the sustainable growth and competitiveness of SMEs and creating jobs in SMEs, including through productive investment"*
- less waste, more value (waste reduction targets, harmonised model for separate waste collection and labelling, minimisation of hazardous substances in recycled materials, harmonised waste information systems, end-of-waste criteria, revision of waste shipment rules, benefiting from the circular economy for people, regions and cities);
- cross-sectoral actions (circularity as a prerequisite for climate neutrality)
- at the forefront of global efforts – global agreements on plastics, natural resource management, free trade;
- monitoring of the progress.

Analysis of the relevance and compliance of the directions to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***EU Biodiversity Strategy by 2030***[13] *(European Commission, 20.05.2020, COM(2020)380)*

The strategy aims to put Europe's biodiversity on the road to recovery by 2030, bringing benefits to humans, the climate and the planet. The main actions to be implemented by 2030 include the establishment of protected areas, restoration of damaged ecosystems, provision of funds for biodiversity, addressing the global biodiversity crisis.

An analysis of the relevance and compliance of environmental protection objectives to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***EU strategy for the Danube region***

The Danube Region covers 9 EU member states (Germany, Austria, Hungary, Czech Republic, Slovakia, Slovenia, Croatia, **Bulgaria** and Romania) and 5 non-EU countries (Serbia, Bosnia and Herzegovina, Montenegro, Ukraine and Moldova). These countries are joining forces to address common challenges, such as:

- environmental threats (water pollution, floods, climate change);
- untapped navigable potential and lack of road and rail transport connections;
- insufficient energy connections;
- unbalanced socio-economic development;
- uncoordinated education, research and innovation systems;
- deficiencies in the security sphere.

[13] *https://eur-lex.europa.eu/legal-content/BG/TXT/HTML/?uri=CELEX:52020DC0380&from=EN*

CBCP and TSIM include predictions regarding environmental threats, unbalanced socio-economic development, innovation.

*Analysis of the relevance of the CBCP and TSIM to the Pillar: Protection of the environment in the Danube region of the strategy is made in **item 5** of the EAR.*

- ***Danube River International Basin Management Plan - Update 2015***[14]

The updated plan integrates the requirements of the Water Framework Directive to achieve the following environmental objectives:

- Good ecological/chemical status of surface water bodies;
- Good ecological potential and chemical status of heavily modified water bodies and artificial water bodies;
- Good chemical/quantitative status of groundwater bodies.

In the implementation of the CBCP and TSIM, the activities shall comply with the current RBMP for the Danube Region, which is a plan for river basin management at national level (level B) in the context of the River Basin Management Plan of the Danube River - an update 2015 and the relevant measures of it should be taken into account. The programming period of the CBCP and TSIM coincides with the period of updating, preparation and implementation of the third RBMP - update 2021.

*Analysis of the compliance of the CBCP and TSIM provisions with the 2015 update plan - is made in the sections of the EAR for the Water component, as well as in **item 5** of EAR.*

- ***Danube Basin Flood Risk Management Plan***[15]

The Flood Risk Management Plan (FRMP) for the Danube Basin sets out appropriate flood risk management objectives at the level of the international river basin covering the entire Danube Basin. It highlights the objectives and issues related to the whole basin perspective and as such complements the national flood risk management plans, which provide all relevant information on measures, flood maps and other national activities in the protection, prevention and mitigation sector in a more detailed manner.

The objectives of the FRMP for the basin of the Danube River are:

- Avoiding new risks;
- Reducing existing risks;
- Strengthening resilience;
- Raising awareness;
- Principle of solidarity.

The plan refers to the period 2016-2021 and the activities in the implementation of the CBCP and TSIM take into account the current FRMP for the Danube Region, which is a flood risk management plan at national level and should take into account the relevant measures from it. The programming

[14] https://www.icpdr.org/flowpaper/app/services/view.php?doc=drbmp-update2015.pdf&format=pdf&page={page}&subfolder=default/files/nodes/documents/
[15] https://www.icpdr.org/flowpaper/app/services/view.php?doc=1stdfrmp-final.pdf&format=pdf&page={page}&subfolder=default/files/nodes/documents/

period of the CBCP and TSIM coincides with the period of updating, preparation and implementation of the second FRMP in the basin of the Danube River - update 2021.

Analysis of the compliance of the CBCP and TSIM provisions with the plan is made in the sections of the EAR for the Water component, as well as in ***item 5*** *of EAR.*

B. Plans, programmes and strategies on the territory of the Republic of Bulgaria relevant to the CBCP and TSIM 2021-2027:

- ***Draft Partnership Agreement for the programming period 2021-2027***[16] *(June, 2021)*

The Partnership Agreement is the national strategic document outlining the framework for the management of EU funds in Bulgaria during the 2021-2027 programming period.

Table 7 of the draft Agreement lists as programme 1 the Bilateral Programme for Cross-Border Cooperation at the External Borders of the European Union between the Republic of Bulgaria and the Republic of Serbia.

The draft Agreement shall be developed in parallel with the programmes for the period 2021-2027 and shall take into account the preparation of the CBCP and TSIM.

- ***National Development Programme: Bulgaria 2030*** [17]*(approved by the Council of Ministers by Protocol No. 67 of 2 December 2020)*

The Programme is a framework strategic document of the highest order in the hierarchy of national programming documents, defining the vision and general objectives of development policies in all sectors of government, including their territorial dimensions.

The programme includes three strategic objectives: Accelerated economic development, Demographic upturn and Reduction of inequalities, for which 13 priorities have been set. CBCP and TSIM shall include priority-based interventions:

1: Education & skills;
4: A circular and low-carbon economy;
5: Clean air and biodiversity
8: Digital connectivity
9: Local development
11: Social inclusion.

As priorities 4, 5 and 6 (Sustainable agriculture) set environmental protection objectives at national level, an analysis of the degree of their integration in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National strategy for regional development for the period 2012-2022*** [18]*(adopted by Decision No 696 of the Council of Ministers of 24.08.2012)*

The strategy sets objectives for economic, social and territorial cohesion at European, national and regional level, which is also the basis for the development of the CBCP and the TSIM. In this regard,

[16] *https://www.eufunds.bg/bg/taxonomy/term/867*
[17] *https://www.minfin.bg/bg/1394*
[18] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=772*

the strategy is taken into account and tailored in the preparation of the documents. Direct linkage has Strategic objective 3 of the Strategy "Territorial Cohesion and Development of Cross-Border, Interregional and Transnational Cooperation".

- *National Spatial Development Concept for the period 2013-2025 - update 2019* [19] *(adopted by Decision of the Council of Ministers of 07.05.2020)*

Following the National Strategy for Regional Development, the update of the National Concept for Spatial Development sets 3 strategic objectives - territorial cohesion, economic cohesion and social cohesion. The concept also defines the zones for cross-border cooperation, one of which is the Bulgaria-Serbia Zone. According to the concept of this zone, it is pointed out that the current development in the fields of tourism, ecology, biodiversity conservation and economic development are the natural directions for cross-border cooperation with the Republic of Serbia. There are reserves for tourism development in the field of health and cultural tourism, in the presence of cultural properties and mineral waters on both sides of the border. The protected areas for the conservation of biodiversity on both sides of the border are the basis for the creation of a cross-border environmental corridor and the preparation and implementation of joint projects. The climate change makes ecology a mandatory area of cross-border cooperation and makes joint development and implementation of initiatives to prevent and combat floods and forest fires mandatory, including awareness-raising and training. The economic relations are deepening and the low unemployment and the new jobs created, especially in the outsourcing industry, are the basis for developing economic relations between the two countries. Increasing the throughput of border crossing points, ensuring the reliability of the system of screening of crossers, solving bottlenecks problems in the transport infrastructure are identified as basic measures to achieve easy physical access. Problems with administrative capacity in smaller municipal centres lead to difficulties in the joint work of public authorities on both sides of the border.

The concept and guidelines for development of the area are aligned in the drafts of the CBCP and TSIM.

- ***National Strategy for Small and Medium-sized Enterprises 2021-2027*** [20]

The national strategy is a key strategic document for the next programming period, which sets out the vision on state policy in support of SMEs and reflects the EU policy towards SMEs. Six areas of impact have been identified (Entrepreneurship, Market Access, Access to Financing, Digitalisation and Skills, Better Regulation and Environment). In the area of impact *3 Access to finance* as a measure 3.5. there is Support for small projects promoting the interregional cooperation of SMEs, where activities financed under the Interreg cross-border programmes are defined – support for the implementation of small interregional projects; support for events, meetings, conferences, workshops and business meetings between Bulgarian and foreign SMEs; support for international cooperation of SMEs in national and regional priority sectors. In addition, in general, operational programmes are indicated for policy funding in response to the COVID-19 crisis.

[19] *https://www.eufunds.bg/bg/oprd/node/4554*
[20] *https://www.mi.government.bg/bg/themes/nacionalna-strategiya-za-malki-i-sredni-predpriyatiya-msp-v-balgariya-2021-2027-g-2194-285.html*

The strategy shall be consistent in identifying the measures and activities under the CBCP and the TSIM.

- ***Innovative strategy for smart specialization for the period 2021-2027*** *(under preparation[21])*

The thematic priority areas for smart specialisation in the period 2021-2027 set out in the Strategy are the following:

1. Informatics and ICT.
2. Mechatronics (autonomous area).
3. Industry for a healthy life and biotechnology.
4. New technologies in creative and recreational industries.
5. Clean technologies, circular and low-carbon economy.

Compliant with Priority 1 of the CBCP, measures 1.1., 2.1. of the TSIM

- ***Concept for digital transformation of the Bulgarian industry [22](Industry 4.0), adopted by Decision No 37 of 30 August 2017 of the Council of Ministers***

The aim of the concept is to create prerequisites for modernization, automation and competitive positioning of the Bulgarian economy in the medium to long term (2017-2030).

The vision outlined in the Concept is as of 2030 Bulgaria to be recognized as a regional centre of the digital economy through the implementation of products, technologies, business models and processes from Industry 4.0.

The adoption of the Concept will allow the adoption of specific policies and measures to digitise the real economy and the manufacturing sector and will help to coordinate policies, instruments and mechanisms in the various line ministries and in line with the European Union's policies in this field.

The areas of intervention covered by the Concept for Business Digitisation, Export Orientation and Competitiveness are the following:

- Direction 1: Strengthening the link between science and industry in the country and accelerating the integration of Bulgaria into European and international programmes, initiatives and networks related to the development and implementation of Industry 4.0.

- Direction 2: Technological renovation of the Bulgarian economy through: standardisation, infrastructure building, development of specific mechanisms to stimulate the development and market uptake of technological innovation (new products, services and production processes) through Industry 4.0 technologies.

- *Direction 3:* Building human, scientific, organizational and institutional capacity for development of Industry 4.0 in Bulgaria.

Activities and measures for digital transformation under CBCP and TSIM are envisaged.

- ***National Strategy Paper "Digital Transformation of Bulgaria for the period[23] 2020-2030",*** *adopted by Decision No 493 of the Council of Ministers of 21.07.2020*

[21] *http://www.arcfund.net/index.php?id=2302*
[22] *https://www.mi.government.bg/bg/themes/koncepciya-za-cifrova-transformaciya-na-balgarskata-industriya-industriya-4-0-1862-468.html*
[23] *https://www.mtitc.government.bg/sites/default/files/cifrova_transformaciya_na_bulgariya_za_perioda_2020-2030.pdf*

The document defines the vision and objectives of the policy for digital transformation of the Republic of Bulgaria for the period up to 2030 as a generalized policy framework within which the National Programme "Digital Bulgaria 2025", the priorities of the "National Programme for Development Bulgaria 2030", as well as a number of other national strategic documents with technological component (listed in the Appendix to the document) covering the period 2020-2030 are located. It takes into account the objectives of the UN 2030 Programme for Sustainable Development and the use of new technologies to achieve them, as well as European Commission strategy papers "A Europe fit for the digital age", "Building Europe's digital future", "A new industrial strategy for Europe", etc.

Activities and measures for digitisation under the CBCP and TSIM are foreseen.

- ***National Strategy for Disaster Risk Reduction 2018-2030*** [24]***(adopted by Decision of the Council of Ministers No 505 of 19.07.2018)***

The Strategy defines the vision for disaster risk reduction on the territory of the Republic of Bulgaria, outlining a coherent framework for adequate reduction of existing risks and preventing the emergence of new ones, increasing preparedness and capabilities for response and rapid recovery after disasters, in compliance with the principle "to rebuild but better".

The strategy is directly reflected in Priority 3 of the CBCP, where a strategic project *"Preparing the population for action in case of disasters and improving the capacity of specialized emergency response teams in the Bulgarian-Serbian cross-border region"* is envisaged.

- ***Updated National Strategy for Sustainable Tourism Development in the Republic of Bulgaria 2014-2030***[25] *(approved by Decision No. 65/02.02.2018 of the Council of Ministers)*

The main objective of the Strategy is the sustainable development of tourism in Bulgaria. In order to achieve it, the following strategic objectives (priorities) have been defined:

1. Creating a favourable environment and business environment for the development of sustainable tourism

2. Development of a competitive tourism sector

3. Successful positioning of Bulgaria on the world tourism market

4. Balanced development of tourist areas - within the scope of the cross-border area, subject of the CBCP and TSIM, fall parts of five tourist regions - Danube Region and Stara Planina Region, Rozova Dolina Region, Sofia Region and Rila-Pirin Region *(acc.* to *the Concept of tourist zoning of Bulgaria, 2015).*

Specific objective 2 of the TSIM is aimed at increasing regional competitiveness, incl. in the field of tourism (at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture), and the identified measures to the specific objective will contribute to the achievement of the strategic objectives of the strategy.

[24] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1279*
[25] *https://www.tourism.government.bg/bg/kategorii/strategicheski-dokumenti/aktualizirana-nacionalna-strategiya-za-ustoychivo-razvitie-na*

- ***Recovery and Sustainability Plan*** [26]*(draft version 1.4, October 2021)*

The main objective of the Recovery and Sustainability Plan is to support the economic and social recovery from the crisis caused by the COVID-19 pandemic. In pursuit of this objective, the government groups together a set of measures and reforms that not only restore the growth potential of the economy, but also develop it by ensuring the resilience of negative externalities. This will make it possible in the long term to achieve the government's strategic objective of convergence of the economy and income to the average for Europe. At the same time, the Plan lays the foundations for a green and digital transformation of the economy, in the context of the ambitious goals of the Green Deal.

The plan is structured in four pillars: **Innovative Bulgaria**, **Green Bulgaria**, **Connected Bulgaria** and **Just Bulgaria**, including measures (reforms/investments) in areas/sectors: education and skills, research and innovation, smart industry, low-carbon economy, biodiversity, sustainable agriculture, digital connectivity, transport connectivity, local development, business environment, social inclusion, healthcare.

The plan has no direct relevance to the CBCP and TSIM as it defines specific financing measures but takes into account the development of the CBCP and TSIM in view of demarcation and complementarity of investments.

- ***Strategy and Action Plan for Transition to a Circular Economy of the Republic of Bulgaria for the period 2021-2027*** [27]*(draft, 2020, Ministry of Environment and Water)*

The transition to a circular economy will provide Bulgaria with economic growth, a clean environment, social well-being and a society with a high environmental awareness that thinks about future generations. The country's policy for transition to a circular economy will be implemented by setting the following strategic objectives in the draft strategy for transition to a circular economy: a green and competitive economy; less waste and more resources; a consumer-friendly economy. Specific objectives are proposed for each of the strategic objectives.

As a result of the transformation of the economy, resource efficiency and the added value of industrial production are expected to increase. Consumption of some products is envisaged to be replaced by services and others to be fit for longer use. Individual productions should be able to be linked so that they exist in symbiosis. Thus, it is envisaged that our country will contribute to the provision of critical raw materials in the European Union. It is expected that landfill waste will be reduced to a minimum and the rest returned to the production cycle or recycled.

The strategy is addressed by activities and measures related to enhancing competitiveness under Priority 1 of the CBCP and Specific Objective 2 of the TSIM.

*Analysis of the relevance and compliance of the objectives of the draft strategy to/in the CBCP and TSIM is made in **item 5** of the EAR.*

[26] *https://nextgeneration.bg/14*
[27] *https://www.moew.government.bg/bg/strategiya-i-plan-za-dejstvie-za-prehod-kum-krugova-ikonomika-na-republika-bulgariya-za-perioda-2021-2027-g-10910/*

- ***National Air Pollution Control Programme (2020-2030)*** [28]*(adopted by Council of Ministers Decision No 541 of 13.09.2019)*

The programme has been developed and adopted in order to meet the commitments of the Republic of Bulgaria to achieve the national ceilings for the total annual emissions of certain air pollutants for 2020 and 2030, in particular for pollutants - sulphur dioxide (SO_2), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), ammonia (NH_3) and fine particulate matter ($PM_{2.5}$), compared to the emissions for the base year 2005 in accordance with Directive (EU) 2016/2284.

*Analysis of the relevance and compliance of the objectives of the programme to/in the CBCP and TSIM is made in **item 5** of the EAR.*

- ***National programme for improving the quality of ambient air 2018-2024*** [29]*(adopted by Decision No 334 of the Council of Ministers of 07.06.2019)*

Due to non-compliance with air quality standards, the Government of Bulgaria is currently subject to infringement proceedings before the Court of Justice of the EU. In particular, this concerns twenty-eight municipalities where the requirements of the Clean Air for Europe Directive for fine particulate matter up to 10 microns (PM_{10}). The programme therefore proposes a package of measures to be implemented by the end of 2024 in order to comply with the requirements of the directive on cleaner air for Europe as regards PM_{10} levels. The measures are targeted at reducing emissions from the two main sectors that are sources of PM_{10} emissions, namely domestic heating and transport.

Measures to reduce emissions from the combustion of solid fuels for domestic heating are aimed at replacing old and inefficient heating appliances with new ones that meet modern performance requirements (eco-design) and replacing solid fuels with other more environmentally friendly heating devices.

*Analysis of the relevance and compliance of the objectives of the programme to/in the CBCP and TSIM is made in **item 5** of the EAR.*

- ***National Climate Change Adaptation Strategy and Action Plan by 2030*** [30]*(adopted by Council of Ministers Decision No 621 on 25.10.2019)*

The strategy analyses climate risks and vulnerabilities by sector of the economy, sets goals and provides opportunities for adaptation. The general strategic objectives are:

- Incorporation and integration of climate change adaptation;
- Building institutional capacity for adaptation to climate change;
- Raising awareness on climate change adaptation.

The strategy is reflected in Priority 3 of the CBCP, where a strategic project *"Preparing the population for action in case of disasters and improving the capacity of specialized emergency response teams in the Bulgarian-Serbian cross-border region"* is envisaged.

*Analysis of the relevance of objectives and opportunities to actions and measures in the drafts of the CBCP and TSIM is made in **item 5** of the EAR.*

[28] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1289*
[29] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1288*
[30] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1294*

- ***Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030*** [31]*(adopted by a Protocol of the Council of Ministers of 27.02.2020)*

The Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030 defines the main objectives and measures for the implementation of national energy and climate policies implementing European legislation, principles and priorities for energy development in order to achieve binding EU climate and energy targets for 2030 as follows:

- Reducing greenhouse gas emissions by at least 40% compared to 1990;
- Increasing energy efficiency to at least 32.5%;
- Increasing the share of energy from renewable sources to at least 32% of the EU's gross final energy consumption;
- Ensure at least a 15% level of interconnection between Member States.

In this regard, the main objectives of the Integrated Plan of the Republic of Bulgaria are defined as follows:

- stimulating low-carbon development of the economy;
- development of competitive and secure energy;
- reducing dependence on fuel and energy imports;
- ensuring affordable energy for all consumers.

Contributions to the low-carbon development of the economy are the activities under Priority 1 of the CBCP, aimed at technological and organizational investments, reduction of production costs (related to resource and energy efficiency).

Analysis of the degree of compliance with the relevant objectives of the plan in the drafts of CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National Programme for the Protection, Sustainable Use and Restoration of Soil Functions 2020-2030*** [32] *(adopted by Decision No 748 of the Council of Ministers of 22.10.2020)*

The general strategic objective of the country related to the protection, sustainable use and restoration of soil functions is: Sustainable land use, ensuring a high level of soil conservation, high productivity, ecosystem maintenance and societal well-being. Strategic objectives have been formulated to achieve the general strategic objective.

As the programme sets objectives for soil protection (as a component of the environment), an analysis of their relevance to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National Strategy for Forest Sector Development 2013-2020*** [33] *(adopted by Protocol No. 48.1 of the Council of Ministers of 27.11.2013)*

[31] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1301*
[32] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1324*
[33] *https://www.mzh.government.bg/media/filer_public/2018/03/02/nacionalna-strategiya-razvitie-gorski-sektor-2013-2020.pdf*

The National Strategy for Forest Sector Development is the main document that defines the strategic framework of state policy to achieve long-term and sustainable management of vibrant and productive multifunctional forests and increasing competitiveness of the forest sector as a basis for better living standards, especially in mountain and rural areas.

The strategy is aimed at realizing the vision: *"By 2020, Bulgaria will have vibrant, productive and multifunctional forests, a sustainable, competitive and innovative forest sector, preserved biodiversity, quantity and quality of water resources in forest territories. The sector will support the economic development of the country, will provide conditions for the full realization of its employees, will help to mitigate the effects of climate change and will ensure the maintenance of a healthy environment. "*

The implementation of the Strategy is expected to preserve and enrich the ecological, social and economic functions of forests.

As part of the cross-border region covered in the scope of the CBCP and TSIM is covered by forest territories, the strategy is tailored to the EAR.

The strategy sets goals for forest protection (as part of the biodiversity component), in connection with which an analysis of their relevance to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National Waste Management Plan 2021-2028*** [34]*(adopted by the Council of Ministers, June 2021)*

Three main objectives are formulated:

Objective 1: Reducing the harmful impact of waste by preventing its generation and encouraging its reuse

Objective 2: Increasing the amount of recycled and recovered waste

Objective 3: Reducing the quantities and risk of landfilled household waste

The plan is not directly reflected in the drafts of the CBCP and TSIM.

As the plan sets waste management objectives (as a significant environmental factor), an analysis of the relevance of the objectives of the plan and the way they are to be complied with in the CBCP and the TSIM is made in ***item 5*** *of the EAR.*

- ***National Strategy for Management and Development of the Water Sector in the Republic of Bulgaria and its Action Plan in the short (2013-2015), medium (2016-2021) and long term (2022-2037) perspectives*** [35]*(approved by the National Assembly on 21.11.2012)*

The long-term goal in the water sector is the sustainable use of water resources, ensuring optimal current and future needs of the country's population and economy, as well as of water ecosystems. To achieve this, 4 objectives have been set. The strategy is directly reflected in the drafts of the CBCP and

[34] *https://www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%9D%D0%9F%D0%A3%D0%9E-2021-2028/NPUO_2021-2028.pdf*

[35] *https://www.moew.government.bg/bg/nacionalna-strategiya-za-upravlenie-i-razvitie-na-vodniya-sektor-v-republika-bulgariya/*

TSIM as an *analysis of the relevance of the objectives to the CBCP and the TSIM and their provisions is made in* ***item 5*** *of the EAR.*

- ***National Plan for Conservation of the Most Significant Wetlands in Bulgaria 2013-2022*** [36]*(prepared 2012)*

The national plan shall include, as a priority, the 11 wetlands listed under the Ramsar Convention. Another 28 wetlands that are not included in the Ramsar list but are reported to meet one or more of the criteria for listing or have great potential for conservation and restoration are under consideration. On the basis of the analysis carried out, horizontal and specific measures have been defined to be implemented in the 10-year period of implementation of the plan.

The territorial scope of the CBCP and TSIM includes two Ramsar sites - *Karst Complex Dragomansko Blato* (as part of the complex is a protected area "Aldomirovsko Blato"), located in Pernik Region *and Ibisha Island* (part of the territory of the island is a maintained Ibisha Reserve), located in Vratsa region, as well as two potential Ramsar sites - *Choklyovo Blato (a* protected area), part of which is located on the territory of the village of Bunovo, Kyustendil municipality, and the *Seven Rila Lakes* (within Rila National Park), located also in Kyustendil region.

For activities and measures under the CBCP and the TSIM that are likely to affect wetlands in a territorial manner or as an effect, the relevant measures of the *National Plan for the Protection of the Most Significant Wetlands in Bulgaria* should be observed.

Analysis of their relevance to/in the drafts of the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- River ***Basin Management Plan (RBMP) in West Aegean Region 2016-2021***[37] ***and RBMP in WAR*** 2022-2027 [38]*(under preparation) and* ***RBMP in Danube Region 2016-2021***[39] ***and RBMP in DR*** *2022-2027* [40]*(under preparation)*

RBMPs aim primarily at achieving long-term sustainable water management based on a high level of protection of the aquatic environment. The general objective to be achieved for all bodies of water is to achieve good status/potential by introducing the principle of preventing further deterioration. When implementing the CBCP and TSIM, the activities shall comply with the current RBMPs and water protection measures shall be applied. The programming period of the CBCP and TSIM coincides with the period of updating, preparation and implementation of the third RBMP 2022-2027.

Analysis of compliance with the RBMP is made in the sections of the EAR for the Water component, as well as in ***item 5*** *of the EAR.*

- ***FRMP in the Western Aegean Region 2016-2021***[41]***, Draft Updated Preliminary Flood Risk Assessment (PFRA) for West Aegean Region*** [42]*(March 2021) and* ***FRMP in***

[36] *http://forthenature.org/documents/879*
[37] *https://wabd.bg/content/%d0%bf%d1%83%d1%80%d0%b1/%d0%bf%d1%83%d1%80%d0%b1-2016-2021/*
[38] *https://wabd.bg/content/%d0%bf%d1%83%d1%80%d0%b1/%d0%bf%d1%83%d1%80%d0%b1-2022-2027/*
[39] *http://www.bd-dunav.org/content/upravlenie-na-vodite/plan-za-upravlenie-na-rechniia-baseyn/aktualizaciia-na-purb/*
[40] *http://www.bd-dunav.org/content/upravlenie-na-vodite/plan-za-upravlenie-na-rechniia-baseyn/purb-2022-2027-v-dunavski-rayon/*
[41] *https://wabd.bg/content/%D0%BF%D1%83%D1%80%D0%BD/%D0%BF%D1%83%D1%80%D0%BD-2016-2021%D0%B3/*
[42] *https://wabd.bg/content/%d0%bf%d1%83%d1%80%d0%bd/%d0%bf%d1%83%d1%80%d0%bd-2022-2027/*

Danube Region 2016-2021[43]***, Draft Updated PFRA for Danube Region 2022-2027*** [44]*(August, 2021)*

FRMPs contain the established framework for flood risk assessment and management and the reduction of their adverse effects on human health, the environment and cultural heritage. In the implementation of the CBCP and TSIM activities, it is necessary to take into account the current FRMPs and measures for flood risk assessment and management should be implemented. The programming period of the CBCP and TSIM coincides with the period of updating, drafting and implementation of the second FRMPs for the period 2022-2027. At the time of preparation of this EAR, PFRA with updated Preliminary APSFRs (including also new APSFRs), are published on the website of the Basin Directorates and are compliant in parts "Waters" of the EAR.

Analysis of compliance with the FRMP is made in the sections of the EAR for the Water component, as well as in ***item 5*** *of the EAR.*

- ***National Priority Action Framework for Natura 2000 for the period 2021-2027*** *(draft - first working version, option 3, 2021)*[45]

The National Priority Action Framework for Natura 2000 is a strategic document providing the necessary financial resources for the implementation of activities to improve the conservation status of species and natural habitats under the Habitats Directive and the Birds Directive. These financial resources shall be provided from different sources: EU funds, national budget, other donor programmes.

The purpose of the update of the document is to make a mid-term review of the implementation of the framework, based on the results of this review and the document developed for the purposes of Natura 2000 to update the priorities and measures for Natura 2000 protected areas at national and regional level, as well as to update their funding from different sources.

Analysis of the relevance of the determined in the document measures to/in the drafts of the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National Strategy for the Conservation of Biodiversity*** [46] *(adopted by Protocol No 15.3 of the Council of Ministers of 06.04.1998)*

The goal of the strategy is to protect, restore and sustainably manage the country's biodiversity, as well as to limit biodiversity loss. The strategy has 7 main priorities - *analysis of the relevance and compliance of environmental protection objectives to/in the drafts of the CBCP and TSIM is made in* ***item 5*** *of the EAR.*

- ***Strategy for Biodiversity in the Republic of Bulgaria*** [47]***2030*** *(under preparation - draft, October, 2021)*

[43] *http://www.bd-dunav.org/content/upravlenie-na-vodite/upravlenie-na-riska-ot-navodneniia/*
[44] *http://www.bd-dunav.org/content/upravlenie-na-vodite/plan-za-upravlenie-na-riska-ot-navodneniia-2022-2027/predvaritelna-ocenka-na-riska-ot-navodneniia-v-dunavski-rayon/; http://www.bd-dunav.org/uploads/content/files/upravlenie-na-vodite/PURN-2022-2027/PORN_Final/00_PFRA_BG1_MainReport.pdf*
[45] *https://www.moew.government.bg/bg/purva-rabotna-versiya-variant-3-na-nacionalnata-ramka-za-prioritetni-dejstviya-za-natura-2000-2021-2027-g/?fbclid=IwAR19l61ktI7_X2_rwqm0zPC3pS7i76w4Gwvx70QwA4MI85c6268P2uaZY_U*
[46] *https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=386*
[47] *https://www.moew.government.bg/bg/proekt-na-strategiya-za-biologichnoto-raznoobrazie-na-republika-bulgariya/*

The draft Strategy sets out the following vision: By 2050, biodiversity, a national and world natural heritage, is protected, restored, valued, sustained and equitably exploited through long-term and strategic policies and approaches, integration into other national sectoral policies, participation and inclusion of state, scientific, educational institutions, non-governmental organisations and initiatives, business and civil society.

3 priorities have been identified:

Priority 1 – Conservation, sustainable use of biodiversity and fair and equitable distribution of benefits arising from the use of genetic resources.

Priority 2 – Preserving and restoring ecosystems and preserving the services and benefits they provide.

Priority 2 – Maintenance and effective management of the National Ecological Network.

On the basis of the priorities formulated, 12 national objectives have been set.

CBCP and TSIM do not have direct predictions for biodiversity conservation, but will contribute as an indirect effect to achieving the priorities of the strategy.

Analysis of the degree of compliance with the 12 objectives of the strategy is made in item 5 of the EAR.

- ***Integrated Territorial Strategy for the Development of South-Western Region of Level 2 for the period 2021-2027*** [48]*(draft)*

The identified vision for development of the region is: South-western region - developing its potential for a dignified place among European regions. 3 development priorities have been identified:

Priority 1: Promoting an innovative and smart economic transition

Priority 2: Preservation and development of human capital by providing access to quality services

Priority 3: Better connected and sustainable area.

The many analyses at regional, national and European level take into account the specificities, problems and development potentials and come to the following recommendations for using cross-border cooperation as an instrument to promote socio-economic development:

- Use of the "functional area" principle: structural interventions in areas defined by common features, challenges and opportunities for development must not be strictly limited to administrative boundaries, but act on the potential to address them in order to achieve tangible results;
- Using the "thematic concentration" principle: focusing on key thematic areas, thus aiming to achieve the greatest possible impact in terms of funding effectiveness and results orientation;
- Consistency with macro-regional strategies - in the case of the EU Strategy for the Danube Region;
- Establishment of a strong coordination mechanism with the authorities managing the main programmes in the various countries, in particular national programmes dealing with transport, environment, regional development, information and communication infrastructure and labour issues;

[48] *https://drive.google.com/file/d/1lxDLrdvhhfrngi5FikAB1ua03D--QZuT/view*

- Raising the awareness of the population and building trust through the implementation of pilot projects aimed at solving problems of great public importance;
- Attracting more stakeholders to participate in the planning and implementation process through policies for solving important problems for them;
- Exploring and developing a common vision for the cross-border region with a long-term perspective, using tools and practices for broad public participation and taking into account the specific challenges of borders with third countries. Joint initiatives to promote the socio-economic and territorial development of the cross-border region can also be implemented through integrated territorial development instruments based on joint territorial and local development strategies;
- An in-depth analysis of the progress and obstacles to the realization and accumulated knowledge in order to correct and increase the adequacy of the measures in relation to the context and the results sought would lead not only to an increase in the effectiveness and efficiency of the measures, but also to a change in the attitude of citizens and institutions towards the problems and policies for their solution.

CBCP and TSIM contribute to all three priorities and there is consistency and coordination between the strategy and the drafts of both documents in terms of cross-border cooperation aspects.

- ***Integrated Territorial Strategy for the Development of North-Western Region of Level 2 for the period 2021-2027*** [49]*(draft)*

The identified vision for development of the region is: The North-Western region overcomes the significant socio-economic backlog and serious structural and demographic problems through appropriate investments in connecting infrastructure and strengthening growth potential, creating prerequisites for catching up development on a national and European scale. 3 development priorities have been identified:

Priority 1: Accelerating the growth of the regional economy

Priority 2: Protecting and developing the human capital

Priority 3: Territorial connectivity, sustainable development and reduction of inequalities

Specifically for the cross-border cooperation, the Integrated Territorial Strategy draws attention to the need to expand access to and improve the quality of services of general interest to support social and economic growth to address problems related to remote areas, disadvantaged groups and small businesses that continue to be under-served, creating shortcomings in growth efforts; investing more and more appropriately in the skills of the current and future workforce, as well as linking education and training to labour market needs; enhancing regional competitiveness, including in the field of tourism, including developing and providing framework support for local business growth, to expand and better represent a greener and smarter competitive global market; rationalization of the use of tourist resources, incl. providing fast, fair and ecological access and conditions for building networks of cultural heritage and tourist sites in the cross-border area.

[49] *https://drive.google.com/file/d/1M3tuTtCD0Ylwf7-sapLQovrMlFPE71TH/view*

CBCP and TSIM shall include provisions, measures and activities in the scope of all three priorities, including consistency and coordination between the strategy and the drafts of both documents in terms of cross-border cooperation aspects.

- ***Regional and municipal strategies, plans and programs for municipalities in the regions of Kyustendil, Sofia-region, Pernik, Vratsa, Montana and Vidin, including General Development Plans*** [50]

The regional strategies for the period 2021-2027 are currently in preparation.

The CBCP and the TSIM have a low level of detail of the provisions, as they do not define an exact location and focus on the activities, given that at the next stage of implementation of the documents it will be possible to assess for each project proposal whether it is in accordance with the current general development plans of the municipalities.

Most of the strategic documents of the municipalities are currently subject to updating/development of new documents, as an example of this are the plans for integrated development of the municipalities (replacing the municipal development plans under *the Regional Development Act*). As part of the system of strategic documents, these plans integrate regional and spatial development and serve to identify current problems, needs and development potentials of regions, municipalities and settlements, which are taken into account in the development of investment programmes and financial instruments, including those co-financed by European Union funds. In line with them is also the planning and implementation of integrated approaches for territorial and urban development and of local initiatives contributing to the achievement of national goals and priorities for regional and local development.

At the moment, plans for integrated development for the period 2021-2027 have been prepared for the following municipalities:

- Kyustendil and Nevestino at Kyustendil region;
- Godech, Dragoman, Pirdop, Pravets, Svoge, Chavdar at Sofia-region
- Borovan, Vratsa, Kozloduy, Krivodol, Mizia atVratsa region;
- Boychinovtsi, Valchedrum, Georgi Damyanovo and Montana at Montana region;
- Boynitsa and Ruzhintsi at Vidin region.

Similarly to what is described for the general development plans, the approval and implementation of project proposals under the CBCP and TSIM should comply with the plans for integrated development of municipalities in order to ensure compliance and avoid contradictions.

C. Plans, programmes and strategies on the territory of the Republic of Serbia relevant to the CBCP and TSIM 2021-2027:

- ***Strategy for waste management for the period 2010-2019*** [51]***; Official Gazette of the RS, issue 29 of 2 May 2010*** [52]

[50] *Municipal websites of the respective regions.*
[51] The strategy for the next programming period is currently under development.
[52] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/reg/viewAct/011043b3-7cee-4488-ba2c-e95f95271713

The waste management strategy is a basic document that provides conditions for rational and sustainable waste management at national level in the Republic of Serbia. The document takes into account the needs for institutional strengthening, development of legislation, implementation of regulations at all levels, education and development of public awareness. Waste Management Strategy: defines the main orientation of waste management for the next period, in line with the EU policy in this field and the strategic commitments of the Republic of Serbia; directs the activities of harmonization of legislation in the process of approximation with EU legislation; identifies the responsibilities for waste and the importance and role of capital targeting; sets waste management objectives in the short and long term; defines measures and activities to achieve the objectives set.

The overall objective of the strategy is to develop a sustainable waste management system to reduce environmental pollution and space degradation.

The strategy is not directly reflected in the drafts of the CBCP and TSIM**.** *As the plan sets waste management objectives (as a significant environmental factor), an analysis of the relevance of the objectives of the plan and the way they are to be complied with in the CBCP and the TSIM is made in* ***item 5*** *of the EAR.*

- ***Sustainable Urban Development Strategy of the Republic of Serbia by 2030***[53] **(*Official Gazette of the RS, issue 47 of 28.06.2019)***

The Sustainable Urban Development Strategy is adopted for the first time in the Republic of Serbia in accordance with the needs of urban planning, solving urban development problems and the potential that urban settlements bring as generators of development activities.

The overall objective of urban development is the sustainable development of urban settlements, which is ensured by improving economic, social and cultural development, the quality of urban planning, environmental protection and adaptation to climate change, improving social well-being (quality of life, health and safety), affordable and quality housing, protection and promotion of architectural heritage and urban identity. The following specific objectives are set for strategic directions of urban development:

1. Sustainable economy development;
2. Arrangement of urban settlements;
3. Social assistance;
4. Environmental quality - Improved environmental quality, health and safety of urban inhabitants and a high degree of adaptation of urban areas to climate change
5. Urban development management.

CBCP and TSIM contribute directly to specific objectives 1 (Priority 1 of the CBCP), 3 (measure 1.1 of the TSIM) and 4 (strategic project under Priority 3 of the CBCP).

- ***Industrial Policy Strategy of the Republic of Serbia from 2021 to 2030 (Official Gazette of the RS), issue 35 of 18 March 2020.)***[54]

[53] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2019/47/1/reg
[54] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2020/35/1/reg

The strategy defines seven strategic areas of intervention. Some of them are directly reflected in the projects of the CBCP and TSIM as follows:

1. Human capacity - *through measure 1.1 under specific objective 1 of the TSIM;*
2. Digital transformation - *through the envisaged measures under Specific Objective 2 of TSIM and Specific Objective 1.1 of CBCP;*
3. Innovation - *through Specific Objective 1.1 of the CBCP;*
4. Internationalization (Mission: Removing barriers to active and equal involvement of local industrial players in international value chains) - *through Priority 1 of the CBCP and Specific Objective 2 of the TSIM*;
5. Investments and infrastructure - *through all activities and measures related to investments under CBCP and TSIM;*
6. Circular economy - *although no specific activities are foreseen, activities and measures for economic growth and competitiveness will achieve energy and resource efficiency, which are part of the circular economy.*
7. Business and institutional environment - *through all activities and measures under CBCP and TSIM.*

- ***National Strategy for Protection and Rescue in Emergency Situations "Official Gazette of the RS", issue 86 of 18 November 2011.***[55]

The strategy has the following vision and mission:

Vision - developed, comprehensive, effective and efficient system for reducing the risks and consequences of natural and other disasters through integrated emergency management in the Republic of Serbia, which contributes to increasing the security and sustainable development in the region.

Mission - creating conditions for building a sustainable to disasters society by developing an integrated and effective protection and rescue system in the Republic of Serbia.

The document defines the following strategic directions:

1. Ensuring that disaster reduction becomes a national and local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor risks and improve early warning.
3. Use knowledge, innovation and education to build a culture of safety and resistance at all levels.
4. Reduction of risk factors.
5. Preparation in the event of a disaster for an effective (emergency) response at all levels.

A direct contribution to their achievement will be *the strategic project* under Priority 3 of the CBCP.

- ***Strategy for the Development of the tourism in the Republic of Serbia for the period 2016-2025***[56]

[55] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/skupstina/ostalo/2011/86/1/reg%20)
[56] *http://demo.paragraf.rs/demo/combined/Old/t/t2016_12/t12_0189.htm*

The strategy defines the vision of tourism of the Republic of Serbia until 2025 in 6 points as follows:

1) in 2025 The Republic of Serbia to become a globally recognized tourist destination as a result of the established system of development and sustainable management of resources and coordination of the activities of all the important for the development of tourism entities;

2) tourism and related activities to become one of the dominant industries that effectively provides new added value and sustainable employment and significantly contributes to local and regional development;

3) the tourism sector of the Republic of Serbia to be able to effectively and flexibly harmonize what it offers as a service with the modern trends of the world tourism market and to offer authentic experiences and high-quality products, which, along with traditional hospitality, will be the basis of recognition in relation to competition;

4) tourism to become a leading engine of the image of the Republic of Serbia in the world as modern for visits, holidays and business - desired destinations, achieving a constant innovative function in the application of modern standards, new technologies and nature conservation;

5) by constantly modernising, adopting and adopting global standards and business and governance models, tourism will become a desirable sector for employment and career development, especially for young people;

6) The Republic of Serbia to become highly ranked and popular as a destination on the global scale of tourism competitiveness.

The strategy is fully aligned with the draft TSIM, through *Specific Objective 2: Enhancing regional competitiveness, incl. in the field of tourism.*

- ***Public Health Strategy in the Republic of Serbia 2018-2026***[57] ***- "Official Gazette of the RS", issue 61 of 08.08.2018.***

The strategy sets out the following objectives:

1. *Mission* - to develop and implement a system of knowledge, skills and activities aimed at improving health, preventing and combating diseases, prolonging and improving the quality of life through organized measures of society.
2. *Vision* - healthier people, reducing health inequalities and joint actions of government and society for health and well-being.
3. General and specific objectives:
   1) improving health and reducing health inequalities;
   2) improving the environment and the working environment;
   3) prevention and suppression of diseases and leading risks to the health of the population;
   4) developing actions to promote health in the community;
   5) supporting the development of affordable, quality and effective healthcare;
   6) development of a public health system based on scientific evidence;

[57] http://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2018/61/1/reg

7) improving governance, communication and partnerships to implement the principle of health in all policies.

CBCP and TSIM include activities and measures contributing to the reduction of inequalities, the provision of services of public interest, the improvement of the environment and the working environment (through the application of environmentally friendly approaches and improvements envisaged in SMEs) and the prevention of leading health risks (through the strategic project under Priority 3 of the CBCP).

- ***Strategy for the National Security of the Republic of Serbia[58], Official Gazette of the RS, issue 94 of 27 December 2019.***

The national security strategy of the Republic of Serbia is reflected in the drafts of the CBCP and the TSIM through the following national security policies set out therein, which concern:

→ *Protection of the environment and resources of the Republic of Serbia.*

The protection of the environment and resources of the Republic of Serbia shall be achieved by achieving the following objectives:

- monitoring, evaluating, planning and mitigating the effects of climate change;
- protection from floods and fires;
- environmental quality standard improvement;
- effective management of hazardous waste;
- improving resource management capabilities and capacities.

The relevant one is in line with the CBCP - the strategic project under Priority 3.

*Given that environmental objectives are also defined for this policy, an analysis of their relevance to the CBCP and the TSIM is also made in **item 5** of the EAR.*

→ *Economic development policy and overall prosperity.*

The economic development and the overall prosperity of the Republic of Serbia and its citizens shall be achieved by achieving the following objectives:

- improving the standard of living of citizens;
- economic progress;
- improving education, scientific and technological development;
- improving economic and energy security.

The relevant objective is reflected in the CBCP *Specific Objective 1.1* and in the TSIM *Specific Objective 2.*

- ***Strategy for Integrated Border Management in the Republic of Serbia 2017-2020[59], Official Gazette of the RS, issue 9 of 10.02.2017.***

The overall objective of the Strategy is effective and efficient integrated border management with strengthening cooperation at all levels and strengthening the administrative, infrastructure and technical capacity of all border services.

[58] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/skupstina/strategija/2019/94/2
[59] http://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2017/9/1

Within the defined dimensions for integrated border management, the following specific objectives are defined:

1. Border control;
2. Detection and suppression of cross-border crime;
3. Model of a four-layer control approach;
4. Inter-agency cooperation in border management;
5. Coordination of activities with Member States, institutions and other EU agencies and bodies.

Specific objective 4 of the Strategy is aligned in the project of the CBCP through the *strategic project* under Priority 3.

- ***Strategy of smart specialisation in the Republic of Serbia for the period from 2020 to 2027[60], Official Gazette of the RS, issue 21 of 6 March 2020***

The smart specialisation strategy of the Republic of Serbia is part of the new innovation policy paradigm, which brings together decision-makers, academia and civil society to enhance the competitiveness of the economy, economic growth and the progress of society by linking research, industry and innovation forces and resources with limited priority economic areas, as follows:

- The Republic of Serbia - producer of "food" with added value through a knowledge-based partnership
- The Republic of Serbia - a source of advanced high-tech products and services for the global market.
- industrial innovation based on effective cross-sectoral cooperation
- creative industries promote individual authors' work and add value to other sectors of the Serbian economy, which complements the positioning of the Republic of Serbia as high-tech and competitive globally.

The strategy is reflected in the drafts of the CBCP - through *Specific Objective 1.1* and TSIM - through *Specific Objective 2.*

- ***Strategy for water management on the territory of the Republic of Serbia by 2034[61]***

The Strategy is an universal planning document that defines the long-term policy of water management in the territory of the country, i.e. the guidelines for sustainable action in the field of water use, protection of water from pollution, regulation of watercourses and protection from harmful effects. The main strategic objective is to achieve integrated water management, a harmonised water regime throughout Serbia and to ensure such water management achieves maximum economic and social effects in a fair manner, with an understanding of the need to protect against pollution and improve natural ecosystems and in compliance with international agreements.

Analysis of compliance with the strategy is made in the sections of the EAR for the Water component, as well as in item 5 of the EAR.

[60] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2020/21/3
[61] https://www.paragraf.rs/propisi/strategija-upravljanja-vodama-u-srbiji-do-2034.html

- ***Plan for water management on the territory of the Republic of Serbia by 2021-2027***[62]*(draft)*

The plan sets guidelines and measures for water management on the territory of the Republic of Serbia. The plan is tailored to the development of the "Water" part of the EAR.

- ***Operational Plan for Flood Protection for 2020***[63]

The operational plan gives concrete measures for flood protection.

Flood protection is addressed by the strategic project foreseen under Priority 3 of the CBCP.

The plan is tailored to the development of the "water" part of the EAR.

- ***National Action Plan to mitigate the effects of desertification and land degradation (draft)***[64]

The document is the first National Action Plan to be developed in line with the ten-year strategy of the United Nations Convention to Combat Desertification. It contributes to better decision-making on desertification, land degradation, drought and sustainable land management. The National Action Plan sets out guidelines for building appropriate institutional capacity and legislation, promoting and raising public awareness and developing education and science, establishing appropriate sectoral policies, involving the public in all important decision-making processes, and creating the necessary synergies with other conventions related to desertification and land degradation.

Analysis of the strategic objectives of the plan is made in item 5 of the EAR.

- ***Programme for Protection of the Nature of Republic of Serbia for the period from 2021 to 2023***[65]

This Programme revises the Draft Strategy for Nature Conservation of the Republic of Serbia for the period from 2019 to 2025. The programme shall consider the results achieved by presenting them in a concise manner according to each of the objectives of the stated strategy and presenting an Action Plan with specific indicators.

General objective: Improving the nature conservation and biodiversity conservation system

Specific objective 1.1: Reduced negative impact on biodiversity

Specific objective 1.2: Improved management system for protected areas, ecological network and species.

[62] *http://www.rdvode.gov.rs/doc/dokumenta/javne-rasprave/Program-rada-i-dinamika-izrade-Plana_nacrt_final_251019.pdf*
[63] *http://www.rdvode.gov.rs/doc/dokumenta/podzak/Naredba-o-utvrdjivanju-Operativnog-plana-za-odbranu-od-poplava-za-2020-godinu.pdf*
[64] http://vs3836.cloudhosting.rs/strateg/68/obr/UNCCD_NAP_SRBIJA_NACRT.pdf
[65] *https://www.ekologija.gov.rs/sites/default/files/inline-files/Program%20zastite%20prirode%20RS%202021-2023.%20godine.pdf*

Specific objective 1.3: Improved public policy for nature conservation and biodiversity conservation and public participation in decision-making.

The activities and measures under the CBCP and the TSIM shall take into account the need of conservation and protection of the nature. *Analysis of compliance with the specific objectives of the strategy is made in* ***item 5*** *of the EAR.*

- ***National Strategy for Sustainable Use of Natural Resources and Goods***[66] **(*Official Gazette of the RS, issue 33 of 15 April 2012)***

Objectives:

- the sustainable use of the mineral resources of the Republic of Serbia as a balance between the use of resources, economic, social and environmental interests.
- the sustainable use of mineral resources by reducing the environmental impact due to the method of exploitation of mineral raw materials and their processing, eliminating the effects of past pollution (historical) and other forms of harmful effects due to exploitation and increasing the efficiency of available and newly discovered mineral resources.

The strategy also defines a number of specific objectives in the field of metallic, non-metallic and energy mineral resources, according to which separate sub-objectives are also developed.

The strategy has no direct relevance to the drafts of the CBCP and TSIM, as it sets objectives outside their thematic area, but is taken into account in the development of the CBCP and TSIM.

- ***National Environmental Protection Programme 2010-2019***[67]

The general environmental policy objectives of the programme are grouped into the following areas:

1. Adoption of strategic and planning documents in the field of environmental protection and sustainable use of natural resources
2. Integration of environmental policy with economic and other sectors.
3. Strengthening the institutional capacity
4. Improvement of the environmental quality control system;
5. Improving the legal system in the field of environmental protection
6. Development of an effective financing system for environmental protection and economic incentives.
7. Improvement of formal and non-formal education in environmental protection and energy efficiency.

The CBCP and TSIM drafts shall take into account the relevant area 2, integrating the need for environmentally sound development of economic activities in the cross-border area.

Analysis of the relevance and compliance of the objectives under area 2 to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

[66] http://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2012/33/1/reg
[67] https://www.ekologija.gov.rs/sites/default/files/2021-01/nacionalni-program-zastite-zivotne-sredine-r.srbija.pdf

- ***Roadmap for a Circular Economy in Serbia (2020)*** [68]

The Roadmap aims to promote production by implementing circular business models, to motivate industry to create new jobs and to improve business by finding innovative sustainable solutions for markets, including:

- Providing information on the importance of the transition to a circular economy, i.e. the new business model and conditions for competitiveness, the possibility of faster development of Serbia and solving the problem of the management of secondary raw materials, including waste, the need for resource and energy independence and environmental security;
- Identification of sectors where there is already a basis for implementing circular instruments in the economy, without underestimating less developed sectors and traditional industries, which will require more investment to move towards new production models;
- Identify key drivers of change that can contribute to a faster transition to a circular economy through synchronised and collaborative activities.

Pre-identified priority sectors in Serbia are:

→ *manufacturing industry;*
→ *agriculture and food industry;*
→ *surplus food and food waste;*
→ *plastics and packaging;*
→ *construction.*

The strategy is addressed by activities and measures related to enhancing competitiveness under Priority 1 of the CBCP and Specific Objective 2 of the TSIM.

Analysis of the relevance and compliance of the document to/in the CBCP and TSIM is made in ***item 5*** *of the EAR.*

- ***National strategy for the inclusion of the Republic of Serbia in the clean development mechanism***[69]

The national strategy for the inclusion of the Republic of Serbia in the Clean Development Mechanism of the Kyoto Protocol is aimed at identifying ways and opportunities for improving the state of the environment, accompanied by the economic and social development of the country, by identifying the potential for implementation of projects of the Clean Development Mechanism in the sector of waste management, agriculture and forestry.

The overall objective of the Strategy is to raise awareness and build capacity on the possibilities of using development projects as a way to promote sustainable development and to speed up the implementation of the Kyoto Protocol in the Republic of Serbia. In accordance with the general objective, the **individual objectives** of this Strategy are:

→ *enhancing the capacity of stakeholders;*

[68] https://www.ekologija.gov.rs/sites/default/files/2021-01/mapa-puta-za-cirkularnu-ekonomiju-u-srbiji.pdf
[69] https://www.ekologija.gov.rs/sites/default/files/old-documents/Klimatske_promene/Strategije/CDM%20Strategija%20srp.pdf

→ *increasing the knowledge of potential contractors/project owners in particular,*
→ *building the individual and institutional capacity needed to identify, prepare, implement and evaluate development projects;*
→ *providing a strategic overview of opportunities and identifying promising types of development projects, as well as possible problems in their implementation;*
→ *identification of key prerequisites needed for faster project development and implementation;*
→ *encouraging investment and informing the public concerned of the results and experience gained.*

The specific objective of the Strategy is to define the framework for the identification of development projects of national importance and their more effective implementation by finding the most appropriate and cost-effective means of implementation.

- ***Spatial plan of the Republic of Serbia from 2021 to 2035***[70] *(draft)*

The vision for long-term spatial development of the Republic of Serbia is: A more balanced and developed territory of the Republic of Serbia based on the principles of economic, social and territorial cohesion, with a higher and more even quality of life and environment, preserved identity and diversity of the space adapted to climate change.

The overall objective of the plan is to achieve sustainable and more balanced spatial development, mitigate regional disparities and increase territorial cohesion in order to improve quality of life, slow down unfavourable demographic processes and create conditions for young people to remain in the country, while improving competitiveness, accessibility, strengthening territorial capital and preserving spatial identity, adapting activities in space and human settlements to climate change.

The specific objectives for spatial development are:

1) making better use of Serbia's territorial capital in order to valorise the advantages of its geostrategic position as a central Balkan country;
2) eased rates/dynamics of depopulation and a more even territorial distribution of the population;
3) a more balanced spatial organisation with a polycentric structure of urban systems and a higher degree of economic and social cohesion of urban and rural areas, more effective urban and regional links and partnerships between urban and rural settlements;
4) a more harmonised spatial distribution of the economy (at national and regional level) in order to strengthen its role as a driver of dynamic, sustainable, more balanced and inclusive socio-economic growth, employment and higher quality of life;
5) better connectivity of the territory with Balkan/neighbourhood areas, a European and wider environment, accessibility and infrastructure networks (especially transport, energy and digital);

[70] https://www.mgsi.gov.rs/cir/dokumenti/javni-uvid-u-nacrt-prostornog-plana-republike-srbije-od-2021-do-2035-godine-i-izveshtaj-o

6) preserved identity and enhanced resilience of the space to change and pressure, sustainable use and conservation of natural resources, environment, biodiversity, natural and cultural heritage, landscape development and landscaping and green infrastructure.

The Spatial Plan shall be fully aligned with the drafts of the CBCP and the TSIM. CBCP and TSIM shall also include provisions, measures and activities within the scope of priorities 2 to 6 inclusive. The vision and overall objective of the plan fully correlates with the objectives of the CBCP and the TSIM

- ***REGULATION laying down the development plan for the Niš Infrastructure Corridor - Bulgarian border - Official Gazette of the RS, issue 86 of 21 October 2009, 96 of 27 October 2017, 101 of 27 October 2021***[71]

The Regulation defines the general objectives of the long-term development of the territory of the spatial development plan of the region as follows:

- achieving a balanced and harmonious development of the entire territory for the time being;
- mitigation of negative demographic and economic trends within the territory affected by the spatial plan
- promoting the rational organisation and settlement of the territory in accordance with its capabilities and the needs of long-term social and economic development;
- achieving optimal land use according to its natural and environmental properties and potential;
- making optimum use of the advantages of the geographical and transport situation of the area;
- activation of natural and anthropogenic tourism properties;
- forming a rational network of infrastructure systems and integrating it into unique technical systems in broader areas;
- the elimination of negative effects and degradation processes from the operation of existing infrastructure systems on the condition and quality of land, water, air and buildings;
- harmonization of the concept of organization, planning and protection of the territory with the needs of environmental protection, natural values and immovable cultural properties from natural and other disasters and of conservation interest.

CBCP and TSIM take into account and/or contribute to most objectives (they are highlighted).

- ***Development strategies, plans and programmes for the regions of Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski (Republic of Serbia)***[72]

Approval and implementation of project proposals under the CBCP and TSIM should take into account the current plans, strategies and development programs at local level, in order to ensure compliance and avoid contradictions.

[71] https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/uredba/2017/96/2
[72] *Municipal websites of the respective regions.*

2. Current state of the environment and possible development without application of CBCP and TSIM

2.1. Current state of the environment

2.1.1. Climate and climate change

A. Climate characteristics

- ***Regions in the Republic of Bulgaria***

The regions of *Vidin, Montana and Vratsa* are located in the western parts of two climatic regions according to the climatic zoning of Bulgaria - North and Middle climatic region of the Danube hilly plain from the temperate continental climate subarea.

The climate in these areas is characterized as markedly continental due to the sharp contrast between winter and summer heat conditions. The average annual amplitude of the air temperature is between 24.5°C and 26°C - the largest for the whole country. The continental character of the climate is also confirmed by the rainfall regime in the area. Its annual amount is between 540 mm and 580 mm, with the maximum in June and the minimum in February. The difference between the rainfall for the three summer months and the three winter months is between 70 mm and 120 mm, i.e. 15% - 20% of their annual amount. The absolute maximum daily precipitation is in summer with values of about 100 mm - 130 mm. However, summer precipitation is grouped on separate days, and especially in the second part of the summer there are too often droughts. In the summer and autumn, there are on average 4-5 precipitation-free periods with a duration of more than 10 days and an average duration of 16-20 days. In individual years, much longer droughts also occur often.

Essential for the climate in these municipalities is the dismembered nature of the relief and the proximity to the river Danube, which is seen as a large aeration channel. In the southern parts of these regions, the influence of Stara Planina is felt. It is reflected in the annual distribution of precipitation, with seasonal amounts almost the same, without abrupt extremes, which is the result of the relative increase in winter and decrease in summer precipitation.

The area of the regions of *Pernik and Sofia* is characterized by a moderate continental climate and falls within 2 climatic regions - the mountainous and low-mountainous regions of Western Middle Bulgaria; the climatic region of the high fields of Western Middle Bulgaria.

The climatic region of the high fields in Western Middle Bulgaria covers the valley fields in this part of the country, characterized by common climatic features. Winter here is cold with an average January temperature of 2-3.5℃ below zero. The summer is cooler than in Northern Bulgaria with average July temperatures around 20. The annual precipitation for the region is about 550-600 mm.

The climatic region of the low-mountain parts of Western Middle Bulgaria covers the Vitosha Mountains (except for its highest parts), Lyulin, Verila, Kraishte, Konyovska Mountains. The climatic conditions in this area are mainly determined by the relatively high altitude - on average 700 to 1000 m. The terrain is characterized by the predominance of sloping forms, which increases the diversity in

thermal and precipitation conditions. Winter is relatively cold and relatively poor in rainfall. However, the very low minimum temperatures characteristic of the valley fields are lacking here. The annual rainfall in this region is about 500-800 mm.

Kyustendil Region

The region falls within the transitional continental climate area of the European Continental Climate Area and in particular Kyustendil-Blagoevgrad Climate Region. The climatic rose of the wind is characterized by the protection from eastern and western invasions, characteristic of zonal air transport. There are about 30 days in the winter with temperatures below 0. The average January temperatures in the area are around the range +1 ÷ -1.

Of the dangerous weather phenomena with damage for the studied areas with the highest frequency is hail. It is observed in July (about 36%), followed by June (32%) and May (17%) - "The climate of Bulgaria", 1991. Their frequency is negligible in April, September and October. The 24-hour run at the beginning of the hail precipitation shows a maximum at 2:00-6:00 PM local time. Night hail is also not excluded between 10:00-12:00 PM and between 00:00 and 04:00 AM, which fall on cold weather fronts.

- ***Regions in the Republic of Serbia***

On the territory of the Republic of Serbia there are two climatic areas - a temperate continental climate in the north, with a cold dry winter and a warm, humid summer with well-distributed precipitation patterns, and a more Mediterranean climate in the south with a hot, dry summer and autumn and relatively cooler and more rainy winters with heavy mountain snow. July is the warmest month and autumn is warmer than spring. January is the coldest month with an average monthly temperature of minus 6°C in mountainous areas, up to 0°C in plain areas of the country. Annual sums for the duration of sunshine range from 1,800 to 2,100 hours.

The precipitation regime is continental in nature, with heavier precipitation in the warmer half of the year, with the exception of the south-eastern regions, which have the most precipitation in autumn. June is the rainiest month - with an average of 13% of the total annual rainfall. The least rainy months are February and October. The annual rainfall for the whole country is 896 mm. It usually snows from November to March and sometimes in April and October, with the exception of mountains with an altitude above 1000 m. January has the most days with snow cover, on average 30-40% of the total number of days with snow cover.

B. Atmospheric circulation

The mode of the ground wind is highly local and is directly dependent on a complex of factors, among which the orographic features have the most influence: the orientation and exposure of the slopes of the relief forms in relation to the directions of the world, which transform the typical for the Balkan Peninsula zone transfer of air masses.

Essential for a climate within the Western Danube plain in the territory of the Republic of Bulgaria are the cyclonal wet ocean air masses penetrating from the north-western direction, and from the north-east dry anticyclonal masses, which in recent years have become more frequent during the cold

part of the year and create conditions for radiation inversions and mists formation. During the warm semester, tropical air masses enter from the south, which are distinguished by a much lower frequency.

The north-western and western winds characteristic of the warm season have the highest percentage within the eastern parts of the Balkan Mountains on the territory of the Republic of Serbia, while the eastern and south-eastern winds (Koshava) blow during the coldest period of the year.

The dynamics of air transfer in the ground layer is characterized by the so-called wind rose - the wind speed and the frequency of the prevailing directions in the main 8 or 16 directions - **Figure 2.1.B-1**.

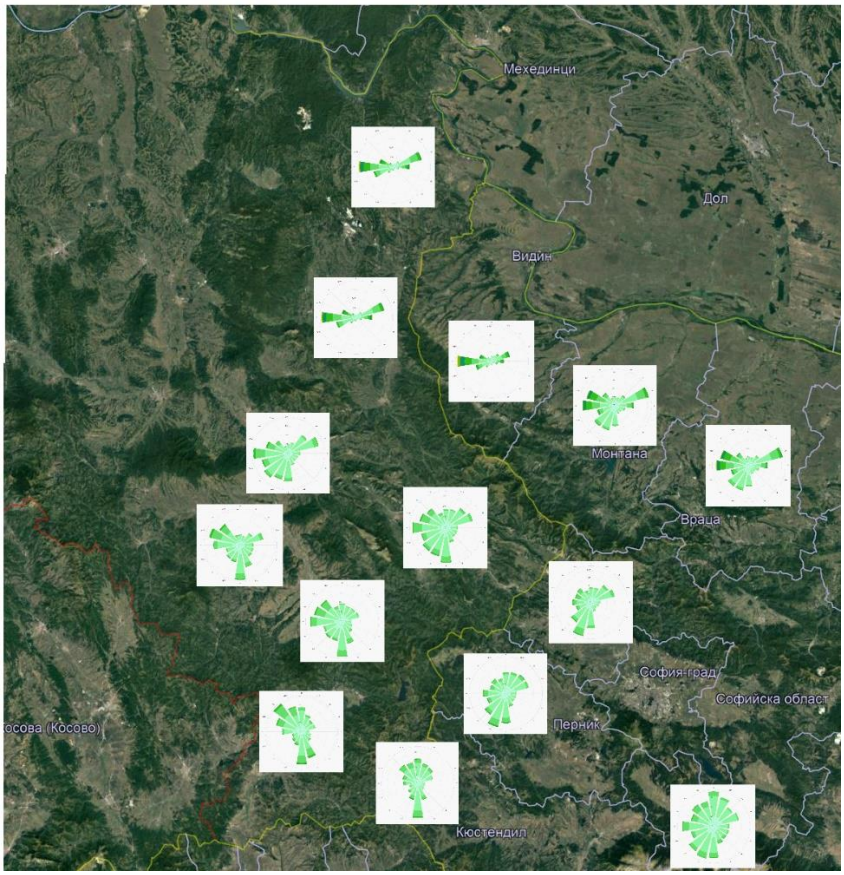


Figure 2.1.B-1 *Wind Roses in the Border Areas of the Republic of Serbia and the Republic of Bulgaria*

C. Climate change

Climate change is the result of global processes on a large scale in both the Northern and Southern hemispheres. They mainly affect the air temperature and precipitation regime, as well as the change of seasons. There is a general tendency to increase global air temperature, increase evaporation and decrease precipitation, especially during winter and increase extreme events such as floods, high temperatures and associated fires and others.

In recent years, the frequency of extreme weather and climate phenomena has also increased: there is a significant increase in the average number of days with round-the-clock precipitation amounts

above 100 mm - by about 30% over the period 1991-2007 compared to the base period 1961-1990. The cases of typical spring-summer type of convective clouds with rainfall, thunderstorms and sometimes with hailstorms in winter months such as January and February are becoming more frequent. The annual amplitude between the maximum and minimum air temperatures decreases - the minimum temperature rises faster than the maximum. The average number of days with thunderstorms and hailstorms in April and September of 1991-2006 increased in comparison to the base period. The snow months in the mountains decreased and the thickness of the snow cover showed a steady trend towards thinning.

The most common hydrometeorological and natural disasters in the regions in the cross-border region of ***Republic of Bulgaria*** (*National Climate Change Adaptation Strategy and Action Plan by 2030* of Republic of Bulgaria) are extreme precipitation and temperatures, storms, floods, forest fires, landslides and drought. The number of deaths and casualties due to natural disasters is significant, indicating vulnerability to weather and climate conditions. The vulnerability of the population and the economy to the impacts of climate change is enhanced by the relatively high level of poverty, the uneven distribution of the population and the different consequences of the transition from a state-controlled economy to a free market economy. There is growing evidence that economic losses from weather and climate disasters are also increasing.

Scientific forecasts suggest that the average temperature will rise between 1.8°C and 4°C by 2100, with the rise in Europe expected to be even higher than the global average.

Studies conducted by the Department of Meteorology of the National Institute of Meteorology and Hydrology at the Bulgarian Academy of Sciences (NIMH) predict an increase in the annual air temperature in Bulgaria from 0.7°C to 1.8°C by 2020. Even higher temperatures are expected by 2050 and 2080, with projected increases ranging from 1.6°C to 3.1°C and 2.9°C to 4.1°C, respectively. Overall, the temperature rise is expected to be higher during the summer season (July to September).

For ***the Republic of Serbia***, the periods of extremely hot weather lasted longer from 1961 to 2010 and the periods of extremely cold weather were shorter. These trends in the duration of extreme temperature conditions are most pronounced during the summer season *(Malinovic-Milicevic et al.).*

In the period 1949-2009 there was an increase in the average annual temperatures in almost all parts of Serbia. Temperatures rise higher in the northern than in the southern parts of the country. The highest increase in average annual temperatures is in Belgrade due to the effect of the urban heat island: 0.20°C/decade in the period 1949-2009. In 1989-2010, there was a significant increase in the average annual temperature in almost all Serbia, especially due to the warming of the summer season; a negative temperature trend was observed for the whole of Serbia for 1961-1989. The daily maximum temperature also rose in the period 1951-2010.

In 2007, Serbia experienced the worst heat wave ever recorded in Serbia, with record maximum temperature values (44.9°C).

Data from 63 weather stations across Serbia for the period 1961-2009 show very slight trends towards drier conditions in winter and spring and wetter conditions in autumn.

The estimated change in precipitation has a large gradient, increasing from north-east to south-west, namely between 0 and -5% in the valleys of the Sava and the Danube; from -5 to -10% in most of

central and eastern Serbia and on the border with Montenegro; and from -10 and -15% in the western and south-western parts of the country.

Analysis of the vulnerability of the sectors concerned by the CBCP and TSIM shows the following:

- *Agriculture* - the vulnerability is high and the ageing population and the unfavourable social status and standard of living are also adversely affected. Longer droughts, intense precipitation - floods, temperature increases - heat waves, water scarcity, more pests, animal diseases, adverse impacts on fisheries and aquaculture are expected;
- *Biodiversity and ecosystems* - climate change leads to loss of genetic diversity, life cycle disruption, spread of invasive species, fires, floods, droughts (which in turn are associated with an increase in pests). The most vulnerable are the southern border territories, as well as the mountain ecosystems prevailing in the cross-border region. As a positive change as a result of climate change, which may lead to benefits is the extension of the vegetation period.
- *The energy sector* - its highest vulnerability to extreme weather events - affects infrastructure, gas transport is under threat. Hydroelectric power plants are the most vulnerable of the RES due to water scarcity, wind power plants - storms and strong winds can damage their infrastructure. Reducing heating needs is positive;
- *Forests* - their vulnerability to extreme phenomena is highest - heat and cold waves, severe storms, wet snow, accumulation of ice, creation of conditions for mass development of pathogenic organisms, spread of invasive, fires, deterioration of water regulating functions, reduced quality for recreation and tourism;
- *Human health* - Climate change is associated with primary and secondary effects. The primary effects directly affect human health, for example through heat and cold waves and flooding. Secondary effects indirectly affect human health through other climate-affected factors such as pollen, carrier diseases, fires, contaminated food, water and air, and damaged crops.
- *Tourism* - Adverse climatic events, including heat and cold waves, intense precipitation, storms or changes in natural tourist attractions, such as lack of snow, can have negative consequences for the experiences of tourists in a destination and for the desire of the tourist to return there. They are associated with water scarcity; a short winter season leading to a short stay; health problems in the summer season; worse conditions for outdoor recreation; damage to infrastructure; poor accessibility; need to search for new tourist markets, e.g. development of cultural tourism;
- *Transport* - the highest is the vulnerability of the sector to floods and landslides, blizzards and snowfalls, extreme heat. Measures need to be taken to ensure the sustainability of the infrastructure;
- *Urban environment* - central urban areas are the most vulnerable due to higher density, intensive traffic, reduced green and open spaces, old infrastructure, poverty - the main

risk phenomena are heat islands, cold waves, floods, hail, prolonged rainfall, landslides, water scarcity;

- *Water* - the vulnerability of the sector is related to floods, droughts (leading to water scarcity), unpreparedness and poor condition of the infrastructure; depends on the readiness of the human factor.

Climate Change and Climate State Summary:

The considered cross-border regions of Bulgaria and Serbia are affected by all the effects characteristic of climate change, especially in the urban areas where the so-called heat island is observed. Climate change carries risks of drought, fires, land erosion and flooding and requires adequate adaptation and resilience actions to be integrated into future projects.

2.1.2. Ambient air state

Directive 2008/50/EC *on ambient air quality and cleaner air for Europe* establishes a framework for the assessment of air quality at EU level and repeals and replaces the previous Air Quality Directive (96/62/EC) and the three subsidiary Directives (1999/30/EC, 2000/69/EC, 2002/3/EC) and Council of Europe Decision 97/101/EC. Directive **2008/50/EC** is complemented by Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

In Bulgarian legislation, these directives have been transposed into **Ordinance No 11 of 14 May 2007 on** *standards for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air* and **Ordinance No 12 of 15 July 2010** on *standards for sulphur dioxide, nitrogen dioxide, fine particulate matter, lead, benzene, carbon monoxide and ozone in ambient air*.

In Serbian legislation, these directives are transposed into the **Ordinance on** *Conditions for Monitoring and Requirements for Air Quality*[73].

The comparison of the legislative air quality standards are presented in **Table 2.1.2-1** and **Table 2.1.2-2.**

Table 2.1.2-1 *Human health protection norms.*

Indicator	Country	Concentration	Dimension	Period of averaging	Resolved excesses	LAT	UAT
LIMIT VALUE							
$PM_{2.5}$	Republic of Bulgaria	25 - Stage 1 - 2015 20- Stage 2 - 2020	µg/m³	1 year	-	12	17
	The Republic of Serbia	25- Stage 1 - 2019 20- Stage 2 - 2024	µg/m³	1 year	-	12	17
Sulphur dioxide (SO_2)	Republic of Bulgaria	350	µg/m³	1 hour	24	-	-
		125		24 hours	3	50	75
	The Republic of Serbia	350	µg/m³	1 hour	24	-	-
		125		24 hours	3	50	75
		50		***1 year***	-	-	-
		200	µg/m³	1 hour	18	100	140

[73] Uredbao uslovima za monitoring i zahtevima kvaliteta vazduha (Службени Гласник РС бр.11/10 и 75/10)

Indicator	Country	Concentration	Dimension	Period of averaging	Resolved excesses	LAT	UAT
Nitrogen dioxide (NO_2)	Republic of Bulgaria	40		1 year	-	26	32
	The Republic of Serbia	***150***	µg/m³	***1 hour***	18	***75***	***105***
		85		***24 hours***	-	-	-
		40		1 year	-	26	32
PM_{10}	Republic of Bulgaria	50	µg/m³	24 hours	35	25	35
		40		1 year	-	20	28
	The Republic of Serbia	50	µg/m³	24 hours	35	25	35
		40		1 year	35	20	28
Lead (Pb)	Republic of Bulgaria	0.5	µg/m³	1 year	-	0.25	0.35
	The Republic of Serbia	***1***	µg/m³	***24 hours***			
		0.5		1 year		0.25	0.35
Carbon monoxide (CO)	Republic of Bulgaria	10	mg/m³	max. 8 hours Average	-	5	7
	The Republic of Serbia	10	mg/m³	max. 8 hours Average		5	7
		5		***24 hours***	-	-	-
		3		***1 year***	-	-	-
Benzene (C_6H_6)	Republic of Bulgaria	5	µg/m³	1 year	-	2	3.5
	The Republic of Serbia	5	µg/m³	1 year			
TARGET VALUE							
Ozone (O_3)		120	µg/m³	max. 8 hours Average	25 days on average. for 3 years	-	-
Arsenic (As)		6	ng/m³	1 year	n/a	2.4	3.6
Cadmium (Cd)		5	ng/m³	1 year	n/a	2	3
Nickel (Ni)		20	ng/m³	1 year	n/a	10	14
Polycyclic aromatic hydrocarbons (PAH)		1 *Concentration of Benzo(a)pyrene*	ng/m³	1 year	n/a	0.4	0.6

Tabel 2.1.2-2 *Critical level for the protection of vegetation and ecosystems*

Pollutant	Concentration	Dimension	Period of averaging	Resolved excesses	LAT	UAT
Sulphur dioxide $(SO_2)_5$	20	µg/m³	1 year in winter (1 Oct - 31 Mar)	-	8	12
Nitrogen dioxide (NO_2)	30	µg/m³	1 year	-	19.5	24

The difference is in some of the limit values, while the target values of the standards and norms for the protection of vegetation and ecosystems in the legislation of the Republic of Serbia have been transposed by **Directive 2008/50/EC.**

➢ ***National Environmental Monitoring System (NEMS), Republic of Bulgaria***

- ***RIEW-Montana*** - within its scope of control of ambient air quality (AAQ) fall two regions Montana and Vidin.

In 2020 in the region of RIEW - Montanaacted:

- **1 stationary AAQ control point** in the city of Montana, - "RIEW - Montana" - urban background point. The controlled atmospheric pollutants are: sulphur dioxide (SO_X), nitrogen dioxide (NO_X), polycyclic aromatic hydrocarbons (PAHs), fine particulate matter (PM_{10}) and nickel (Ni). works with manual sampling every working day. In 2020:
  - → the annual average target rate of 1 ng/m^3 for PAHs **(Table 0-1**) was exceeded more than twice - 2.36 ng/m^3. Increased values were reported mainly in the autumn-winter period (January-March and October-December), which is due to the incomplete combustion of solid fuels in the domestic sector and diesel fuel in the engines of the cars. The predominant use of solid fuels in the winter season, the old car fleet and increased traffic in recent years inevitably have a negative impact and a gradual increase in polycyclic aromatic hydrocarbon pollution.
  - → for a second consecutive year, the annual concentrations of PM_{10} are below the annual average rate (AAR) of 40 µg/m^3 - 32.1 µg/m^3. The number of days when DAR were exceeded was 53-15% of the total 355 samples procured and analysed, with a clear downward trend over the past few years.
- **1 automatic measuring station (AMS-Vidin) in the city of Vidin.** The point is an urban background type and the controlled pollutants in it are: sulphur dioxide (SO_X) and fine particulate matter (PM_{10}). In 2020 For the first time since the beginning of the measurements in Vidin is reported an average annual PM_{10} value of 38.7 µg/m^3, which is below the AAR. The daily average rate (DAR) was 77, or about 21% of the total number of 364 samples analysed.

Pollution with fine particulate matter in the municipalities of Montana and Vidin is of a markedly seasonal nature - from January to March and from October to December, i.e. during the autumn-winter season. The excessive number of overshoots of the PM_{10} concentration during the day is mainly due to the prevalence of solid fuel heating in the domestic and public sectors and to a significantly lesser extent to pollution from industry and transport. No exceeds of the appropriate standards have been recorded for other pollutants.

The cities of Montana and Vidin are the largest cities in the territory controlled by RIEW - Montana, with the best developed infrastructure, industry, population and respectively the most active and potential sources of ambient air pollution.

- ***RIEW-Vratsa*** - within its scope of control of ambient air quality (AAQ) falls only Vratsa Region.

RIEW-Vratsa performs control of the main indicators characterizing the quality of the ground layer of the ambient air - sulphur dioxide, nitrogen oxide, nitrogen dioxide, nitrogen oxides, carbon monoxide, PM_{10} and ozone.

An automatic measuring station (AMS "Railway Station" - Vratsa) is located on the territory of Vratsa region in the city of Vratsa - urban background point.

The measurements for 2020 from AMS "Railway Station" - Vratsa register exceeds of the daily average rate (DAR) of 50 μg/m^3 only according to the indicator PM_{10} - 23 in number. Exceeds in 2019 were 44.

- ***RIEW-Sofia*** - within its scope of AAQ control are three areas: Sofia-region, Pernik and Kyustendil.

On the territory of the considered cross-border regions, RIEW-Sofia controls 4 monitoring stations for AAQ. In 2020, ambient air quality is as follows:

- **Manual Sampling Point (MS) "Pirdop"** - urban background monitoring point with manual sampling;
  - → PM_{10} - average annual concentration is 24.77 μg/m^3, exceeds of the DAR of 125 μg/m^3 are 9.
  - → SO_2 - no excess of the Average hourly rate (AHR) and DAR has been reported.
  - → NO_2- no excess of AHR and AAR has been reported.
- **AMS "Vitinya - ES1"** - extra-urban background point;
  - → PM_{10} - no concentration data for this indicator for 2020
  - → $PM_{2.5}$ - the samples collected are below the required 90% to calculate an annual average value. However, in calculations made with the available data, the average value for $PM_{2.5}$ is 9.90 μg/m3, which does not exceed the average annual rate of 20 μg/m^3.
  - → NO_2 - no excess of AHR and AAR has been reported
- **MS point "Tsarkva", city of Pernik** - suburban background point:
  - → PM_{10} - for the reporting period, the observed exceeds are below the permissible annual rate of 35 per calendar year. Exceeds recorded mainly during the winter months (heating season). The main reasons for exceeding the norms are the fuels used in the household sector (wood and coal), transport and industrial sources. Tsarkva neighbourhood, city of Pernik, in which the point is located, is not provided with district heating, the number of gasified households is small and the heating in the neighbourhood is mainly solid fuels, wood and coal.
  - → $PM_{2.5}$ - only 171 pcs. of data are registered, i.e. the time range is below 90% - the equipment is out of operation from 16.07.2020 and an annual average cannot be calculated.
- **AMS "Centre", city of Pernik** - urban background point.
  - → SO_2 - 23 exceeds of AAR were reported, at permissible 24 according to **Table 0-1**. There are also 3 registered exceeds of DAR - as many as permissible. On 15 January 2020, 3 exceeds of the alarm threshold of 500 μg/m^3 were reported, after which actions were taken in accordance with the "Instruction for informing the population in case of

exceeding the established alarm thresholds for the levels of sulphur dioxide, nitrogen dioxide and ozone", approved by Order No 353/2019 of the Minister of Environment and Water. A check was carried out at the TPP Republika of Toplofikatsiya Pernik AD in order to give a prescription for reducing the power of the working steam generators to the technological minimum.

→ NO_2 - no excess of AHR and AAR has been reported.

According to the indicator **ozone (O_3)** in the AAQ monitoring points on the cross-border territory of RIEW-Sofia, no exceeds of the threshold for information (180 μg/m^3) were reported, as well as the exceeds of the threshold for warning the population (240 μg/m^3).

There is no AAQ stationary control post on the territory of Kyustendil region. The municipality is included in the annual schedule for 2021 for AAQ research through a mobile automatic station (MAS) of the Executive Environment Agency (EEA). The measurements of the contents of lead aerosols, sulphur dioxide, nitrogen dioxide and dust in the city of Kyustendil are carried out periodically by an accredited regional laboratory - Pernik to the EEA. No infringements were found from the measurements carried out, but concentration limits for sulphur and nitrogen dioxide, ozone and carbon monoxide.

A large number of the municipalities in the regions in the cross-border region have developed ambient air quality programmes and implement measures to reduce the levels of pollutants.

Pursuant to Art. 27 of the Ambient Air Quality Act (AAQA), the regions of Vidin, Vratsa and Montana (part of the region for assessment and management of ambient air quality (RAMAAQ) "North/Danube") and the regions of Kyustendil, Pernik and Sofia-region (part of RAMAAQ "South-western" fall in the list of regions (including agglomerations) for assessment and management of ambient air quality, approved by Order No. РД-969/21.12.2013 of the Minister of Environment and Water. In the 6 regions, programmes for the reduction of pollutant levels have been prepared and are in operation, in accordance with Art. 37 (2) of Ordinance 12/2010 (AAQ Ordinance), namely:

- **Vidin region**
  - The programme for reducing PM_{10} levels and reaching the established norms for their content in the ambient air in the **municipality of Vidin** for the period 2021-2025.
- **Montana region**
  - The Complex Program of **Montana Municipality** to Reduce PM_{10} and PAHs in Ambient Air for the Period 2019-2023.
- **Vratsa Region**
  - Update of the Programme for reducing the levels of PM_{10} and reaching the established norms for their content in the ambient air of the **Municipality of Vratsa** for the period 2019-2023.
- **Pernik Region**
  - Program for Ambient Air Quality of **Pernik Municipality** 2017-2021,
  - Programme for management of the quality of ambient air in **Radomir Municipality** for the period 2019-2023.
- **Kyustendil Region**

- Programme for management and improving of the quality of ambient air in Kyustendil Municipality for the period 2016-2020.
- The programme for reducing PM_{10} levels and reaching the established norms for their content in the ambient air in the **municipality of Dupnitsa** for the period 2019-2023.
- **municipality of Bobov Dol** - exceeds of the established norms according to indicators PM_{10} and SO_2 were measured. The municipality of Bobov Dol has been given a prescription to develop a municipal program for reduction of pollutants in accordance with the regulatory requirements.

- **Sofia-Region**
  - Programme under Art. 27 of the AAQA for taking urgent action to achieve compliance with the ambient air quality standards on the territory of the **municipality of Zlatitsa** and in particular with the norms for the content of PM_{10} for the period 2014 - 2016,
  - Complex program under Art. 27 of the AAQA for taking urgent actions to achieve compliance with the ambient air quality standards on the territory of the **municipality of Chelopech**, and in particular with the norms for content of PM_{10} and arsenic with a period of effect from 2020 to 2024.
  - Programme for reduction of emissions and achievement of the established standards for fine particulate matter PM10 and air quality management in the **municipality of Pirdop** for the period 2013-2017 The Municipality of Pirdop should take the necessary measures to keep the levels of pollutants below the established standards for them, and until the update of the program annually should provide a report on the implementation of the measures taken in RIEW-Sofia.

One of the factors determining the quality of ambient air is the household sector. A problem for the quality of the ambient air is also the linear sources of emissions - roads, motorways and street network in the settlements. There is also a large share of mobile point sources - cars that are in poor technical condition. There are also municipalities in Sofia region where the quality of the ambient air is close to the natural background, without significant anthropogenic influence, where ecotourism and balneotherapy can be successfully developed - Dolna Banya, Koprivshtitsa, etc.

➢ ***State and local air monitoring network in the Republic of Serbia***

In ***the 2019 Annual Report on the Air Quality Situation in the Republic of Serbia***[74] the air quality assessment is presented on the basis of average annual pollutant concentrations obtained by monitoring air quality in the national and local air monitoring networks on the basis of the following 3 categories:

- **The first (I) category (🟢)** - clean or slightly polluted air, no limit values of any of the pollutants have been exceeded.
- **The second (II) category (🔴)** - moderately polluted air, where limit values for *nitrogen dioxide* are exceeded, but the tolerance value is not exceeded and no limit values for other pollutants are exceeded.

[74] http://www.sepa.gov.rs/download/izv/Vazduh_2019.pdf

- **The third (III) category (●)** - excessively polluted air in which the limit values for one or more pollutants are exceeded.

  The air quality assessment by zones and agglomerations for 2019 is presented in **Figure 2.1.2-1**. The figure shows that:

  - In the Niš agglomeration (the territory of the city of Niš), the air is of category III, i.e. excessively polluted air, due to concentrations exceeding the limits of the fine particulate matter PM_{10} and $PM_{2.5}$.
  - In the agglomeration of Bor (the territory of the municipality of Bor), the air is of category III, i.e. excessively polluted air, due to concentrations that exceeded the limit value of SO_2.
  - In the city of Zaječar air is of category III due to concentrations exceeding the limit value of PM_{10}.

  The other cross-border territories concerned fall into the first category.

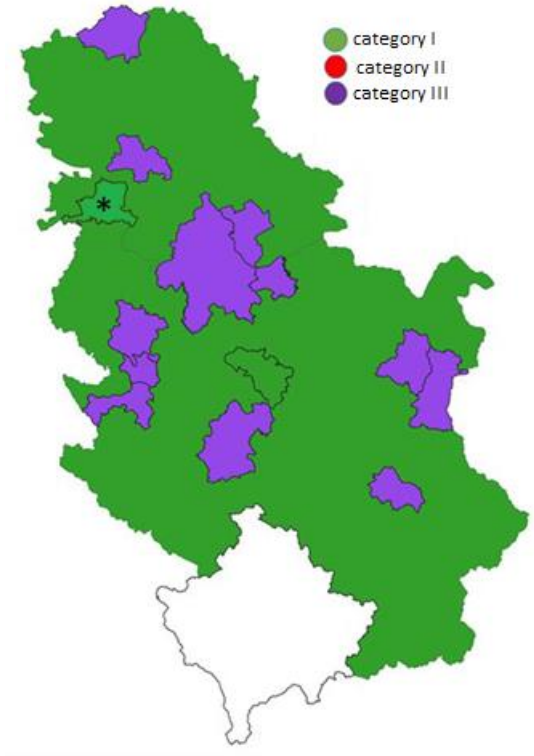
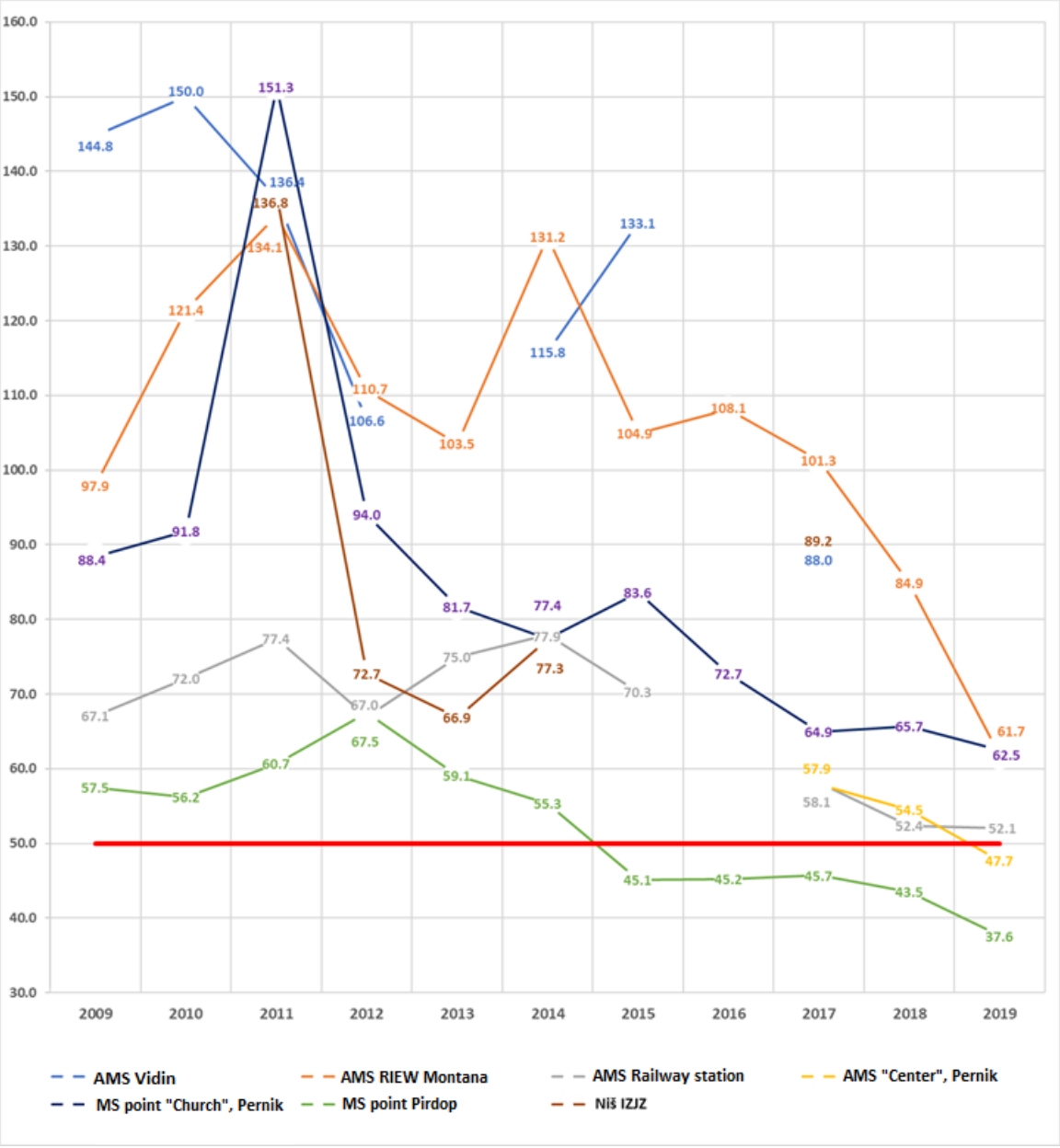


Figure 2.1.2-1 *Ambient air quality categories by zones, agglomerations and cities in 2019 in the Republic of Serbia.*

Summary of ambient air condition:

In accordance with the procedure laid down in ISO 11222 (2002) "*Air quality - Determination of uncertainty in air quality measurements averaged over time",* a **percentile 90.4 of the daily average concentrations determined on the basis of** 35 permitted exceeds of the DAR over a calendar year lower than or equal to the DAR for PM_{10} of 50 $\mu g/m^3$shall be used as an indicator of the excess of DAR for PM_{10}, instead of the number of absolute exceeds strongly affected by the data coverage.

Figure 2.1.2-2, according to data from the European Environment Agency (EEA)[75] for a period of 11 years (2009-2019), shows the exceeds of the concentrations (in µg/m3) of DAR according to indicator PM_{10} for all points in cross-border areas, showing a sustained trend of DAR excess, therefore **air pollution with PM_{10} is a problem for** AAQ, especially in urban locales (agglomerations) during the winter months. The red line is DAR.



[75] https://www.eea.europa.eu/data-and-maps/dashboards/air-quality-statistics

Figure 2.1.2-2 - Summary results of the exceeds of 90.4 per centile (in μg/m^3) of DAR for PM_{10} at the cross-border ambient air quality monitoring points for the period 2009-2019 in the Republic of Bulgaria and the Republic of Serbia

Only after 2015 in the Pirdop MS point there is an improvement of AAQ also in the AMS Centre, Pernik for 2019.

Analysis of data and assessments of climatic and meteorological conditions in these areas shall lead to the following conclusions on processes and phenomena of interest to the existing state of the environment:

→ the daily average concentrations of PM_{10} consistently exceed the DAR.

→ there are no persistent exceeds of the standards for the protection of human health for other gaseous pollutants.

The main sources of dust pollution are:

→ the use of solid fuels (coal and wood) in domestic heating during the winter months in populated areas,

→ construction activities - diffuse dust emissions from open construction sites,

→ agricultural activities - diffuse emissions of dust from the soil carried by the wind when working in open fields,

→ road transport - the re-subsidisation of dust from unclean streets and unpaved roads.

→ forest and agricultural fires - burning stubble.

2.1.3. Water state, water protection zones, flood risk

A. Surface water

➢ ***Regions of Vidin, Montana, Vratsa, Sofia-region (Republic of Bulgaria)***

The total area covered by the Danube Region for Basin Management (DRBM) is 47,235 sq. km., or 42.5% of the country's territory. The region unites the river basins of 11 rivers: Danube, Rivers west of Ogosta, Ogosta, Iskar, Vit, Osam, Yantra, Rusenski Lom, Danube Dobrudzha Rivers, Erma and Nishava. The territories of the composite river basins are presented in Table 1.1.1.1 to Section 1 of the RBMP. The territory of DRBM - in total is 47,235 sq. km and by river basins is: Erma and Nishava 1,159, Ogosta and Rivers west of Ogosta 8,193, Iskar 860.7 Vit 3,228, Osam 2,838, Yantra 7,862, Rusenski Lom 2,985, Danube Dobrudzha Rivers 8,027, Danube 4,331 km.

Main river valleys in the scope of the CBCP

DRBM includes the river valleys of all rivers flowing into the river Danube on the territory of Bulgaria or beyond (crossing our western border). The main river valleys in DRBM are: The river valleys of Erma and Nishava. The Erma River is a left tributary of Nishava, which flows into the territory of Serbia. Springs from the Vlashka Mountains - Serbia. The length of river Erma is 65 km, in Bulgaria - 25 km. The catchment area of the river on the territory of Bulgaria is 360.5 km^2. The Nishava River is a right tributary of South Morava, which flows to the west of Niš, Serbia. Under the name Ginska Reka springs from the locality “Golyamo mochurishte”, Western Stara Planina. The catchment area of the river in Bulgaria is 330.90 km^2 and its length is 218 km, of which 40 km are in Bulgaria. The rivers to

the west of the river Ogosta include the rivers Timok, Topolovets, Voynishka, Vidbol, Archar, Skomlya, Lom, Tsibritsa and their tributaries. The Timok River is a river in eastern Serbia, a right tributary of the Danube, into which it flows to the north-west of the village of Vrav, Vidin region. In its estuary part it serves as a border between Bulgaria and Serbia - about 15.5 km. Targovishki Timok, which springs from the Serbian territory to the north-west of the peak Midzhur is considered a starting point. The Topolovets River springs under the name Mostishte 1.75 km north-east of the height of Vrashka Chuka, Western Predbalkan. It has a length of 67.6 km and a catchment area of 582.8 km^2. The Voynishka River is formed mainly by the Chichilska tributary, which springs east of the peak Chernoglav. It has a length of 55.2 km and a catchment area of 276.5 km^2. The Vidbol River springs from the Western Stara Planina. It flows into the Danube 2.5 km south of the Dunavtsi, Vidin region. The length of the river is 61.8 km and the catchment area is 329.8 km^2. The Archar River springs from the south-eastern slopes of Babin nos - 300 m from the peak. It flows into the Danube south of Bliznatsi Island. The length of the river is 59.4 km, with a catchment area of 365.7 km^2. The Skomlya River has a length of 41.6 km, the catchment area 162.8 km^2. In the lower stream of the river an adjustment has been made and it flows through a channel into the river Danube, south of the island of Kerkeneza. The Lom River springs from the Chiprovsko-Berkovska Mountain and flows into the Danube near the city of Lom. It is 92.5 km long, with a catchment area of 1,140 km^2. The Tsibritsa River springs from Shiroka Mountain, Western Predbalkan. It flows north-east through the Predbalkan and Danube hilly plain in a wide asymmetrical valley. It flows into the Danube after the island of Tsibar. It is 87.5 km long, with a catchment area of 933.6 km^2. The Ogosta River springs in the Chiprovsko-Berkovska Mountain. The length of the river is 144.1 km, with a catchment area of 3,157.1 km^2. Ogosta receives the waters of about 40 tributaries. The Skat River is a tributary of the river Danube, into which it flows through a common adjusted estuary with the river Ogosta. It springs from the north-west slope of the Veslets hill. The length of river Skat is 134 km and its catchment area is 1,074 km^2. Iskar. The Iskar River is the oldest river on the Balkan Peninsula and is the longest river in Bulgaria - 368 km, flows from south to north and flows as a right tributary of the river Danube. It has 25 tributaries. The catchment area of the river Iskar is 8,646 km^2. The largest tributary of the river Iskar is river Malak Iskar of 85.5 km long. Other significant tributaries of the river Iskar are river Lesnovska - 65 km and river Zlatna Panega - 50 km.

The updated surface water bodies total 256, of which 249 bodies of water category rivers and 7 bodies of water category lakes. *Appendix 1.2.4.4 to Section 1 of the RBMP* provides the full list of surface water bodies in the DRBM.

Due to alignment, the lakes are reported as 32 and 224 bodies of water are considered as rivers.

The following **cross-border water bodies have been identified on the territory of the DRBM**: water body with code BG1DU000R001 - represents the Danube River, which is the northern border of the Republic of Bulgaria and is a border river with the Republic of Romania. - water body with code BG1WO100R001 - the Timok River from the river valley "rivers west of the Ogosta River" is part of the western border of the Republic of Bulgaria and is a border river with the Republic of Serbia. - water body with code BG1ER100R001 and water body with code BG1NV200R1001 - respectively the Erma River and the Nishava River, which cross the border of the Republic of Bulgaria with the Republic of Serbia.

Heavily modified bodies of water (HMBW) and artificial bodies of water (ABW):

The surface water body (WB) river Danube is defined as a HMBW. *Appendix 1.2.5.1 to Section 1 of the RBMP* provides a list of surface water bodies, defined as HMBW and ABW, map of HMBW - *Appendix 1.2.5*, as well as map of ABW - *Appendix 1.2.5.3.* - 5 pcs.

Based on the information on the DRBM in the RBMP, the following main categories of surface water loads have been identified: - Pressure from point sources of pollution - significant at the RBM level; - Pressure from diffuse sources of pollution- significant at the RBM level; - Pressure from physical changes/Hydromorphological pressure- significant at the RBM level; - Pressure from invasive species; - Pressure from climate change.

Point sources of wastewater are defined and considered: Discharges of wastewater of predominant household nature, with permits under the Waters Act (WA) from: - Urban wastewater treatment plants of agglomerations with more than 2,000 population equivalents - PE, pcs.; - Sewerage networks of agglomerations with more than 2,000 PE, pcs.; - Local household wastewater treatment plants, pcs.; - Sewerage networks of agglomerations with less than 2,000 PE, pcs. Industrial wastewater discharges from industrial plants - with permits issued under WA, pcs.; - with permits issued under the EPA, *See Appendix 2.2.1.1 and Map 2.2.1.1 , section 2 of the RBMP*.

Industrial wastewater is analysed in the following sectors and types: - Food industry; - Mining and processing of minerals; - Metallurgy, mechanical and metalworking industries; - Chemical industry; - Manufacture of construction products, construction and construction equipment; - Manufacture, extraction and storage of oil and petroleum products; - Car repair workshops and car washes; - Manufacture and/or refining of vegetable oils and biodiesel; - Cellulose, paper and wood processing industries; - Thermal power plants; - Manufacture of textiles and knitwear; - Manufacture and repair of electronic and electrical products; - Animal husbandry. Appendix 2.2.1.3A presents these sources of pressure for DRBM as of 31.12.2012. Their number within the scope of the CBCP shall be: Iskar 57 pcs. Erma 0, Nishava 0, Ogosta 6, West of Ogosta 25, Danube 36, of which food industry predominates.

Map 2.2.1.3 to Section 2 of the RBMP presents the discharges of industrial wastewater into the DRBM.

As diffuse sources of pollution of surface water in RBMP are defined: - Settlements with more than 2,000 PE without constructed or partially built sewerage network; - Agriculture and its accompanying activities in the catchment area: utilised agricultural area - UAA, areas on which fertilisers have been applied, areas on which plant protection products have been imported, warehouses for plant protection products; - Livestock - number and density of farmed animals; - Extraction of subsoil; - Erosion ; - Landfills for non-environmental waste; - Atmospheric deposition; - Transport, including shipping.

The layout of the constructed hydroelectric power plants (HPPs) is shown on *Map 2.2.3.2. to the RBMP*. The active hydropower plants at the end of 2012 are shown, as well as the locations for which permits have been issued, but there are no active hydropower plants yet. Active HPPs are in 44 water bodies. The largest load of hydroelectric power plants in the scope of CBCP is in the upper and middle course of the river Iskar and the upper course of Ogosta.

Other identified problems in water management in DRBM:

- Floods - Unlike other natural disasters, floods are significantly predicted, both in terms of their occurrence and spread, as well as their possible consequences. Flood Risk Management is subject to a stand-alone Plan - Flood Risk Management Plan.

- Integration with other sectoral policies - for successful water management it is necessary to link these activities with the policies on shipping, hydropower - HPP, agriculture, urban planning, etc.

- Invasive non-native species - the Danube basin is highly vulnerable to invasive species due to the direct connection with other large bodies of water.

- Adaptation to climate change

- Water scarcity and drought.

Environmental status *(Appendix 4.1.2.1 to the RBMP)*

Of the 256 bodies of surface water, 215 have been assessed for ecological status. 41 new bodies of water have not been assessed due to a lack of monitoring data. The analysis of the results of the environmental assessment shows that out of 256 total 17 bodies of water - 6.64% are in excellent condition; 109 are in good condition/potential, i.e.126 bodies are in excellent and good condition, which represents a total of 42.92%, 57 surface BW or 22% are in moderate condition/potential and the other 32 bodies of water - 12.50% - in poor and very poor condition/potential.

A serious deterioration is observed in the valley of Malak Iskar in the section after the copper ore mining enterprise Elatsite Med AD. A high content of metals (copper, manganese and aluminium) and heavy metals (nickel and cadmium) is reported and this has an impact on ecosystems.

Water bodies located along the main course of the river Ogosta from the spring to the mouth, incl. the Martinovska Ogosta tributary as a result of industrial or mining activities are contaminated with arsenic.

Some of the water bodies are in poor condition in terms of the measured biological index. Such bodies are water bodies of the rivers Timok and Iskar in the section after the wastewater treatment plant (WWTP) of the city of Sofia.

Chemical status

Of the 256 surface water bodies assessed in the Danube Region, 165 are in good chemical condition, 6 are in poor condition and 85 are not assessed. Exceeded concentrations of priority substances above the specified environmental quality standards (EQS) are observed in six surface water bodies identified in poor chemical status:

In the Timok river valley, water body - with code BG1WO100R001 river Timok from Bregovo to the estuary - above the MPC are nickel and cadmium. Pollution is outside the territory of the Republic of Bulgaria.

In the river valley Iskar, Vladayska River - water body BG1IS500R1010 - river Vladayska from Vladaya to flow into the river Iskar, incl. tributaries - Perlovska, Suhodolska and Slatinska - high content of trichloromethane;

In the river valley Iskar, water body - BG1IS135R1426 - river Iskar from the flow of the river Vladayska to the flow of the river Batuliyska at the village of Rebrovo - high content of trichloromethane;

In river Malak Iskar - water body BG1IS200R1243 - river Malak Iskar from the flow of river Suha at Etropole to flow at the village of Malak Iskar - pollution with heavy metals - nickel and cadmium and high concentrations of copper, zinc, aluminium and manganese. Reasons - discharge of insufficiently treated industrial wastewater from the enterprise "Elatsite Med AD"

Danube River, northern border of the Republic of Bulgaria with the Republic of Romania, water body river Danube from the border at Novo Selo to the border at Silistra, BG1DU000R001 - high concentrations of trichloromethane.

After reviewing the analysed biological quality elements (BQE) - macrozoobenthos, phytobenthos, phytoplankton, macrophytes and fish, the BQE assessment for the water body of the Danube River is moderate. Given the assessment of the Romanian side, the chemical status of the Danube River in the Bulgarian-Romanian section has not reached good status.

The overall assessment shows that the hydromorphological conditions in the lower Danube, where the Bulgarian section is located, are much better than those in the upper Danube.

Biological quality elements/BQE/

Macrozoobenthos. There are no serious organic pollutions in the Bulgarian section of the river. Points in good condition prevail.

Phytobenthos. All valuation indices used significantly reduce their values in the lower stream, which is an indication that the status is likely to be moderate or poor.

Macrophytes. It is considered that Macrophytes cannot be used for evaluation, but only for general information.

Phytoplankton. The values of chlorophyll A give an indication of very good status in the Bulgarian section of the river.

Fish. At some of the points in the Bulgarian section there was an insufficient set of data and no status assessment was made.

Invasive species. During the study, many invasive species were found, as in the lower course of the river Danube there is a low bio-pollution with invasive species.

General physico-chemical parameters. The results show that most points are of very good or good status.

There are only occasional EQS overruns, mainly for nickel and leadam For mercury and cadmium, these limits are not exceeded.

Priority and hazardous substances - study. The conclusion is that for the Danube river along its entire length there is no exceed of any of the existing EQS values for persistent organic pollutants in aquatic biota and suspended solids/sludge.

Pressure

Diffuse pollution

Agriculture. The most significant reduction in total nitrogen emissions was observed in 35 bodies of water, where emissions in 2010 were above 3.03 kg/ha and decreased to below 0.6 kg/ha in 2012. These bodies of water along the river within the scope of the CBCP are:

River valley Iskar - BG1IS100R1024, BG1IS100R1124, BG1IS135R1026, BG1IS135R1126, BG1IS500R011, BG1IS600R1015, BG1IS600R1115, BG1IS600R1215;

River valley Ogosta - BG1OG100R014, BG1OG200R008, BG1OG307R1213, BG1OG307R1313, BG1OG600L015, BG1OG600R007, BG1OG600R1018, BG1OG600R1118, BG1OG700R005;

River valley rivers west of Ogosta river - BG1WO300R1108, BG1WO500R011, BG1WO600R1013, BG1WO800R1016;

Total phosphorus emissions from agriculture decreased in 2012. These are Rivers west of Ogosta river, water bodies - BG1WO200L003, BG1WO200R004;

Urbanisation pollution. Almost unchanged remains the phosphorus load from populated areas.

Point pollution

For 2012 there was no change in the values of total nitrogen emissions from point sources compared to 2010, which is largely due to the delay in the implementation of the main measures for the construction of sewerage systems. The highest values of total nitrogen emissions from point sources are observed in the following bodies of water: Danube - BG1DU000R001 and Iskar - BG1IS135R1426 - 919 tons/year.

Emissions of total phosphorus in the Danube basin originate mainly from urban systems and soil erosion. Emissions decreased by 27% compared to the previous RBMP.

Hydromorphology

HPP. With the introduction of restrictive measures in the RBMP and in the Waters Act, there is a significant decrease in the number of permits issued for the construction of new hydroelectric power plants. 63 permits were issued, 4 refusals were made, 13 suspended permits and 40 amendments were made to the permits.

Silt deposits. 315 permits were issued for the seizure of silt deposits, 10 were terminated, 16 were amended, 24 were issued refusals to issue permits.

Chemical pollution

In the RBMP 2009, the entire surface BW BG1OG307R013 was assessed in not reaching good chemical status by exceeding the average annual lead concentration. Update of the RBMP in all newly formed BW originating from the body did not reveal lead pollution. These are: BG1OG200R1113, BG1OG200R1413, BG1OG307R1013, BG1OG307R1213, BG1OG307R1313, BG1OG600R1018. See Appendix 4.5.1 of Section 4 of the RBMP of the DRBM.

- ***Regions of Pernik and Kyustendil (Republic of Bulgaria)***

West Aegean Region for Basin Management (WARBM) with centre city of Blagoevgrad to the south and west borders the state borders of the Republic of Bulgaria with the Hellenic Republic, the Republic of Serbia and the Republic of North Macedonia, respectively. The West Aegean region covers the catchment areas of the Struma, Mesta and Dospat rivers, which are cross-border. The rivers cross the state border and flow into the Aegean Sea on the territory of the Hellenic Republic.

The catchment area of the river Struma amounts to 17,300 km^2 and covers parts of four Balkan countries - the Republic of Bulgaria, the Hellenic Republic, the Republic of North Macedonia and the Republic of Serbia. It covers the whole region of Kyustendil, about 80% of the region of Pernik and a very small part of the region of Sofia. In the catchment of the river Struma operate 33 hydrometric stations, of which 5 on the main river and the rest on its tributaries.

For the Struma River basin, a cross-border surface water body, which is common to the Republic of Serbia, has been identified within the scope of the CBCP. This is the Dragovishtitsa River from the Bulgarian-Serbian border to flow into the Struma River, with code BG4ST700R019. It springs on the territory of the Republic of Serbia, passes on the territory of the Republic of Bulgaria and flows into the Struma River.

In the territorial scope of the WARBM, 29 HMBW are defined and no ABW are defined.

Codes and names of the HMBW falling within the scope of the CBCP - 15:

11 BG4ST500L1004 KARAGYOL AND KALIN DAMS

12 BG4ST500L1006 Stoykovtsi Dam

17 BG4ST600R1032 Dzherman River from elevation 1052 meters with its tributary river Valyavitsa and parts of its left tributaries river Fudina (from elevation 900 m) and river Goritsa (from elevation 814 m) to the city of Dupnitsa

18 BG4ST700L1002 DRENOV DOL DAM

19 BG4ST700R021 Struma River from the flow of the river Sovolyanska Bistritsa to the flow of the river Eleshnitsa

20 BG4ST700R1020 Sovolyanska Bistritsa River from elevation 1195 m to the flow into the river Struma

21 BG4ST700R1023 Novoselska River from the springs to the flow into the river Struma

22 BG4ST900L014 IZVOR DAM

23 BG4ST900L1001 STUDENA DAM

24 BG4ST900L1005 DYAKOVO DAM

25 BG4ST900L1008 DOLNA DIKANYA DAM

26 BG4ST900L1010 PCHELINA DAM

27 BG4ST900L1012 CHOKLYOVO BLATO DAM

28 BG4ST900R015 Orolachka (Kosmatitsa) River from the Izvor dam to flow into the river Struma

29 BG4ST900R1009 Arkata from the dam Dolna Dikanya to the flow into river Struma.

Environmental status of surface BW

Of all the 183 surface water bodies in the WARBM, an assessment of the ecological status in the RBMP was made for 178 bodies of water, and 5 surface water bodies are in unknown environmental status. The analysis of the results of the assessment of the environmental status/potential of surface water bodies shows that 11 bodies of water - 6% are in excellent condition/maximum potential, 103 bodies - 56% are in good condition/potential, 51 bodies of water - 28% are in moderate condition/potential, 8 bodies of water - 4% are in bad condition/potential and 5 bodies of water - 3% are in very bad condition/potential.

The most common causes of deterioration of the environmental status of the surface water bodies in the WARBM are: the exceeds of the good environmental status standards for the indicators related to oxygen regime - dissolved oxygen, oxygen saturation, BOD_5 - related to organic pollution from untreated domestic and industrial wastewater; the exceeds of the good environmental status standards for biogenic substances - ammonium nitrogen, nitrate nitrogen, nitrite nitrogen - related to biogenic

pollution from untreated domestic wastewater and diffuse pollution from agricultural activities - agriculture and livestock; the EQS for the following specific pollutants - copper, zinc, cyanides, rarer iron and manganese - related to unregulated discharges of untreated domestic and industrial wastewater; degraded values of the indicative BQE. Within the scope of the CBCP, 7 surface BW in poor and very poor environmental condition/potential were identified.

Chemical state of surface BW

Of the 183 surface water bodies in the West Aegean region, 63 bodies of water - 34.4% are in good chemical state, 3 bodies of water - 1.6% are assessed in poor chemical state and 117 bodies of water - 64% are not assessed and have been determined in unknown chemical state. Exceeded average annual concentrations of priority substances above the EQS are observed in three surface water bodies within the scope of the CBCP - Kyustendil Region, identified in poor chemical state, namely:

- water body with code BG4ST700R1020, river Sovolyanska Bistritsa River from elevation 1195 m to the flow into the river Struma - high AAV values exceeding the EQS for the priority substances cadmium and lead were measured. The pollution is the result of old, already completed industrial activities in the area for extraction and enrichment of non-ferrous ores;

- water body with code BG4ST900R1009, river Arkata from the dam Dolna Dikanya to the flow into river Struma. High annual average values (AAV) exceeding the EQS for the priority substances nickel and lead have been measured. The source of this pollution is insufficient treatment of industrial wastewater discharged;

- water body with code BG4ST700R1022, river Glogoshka (Banshtitsa) from elevation 1160 m to the flow into the river Struma. High AAV exceeding the EQS for the priority substances nickel, cadmium and lead were measured. The source of this pollution is insufficient treatment of industrial wastewater discharged in the region of Kyustendil.

Pressure

The RBMP for the second planning period identifies the potential categories of pressure on surface water: pressure from point sources of pollution; pressure from diffuse sources of pollution; pressure from physical changes/hydromorphological pressure; pressure from climate change.

Point sources

As point sources of pollution in the WARBM are identified:

Discharges of household waste water from: - Urban wastewater treatment plants in settlements with over and below 2,000 population equivalent - Urban sewerage networks in settlements with over and below 2,000 PE Local household wastewater treatment plants.

Industrial wastewater discharges from all sites of Annex 5 of Ordinance No. 6/2000 on emission standards for the permissible content of harmful and hazardous substances in wastewater discharged into water bodies within the territorial scope of the BDA.

8 sites have been identified on the territory of WARBM, of which 4 sites are classified as enterprises/facilities with high and 4 sites with low risk potential under the Environmental Protection Act (EPA). Eight bodies of water are affected, all in the Struma River valley. Detailed information is provided in *Table 2.2.1.c, Section 2 of the RBMP*.

28 significant point sources of pollution have been identified within the scope of the CBCP *(see appendices 2.2.1.a, 2.2.1.b to the RBMP - maps).*

The diffuse sources of surface water pollution in the Western Aegean Region have been identified and considered: Waste landfills, Settlements below and above 2,000 PE without built or partially built sewerage network in the catchment area of the rivers; which do not meet the environmental requirements; Agriculture and its accompanying activities in the catchment area of the surface water body/river/WARBM; - UAA, on which fertilizers have been applied, imported plant protection products, warehouses for plant protection, livestock, mining, erosion, land use, fish farming, tourism and recreation, past activities, atmospheric deposits. transport. 87% of the bodies are free of significant diffuse pressure. Surface water bodies with identified significant pressure from diffuse sources within the scope of the CBCP are 10.

Hydromorphology

The main activities generating hydromorphological pressure on water bodies in the West Aegean Region for Basin Management are: - water abstraction; - morphological changes, including construction of flood protection facilities; - seizing of silt deposits; regulation of flow; - production of electricity through small hydroelectric power plants. Water bodies with significant hydromorphological pressure in CBCP are 12 pcs.

Invasive species

Individual invasive species have been identified during monitoring in the West Aegean region without targeted research. Of the animal species, these are: - Lepomis gibbosus; - Salvelinus fontinalis; - Oncorhynchus mykiss; - Salmo trutta fario; - Dreissena polymorpha. Of the invasive plant species, the following have been identified: - Elodea canadensis and Elodea nuttallii, outside the CBCP - in the dam Dospat. Pressure is low.

Climate Change

The forecasts for the intensity of climate change in the West Aegean region are for the levels "weak" for the periods 2013-2042 and 2021-2050. For the period 2071-2100, the same scenario shows a high intensity of climate change for the upper stream of the Struma River and an average for other parts of the region. Better-quality bodies of water are considered to be less at risk of climate change-related disturbances. In the upper part of the river Struma, the forecast for the change of flow is the spring flow to decrease to -3%, summer flow to -24%, autumn flow to -9%, and winter flow to change marginally.

- ***Regions in the Republic of Serbia***

In the Republic of Serbia, three catchments have been set aside: Black Sea, East Aegean and Adriatic. Larger parts of the CBCP fall in the Black Sea basin and very small parts - in the Aegean.

The Black Sea basin is the largest in the Republic of Serbia and covers 92.6%. The Danube River has a catchment area of about 801,463 km^2 and an average inflow rate into the Black Sea of about 6.500 m^3/s.

The other rivers in this basin are Timok, Velika Morava, Zapadna Morava and Yuzhna Morava. Yuzhna Morava with an area of 15,696 km^2.

The most significant tributary is the river Nishava, springing from the Republic of Bulgaria. The rivers Veternitsa, Yablanitsa, Pusta reka and Toplitsa are also flowing into it. Timok is made up of Beli, Targovishki, Svarlizhki and Cherni Timok. Timok is a border river with the Republic of Bulgaria.

The ***Aegean Sea Basin*** covers only 2.14%. In this basin fall the rivers: Dragovishtitsa, Pchinya and Lepenats. Dragovishtitsa consists of two tributaries at Bosilegrad, after which it enters Bulgaria. Pchinya is a left tributary of Vardar. Its catchment area is about 468 km² on the territory of the Republic of Serbia.

Timok and Nishava have the largest flow in March and April, and the smallest in August and September.

Velika, Yuzhna and Zapadna Morava, as well as Timok, Nishava, Pchinya and Dragovishtitsa are the most watery in March and April, and the driest in August and September.

Water bodies

The Water Management Plan identifies a total of 3,216 bodies of water on the territory of the Republic of Serbia.

Rivers. Water bodies with a catchment area of more than 10 km^2 have been identified. The total number of water bodies is 3,216 and their length - 8,450 km.

Lakes. Three natural lakes larger than 0,5 km^2 have been identified, all of them outside the CBCP.

Surface water bodies are represented in *Fig. II-8* of the Water Management Plan of the Republic of Serbia.

HMBW and ABW

Of the 2,820 water bodies, 2,454 are natural water bodies, 218 are probably HMBW and 148 are ABW - Table II.6 of *the Water Management Plan of the Republic of Serbia*.

In the Black Sea basin, a total of 2,391 surface BW have been determined, of which 216 are HMBW and 148 are ABW. In the Aegean Basin a total of 63 surface BW have been determined, of which 2 are HMBW and 0 are ABW.

Among the category of superficial BW in the scope of CBCP are predominant natural, few are HMBW - 31 pcs and only one body is ABW. Fig II-9 *Water Management Plan of the Republic of Serbia*.

Significant pressure

Population

The population of the Republic of Serbia lives in 4,722 settlements with a population of several to more than 200,000. Currently, 56% of the total population is connected to a sewerage system - about 3.9 million, or about 300,000,000 m^3 of wastewater: 69% of households, about 19% of industry and about 12% of other activities. Approximately 7 million inhabitants in the Republic of Serbia live in 398 agglomerations that comply with the Water Framework Directive (WFD).

Industry

The share of emissions from industrial wastewater does not represent a significant percentage. A significant number of enterprises own their own WWTP. The most developed activities in R. Serbia are: food production and processing, metal production and construction materials production. In the Republic of Serbia, 227 industrial operators are obliged to have a complex permit (CP), and so far 26 permits have

been issued by the Ministry of Environmental Protection. The points of discharge of household and industrial sewers within the scope of the CBCP are shown in source: ОВП „Србијаводе“. These are: Urban wastewater without treatment 27; Urban wastewater with treatment 9; Industrial wastewater 19.

Along with the discharge of industrial wastewater, the pollution of surface water also stems from agriculture, mines and sanitary landfills. The Republic of Serbia has about 200 active mines and about 250 abandoned landfills with mining waste. In the scope of the CBCP are the regions of: Bor, Grot-Vranja, Bosilegrad.

Household waste landfills

In the Republic of Serbia there are 164 landfills, of which 25 landfills are less than 50 meters away from water bodies, of which 14 landfills are practically on the coast or in the beds.

Urban and suburban terrains, mining terrains and less-industrial terrains predominate within the scope of the CBCP.

Agriculture

Agriculture and land use are one of the main sources of emissions in the Republic of Serbia. This includes excessive use of fertilisers and pesticides, inappropriate warehouses and poor farming practices.

According to the 2012 census, 82 municipalities have farms with 20,000 chickens, 129 municipalities have cattle farms with 200 heads and 40 municipalities have pig farms with 2,000 pigs. The majority of the territory of CBCP occupies terrains with less than 2 animal units, along the valleys of the large rivers are from 2 to 10 animal units and only in separate places - from 10 to 25 animal units. There are only four big farms. See fig. III - 6 of the *Water Management Plan of the Republic of Serbia*.

Hydromorphological pressure. Included here are: Construction of dams and reservoirs, drainage systems, river regulations and embankments, land and coastal use change, ballast extraction, water abstraction.

Pressure from organic pollution. The analysis of the pressure shows that the dominant sources are the population and industry - about 78% . The scope of the CBCP is dominated by areas of first class - less than 2.5 kg/ha per year and second class - 2.5-7.5 kg/ha per year. Fig. III-10 of *the Water Management Plan of the Republic of Serbia*.

Pressure from nutrients. Pollution from point and diffuse sources of the population, followed by agriculture and livestock, is the biggest contributor.

Pressure of priority and priority hazardous substances. Industrial emissions have been assessed as the main source of hazardous substances. For basins in the Republic of Serbia, basins with specific pollutant have not yet been identified. Industrial surfaces, mines and landfills have been analysed as diffuse sources of pollution. The scope of the CBCP is dominated by the low emission index. Water bodies with a potentially significant risk of low pollution with pesticides (medium index) are present in the valley of the Morava River and at Negotin.

Organic pollution. Analysis was performed on 2,816 surface BW, with about 40% surface BW - 1,133 pcs are exposed to significant impact.

Nutrients. Analysis was performed for 2,816 surface BW, with 35% surface BW - 971 pcs are exposed to significant impact. Concentrated sources are agglomerations with more than 2,000 PA. The most important diffuse source is the use of land.

Priority substances

Of the 2,816 surface BW analysed, only 61 were identified, which have a "possible significant" or "significant" impact. The scope of the CBCP is entirely dominated by areas with very low and only in parts - medium impact. Fig. III-19 of *the Water Management Plan of the Republic of Serbia*.

Hydromorphological changes

Three key components of hydromorphological changes that are relevant to basins in Serbia have been identified: a) hydrological regime and flow change, b) longitudinal continuity of the river, discontinuity and change in sediment dynamics, c) morphological conditions.

Hydrological regime. This includes the formation of reservoirs, water abstraction, changed drainage regime - dams, hydroelectric power plants and drainage systems. In Serbia, there are 72 surface BW with significant accumulation effects or 2.3% of surface BW. The affected water bodies are the Danube, Moravitsa, Rasina, Visochitsa, Pusta reka, Veternitsa, Vlasina.

Water abstraction. Water abstraction is carried out at 17 water supply points, 31 industrial sites, 45 irrigation sites and 120 hydroelectric power stations, with significant impact estimated for 70 surface water supply points in the Republic of Serbia. There are no significant water abstractions within the scope of the CBCP.

For the needs of the Water Strategy of Serbia, the needs of drinking water for the population are analysed and new water abstractions from: 1. Timoshka regional system through a reservoir of Cherni Timok - "Bogovina". Municipalities that can be supplied from this system: Bor, Zaechar, Bolevac, Negotin and Knyazhevac. 2. Lower southern Moravian - within the scope of "Водопривредне основе Републике Србије" is planned to supply water to the subsystems: Vlasinska, Jablanički, Topлички, Nišavski and Moravicka. 3. Upper southern Moravian - within the scope of "Водопривредне основе Републике Србије", it is envisaged that this system will be based on the construction of the accumulation "Vlasinsko Yezero" on the Vlasina River, "Lisina" on the Bozhicka River, "Prvonek" on the Banska River and a possible future reservoir on the Pchinya River.

Discontinuity. In Serbia, there are numerous dams/barriers - along with 22 large dams there are 160 dams/barriers for different purposes, 120 dams/barriers for mini HPPs, barriers for fish ponds and about 400 barriers against strong streams. Significant pressure is exerted on 272 surface BW, or 8.9% of all natural and ABW.

Seizure of deposits. In the Republic of Serbia, river deposits are primarily extracted to improve the water regime, while commercial mining is of secondary importance. The activity thus becomes a means of securing the necessary flow capacity of the bed. The uncontrolled extraction of deposits from small and medium-sized streams is a problem. Significant pressure is present in 4 water bodies, which is only 0.1% of the surface BW and possible ABW.

Morphological changes. Morphological changes are intended to protect against flooding, navigation, hydropower, urbanisation and agriculture. Regulatory activities represent significant

pressures when they affect more than 40% of surface BW. The coastal zone is changing, especially for urbanisation and agriculture.

Meandering. The meandering of natural flows contributes to the natural wealth and structure of the biotope. It is known that 6.3% of natural and probable ABW (194 of 3,068) have a significant change.

Hydromorphological changes are summarized in Fig. III-22 and shown in Fig. III-23 of the *Water Management Plan of the Republic of Serbia*. The scope of the CBCP is dominated by: water abstractions, barriers and cascades, dams. There is little pressure from regulation and reservoirs and they are absent from ballast, fish ponds and drains.

Quality of sediments

The highest concentrations of heavy metals in the scope of CBCP are measured as follows: - zinc and lead (Pb) in the Borska Reka of the Slatina Profile, - copper in the Veliki Timok of the Chokonar Profile, Pesticides were measured in the river sediments of the Rasina River of the Lepenats Profile, and in the Zapadna Morava River and Nishava - concentrations of dichlorodiphenyltrichloroethane. Triazine pesticides (terbutryn, terbulthylazine, distilterbulazine, metolachlor) are present in the Beli Timok river sediments of the Zaječar profile without exceeding the maximum concentration limits.

Invasive species

Serbia's aquatic ecosystems, especially in the northern, lowland parts, are under great pressure from biological invasion. The Danube is part of the southern European invasion corridor. The number of allochthonous species by taxa in Serbian waters is given below: Algae - 2 pcs.; Aquatic macrophytes >10 pcs.; Amphibians 26 pcs.; Fish 26 pcs. ; Parasites - unknown number. The high level of pressure from invasive species is assessed as “strong” to “very strong” on the basis of an index proposed for use in the Danube basin and the major Serbian rivers Danube, Sava, Tisa, Tamish and Velika Morava.

Floods

It is estimated that floods potentially threaten about 18% of the territory of the Republic of Serbia, mostly the Danube, Tisa and Sava coasts, lesser Morava, Drina, Kolubar, Timok, etc. A correlation has been established between water quality and flooding: positive - decreasing concentrations of pollutants, self-processing and negative, such as mobilization of substances from sediments, extraction of nutrients and pollution from destroyed buildings, tailings ponds, landfills, etc.

Drought

Reducing flow negatively affects the ecological situation as a significant number of plants and animals require a certain water regime. An analysis of the drought index shows that the trend of increasing drought frequency began in the late 1980s and that since the end of the 19th century and that this indicator is the highest in recent decades.

Climate Change

The trend of increasing average annual temperatures in the Republic of Serbia is higher than the trend of increasing average global temperatures, especially after 1980. The average downward trend in the average annual flow in Central Serbia is about 20-25% per 100 years. The smallest changes are in the south-west of Serbia and the largest in the east. At the same time, in the second half of the 21st century average annual precipitation is expected to start decreasing and at the end of the 21st century

central and especially southern Serbia will see the largest decrease in precipitation - to more than 10% compared to the period 1986-2005.

Environmental state

Rivers.

Based on the monitoring of biological parameters, the environmental state is estimated at about 800 GB. By grouping, 1,070 groups of surface BW were defined - Fig. VI.2 of the *Water Management Plan of the Republic of Serbia*. Overall, the results show that out of 1062 GB excellent ecological status have 273 (26%) surface BW, and good - 220 (21%) surface BW. Moderate status has 297 surface BW or 28%. Weak status has 181 surface BW- 17% and 91 - 8% surface BW have poor status. Fig. VI.3 of *the Water Management Plan of the Republic of Serbia*. Within the scope of the CBCP are approximately equally spread surface BW with excellent, good and moderate status, as well as unknown status. Fewer bodies are represented with weak and poor status.

The lakes and reservoirs are classified as likely HMBW and ABW. Their environmental potential has not been evaluated.

Chemical status.

For many priority and priority hazardous substances in surface BW, pollution is low or absent. It is local, related to mining or combustion, as well as agriculture - pesticides and herbicides. Another 153 organic substances come from households, hospitals, industry. Out of the total number of 185 surface BW, which are observed 107 pcs. have good chemical status, 78 pcs. do not have good status. 3,031 are with unknown chemical status. Within the scope of the CBCP, 41 bodies of water in good chemical status and 11 in poor status have been identified and the rest are with unknown status - Fig. 4.9 of *the Water Management Plan of the Republic of Serbia*.

For 2018, GB in the scope of the CBCP are with very good and good status in terms of nitrogen, ammonium and nutrients. Under orthophosphate there is also a moderate condition. In river Timoc have been established above the maximum permissible concentrations of nickel and cadmium. Sustainable organic chemicals have not exceeded the maximum permissible concentrations, see Annual Environmental Report of the Republic of Serbia - Fig. 43-53 and Tables 3-5. Appendix 12 - Environmental status of GB in the Republic of Serbia and Appendix 13 - Chemical status of surface BW in the Republic of Serbia from *the Water Management Plan of the Republic of Serbia.*

Quality of drinking water.

Physico-chemical and microbiological deficiencies of drinking water have not been detected in about 50% of the central water supply systems, and especially in central Serbia - 65-70%. The problem of poor water quality is mainly present in small systems, while in large systems it is within the limits of maximum permissible concentrations. The problem of insufficient protection of water sources is present regardless of the size of the system. *Strategy for water management in the Republic of Serbia by 2034. Table 17.*

According to the Annual Environmental Report of the Republic of Serbia, the main conclusions for drinking water for the yer 2018 are: 1) Appropriate physical-chemical and microbiological condition have 61% of public water mains in cities and 15.6% of water mains have both disadvantages; 2)

physical-chemical deficiencies have 26.6% of public water mains in cities; 3) microbiological deficiencies have 27.9% public water mains in cities.

According to the Spatial Development Plan of the Republic of Serbia, significant environmental impacts have: - Use of agricultural land and agriculture and fisheries; - Use of natural resources, forests and hunting; - Use of water infrastructure; - Mineral raw materials and mining; - Tourism; - Transport and communications; - Energy and energy infrastructure; - Environmental management; - Waste management; - Sustainable use of natural values and cultural values.

B. Groundwater

➢ ***Regions in the Republic of Bulgaria***

DRBM

Considering the layout of the aquifers in a number of regions and without following a strict stratigraphic sequence, the outlines of the groundwater bodies are located in 8 layers for the whole territory of the Republic of Bulgaria, which on the territory of the DRBD are presented in 6 layers.

As a result of the accession and merger of some of the bodies transferred from the Black Sea basin management area to groundwater bodies of the DRBM, for the first RBMP a new allocation of groundwater bodies (GB) by strata was made as follows:

- first layer - Quaternary and Neogene aquifers with interstitial waters
- second layer - Neogene aquifers with interstitial waters
- third layer - Neogene aquifers with karst and karst-interstitial waters
- fourth layer - Upper Cretaceous aquifers
- fifth layer - aquifers of Triassic-Jurassic-Cretaceous
- sixth layer - Upper Jurassic - Lower Cretaceous - Malm-Valangian aquifer.

By applying the characterisation approach, an initial and additional characterisation of the groundwater bodies has been carried out. Each groundwater body is assigned a code, name, delineation criteria, a number of geological and hydrogeological indicators, including the relationship with terrestrial and aquatic ecosystems. The stratigraphy of each groundwater body is embedded in the very name of the body. The relevant processed data are specified in *Appendix 1.3.2.1 of the RBMP*.

Table 2.1.3.B-1 gives some basic characteristics of groundwater in the DRBM.

Table 2.1.3.B-1 *Groundwater bodies in DRBM*

No by order	Name of the GB	Code of GB	Type of GB	Area of GB	Natural resources of GB	Available resources	Permitted water quantities
				km^2	l/s	l/s	l/s
1	2	3	4	6	7	8	9
1	Interstitial waters in Quaternary - Bregovo-Novoselska Valley	BG1G0000QAL001	ff	1,374	488	488	73

2	Interstitial waters in Quaternary - Vidin Valley	BG1G0000QAL002	ff	2,014	1106	1104	418
3	Interstitial waters in Quaternary - Archar-Orsoyska Valley	BG1G0000QAL003	ff	489	347	347	142
4	Interstitial waters in Quaternary - Tsibar Valley	BG1G0000QAL004	ff	186	114	114	0
5	Interstitial waters in Quaternary - Kozloduy Valley	BG1G0000QAL005	ff	393	156	156	387
6	Interstitial waters in Quaternary - Ostrovska Valley	BG1G0000QAL006	ff	251	111	111	44
7	Interstitial waters in Quaternary - Karaboazka Valley	BG1G0000QAL007	ff	2,221	649	647	69
8	Interstitial waters in Quaternary - Belene-Svishtov Valley	BG1G0000QAL008	ff	1,881	634	634	830
9	Interstitial waters in Quaternary - Vardim-Novograd Valley	BG1G0000QAL009	ff	336	230	230	254
10	Interstitial waters in Quaternary - Brashlyan Valley	BG1G0000QAL010	ff	2,178	1014	1014	294
11	Interstitial waters in Quaternary - Popinsko-Garvanska Valley	BG1G0000QAL011	ff	200	82	82	31
12	Interstitial waters in Quaternary - Aydemir Valley	BG1G0000QAL012	ff	401	725	725	420
13	Interstitial waters in the Quaternary of the river Lom	BG1G0000QAL013	ff	1,496	474	461	41
14	Interstitial waters in the Quaternary of the river Tsibritsa	BG1G0000QAL014	ff	630	135	135	33
15	Interstitial waters in the Quaternary of the river Ogosta	BG1G0000QAL015	ff	2,504	808	790	55
16	Interstitial waters in the Quaternary of the river Skat	BG1G0000QAL016	ff	1,098	252	247	37
17	Interstitial waters in the Quaternary of the river Iskar	BG1G0000QAL017	ff	3,508	1497	1395	163
18	Interstitial waters in the Quaternary of the river Vit	BG1G0000QAL018	ff	1,888	648	615	419
19	Interstitial waters in the Quaternary of the river Osam	BG1G0000QAL019	ff	3,663	1000	913	151
20	Interstitial waters in the Quaternary of the river Yantra	BG1G0000QAL020	ff	4,740	970	929	154
21	Interstitial waters in the Quaternary of the river Rusenski Lom and the tributaries	BG1G0000QAL021	ff	1,444	379	362	134

22	Interstitial waters in the Quaternary of the river Suha	BG1G0000QAL052	ff	432	57	56	9
23	Interstitial waters in the Quaternary of the river Rositsa in the Sevlievska kot	BG1G0000QAL022	ff	560	105	100	35
24	Interstitial waters in the Quaternary - between the Lom and Iskar rivers	BG1G0000QPL023	ff	28,866	1930	1734	54
25	Interstitial waters in the Quaternary - between the rivers Iskar and Vit	BG1G0000QPL024	ff	7,667	377	301	50
26	Interstitial waters in the Quaternary - between the rivers Vit and Osam	BG1G0000QPL025	ff	9,989	869	721	151
27	Interstitial waters in the Quaternary - between the rivers Osam and Yantra	BG1G0000QPL026	ff	19,765	1512	1399	131
28	Interstitial waters in Quaternary - Vratsa torrential cone	BG1G00000QP027	ff	701	142	138	24
29	Interstitial waters in Neogene-Quaternary - Botevgrad valley	BG1G00000NQ028	ff	1,479	225	204	52
30	Interstitial waters in Neogene-Quaternary - r, Nishava	BG1G00000NQ029	ff	669	164	159	5
31	Interstitial waters in Neogene-Quaternary - Sofia valley	BG1G00000NQ030	ff	10,885	1482	1405	993
32	Interstitial waters in Neogene-Quaternary - Samokov valley	BG1G00000NQ031	ff	1,704	380	372	0
33	Interstitial waters in Neogene-Quaternary - Znepolska valley	BG1G00000NQ032	ff	419	91	83	0
34	Interstitial waters in Neogene - Sofia hollow	BG1G000000N033	p	10,885	400	400	377
35	Interstitial waters in Neogene - Pleven hollow	BG1G00000N2034	p, ff	30,725	1696	1676	130
36	Interstitial waters in Neogene - Ruse - Silistra region	BG1G00000N1035	ff	17,432	881	871	18
37	Karst waters in Lom-Pleven depression	BG1G00N1BP0036	p	65,739	4204	4131	362
38	Karst-interstitial waters in Neogene - Sarmatic - Dobrudzha	BG1G000000N049	ff	32,477	4807	4803	37
39	Karst waters in Lom-Pleven basin	BG1G0000K2M047	p	20,080	940	905	48
40	Karst waters in Predbalkana	BG1G0000K2S037	ff	14,860	5027	4823	6
41	Fissure waters in the region of Erma and Iskar rivers	BG1G00000K2038	ff	21,080	816	692	62
42	Karst waters in the Gorno-Malinski massif	BG1G00000K2039	ff	490	200	192	8

43	Karst Waters in Lovech-Tarnovo	BG1G00000K1040	ff	13,852	2578	2445	34
44	Karst waters in the Ruse Formation	BG1G0000K1B041	ff	66,260	11223	11136	1061
45	Karst waters in Razgrad formation	BG1G000K1HB050	ff	49,281	3730	3627	131
46	Karst waters in Mramorensk	BG1G000K1AP043	ff	718	206	203	18
47	Karst waters in the Zapaden Balkan	BG1G0000TJK044	ff	33,687	5798	5661	37
48	Karst waters in the Central Balkan	BG1G0000TJK045	p	94,068	10246	9495	78
49	Karst waters in Godech ma	BG1G00000TJ046	ff	18,337	4912	4752	40
50	Karst waters in Malm-Valanginian basin	BG1G0000J3K051	p	131,045	4294	4242	648

Note: In column 4: p - pressure; ff - free-flow

The information of the connection GB with surface waters and the extent of the connection

The determination of the degree of interaction between groundwater and associated surface water for the territory of the DRBM is determined in the development of a public procurement on the topic : "Determination of groundwater pollution thresholds and development of a classification system for the chemical status of groundwater bodies" for the first RBMP 2010-2015

For the assessment of the degree of interconnection between surface water and groundwater, a specific methodology has been developed, detailed in the topic.

As a result of the application of the methodology, the degree of interconnection (Кв) is assessed on the basis of the following graduation:

0% ≤ Кв ≤ 30% - low;

30% ≤ Кв ≤ 70% - average;

70% ≤ Кв ≤ 100% - high.

For the territory of DRBM the direction and degree of interconnection of the first from the surface GB with the surface water is determined. The information is presented in *Appendix 1.3.2. of the RBMP - initial and additional characterisation of GB, in the additional characterisation - column 16 and 17.*

Cross-border groundwater bodies in Danube RBM

On the territory of the DRBM as cross-border with the Republic of Romania, 2 GB located in Layer 3 and Layer 6 are defined as follows:

- "Karst-interstitial waters in Neogene - Sarmatic - Dobrudzha" with code BG1G000000N049 (international code BG02/R02);
- "Karst waters in Malm-Valangian basin" with code BG1G0000J3K051 (international code BG04/R04).

The separation of groundwater bodies between the DRBM and the Black Sea Region for Basin Management in 2009 was a technical error in terms of overlapping parts of water bodies in a common horizon. With the GB boundary update, the error has been corrected. As a result, the boundary of the cross-border groundwater body *"Karst-interstitial waters in Neogene - Sarmatic - Dobrudzha" with code BG1G00000N1049* has been changed. The change does not constitute a substantial change in the

characteristics of the GB within the meaning of the approved approach, therefore it is not necessary to define it as a new GB (incl. with a new code).

No cross-border groundwater bodies with the Republic of Serbia are currently designated. On the border with the Republic of Serbia are outlined the groundwater bodies "Fissure waters in the region of the river Erma and the Iskar River with code BG1G00000K2038, "Karst waters in Zapaden Balkan" with code BG1G0000TJK044, "Karst waters in the Godech massif" with code BG1G00000TJ046, which are intended to be proposed for discussion as part of common cross-border groundwater bodies.

Updated review of groundwater pressure

The risk of non-achievement of environmental objectives is conditioned by the presence of human activity pressures on groundwater bodies. When conducting the groundwater pressure review, an approach developed on the basis of Guidance Document No 3 "Analysis of the Pressure and Impacts of a Common Strategy for the Implementation of the WFD" and an approach developed under the Twinning Project "Institutional Strengthening of the Basin Management Bodies in Bulgaria in the Implementation of the EU Water Framework Directive in the Danube River Basin" (*Twinning Project "WFD-Danube-Bulgaria" BG2003/IB/EN/02*) was used.

The process of anthropogenic pressure analysis includes the identification of sources and assessment of anthropogenic pressure, including its potential effects on groundwater.

The analysis of anthropogenic pressures affecting the quality (chemical state) of groundwater bodies considers the main types of pressures, namely:

- Point sources of pollution;
- Diffuse sources of pollution;
- Pressure from direct introduction of pollutants into groundwater

Information available in the DRBD and collected from other institutions has been used to carry out the evaluation.

To assess the pressure in quantitative terms, the information for each permitted groundwater abstraction in the GB is analysed and summarised. The information is also analysed in general for individual water use purposes (driving forces).

Assessment of pressure from point sources

The following types of sources are analysed:

- Industrial installations with issued complex permit (CP)
- Industrial installations without issued complex permits
- Significant household waste water discharges - urban sewers and urban waste water treatment plant (UWWTP)
- Agricultural sites - warehouses for fertilizers and pesticides
- Landfills
- Mines, tailings ponds

The analysis according to the approach is carried out for groundwater bodies that have an exposed area. After processing the available information for all point sources, the following was established:

- At risk of not achieving good condition due to pressure from point sources only, 2

groundwater bodies were assessed - groundwater body "*Interstitial waters in the Quaternary - Aydemir Plain*" with code BG1G0000QAL012 and groundwater body "*Interstitial waters in the Quaternary - river. Vit*" with code BG1G0000QAL018.

- The main drivers of pollution in the GB "*Interstitial waters in the Quaternary - Aydemir Plain*" are discharges of domestic waste water -12 pcs and unregulated landfills - 8 pcs, while in the GB "*Interstitial waters in the Quaternary - river Vit*" the main pressure, adversely affecting the good condition in this case is caused by the warehouses for pesticides - 14 pcs. and discharges of household wastewater- 10 pcs. In 5 pcs. groundwater bodies there is not a single *significant point source of pollution.*

There are no cases of direct disposal of hazardous and noxious substances in groundwater in the DRBM. Wastewater from the extraction of oil and gas into aquifers at great depth in parts of the subsoil from which oil and gas has been extracted and which cannot be used for other purposes is permitted, as they do not contain fresh groundwater. These aquifers are not separated into groundwater bodies. There is a discharge of water (after treatment in a treatment plant) in the roof loess layers of the Sarmatian aquifer, which layers are not separated and/or connected to an underground water body. For the above cases, monitoring of the below-lying groundwater bodies is provided.

Assessment of pressure from diffuse sources

The following types of sources were *analyzed:*

- Agriculture (arable land, permanent crops, grassland, heterogeneous farms);
- Settlements without a sewer system;
- Underground mining sections (mines, gas deposits, quarries);
- Sections with a high degree of susceptibility to erosion.

After analysis of the diffuse pressure on each groundwater body, it was found that:

- 32 groundwater bodies (64%) are rated as loaded from diffuse sources
- The main driving force causing diffuse pollution is agriculture, due to the highly developed agricultural activity in DRBM. Another significant source of pollution are the settlements without built sewers.
- In 9 groundwater bodies (18%) the area affected by diffuse pollution exceeds 90% of the exposed area of the water body. The main driving force causing this significant pressure is also agriculture.

The identified specific sources of pressure (point and diffuse) for each individual water body are presented on separate maps (by bodies) in a common file - *Map 1.3.2.1 to the RBMP.*

Assessment of water abstraction pressure

The pressure of groundwater abstraction in the DRBM is determined according to the developed unified national approach. For this purpose, the information for each permitted abstraction from groundwater in the GB is analysed and summarised. The information is analysed in general and for individual water use purposes. In determining the pressure and impact, the flow rates of the natural springs, draining GB are not included. In determining the pressure from water abstraction for agricultural purposes, account shall also be taken of the water quantities foreseen by farmers for irrigation of

individual farms in the following 5 years, determined in accordance with a specific survey carried out.

The following were used to determine the pressure from water abstraction: the registers of permits issued for groundwater abstraction, the registers of wells to meet citizens' own needs and the register of groundwater bodies' resources for each GB. The registers are drawn up on GB. The register of GB resources updated according to the approach is presented in *Appendix 1.3.2.3 of the RBMP*.

Water abstraction pressure is defined as significant when the service index is above 40% (for the whole or part of the GB), determined by the module of available GB resources and area of GB/region.

In *Appendix 2.3.3.1 of the RBMP*, the water abstraction pressure on groundwater bodies is presented in tabular form determined according to the water abstraction objectives and for the total (aggregate) water abstraction for all purposes, as well as for the sections of the GB.

In *Appendix 2.3.3.2 of the RBMP*, the pressure is presented in two tables, one in l/s and the other in m^3/year. The permitted annual water quantities are compared with the annual values of the available resource. There are no permitted water quantities for two GB. The water abstraction pressure in GB and in quantitative terms is shown **in Figure** 2.1.3.B-1 and **Table 2.1.3.B-2**.

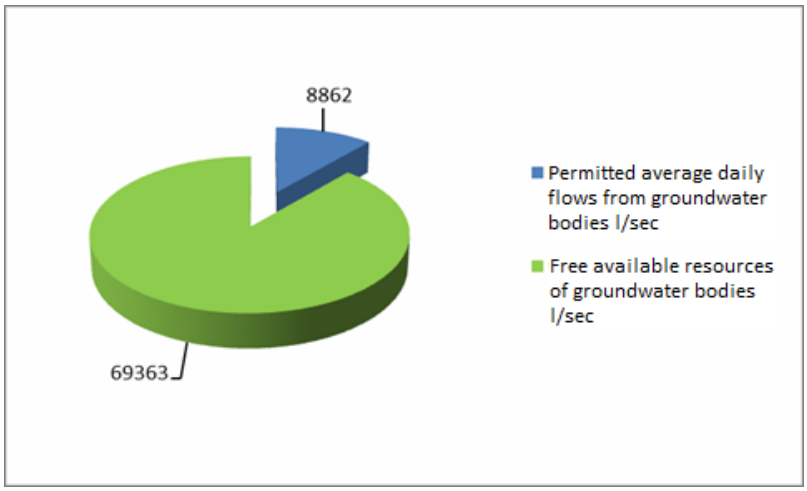


Figure 2.1.3.B-1. *Pressure from water abstraction of GB*

Table 2.1.3.B-2 *Amounts of groundwater used for different needs*

Permitted water quantities of GB by water abstraction targets not total, l/s	For central drinking and household water supply to the population, l/s	For agricultural objectives (irrigation and livestock), l/s	For industrial targets, l/s	For refrigeration or power generation (excluding HPP), l/s	For aquaculture, l/s	For meeting citizens' (households') own needs, l/s	Others, l/s
8862	4954	846	777	1016	4	387	878

Permitted annual water quantities broken down by water abstraction target and by driving power are presented in **Table 2.1.3.B-2**. The analysis shows that 57% of the allowed water quantities are for

drinking and domestic water supply to the population, followed by 21% for induction (industrial and cooling), 10% of the allowed water quantities are for other purposes, 10% for agriculture and 4% for own needs.

The assessment of the water abstraction pressure shows that out of 50 groundwater bodies, 9 GB are subject to significant pressure and 41 GB are not subject to pressure, respectively, with 25 GB defining 61 sections that are subject to significant water abstraction pressure.

Assessment of climate change pressures

The good state of groundwater is crucial for achieving the country's environmental and socio-economic goals.

Groundwater abstraction can cause changes in water levels, with consequences such as the attraction of salt or polluted water, adverse effects on the state of associated surface waters or ecosystems, loss of habitats (e.g. wetlands), adverse effects on the drinking and domestic water supply of the population.

The change in groundwater levels may also be the result of climate change (decrease in precipitation, increased temperature).

Climate change pressures have been assessed on the basis of precipitation change scenarios on the groundwater body feeding zone (exposed area). On this basis, resource change (GB feeding) has been assessed and a national approach has been developed in 2010 to annually determine the average multiannual feeding of groundwater bodies according to the available monitoring of water quantity. The approach is based on an empirical comparison of the annual average precipitation on the exposed part (feeding) of groundwater bodies and precipitation (feeding). This approach was required due to insufficient data from direct measurements of groundwater levels and flows, allowing estimation based on measured water levels.

In 2011-2012, a *"Methodology for determining groundwater resources taking into account the change in climate factors and the monitoring of the amount of water required for its implementation"* was developed.

According to the approach developed and approved in 2015 for the characterisation of GB, the part of the water quantity for ecosystems that is provided by groundwater has been determined and then recalculated into available GB resources.

The assessment of the pressures and impacts of climate change on groundwater has been carried out as a result of scientific work on the topic *"Assessment of the pressures and impacts on surface and groundwater of climate change and assessment of the availability of water for economic sectors", on the basis of which "Approach for assessment of the pressures and impacts on surface and groundwater of climate change and assessment of the availability of water for economic sectors"* has been prepared.

Climate change and the ratio of "surface /groundwater" - the precipitation left after evapotranspiration - form the two parts of the flow - "surface" and "groundwater". The first part covers those precipitation waters that drain directly into the terrain, to the nearby gullies and river valleys. The remainder infiltrates the depth, reaches the groundwater level and forms the underground flow in the massif. The ratio between these two components for the country as a whole is 70% to 30% in favour of the purely surface flow. Of course, for individual catchments this ratio is different.

If we summarize all the above, we come to the conclusion, that the results of the forecasts show that the expected climate changes will undoubtedly affect to some extent the groundwater status in Bulgaria - both in terms of quality and quantity (resources). In particular, the following main conclusions and expectations can be formulated:

- Considering the predicted changes in climatic performance (temperature and precipitation) through climate modelling, changes in the quantitative and qualitative state of our groundwater will occur, but they will be within moderate limits. We should not expect any very radical (disastrous) changes.
- Groundwater resources will increase in the first two forecast periods and decrease in the third period. In both directions, the changes will be almost everywhere, within a range of no more than 10-15% of current resources. Therefore, no critical dehydration of our groundwater is expected.
- The quality (composition) of groundwater as a whole will not undergo major changes, i.e. no significant and general deterioration of its quality due to climate should be expected. Climate impacts cannot fully cover all groundwater bodies, but can create local problems, the significance of which will depend on the particular type of impact and the particular hydrogeological conditions. This significance can only be assessed after a specific study on the impact and conditions in the affected area (water body).
- Should be considered, that all provisions (of both climate change and resulting impacts on water) are made for decades to come and contain some conditionality and uncertainty. Therefore, the availability of well-organised and systematic monitoring observations is particularly important. For groundwater in particular, it will be essential to improve and maintain a fully functioning monitoring network to monitor water flows, levels, temperatures and composition. It will help to identify potential adverse trends and take the necessary measures to protect water in a timely manner.

The analysis of the data on the determined available resources for the period 2010-2014, provided by the National Institute of Meteorology and Hydrology at the Bulgarian Academy of Sciences (NIMH) (considering that data from the previous year are provided), shows that as a result of climate change, the natural resources of GB are reduced, and hence the available resources are reduced.

Monitoring and assessment of surface and groundwater status

Data from the monitoring of the chemical status of groundwater is a basis for identifying significant and sustainable trends for increasing the concentration of each pollutant in groundwater and for implementing measures to direct them in the opposite direction.

The results of water monitoring, as well as of own monitoring, are the basis for control and sanctions for breaches of regulatory requirements.

The DRBD develops the following groundwater monitoring programmes in the DRBM.

- a programme for control and operational monitoring of the chemical status of water;
- a water monitoring programme for drinking water protection zones;
- a monitoring programme for nitrates in waters in nitrate vulnerable zones;
- a programme for monitoring the quantitative status of water.

In accordance with the requirements of the regulations, the so-called *exploratory monitoring* is also carried out if necessary. The appointment and implementation of this type of monitoring is in cases where the cause of the pollution is unknown, as well as to specify the magnitude of the impact of accidental pollution.

Control and operational monitoring data in the DRBD are used to determine pollutant trends.

For the period 2010-2013 in the implementation of the control and operational monitoring program approved by Order РД 715/02.08.2010 of the MoEW are included 100 points for monitoring the chemical status of groundwater. Since 2013 and currently in the program for control and operational monitoring of the chemical status in implementation of Order РД 182/26.02.2013 of the MoEW the monitoring points are 99. Point with code BG1G00000NQMP167 Yana station, MP 32 "Murgash plant" was dropped due to demolition.

Currently, out of 99 monitored points, all of which are included in the control monitoring programme, 26 of which are also designated for operational monitoring.

In the control and operational monitoring programme, each monitoring point shall have a specific scheme for subscribing and analysing indicators divided into the following groups:

Physico-chemical indicators

Group I Basic physico-chemical indicators:

- dissolved oxygen, active reaction, electrical conductivity, nitrates, ammonium ions, water temperature, permanganate oxidation, total hardness, calcium, magnesium, chlorides, sodium and potassium, sulphates, hydrogen carbonates, carbonates and dry residue

– analysed at all groundwater points seasonally (four times a year) or half-yearly (twice a year).

Group II additional physico-chemical indicators:

- nitrites, phosphates, total iron, manganese - analysed at all groundwater points seasonally (four times a year) or half-yearly (twice a year).

Specific pollutants

Group I - metals and metalloids:

- lead, cadmium, arsenic, mercury, copper, zinc, nickel, total chromium, chromium three and hexavalent, strontium, total alpha and beta activity - analysed all or individual indicators at half-year (twice a year) or once a year.

Group II - organic pollutants:

- trichloroethylene, tetrachloroethylene, aldrin, dieldrin, endrin, atrazine, simazine, propazine, endosulfan, methoxychlorine, heptachlor, chlordane, DDT/DDD/DDE, HCH-compounds, acetochlor, pendimethalin , flutriaflor, triadimenol, mancozeb, alachlor, cypermethrin;

– analyses shall be carried out once a year.

Based on the requirements of the Waters Act, the DRBD prepares a water monitoring program in the drinking water protection areas for GB, which have an average daily flow rate of more than 100 m^3. This programme complements the control and operational monitoring programmes for groundwater. The points of the monitoring programme in the drinking water protection zones are part of the

groundwater control and operational monitoring programme. These are water abstraction facilities at pumping stations for drinking and domestic water supply. Groundwater monitoring in drinking water protection areas shall be carried out between the control monitoring. The indicators observed in the implementation of this programme are identical to the above groups of indicators analysed in the control monitoring in groundwater.

Assessment of chemical status of groundwater

The assessment of the chemical status of groundwater was carried out by applying an approved approach developed in accordance with the requirements of Directive 2000/60/EC, Directive 2006/118/EC on the protection of groundwater against pollution and deterioration, Ordinance No.1 on the study, use and protection of groundwater, Guidance No.18 on the assessment of the status and trends and Guidance No.17 on the prevention or limitation of direct and indirect discharges.

The evaluation uses the results of the monitoring carried out under the national programme for the period 2010-2014 and the networks for own monitoring of permit holders for the same period - 2010-2014.

The main criteria used in the assessment of the chemical status are the quality standards defined in *Appendix No.1 to Ordinance 1/2007 for the study, use and protection of groundwater* and the threshold values of the pollution indicators.

The results of the chemical status assessment and the plausibility assessment are presented in *Appendix 4.2.2.1 and Appendix 4.2.2.2, respectively, of the RBMP*.

The results of the chemical status assessment show that out of the 50 groundwater bodies (GWBs) within the territory of the Danube region:

- 22 bodies were assessed in "poor" chemical status;
- 28 bodies were assessed in "good" chemical status;

The largest share have GWBs with increased concentrations above the quality standard for **nitrate** content – 14 GWBs - BG1G0000QAL001, BG1G0000QAL002, BG1G0000QAL011, BG1G0000QAL013, BG1G0000QAL019, BG1G0000QAL052, BG1G0000QPL025, BG1G0000QPL026, BG1G00000N2034, BG1G00000K1040, BG1G0000K1B041, BG1G0000TJK045, BG1G000K1AP043, BG1G000K1HB050, as for one of them – BG1G0000K1B041 in addition to nitrates, values above the standard have also been established for phosphates. In a body with code BG1G0000TJK045, increased ammonium levels have also been identified in parallel with nitrates.

Nitrate values bordering the quality standard are also observed in the body with code BG1G0000QAL004.

Nitrate pollution is associated with areas where there is evidence of “historical pollution” according to the indicator nitrates – such evidence is present in Vidin and Montana districts.

Two bodies were found to have increased values of concentrations above the quality standard for the total **chromium** indicator. These are bodies with codes: BG1G0000QAL004 and BG1G0000QAL007. According to available information on the sources of pollution in the Danube Region Basin Directorate, there is no possible anthropogenic source of such pollution in the area –

presumably due to the incoming waters from loess deposits, which have naturally high chromium content in this part of the country.

Two bodies were found to have deviations from the requirements for good condition according to **iron** and **manganese** indicators. These are bodies with the following codes: BG1G00000NQ030 and BG1G000000N033.

Two bodies were identified with exceeds of the standard according to **manganese** indicator. These are bodies with codes: BG1G0000QAL018 and BG1G00000NQ031. In the body with code BG1G0000QAL018, **ammonium** above the standard is also observed.

According to the available information, there are groundwater bodies on the territory of the Danube Region Basin Control for which naturally increased levels of the manganese indicator have been established. It is due to:

- its extraction from manganese-containing minerals in rocks in the region of groundwater – manganese in FTP BG1G0000QAL022 is of such origin;
- The dissolution of various manganese compounds accumulated in sedimentary rocks and in quaternary deposits in the process of their precipitation – of such origin is manganese in groundwater in bodies with codes BG1G0000QAL009 and BG1G0000QAL021;
- Mixed type in which increased concentrations of manganese are the result of natural causes and as a result of anthropogenic pressure – of such origin is manganese in groundwater in bodies with codes BG1G00000NQ030 and BG1G000000N033.

In two bodies with codes BG1G0000QAL022 and BG1G00000NQ029, increased values of **iron** indicator above the quality standard have been established.

Information on "historical pollution" according to the **arsenic indicator** in groundwater is available for the region of Kobilyak with code BG1G0000K2SMP203 – monitoring point of the programme for control monitoring of the chemical status of groundwater body with code BG1G0000K2S037. The area is local and so far there is no prevalence in other areas of the body. Based on the results obtained in the Danube Region Basin Directorate from studies conducted in the Ogosta River region, it was found that the excess arsenic content in the area is due to the fact that for millions of years natural erosion has been destroying arsenic-containing ordnance located high in the relief and transported this material in river valleys. In addition, it should be taken into account that for years in the past a trailing with arsenic content was discharged directly into the river.

Assessment of the quantitative status of groundwater

In accordance with the Groundwater Directive, a status assessment has only been carried out for GB identified as at risk. GB for which it has been established that there is no risk are automatically classified as such in good condition.

The assessment of GB quantitative status has been carried out using available GB quantitative status monitoring data and own monitoring data on water levels in groundwater abstraction facilities.

The main criteria for assessing good quantitative status are available GB resources and groundwater level.

The GB is identified in good quantitative condition when all of the following criteria are met:

- The level of groundwater in the GB shall be such that the available resources are not exceeded by the total average multiannual abstraction, including abstraction on the basis of water abstraction permits issued and abstraction from wells to meet citizens' own needs;
- Changes in the level of groundwater resulting from abstraction have not caused a temporary or permanent change in the direction of flow, including in limited areas which may lead to:
    - failure to achieve the objectives for the related surface water bodies;
    - significant deterioration of surface water bodies;
    - significant damage to terrestrial ecosystems directly dependent on GB.
    - the attraction (intrusion) of salt water or other contaminated water;
    - a continuous and clearly defined anthropogenic tendency to change in the direction of flow, which can lead to intrusions.

Different elements of the definition of good quantitative status have been tested to verify compliance with these criteria. The assessment of GB quantitative status was carried out according to data for the period 2010-2013, and all available data from 2000 to 2013 were used in the tests evaluating trends.

The approved approach has been used to assess the quantitative situation. According to the approach, the quantification was carried out on the basis of the following tests: *Water Balance, Surface Water Flow, Groundwater Dependent Terrestrial Ecosystems and Salt or Contaminated Water Intrusion.*

Test Water Balance

For the determination of GB quantitative status, the water balance method (available resources minus the total annual abstraction from GB under water abstraction permits and from citizens' own wells) has been used, as there is currently no reliable information on groundwater levels in the entire GB to assess the existence of a sustained long-term decrease in water levels caused by long-term abstraction, as follows:

- **The available GB resources** are determined using the methods described in the approach for further characterisation of GB;
- **The total annual abstraction** from GB is determined according to: for authorised water abstractions for which no information is available on the quantities of water drawn, established in the course of the control of the abstraction or provided by water users for the purpose of calculating the annual water abstraction fee due. In determining the total abstraction, the following are not taken into account: drainage of GB from natural springs, drainage of GB from drains or other drainage facilities, evaporation from surface groundwater (quarries for aggregates extraction and open drainage facilities).

The GB is identified as being in good quantitative condition when the available GB resources (GB average multiannual feeding minus ecosystem water requirements) are not exceeded by the total annual groundwater abstraction from the GB and at the points of the national GB quantitative monitoring network (where available) there is no downward trend in water levels between 2010 and 2013.

Where the available GB resources (GB multiannual average feeding minus water required for ecosystems) are exceeded by the total annual groundwater abstraction from GB and/or in one or more points of the national NIMH network for monitoring the quantitative status of GB (where available), a downward trend in water levels has been observed between 2010 and 2013. GB are defined in poor quantitative condition.

The results of the assessments are presented *in Appendix 4.2.3.1.1 - water balance test of the RBMP (for all GB) (containing columns:* GB *code, GB name, GB resources available (in cubic metres/year), total GB abstraction (in* m^3*/year), GB quantitative status.*

The assessment of the quantitative status through water balance shows a free available resource of 73,430 l/s and abstracted water quantities 4,795 l/s, respectively total available resource 78,225 l/s. 61% of the abstracted water quantities are for drinking-water supply to the population, followed by 19% for industry (industrial and cooling), 9% of the abstracted water quantities are for other purposes, 8% are for drinking-water supply and 3% for agriculture

West Aegean Basin Control Region

The submitted information is in accordance with *the River Basin Control Plans of the West Aegean Region for the period 2016-2021*.

In WABCR are formed all main types of groundwater – cracks, karst (karst-cracks) and pore. Depending on the type of collector, the water-consuming geological structure, the nature and conditions of drainage and feeding, and the interconnection with surface water bodies, groundwater bodies (GWBs) (Map 1.3.2.a – the numbering is in accordance with the RBCP) are separated into the following types:

- Water bodies in the alluvial deposits of the rivers – 10 pcs. (Map 1.3.2.b – numbering is in accordance with the RBCP);
- Water bodies in graben-like depressions – 7 pcs. (Map 1.3.2.c – the numbering is in accordance with the RBCP);
- Water bodies with crack waters – 11 pcs. Map 1.3.2.d. – numbering is in accordance with the RBCP);
- Water bodies in areas with karst basins located in areas with propagation of rupture collectors – 4 pcs. (Map 1.3.2.e – numbering is in accordance with the RBCP)
- Water bodies in separate karst basins – 6 pcs. (Map 1.3.2.f – numbering is in accordance with the RBCP).

The 2 GWBs closest to the border with the Republic of Serbia are:

- BG4G000T2T3028 – Karst waters in the Zemen Karst Basin;
- BG4G00001Pg039 – Crack and pore waters in Osogovski Paleogene Volcanogenic-Sediment Complex.

Assessment of the possible cross-border transmission will be made when the groundwater levels in the Republic of Serbia in the border regions with the Republic of Bulgaria are delineated.

The natural available resources of GWBs for WAR in total are 10,242 l/s, with quantities required for ecosystems of 1,263.9 l/s and available resource of 8,978.1 l/s.

For 8 out of 38 pcs. GWBs has been identified connection with surface water bodies. All 8 GWBs are of the 1st horizon and are of type GWBs in the alluvial deposits of the rivers. With a high and medium

degree of interconnection with surface water bodies have 3 pcs. GWBs, and 2 pcs. GWBs are defined with low degree.

Review of groundwater pressure

Based on collected, analysed and processed information in the West Aegean region, the following categories of groundwater pressure have been identified:

- **point sources of pollution** – Urban waste water treatment plants (UWWTPs), installations with Complex Permits (CP), industrial enterprises with Water Act permits, landfills ((*with an area of up to 0.25 km^2*), mines, quarries and tailings ponds (*with an area of up to 0.25 km^2*), contaminations from mining activities (*with an area of up to 0.25 km^2*) have been identified as significant such sources. There is no direct disposal of pollutants in the GWBs on the territory of the WABCR. The highest percentage of the types of point sources of groundwater body pollution is occupied by discharges of domestic waste water from settlements and sites with issued permits for discharge of waste water into a surface water body. Within the territory of the WABCR there are no groundwater bodies identified for which the pressure from point sources of pollution is significant.
- **diffuse sources of pollution** – agriculture, landfills (*with an area of more than 0.25 km^2*), mines, tailings ponds (*with an area of more than 0.25 km^2*), pollution from past activities (*with an area of more than 0.25 km^2*), settlements without or with partially built sewers have been identified as significant such sources. Agriculture has the largest share – 76%. For 9 of total 38 groundwater bodies in the WABCR the pressure from diffuse sources of pollution is identified as significant.
- **groundwater abstraction** – The water abstraction pressure is defined as being exceeded for 8 groundwater bodies where the operating index exceeds 40%. In 5 of these 8 groundwater bodies, the operating index for a specific purpose (driving force) is over 40%, respectively the pressure from that purpose is defined as significant. Areas (aggregated water abstraction systems) with significant groundwater body abstraction pressures have also been identified. Within the WABCR there is no identified pressure from artificial feeding of groundwater.
- **climate change** – In the first two forecast periods (2013-2042 and 2021-2050) some increase in natural groundwater resources is expected – mainly related to some increase in precipitation. In the third forecast period (2071-2100), a decrease in resources emerged - associated not so much with a decrease in precipitation as with an increase in evapotranspiration (due to higher temperatures).

GWBs for which there is a risk of not meeting the objectives set

The impact assessment of the quantitative state of groundwater shows that all water bodies are expected to have an impact as a result of water abstraction of at least one receptor. The final risk assessment for a poor GWB status indicates that 13 out of 38 GWBs are at risk.

No groundwater intrusions were detected in any GWB. There is no GWB at risk from point sources, but 9 GWBs are at risk from diffuse sources of pollution, thus the overall assessment of the risk of not achieving good chemical status of GWBs (for 9 out of 38 GWBs there is a risk).

- ***Regions in the Republic of Serbia***

Hydrogeological zoning

The geological structure of the territory of the Republic of Serbia is characterized by great complexity, both in terms of lithofacial and tectonic characteristics.

The structure of the terrain includes magmatic, sedimentary and metamorphic rocks, created in the period from Precambrian to modern Holocene deposits. The complexity of the geological construction and the structural assembly is also reflected in the complexity of the hydrogeological characteristics on the territory of the Republic of Serbia. In such a complex area it is possible to separate several hydrogeological units that are characterized by a characteristic geological composition and specific hydrogeological characteristics. In this sense, the following hydrogeological units are separated (**Figure 2.1.3.B-2**):

1) the region of Bachka and Banat;
2) the region of Srem, Machva and Posavo-Temnava;
3) the region of south-western Serbia;
4) the region of western Serbia;
5) the region of central Serbia;
6) the region of eastern Serbia.

The accumulation of groundwater on the territory of the Republic of Serbia occurs in rock massifs with different types of porosity:

1) Interstitial waters (Quaternary and Neogenic deposits);
2) Karst Waters;
3) Fissure waters.

From the point of view of groundwater abstraction, the most important are the accumulations in rock massifs with interstitial and karst porosity.

Interstitial water rocks

In the area of Bachka and Banat, the most important areas in terms of groundwater capture are represented by older Quaternary-Eopleistocene and Middle Pleistocene sand and gravel sediments. These deposits have a continuous spread over almost the entire Pannonian Basin. In general, polycyclic river and lake deposits constitute the main aquifer complex in the area of AP Vojvodina. Younger Quaternary sediments, sands, in places sand gravels in the area of the alluvial plain of the Danube, the lower course of Tisa and most of Western Bachka are deposited on the deposits of the main aquifer complex. The depth of the deposits of the main aquifer ranges from 10 m along the banks of the Danube, where they are about 25 m thick, to less than 100 m in the region of North-eastern Banat.

In the region of southern and especially south-western Srem, there are clusters of groundwater formed within the sand and gravel deposits of the Quaternary, which are used for the needs of the public water supply. In the aquifers of the younger Quaternary is formed a free "first" out-crop, which is in hydraulic connection with Sava. The thickness of younger Quaternary deposits varies from 15 to 50 m. In the polycyclic river-lake sand and gravel deposits of the older Quaternary (main aquifer complex) are formed 2-3 sub-artesian-artesian out-crops, separated by layers of semi-permeable aleurolites.

In the area of Machva the main environment is sandy gravel deposits of the younger and older

part of the sediments, which are practically directly connected throughout the terrain, that is, within these deposits there is a unique revelation. The largest thickness of these deposits is downstream of the Drina from Badovinac and Prnyavor to the Crna Bara and Ravne and amounts to 50 to 75 m, while in the rest of the Machva it is between 20 and 40 m.

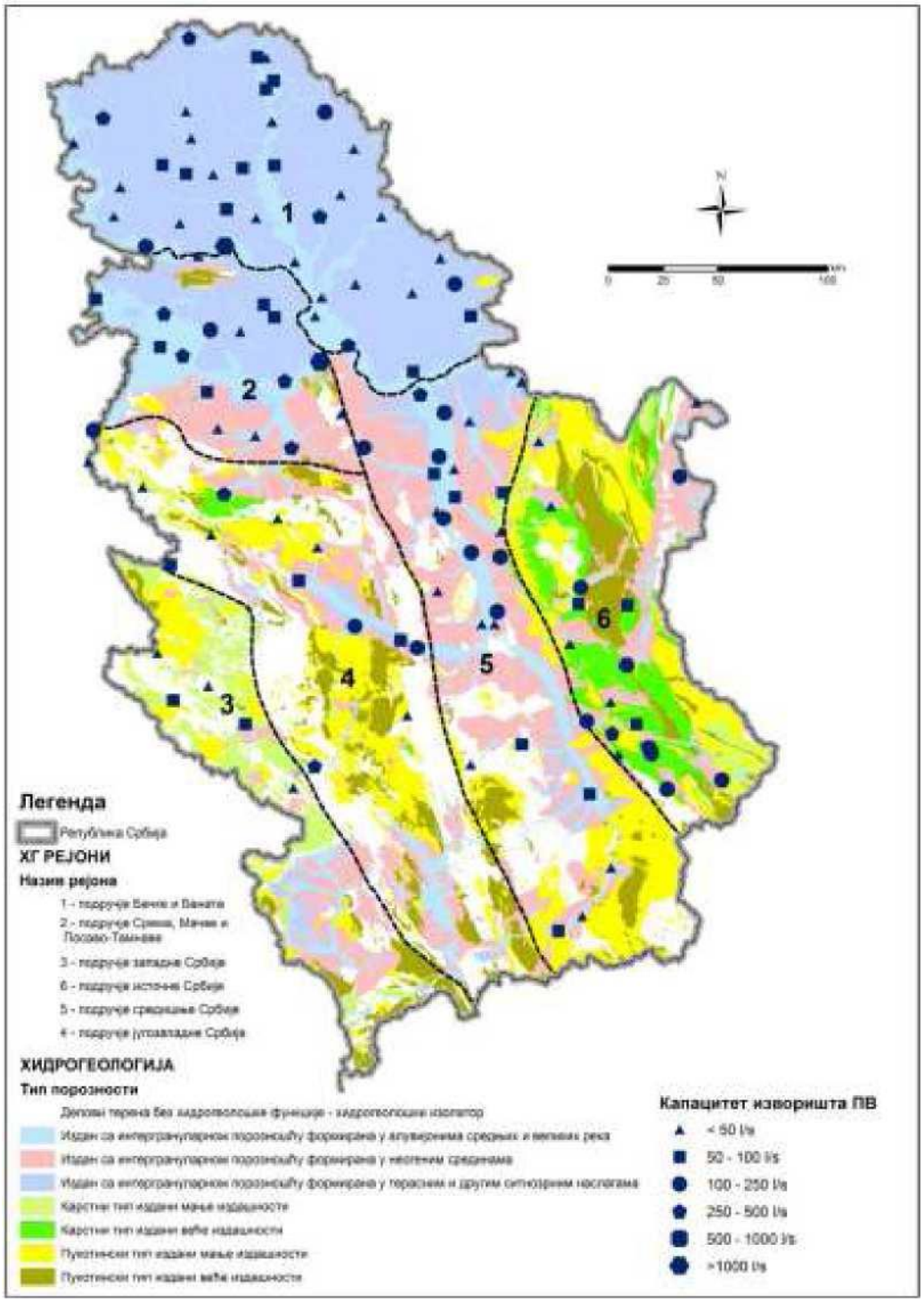


Figure 2.1.3.B-2 *Hydrogeological units on the territory of the Republic of Serbia*

In Posavo-Tamnavska area, the aquifers are uneven in thickness and extend, with the most significant spread being in the part of Podgorica Ada and downstream from Ostruzhnitsa, to the inflow of Sava into the Danube. The aquifers with Pliocene age have a continuous spread in the region of Srem, Machva and Posavo-Tamnava. The aquifers of the Pliocene are represented by 2-3 layers of small-grained to medium-grained sand (subordinate gravel), separated by layers of semi-permeable to impermeable aleurolytes and clays. Within these deposits, artesian groundwater reservoirs were formed, which are used for public water supply.

In the region of south-western Serbia are the most important alluvial aquifers they are connected with the sand and gravel deposits of Beli Drim and its tributaries Pechka and Decanska Bistrica. The deposit of Beli Drim is characterized by uneven thickness and variable filtration characteristics, the alluvium of Pechka Bistritsa has a large thickness and slightly lower permeability, while the alluvial deposits of Decanska Bistritsa have the most modest characteristics in terms of exploitation resource. Neogene sediments are present in the basin of Senica-Shtaval and in the valley of Metohiya and are generally characterized by low conductivity and low resuscitation.

Quaternary alluvial deposits of Drina (Bazhina Bashta-Loznitsa sector), Kolubara, Western Morava (between Cacak and Trstenik) are presented in the region of Western Serbia. Of these alluvial deposits, the most important are the Drina sediments in the Loznisko Pole area. The alluvial deposits of Kolubara, West Morava and Ibar are less thick and have weaker filtration characteristics, i.e. resources. Neogene deposits have been postponed in several basins (Valjevsko, Cacak-Kraljevo, Kosovo, Podueva and Drenica), but they have very modest filtration characteristics and low resources.

In the region of central Serbia, the most important Quaternary aquifers are related to the alluvial deposits of the Danube, Velika Morava, parts of Western Morava and Southern Morava. The accumulation of groundwater formed in the alluvial sediments of Velika Morava is a major resource for water supply in this area. The thickness of the sandy-gravel deposits of Velika Morava ranges from 4-8 m in the region of Stalats, to about 60 m in the region of Godominski Rit. The Danube alluvium in the sector Kostolats-Veliko Gradishte has an average thickness of about 15-30 m, while the South Moravian alluvium has a thickness of 5-10 m, locally 40 m. The most significant accumulations of groundwater within the Neogene deposits are related to sand sediments in Leskovatsky and Yagodinsko-Parachinsky Neogene basins, where they are used for the needs of the public water supply.

In eastern Serbia are presented the most significant Quaternary deposits alluvial sediments of Nishava and alluvial sediments in Knyazhevatsko-Minichevsky basin. In general, these deposits are characterised by relatively good permeability but small thickness, so that significant amounts of groundwater cannot be captured. Neogene deposits are found in several Neogene basins (Knyazhevacko-Minichevski, Zaječarska Kotelina, Negotinska nisia and Svarlishki basin), which are usually characterized by low permeability and water resistance.

Karst Waters

The most significant karst aquifers are in south-western, western and eastern Serbia.

In the region of south-western Serbia they are represented by carbonate deposits from the middle and upper Triassic, characterized by large thickness and significant distribution, which in the southern

part of the region is almost continuous from the Peshersko plato to the Metohia valley, and intense karstification to significant depths.

Significant limestone masses south of Valevo and the so-called "Lelishki" karst, built of Upper and Middle Triassic limestone, are found in the region of Western Serbia, within which groundwater accumulation has formed. This karst emission is drained through the springs of Paklja and Petnica and Gradačke vrele.

The main hydrogeological characteristic of the region of Eastern Serbia is certainly the significant presence of masses of cracked and karstified limestones aged from the Upper Jurassic and to the Lower Cretaceous, the thickness of which ranges from 50 to 500 m. Within these rock massifs, significant accumulations of groundwater (recorded above 70 with a minimum flow rate of 10 l/s and 16 with a flow rate of more than 100 l/s) have formed, which are emptied through numerous karst springs, the yield of which varies considerably throughout the year. The most important karst springs in this region are Lyuberadzha, Mlavsky Izvor, Krupansko Izvor, Radovansko Izvor, Belavinsky Izvor, Krupec, Belopalanacko Izvor and others.

Fissure waters

Rocks with a porosity similar to fissures have a significant distribution, especially in the region of western and south-eastern Serbia, but due to the extremely modest permeability characteristics, they are not of great importance for the public water supply except locally (flow rates below 1 l/s, rarely up to and above 3 I/s).

Groundwater bodies

Groundwater bodies are the main groundwater resource management units, monitoring of the condition and implementation of measures to achieve good groundwater status. A total of 153 groundwater bodies have been identified in the Republic of Serbia, of which 152 belong to the Danube basin (Black Sea) and one to the Aegean basin. The size of isolated water bodies varies from 35 km^2 to 2,643 km^2. The number of isolated water bodies by water region is given in **Figure 2.1.3.B-3**.

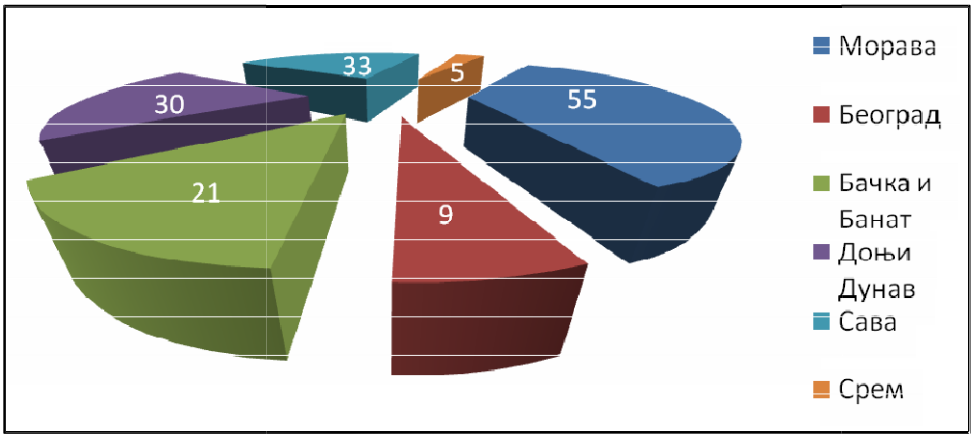


Figure 2.1.3.B-3. *Number of bodies of water by water region*

Of the total number of groundwater bodies separated, 131 were national, while 22 were identified as cross-border. They are cross-border with Hungary (six water basins), Romania (six water basins), Croatia (three water basins), Montenegro (two water bodies), Bosnia and Herzegovina (two

water basins) and Bulgaria (three water basins). Only six water bodies have been bilaterally harmonised with Hungary, which is the basis for further cooperation in the area of shared management of resources.

Data on initial and additional characterisation of groundwater bodies were not found.

Available groundwater monitoring network, its density, hydrochemical programmes used, frequency of sampling and measurement

The complex geological construction of the territory of the Republic of Serbia and the adjacent regions has led to hydrogeological heterogeneity and considerable diversity in aquifers and the distribution of groundwater. The area is characterized by the presence of formations with a small reserve of groundwater (Paleozoic formations, magmatic and metamorphic rocks, Jurassic and Cretaceous flysch or deeper and thick sedimentary complexes), as well as Mesozoic carbonate rocks, and Tertiary or Quaternary alluvial and terraced deposits which may be very rich in groundwater. Therefore, the Republic of Serbia is relatively rich in groundwater reserves formed in different aquifers, but unevenly distributed across the territory. The main groundwater reserves accumulate in thick Quaternary and Neogene interstitial aquifers and karst aquifers that dominate the south-western and eastern regions of the Republic of Serbia. The alluvial aquifers of the major rivers (Danube, Sava, Velika Morava and Drina) are particularly important and widely used for drinking water supply. Approximately 90% of the population has access to public water supply, while about 75% of public water supply is provided from groundwater resources. In some areas, the resources currently used are not able to quantify the population's water needs. However, there are other significant groundwater resources, especially in the alluvium of large rivers or in karst aquifers, which are still under-exploited.

Most resources provide good natural groundwater quality. The main exception is the northern Serbian province of Vojvodina, where the dense Pleistocene and Neogene sediments of the Pannonian Basin form sub-artesian aquifers. Organic matter is deposited in sediments, and groundwater is often contaminated with organic matter, ammonia, sometimes also arsenic or boron.

Although the high groundwater consumption in the Republic of Serbia is not a solid network for monitoring the quality and quantity of groundwater. The situation is not much different in the other countries of the former Yugoslavia, except those that have already become EU members. The obligations of the Republic of Serbia and the steps to be taken to achieve EU environmental standards, in particular the requirements of the Water Framework Directive (WFD, 60/2000), should definitely include a reorganisation of the current network for monitoring and strengthening the technical capacity of the responsible institutions.

History of the existing network and groundwater monitoring

Systematic monitoring of groundwater in Serbia began immediately after World War II. The network of groundwater monitoring stations was established in 1947 by a decision of the Federal Administration of the Hydrometeorological Service of the Federal People's Republic of Yugoslavia. In 1948 groundwater monitoring of 41 stations was started and already in 1950 the number of stations increased to 233 and then in 1960 to 279. Unfortunately, some of the stations have been closed and abandoned since 1961 and 1990, so in 1990 there were only 201 piezometers. However, since 1990, The Republican Hydrometeorological Office of the Republic of Serbia is placing increasing emphasis on groundwater monitoring. The number of recovered and new piezometers increased and doubled by 2014,

when the number of monitoring stations was 409. Groundwater levels and temperatures are measured from the outset, but groundwater sampling for analysis began in 1968 at 35 stations (piezometers). The number of stations has varied since 1969, from only 34 to a maximum of 84.

In spatial terms, the stations are built only in the alluvial deposits of large rivers and aquifers composed of Quaternary (Pleistocene) sediments in the province of Vojvodina. In terms of catchments, the national network of stations covers the Velika Morava, Western Morava, Southern Morava, Kolubara and Mlava rivers, the Matchva region and Kosovo and Metohiya and Vojvodina regions.

Apart from the monitoring of groundwater occurring in interstitial aquifers, despite the importance of groundwater reserves, very little or no monitoring of other aquifer types (primarily karst aquifers) has been undertaken so far. For example, Vrelo Mlave (the source of the river Mlava) is the first karst spring, where in 1949 began monitoring of the water regime of Zhagubitsa station. Hydrometric studies to determine the flow rate of the spring began at this station in 1966, and monitoring and studies of this spring continue to this day.

In the mid-1990s, flow rate measurements were made at 19 karst springs, but as part of only one or no more than two hydrometric campaigns. These sources include, inter alia: Izvor Banja (Rakova Bara), Izvor Krupaja (Milanovac), Izvor Leshe, Izvor Petnica, Izvor Gradac, Izvor Andric (Ravni), Izvor Tolishnitsa, Izvor Gostile, Izvor Vapa, Veliko vrelo (Strmosten). Unfortunately, monitoring of these sources was cancelled in the period 2004-2006.

Outside the RHMS programme, groundwater monitoring is also carried out in part of the riverside lands of the Danube, Sava and Tisa rivers, which are located in the back zone of the Jerdap dam (Zhelezni porti dam, built at the Danube). The Late Monitoring Programme was introduced in 1977 to take into account the effects of the capture of the Danube on the groundwater regime, to assess the effectiveness of drainage systems (new, reconstructed and non-reconstructed), to improve their modes of operation, the need and timely interventions to protect the area. More than 700 piezometers have been observed over the past decades to define the groundwater regime and assess the impact of the Jerdap dam on riverside lands.

EU Water Framework Directive (WFD) and implementation tasks of the Republic of Serbia

The Republic of Serbia has made its first steps towards the implementation of the WFD in 2003 within the framework of the International Commission for the Protection of the Danube River (ICPDR, 2009). The country participated in the preparation of the 2004 Danube Basin Management Report and generated a preliminary national report in early 2005. Since then, in order to harmonize the country's water management policies with the requirements and objectives of the WFD, the country has adopted a series of implementing laws and legislation, including: The Waters Act (Official Gazette of the Republic of Serbia 30/10), the Law on Meteorological and Hydrological Activities (OG 88/2010), the Ordinance on the Determination of Surface and Groundwater Bodies (OG 96/2010) and the Ordinance on the Environmental and Chemical Status Parameters of Surface Water Resources and the Chemical and Quantitative Status Parameters of Groundwater Resources (OG 74/10).

The Republic of Serbia has adopted an Ordinance on the determination of surface and groundwater bodies in order to preserve or achieve good ecological, chemical and quantitative status of groundwater resources. The GB, defined within a geological formation, was taken as a basis for

groundwater monitoring or at least a planning unit for the monitoring network. All defined GB are classified as interstitial, karst or fissure groundwater bodies. After detailed analyses and several mapping stages, the initial number of GB of 208 was eventually reduced to 153. This is the first step towards the implementation of the WFD in relation to groundwater management.

The spatial distribution of observation objects - piezometers on delineated GB is shown in **Figure 2.1.3.B-4**. The list of GB with established monitoring is presented in **Table 2.1.3.B-3**. It can be concluded that only 34 out of 153, or about 20% of all GB, have continuous groundwater monitoring. 9% of GB have 5 or more observation points per 100 km^2. In contrast, 13 GB or 38% had between 0.5 and 0.177 piezometers per 100 km^2. This is equal to a density of 1 object per 200 km^2 and 500 km^2 respectively.

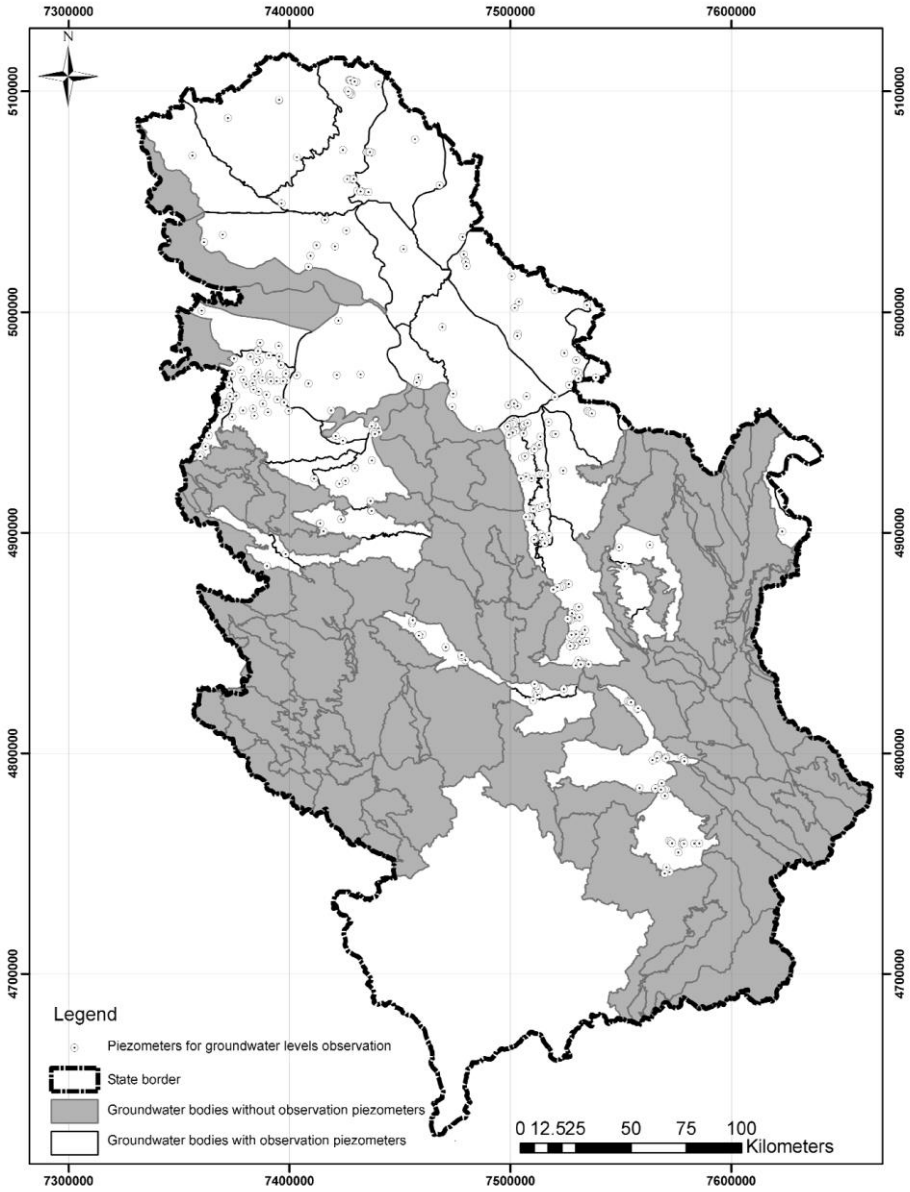


Figure 2.1.3.B-4 *Distribution of piezometers in GB of the Republic of Serbia*

The next important step in the implementation of the WFD was the characterisation of GB, which allowed integration into GB groups. Characterisation includes the determination/description and quantification of geological and hydrogeological conditions, in particular the geometry of the GB, the nature of the upper and lower aquifer water reservoirs, the rate of water exchange and the dependence of terrestrial ecosystems on infiltrated or discharged groundwater. The focus was on pressure on chemical indicators - diffuse and point sources of pollution, as well as quantitative pressures - operational indices and artificial feeding, if any. The WFD introduced supervisory monitoring and operational monitoring, depending on the nature of the groundwater pressure. Operational monitoring requires a higher frequency of monitoring and testing of specific components critical to water quality.

In the WFD, groundwater level is the main parameter that determines the quantitative status. There is no precise limit, but it must ensure that long-term use does not endanger the available groundwater resource, that the environmental objectives of the associated surface water bodies will be achieved and that there will be no threat to the terrestrial ecosystems . Given that there was some doubt as to what overexploitation meant and when it happened, it was necessary to remain within the relative categories.

The consistent implementation of the WFD and the establishment of a new groundwater monitoring network in the Republic of Serbia is extremely important for improving the knowledge of groundwater resources and their active protection. As an EU candidate, Serbia declared its commitment to the WFD as early as 2003, but above all the lack of funds and the still unregulated water user led to an unsatisfactory state of monitoring of underground water resources, which provide drinking water for about 75% of the population of the Republic of Serbia.

Despite the fact that groundwater level regimes are monitored by more than 400 special-purpose piezometers in Serbia, almost all of them are located in the same type of alluvial aquifer, where groundwater levels are largely reflective of river water levels. This is certainly a departure from the hydrogeological "logic" and from the preferred approach to national groundwater monitoring, which should include all types of aquifers. As such, the phreatic (upper) aquifers in the geological circumstances of the Republic of Serbia must include aquifers in mountainous areas (e.g. karst aquifers are located in more than 30% of western and eastern Serbia) that have not been observed in practice.

There is a need for a new and efficient monitoring network covering all or most of the GB and all major aquifers covered (not only alluvial as at present), defined on the basis of hydrogeological surveys and systematic quality and quantity of groundwater. Data collection with active participation of water users are both national needs and obligations. The proposal is to reach a density of 1 observation object/200 km^2. This density is due to the complex geology, hydrogeological conditions, historical data, but also the economic situation in the "transitional" country. The scope and extent of monitoring as well as the frequency of measurements and analyses depend on the hydrogeological situation and the aquifer regime.

Table 2.1.3.B-3 *Groundwater bodies under systematic observation and actual number of piezometers*

No	Groundwater body - GWB	Area F (km^2)	Number N*	Number N**	N* / F	N** / F
1	2	3	4	5	6	7
1	Severozapadna Bačka - top aquifer	1232.43	5	1	246	1232
2	Telečka - top aquifer	2643.55	11	3	240	881
3	Gornja Tisa - top aquifer	1772.02	30	4	59	443
4	Severni Banat - top aquifer	1545.78	19	3	81	515
5	Srednja Bačka - top aquifer	2068.06	16	3	129	689
6	Donja Tisa - top aquifer	1099.78	5	1	220	1100
7	Srednji Banat - top aquifer	1013.72	3	0	338	
8	Jugozapadni Banat - top aquifer	2228.19	16	2	139	1114
9	Vršačke planine	257.63	2	1	129	258
10	Jugoistočni Banat - top aquifer	2298.93	25	3	92	766
11	Beograd right bank of Sava	179.68	7	2	26	90
12	Pančevački rit	413.74	4	1	103	414
13	Negotin Kladovo - alluvium	462.86	4	1	116	463
14	Kličevac	604.28	4	1	151	604
15	Kostolac	1005.37	4		251	
16	Kučaj i Beljanica	726.52	2	2	363	363
17	Velika Morava alluvium left bank	468.26	27	3	17	156
18	Velika Morava alluvium right bank	429.31	28	3	15	143
19	Levač	718.98	2	1	359	719
20	Velika Morava Neogene - south	1321.17	38	3	35	440
21	Kučaj - west	288.06	1	1	288	288
22	Južna Morava Neogene - north	1153.38	21	3	55	384
23	Leskovac - Neogene	914.31	22	2	42	457
24	Rasina	497.41	1	1	497	497
25	Zapadna Morava - alluvium	588.04	21	3	28	196
26	Mačva Basic water bearing layer	763.41	40	3	19	254
27	Kolubara - Neogene	656.57	10	4	66	164
28	Valjevo	542.81	6	2	90	271
29	Lelić - karst	306.83	1	1	307	307
30	Ljig	565.82	1	1	566	566
31	Lozničko polje	243.88	11	2	22	122
32	Povlen	322.37	1	1	322	322
33	Zapadni Srem - Pliocene	1172.92	11	2	107	586
34	Istočni Srem - Pliocene	2248.99	10	1	225	2249
	Total	32755.06	409	34		

Note:
** - number of piezometers for monitoring at water level;*
** * - number of piezometers for monitoring of groundwater quality*

C. Water protection areas (WPA)

- ***Regions of Vidin, Montana, Vratsa, Sofia-region (Republic of Bulgaria)***

WPA of Drinking-Domestic Water Supplies

As a result of the update of the register of areas for the protection of surface waters in the DRBD, intended for household drinking water supply in the RBMP 2016 2021, 72 zones have been defined - *Map No 3.1.1 and Appendix 3.1.1 in the RBMP of the DRBM*. These are the "river" or "lake" category of GB. Areas for the protection of surface water intended for drinking and domestic water supply (DDWS) in the scope of the CBCP are river Iskar 37,985.098 sq km, Ogosta 7,346.803 sq km, rivers west of Ogosta 567.547 sq km, Nishava 263.631 sq km, total for DRBD - 722,588.445 sq km.

71 of the 72 surface water protection zones for DDWS were assessed in good condition. Only one zone was assessed as not reaching good condition - with code BG1DSWIS1109 - PB "Kamenno zdanie" of river Perlovska - **Figure 2.1.3C-1**:

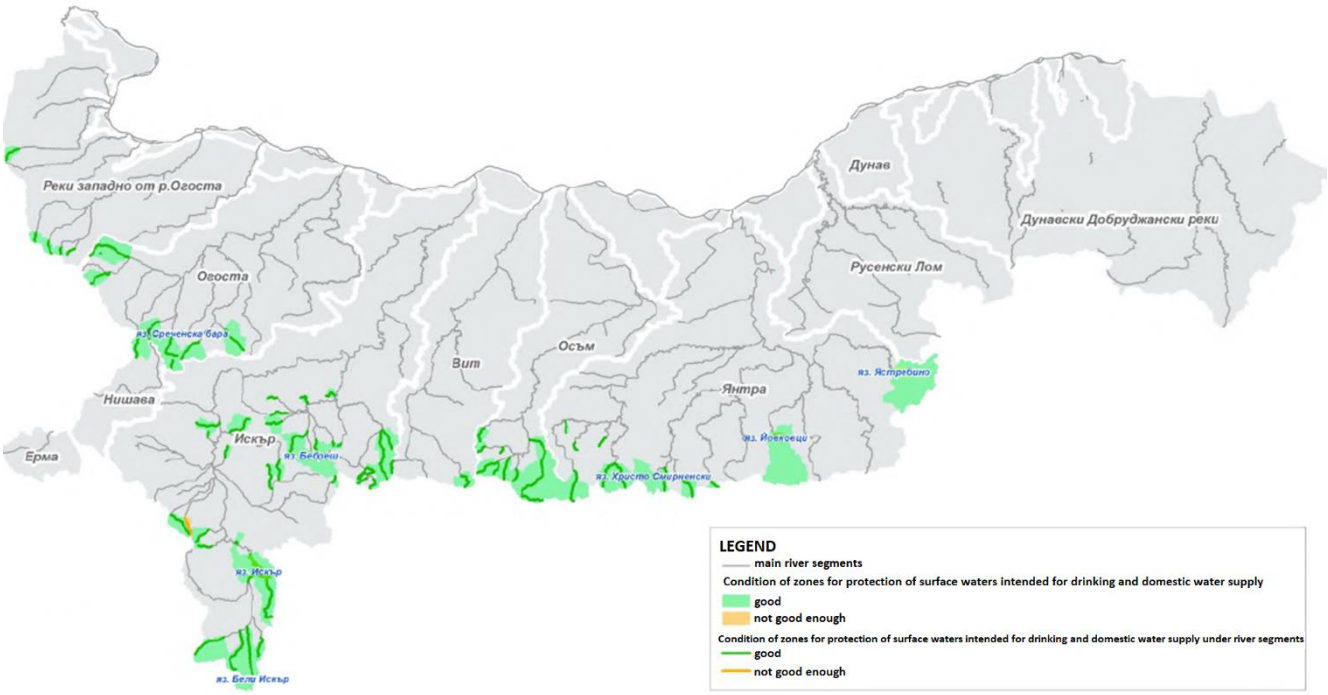


Figure 2.1.3.C-1 *Assessment of the state of the WPA of surface water intended for drinking and domestic water supply*

Recreational and bathing areas

On the territory of DRBM there is a designated bathing area with the name "Pchelina 2 Dam" and code BG3242661710017001, which is located in a rest zone Pchelina south-west of the city of Razgrad. At the present time, no recreational areas and/or water sports have been defined in the DRBM from the update of the plan, in accordance with the latest changes from July 2015 in the WA.

Vulnerable zones

The update of the register of these zones was made on the basis of the current Order No. РД 146/25.02.2015 of the Minister of Environment and Water for determination of nitrate vulnerable areas (NVA). In the annexes to the order are defined the water bodies that are polluted or are threatened with pollution by nitrates from agricultural sources, the territories of the municipalities or parts of them in the range of the vulnerable area by altitude and a map of the area.

In *Appendix 3.3.1 and Map No 3.3.1 to the RBMP* is presented the updated register and map of nitrate vulnerable areas. Polluted with nitrates GB is with code ISRWB025 - river Gostilya from estuary to flow into the river Iskar.

Municipalities in NVA within the scope of the CBCP: Boychinovtsi, Borovan, Bregovo, Brusartsi, Byala Slatina, Vidin, Bratsa, Valchedram, Dimovo, Knezha, Kozloduy, Krivodol, Lom, Medkovets, Mezdra , Mizia, Montana, Ruzhintsi, Hayredin, Cherven bryag and Yakimovo.

Sensitive areas

According to the current Order No. РД 970/28.07.2003, the sensitive areas in the surface water bodies in the DRBM are: beginning - "river Danube, from the border at the village of Novo selo" and end at the "river Danube, near the border at the city of Silistra", as well as "All water bodies in the catchment area of the river Danube on the territory of the Republic of Bulgaria". All water intakes within the scope of the CBCP fall into sensitive areas - *Appendix 3.3.2 and Map 3.3.2 of the RBMP*.

Areas for the conservation of economically valuable species of fish and other aquatic organisms

DRBM takes into account the requirements of the FAA and information from Order РД 09-152/09.03.2015 of the Minister of Agriculture and Food, issued on the basis of the FAA, with certain river sections and fish farms in which it is prohibited to fish. In DRBM 39 areas for the conservation of economically valuable species of fish and other aquatic organisms are designated. In these areas, the species included in the list of economically valuable fish species and other aquatic organisms are subject to conservation - *Appendix 3.4.1A of the RBMP*.

Protected areas designated for the conservation of habitats and species in which the maintenance or improvement of the status of waters is an important factor for their conservation

Updating the register of these areas has made the following changes: - The protected areas of the National Ecological Network Natura 2000 for the conservation of the types of natural habitats and habitats of species of plants and animals, without birds - from 110 in the first plan to 98 in the update, dropping 15 of the areas, and 3 areas for the first time are included.

Protected territories designated for the conservation of habitats and species in which the maintenance or improvement of the status of waters is an important factor for their conservation

According to information from the RBMP, 190 protected territories have been designated in the DRBM, declared under the Protected Areas Act, in which the maintenance or improvement of the state of the waters is an important factor for their protection. These include national parks, nature parks, reserves, maintained reserves, natural landmarks and protected areas. The purpose of declaring these protected territories is the conservation of species or habitats that are related to the protection of water.

- ***Regions of Pernik, Kyustendil (Republic of Bulgaria)***

In WARBM are defined 63 surface drinking water bodies, which are protection areas. Of these, 60 are surface water bodies category "river" and 3 are surface water bodies category "lake".

The assessment of the status of the protection areas for water intended for drinking and domestic water supply, according to the RBMP for BDA 2016- 2021, shows the following: in good condition all 63 areas for the protection of surface water intended for DDWS have been assessed; in poor condition, no areas for the protection of surface water intended for DDWS have been assessed.

Vulnerable zones

According to Order No. РД-146/25.02.2015 of the Minister of Environment and Water for the West Aegean Region for Basin Management, there are no surface water bodies that are contaminated or are threatened with pollution by nitrates from agricultural sources.

Sensitive areas

The following surface water bodies are defined as sensitive areas within the scope of the CBCP:

- river Struma from the springs to the flow into the river Konska - water bodies BG4ST500R003 and BG4ST500L1001;
- river Struma from the flow into the river Konska to flow into dam Pchelina inc. the dam - water bodies BG4ST500R006 and BG4ST500L1010;
- river Arkata from the springs to the flow into the river Struma - water bodies: BG4ST500R1007, BG4ST500R1009 and BG4ST500L1008;
- river Struma from the flow into the river Dzherman to flow into the river Blagoevgradska Bistritsa BG4ST500R1030.

Protection areas - water bodies designated as recreational waters and areas for water sports, including designated areas with bathing waters, in accordance with the ordinance under Art. 135, para.1, item 7 in accordance with Art. 119a, para. 1, item 4 of the Waters Act. In the RBMP 2016 - 2021, no recreational areas and/or areas for water sports are defined in the BDA, in accordance with the amendments to the Waters Act as of July 2015.

Areas for the conservation of economically valuable species of fish and other aquatic organisms

In connection with the identification of areas for the conservation of economically valuable fish species and other aquatic organisms, the Minister of Environment and Water in 2012 approved a List of economically valuable fish species and other aquatic organisms. There are no economically valuable fish species and other aquatic organisms for the territorial scope of the West Aegean Region for Basin Management, respectively no areas have been declared for their protection.

Protected areas designated for the conservation of habitats and species

Updating the register of protected areas designated for the conservation of habitats and species in which the maintenance or improvement of the status of waters is an important factor for their conservation has made the following changes: out of a total of 42 in the RBMP 2010-2015, they increased to 44 in the second planning period.

The protected areas of the National Ecological Network Natura 2000 for the conservation of natural habitat types and habitats of species of plants and animals, without birds - the update retains the initially defined number of 25 habitat areas defined in the first RBMP. In the scope of the CBCP are 13 areas:

The protected areas of the National Ecological Network Natura 2000 for the conservation of habitats of birds and of territories in which during breeding, littering, wintering or migration significant quantities of birds are accumulated - in the update of the register 19 areas for birds in RBMP (2016-2021) have been identified in relation to 17 in the RBMP (2010-2015). The changes are outside of CBCP. In the scope of the CBCP are 12 areas:

- ***Regions in the Republic of Serbia***

The protected areas in the Water Management Plan of the Republic of Serbia are: 1) SSZ, 2) bodies of water intended for drinking purposes, 3) bodies of water intended for recreation and bathing, 4) vulnerable areas to nitrates from agricultural sources, 5) Sensitive areas, 6) Protected areas for habitats and birds in which water is an important element and 7) Areas for the protection of economically important aquatic species. Currently, Serbian legislation has not fully incorporated the protected zones required by the WFD.

Water extraction areas for human use

Three sanitary protection areas have been defined: wide area, narrow area and immediate protection area. The Ministry of Health is responsible for the establishment of the areas. Significant areas in the CBCP are covered by the widest Protection Area. Fig. 4.1 of the Water Management Plan of the Republic of Serbia.

Economically important aquatic varieties

The issue of economically important water varieties has not yet been regulated in the legislation of the Republic of Serbia. It is necessary to prepare regulations in order to be able to prepare a register of these areas.

Recreational waters, including bathing areas

Although there are bathing areas in the Republic of Serbia, attempts to define bathing areas do not fully comply with European directives. Therefore, a register cannot be established for these areas in accordance with the Waters Act.

Vulnerable zones

A planned nitrate vulnerable zone in the Republic of Serbia covers an area of 37,980 km^2 or 49%. A map of nitrate vulnerable areas has been made - Fig. IV.2 of the Water Management Plan of the Republic of Serbia. As can be seen, in the scope of the CBCP, vulnerable areas occupy the valley of the river Morava near the city of Niš and the valley of the river South Morava near the city of Vranja.

Sensitive areas

As the Black Sea watershed has been declared a sensitive area, the entire Danube basin is considered a sensitive area. The Republic of Serbia has signed the Convention for the Protection of the Danube and since about 92% of the territory is located in the river basin, it is proposed that the whole territory of Serbia be declared a sensitive area by nutrients. This area includes the whole territory of the CBCP.

Areas for the conservation of habitats or species in which water is an important element for their conservation.

The total area of these areas is 678,237 ha, which is 7.66% of the territory of the Republic of Serbia. A total of 473 protected areas are under state protection for 2019 - Fig. 78 of the Annual report for E 2019. There are 125 zones that have been identified as places where water is an important factor for their conservation - Fig. IV.3 of the Water Management Plan of the Republic of Serbia. The main Protected Areas in the CBCP are parts of: the Danube Valley, Stara Planina Mountain, the valley of the river Nishava, as well as the area of Lake Vlasina. A total of 2,633 species are protected. Approximately

all mammals, birds, amphibians and reptiles and large numbers of insects fall under the protection regime.

According to the Spatial Development Plan of the Republic of Serbia, areas of very high environmental quality, such as areas protected for natural benefits, wetlands protected by international conventions, mountain peaks and hard-to-reach terrains, class I watercourses, including the WPA, must be provided with such solutions as to maintain the existing state of ecosystems.

D. Flood risk

- ***Regions of Vidin, Montana, Vratsa, Sofia-region (Republic of Bulgaria)***

DRBM includes 17 river basins located entirely within the area (including Kanagyol and Suha river) and 3 cross-border river basins - river Danube, river Nishava and river Timok. *Figures 4 and 5 of PFRA:*

Areas with potential significant flood risk (APSFR) for the Danube

During the first cycle of application of the Floods Directive (FD), the Bulgarian section of the Danube is defined as the APSFR (BG1_APSFR_DU_001). In agreement with the competent authorities of the Republic of Romania, the Bulgarian-Romanian section of the Danube has been designated as a common international APSFR for Bulgaria and Romania and a common designation code (RO_BG_DU_1) has been adopted in accordance with the policies of the International Commission for the Protection of the Danube River - ICPDR.

A list of the identified APSFRs in the DRBM is available in *Appendix 10 of the PFRA.*

As a result of the revision and update of the PFRA, 35 APSFRs have been identified for the DRBM, of which 8 are new. They are located in nine main river valleys. The largest number is in the catchments of the rivers Yantra 9 pcs., Iskar 7 pcs. and Rusenski Lom 5 pcs. Figure 23 of the PFRA.

The types of floods that are defined for the DRBM areas are 4 types: river, rain-torrential, rain-urban and infrastructure. The scope of the CBCP is dominated by river and rain-torrential types.

Cross-border coordination

Considering the affiliation of DRBM to the international basin of the Danube, cross-border coordination in flood risk management takes place at two levels: - Coordination in the international basin of the Danube; - Bilateral coordination with neighbouring countries - Republic of Romania and Republic of Serbia. Integrated water management activities in the international basin are coordinated by ICPDR, which brings together and coordinates the efforts of 14 countries, each covering more than 2000 square km of the Danube river basin. The ICPDR organizes and manages the development of a common Management Plan for the International Danube Basin and a Flood Risk Management Plan for the Danube Basin. Flood risk management activities, including updating of the PFRA in the DRBM, are coordinated through the ICPDR Flood Protection Expert Group, assisted in individual specific activities by the Information Management and Geographic Information System Expert Group.

Coordination with the Republic of Serbia

The basis for coordination with the Republic of Serbia on FD issues is the signed on 22 January 2019 in the city of Dimitrovgrad, Republic of Serbia, Memorandum of Understanding between the Ministry of Environment and Water of the Republic of Bulgaria and the Ministry of Environmental

Protection of the Republic of Serbia on cooperation in the field of environmental protection has been in force since 4 April 2019. The modernisation of contractual relations in the field of environment is necessitated by the need to update the areas of cooperation according to the priorities of the two countries and the European and global environmental processes. In May 2015 the Bulgarian side presented a draft Agreement between the Ministry of Environment and Water of the Republic of Bulgaria and the Ministry of Agriculture and Environmental Protection of the Republic of Serbia on cooperation in the field of water management. The Bulgarian draft document focuses on the need to coordinate flood risk management plans. Negotiations on the document continue through diplomatic channels. A bilateral meeting on water has not been held in 2020 due to the deteriorating epidemiological situation in relation to COVID-19. In the process of updating PFRA in DRBM through diplomatic channels, information has been sent to the competent flood risk management authorities in the Republic of Serbia for the publication of the draft Updated PFRA in DRBM. A reply has been received from the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia stating that a detailed review has been carried out of the methods, approaches and data used in the update of the PFRA in DRBM. The results in PFRA in DRBM are analysed, focusing on the assessment of climate change, data on past floods and the assessment of potential future floods (especially for the Timok and Nishava rivers) and the identified APSFRs in DRBM. The response also identifies the identified APSFRs on the territory of the Republic of Serbia falling within the Danube River Basin.

- ***Regions of Pernik, Kyustendil (Republic of Bulgaria)***

As a result of the revision and update of the PFRA for WARBM, 17 APSFRs have been identified, of which 3 are new. They are located in the three main rivers - on the river Struma 10 pcs., on the river Mesta 6 pcs. and on the river Dospat 1 pcs.

A detailed map of all APSFRs is available in *Appendix* 10 to PFRA. The types of floods that are defined for the areas in the WARBM are: river, rain-torrential, rain-urban and infrastructure. Infrastructure floods are associated with the threat of overflow or rupture of dam walls. For each APSFR, one or more types of flooding have been investigated. A type of flood, such as infrastructure flooding, can be explored in different dams/sites, i.e. at more than one site in the same APSFR. The river type floods are investigated in almost all regions, namely 16 of them. Rain-torrential is in second place - in 6 regions, and rain-urban - in 1. Infrastructure floods are represented in 3 APSFRs. A list of APSFRs within the scope of the CBCP in the WARBM is presented in the table below. For the infrastructure floods, the specific dams that are under study are indicated, and for the rain-urban - settlements. No cross-border APSFRs have been defined in the WARBM.

Table 2.1.3.D-1 *List of APSFRs in the WARBM*

Code of APSFR	Name of APSFR	Type of flood, according to the source	Type of change compared to the previous FD cycle
BG4_APSFR_ST_06	river Struma - village of Nevestino	river	change - expansion
BG4_APSFR_ST_07	river Dzherman - from the city of	river, rain-torential	change - simultaneous

	Dupnitsa to the village of Dzherman		expansion and reduction
BG4_APSFR_ST_08	river Banshtitsa - from the city of Kyustendil to the village of Zhabokrat	river	change - expansion
BG4_APSFR_ST_09	river Struma - city of Zemen	river, infrastructure (overflow of dam Pchelina)	change - redundancy
BG4_APSFR_ST_10	river Struma - from the dam Studena to the city of Batanovtsi	river, rain (torrential and urban), infrastructure (overflow of dam Studena and demolition of the wall of dam Oslome and dam Yardzhilovtsi)	change - simultaneous expansion and reduction

- ***Regions in the Republic of Serbia***

Floods potentially threaten about 18% of the territory of the Republic of Serbia, mostly along the banks of the Danube, Tisa and Sava, less - Morava, Drina, Kolubar, Timok, etc. In 2019, a total of 101 APSFRs were defined - *map and tabular application. Preliminary assessment of the risk of flooding - Republic of Serbia 2019.*

Within the scope of the CBCP, a significant flood risk is identified in the rivers as follows: Binachka Morava, Moravica, Pcinja, Jablanica, Veternica, Vlasina, Pusta reka, South Morava, Toplica, Nishava, Luzhnitsa, Svrljishki Timok, Trgoviski Timok, Beli Timok, Crni Timok, Timok, Jasenicka, Danube.

A total of 3,600 km of dykes and other protection sites, 53 dams, 413 hydro-melioration systems with more than 25,000 km of canal network and many pumping stations are planned in the operational plan for flood protection for 2020.

As regards flooding in the Republic of Serbia, two main categories are separated: 1) plain, with a large uneven flow but with a long duration; 2) lush flows with a large longitudinal drop in the bed, a small wave length, a large water velocity and large silt exports. Fig. 32 - Existing flood protection systems: Strategy for the waters of the Republic of Serbia.

As water levels rise relatively slowly in large plain watercourses, there are better opportunities to forecast and take mitigation measures such as flood protection and evacuation of people and goods. In the event of a flood, the damage may be significant due to the size of the flooded area and the concentration of population, assets and infrastructure.

The Danube within the scope of the CBCP is covered by the Zhelyazna Vrata reservoir. The protective line along the lower Timok along with the Danube dikes protects the most fertile lands. Local

protection activities were also carried out in the basin - embankments and "urban" regulations. The current level of protection is not sufficient, which was found during the flood in Zaječar in 2010.

Until now, the following measures have been applied in the Morava basin:

1) Construction of protective embankments and walls. The total length of the Republican embankments in the South Morava basin is 293 km, West Morava 99 km and along the Velika Morava and its tributaries is 718 km;

2) Increase in river capacity - decrease in resistance, increase in profile. Of particular importance are the regulations of the "urban" type, built in the large settlements. In the basin of South Morava are regulated the rivers Niš, Pirot, Vladichin Han, Leskovac, Prokuple, Vranska Banja, Kursumlia and others;

3) Retention of high wave in reservoirs, as well as reservoirs designed to protect against flooding;

4) Taming the high wave in canals, for example the Hisar Canal in Leskovac.

Pcinja and Dragovishtitsa are cross-border rivers from the Aegean basin. Pcinja crosses the state border between Republic of Serbia and Republic of North Macedonia and Dragovishtica - the border between Serbia and Bulgaria. Flood protection is not enough, according to the 2010 Targovishte flood of Pcinja.

Summary of water status, including conservation objectives and measures:

For the regions on the territory of the Republic of Bulgaria

There are no significant problems related to the current status of the waters and related to the CBCP and TSIM in the **DRBM**.

In Table 2.4.1 and Figure 2.4.1 of the RBMP are summarised the results of the risk assessment of surface water bodies, category river, and Table 2.4.1.1 and Figure 2.4.1.1 summarise the results of the risk assessment of surface water bodies, category lake.

Assessment of biological quality elements - mainly at risk and possibly at risk;

Physico-chemical assessment - mainly at risk under BOD, Nitrogen and Phosphorus and possibly at risk, but there is also a significant percentage of water bodies that are "not at risk";

Environmental risk assessment - bodies are probably at risk and not at risk; bodies at risk are also found.

Chemical risk assessment - priority substances - bodies are not entirely at risk and probably at risk with only three exceptions: river Timok at Bregovo, river Malak Iskar at Etropole and the river Iskar from Sofia to Rebrovo. Appendixes 2.1.3.2.

Republic of Bulgaria - due to the geographical location, atmospheric circulation and landscape, the water balance is unsatisfactory in spatial and temporal terms, including the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil. Water resources per capita place the country at the back of the Balkan Peninsula. Bulgaria is also facing serious challenges due to the location in a drought zone, uneven distribution of water resources, depreciation of water supply systems and poor construction of the sewerage system. The construction of wastewater treatment plants is slowing down compared to water supply systems and many water ecosystems are still at risk. It is necessary to insist on good agricultural and farming practices; reclamation of terrains from mining activities; restoration of rivers,

improvement of coastal areas; prohibition of logging of natural coastal vegetation; efficient use of water, including technical measures for irrigation, industry, energy and households; modernization or improvements of industrial waste water treatment plants, including from agricultural farms; implementation of projects for construction, reconstruction, modernization of WWTP in settlements;

For surface water bodies in **DRBM** in good ecological condition/good ecological potential and good chemical status, the following environmental protection objectives are planned: - as of 2015: "Achieving and preserving good environmental and chemical status"; - as of 2021 and 2027: “Preserving good environmental and chemical status” For surface water bodies in lower than good ecological status/good ecological potential and/or not reaching good chemical status, the following environmental protection objectives are planned: - as of 2015: “Prevention of environmental status degradation/Prevention of environmental potential degradation. Preservation, improvement and restoration of the surface water body. Prevention of pollution and preservation of good chemical status"; - as of 2021 and as of 2027 - subject to the justification of an exception to the achievement of the objectives:

"Achievement of the EQS for good environmental status/good environmental potential for the indicators with deviations until 2021. Prevention of deterioration of the environmental status/ecological potential of other quality elements. Prevention of pollution and maintenance of good chemical status”, or:

“Achievement of the EQS for moderate environmental status/moderate environmental potential for the indicators with deviations until 2021. Prevention of deterioration of the environmental status/ecological potential of other quality elements. Decrease in concentration of the indicators with deviations. Prevention of deterioration of the chemical status of the indicators without EQS deviations”; or

"Achievement of the EQS for good environmental status (for the indicators with deviations) by 2021/2027. Achievement of the EQS for good environmental status (for the indicators with background-adjusted deviations) by 2027. Prevention of deterioration of the environmental status of other quality elements. Achievement of the EQS for good chemical status/for the indicators with deviations by 2027. Prevention of deterioration of the chemical status of the indicators without EQS deviations”. In *Appendix 5.1.1 of the RBMP for* DRBM are presented the updated objectives for environmental protection of surface water bodies in Danube .

Objectives in the WPA

Environmental objectives of water protection areas intended for drinking and domestic water supply. The environmental targets in these areas have been updated on the basis of their assessment of the status of basic physico-chemical indicators, specific pollutants, priority substances and microbiological indicators.

The environmental objectives for surface water protection areas intended for DDWS are: - for the areas defined in category A1 or A2 - "Maintenance and prevention of deterioration of surface drinking water"; - for the area defined in category A3 - "Reaching a value of an indicator/indicators with deviations corresponding to the standard of quality of surface drinking water at least for category A2". Appendix 5.3.1 of the RBMP

Environmental objectives of areas where water is susceptible to biogenic elements. Specific environmental objectives for these areas are not defined. The environmental protection objectives set out in the WA, i.e. achieving good surface water status, are integrated with the objectives of water protection from eutrophication.

Environmental protection objectives for the conservation of areas for economically valuable species of fish and other aquatic organisms. Specific environmental objectives for these areas are not defined. Environmental protection objectives, i.e. achieving good surface water status, regulated in the WA, are integrated with the objectives of protecting economically valuable species of fish and other aquatic organisms.

Environmental protection objectives of protected areas and zones designated for the conservation of habitats and species in which the maintenance or improvement of water status is an important factor for their protection. No specific environmental objectives have been set for these areas within the territory of the DRBM. At this stage, the environmental protection objectives set out in the WA, i.e. achieving good surface water status, are adopted as water protection objectives in protected areas and protected areas declared for the protection of water dependent species and habitats. The defined environmental protection objectives of protected areas and areas declared for protection with water dependent habitats and species are presented in Appendices 5.3.5.1, 5.3.5.2 and 5.3.5.3. of the RBMP.

Priorities and objectives in the FRMP

The FRMP of the DRBM is in line with the flood risk management priorities at the basin level under the FRMP for the international basin of the Danube, which are: - Avoiding new risks; - Reducing existing risks; - Strengthening resilience; - Raising awareness; - Applying the principle of solidarity. Appendix 5 and 6 of the FRMP 2016-2021 show the priorities and objectives for flood risk management at the level of the RBM and the APSFR.

Measures

The planned measures are selected from a single catalogue of measures developed at national level, as a result of which: - Measures of the first plan - some of the measures remain with the same name or with a precise wording; - Modified measures - some of the measures have been amended; - New measures - new measures have been included. The updated list for the final version of the plan contains 84 measures. They are planned to achieve the planned environmental objectives of surface and groundwater and their protection areas. The included measures are aiming at:

- sources of point, diffuse and/or hydromorphological pressure, as well as pressure from water abstraction and climate change, - reduction, mitigation and prevention of the impact of the pressure.

The list of measures for DRBM is presented in Appendix 7.2.1A of the RBMP.

The following are included in Appendix 7.2.1C:

Main measures - measures to ensure compliance with mandatory Community requirements and other environmental legislation.

- The complementary measures are aiming at: implementation of cost recovery; sustainable use of water; quality of drinking water; control of water abstraction; point discharges; diffuse pollutants in water; hydromorphological conditions; pollution with priority substances; accidental pollution;

- Additional measures are planned when monitoring data or other data show that the environmental protection objectives of a body of water cannot be achieved by the measures envisaged and/or within the set deadline.

In Appendices 7.2.2 ÷ 7.2.7 to the RBMP are presented the programmes of measures for surface and groundwater bodies and for water protection areas structured according to the identified significant problems in water management in Danube RBM.

The measures included in the PoM of the RBMP for the Danube Region and which have a positive effect in terms of achieving the objectives of the two Directives - the WFD and the FD - are shown below and contain different actions.

- Restoration and protection of river banks and river beds from erosion,
- Restoring the natural state of the bottom of lakes,
- Improving the hydromorphological condition of rivers,
- Reduction of catchment erosion,
- Reducing diffuse pollution from industrial activities,
- Decrease of pollution from mining activities;
- Reclamation of sections affected by aggregate extraction,
- Ensuring the continuity of watercourses and the movement of fish,
- Ensuring the collection, discharge and treatment of wastewater in the settlements;;
- Improvement of natural water retention,

Climate change adaptation measures:

The measures include activities aimed at: - Water saving; - Preservation of the quantitative status of water; - Reduction of erosion; - Reduction of water losses; - Requirements for the removal of atmospheric water; - Preservation and improvement of the state of the WPA; - Disposal and treatment of waste water in settlements; - Water prices that provide incentives for efficient use; - Reliability of the assessment of the ecological status of surface water; - Prevention of the deterioration of the ecological status of surface water as a result of climate change; - Application of selection criteria for project financing; - Reuse of water; - Ensure the minimum permissible and/or ecological flow in rivers; - Increase efficiency in consumption; - Improvement of the management of forests in catchment areas; - Restoration, protection and strengthening of ecosystems related to agriculture and forestry.

Measures from the FRMP:

Development and updating of disaster protection plans/in part floods;

Development and implementation of regional and municipal programs for disaster risk reduction incl. from floods;

Initiatives for the development of regulations for determining the preventive norms, construction and technical norms for the spatial planning of the territory, the design, implementation and maintenance of the construction works in connection with the reduction of the risk of disasters (floods);

Establishment of a National Real-Time Water Management System;

Preparation of guidelines for the development and preparedness for the implementation of disaster protection plans, including flood protection;

Establishment of early warning systems specifically addressed to torrential floods;

Creation of manageable polders and small buffer pools in bay terraces of the rivers;

Effective management of water levels of dams and retention reservoirs;

Updating the regulations for maintenance and operation of small dams in order to safely conduct high waves;

Coordination and cooperation between all levels of government (national, basin and local) of the single rescue system;

Completion and modernization of the network for meteorological and hydrometric monitoring;

Establishment of a mechanism for coordination of actions in the event of flood risk, incl. in a cross-border area;

Capacity building of competent authorities - RIEW and BD;

Annual inspection of the technical and operational condition of the dam walls and their facilities;

Cooperation with competent bodies for basin management and flood risk management of other countries;

Maintaining and improving the condition of existing dams;

Removal of dangerous, obstructing and/or ineffective dams;

Recovery of compromised dykes;

Provision of slopes for water retention;

Cleaning of river stretches and gullies to ensure the passage of high wave;

Cleaning and management of river beds within an urban area;

Removal of illegal buildings, subversive facilities, fences, stored materials and others within the boundaries of riverbeds or gullies;

Increasing the readiness of the population to respond to floods;

Promoting the use of insurance property products in flood-prone areas;

Constant monitoring of development in the vicinity of floodplain areas;

Conducting training and information campaign on the problems related to the floods;

Informing the population through the use of modern methods and technologies;

Preparation of a daily hydrometeorological bulletin. Issuance of flood hazard warnings to the MoEW and the Ministry of Interior;

Informing downstream stakeholders;

Atmospheric water management to reduce the risk of flooding (especially in populated areas) ;

The GB risk assessment for the **WARBM is** shown in Appendix 4.1 RBMP (2016 - 2021) according to the following criteria: water bodies at risk due to significant pressure detected, water bodies at risk due to assessed poor environmental status, water bodies at risk due to poor chemical status, water bodies at risk due to significant pressure detected or assessed poor environmental or chemical status, water bodies possibly at risk. Their number in the Struma River is 53 and in total in BDA 76 pcs. The updated risk assessment of all 183 bodies of water within the territorial scope of the BDA (after the change in their number due to the designation of the bodies intended for drinking and domestic water supply in 2015) is presented in Appendix 2.4.1, - table from the RBMP. In the scope of the CBCP and the TSIM are 49 GB that are at risk.

The main goal for the surface water bodies in the **WARBM** is the restoration and preservation of their good condition, including: prevention of deterioration of all surface water bodies; protection, improvement and restoration of all surface water bodies to achieve good water status; protection and improvement of water quality in all heavily modified water bodies and achievement of good ecological potential and good chemical status of surface water; prevention, progressive reduction and cessation of pollution from emissions, discharges and releases of priority and priority hazardous substances; Appendix 5.1.1. of the RBMP.

WPA

The environmental protection objectives of the WPA are defined in terms of quantity and quality of water, in order to achieve the requirements of the legislation under which the area is declared or determined.

DDWS

All 63 surface water bodies intended for drinking and domestic water supply are assessed in "good condition" in terms of the purpose of determining the areas. For them, the environmental objective is to maintain good condition and to protect against deterioration.

Update of ecological targets for surface water bodies that are nitrate vulnerable areas. The main environmental objective of the designated nitrate vulnerable areas is not to exceed the concentration of the pollutant nitrates in surface water above 50 mg/l.

Sensitive areas

The WFD does not require the setting of specific targets for surface water bodies that are sensitive areas. The environmental objectives for them are to achieve or maintain good environmental status for the water body type concerned.

Update of ecological objectives for surface water bodies that are areas designated or declared for the conservation of habitats and species in which the maintenance or improvement of water status is an important factor for their conservation. At this stage, the environmental protection objectives set out in the WA, i.e. achieving good surface water status, are adopted as water protection objectives in protected areas and protected areas declared for the protection of water dependent species and habitats. Appendices 5.3.1.4.a, 5.3.1.4.b and 5.3.1.4.c to the RBMP of WARBM.

Measures from the RBMP

Key type measure (KTM) Construction or upgrading of wastewater treatment plants;

KTM Efficiency of water use, technical measures for irrigation, industry, energy and households;

KTM Price policy measures for the implementation of the reimbursement of costs of water services by households;

KTM Measures to prevent or control pollution from urban areas, transport and infrastructure;

KTM Measures to phase out emissions, discharges and losses of priority hazardous substances or to reduce emissions, discharges and losses of priority substances;

KTM Restoration of polluted areas;

KTM Price policy measures for the implementation of the reimbursement of costs of water services by industry;

KTM Measures to prevent or control pollution from urban areas, transport and infrastructure;

KTM Upgrading or improvements of industrial waste water treatment plants, including from agricultural holdings;

KTM Efficiency of water use, technical measures for irrigation, industry, energy and households;

KTM Upgrading or improvements of industrial waste water treatment plants, including from agricultural holdings;

KTM Reducing nutrient pollution from agriculture;

KTM Reducing pollution by pesticides from agriculture;

KTM Price policy measures for the implementation of the reimbursement of costs of water services by agriculture;

KTM Efficiency of water use, technical measures for irrigation, industry, energy and households;

KTM Research, improving the knowledge base to reduce uncertainty.

KTM Measures to reduce sediment from soil erosion and surface flow;

KTM Research, improving the knowledge base to reduce uncertainty.

KTM Improvement of the longitudinal continuity, e.g. creation of fish passages, demolition of old dams;

KTM Improving the hydromorphological conditions of water bodies, i.e. restoration of rivers, improvement of coastal areas, removal of solid embankments, restoration of the connection between rivers and floodplains, improvement of the hydromorphological status of transitional and coastal waters, etc.;

KTM Improvement of the flow regime and/or determination of ecological flow;

KTM Price policy measures for the implementation of the reimbursement of costs of water services by industry;

KTM Research, improving the knowledge base to reduce uncertainty

KTM Measures for the protection of drinking water, e.g. designation of protection areas, buffer zones, etc.;

KTM Improving the hydromorphological conditions of water bodies, i.e. restoration of rivers, improvement of coastal areas, removal of solid embankments, restoration of the connection between rivers and floodplains, improvement of the hydromorphological status of transitional and coastal waters, etc.;

KTM Improvement of the flow regime and/or determination of ecological flow;

Some KTMs are repeated because they are caused by different driving forces.

The full text of the updated Programme of Measures (PoM) of the WARBM is presented in Appendix 7.2.d. - Programme of Measures for Surface and Groundwater in the WARBM.

Measures in RBMP relevant for the implementation of measures in FRMP. The preparation of management plans under the WFD and the FD are an opportunity to use the information available on status and pressures together and to design PoMs that help achieve “good status” while reducing flood risk. Appendix 7.3 presents the measures from the FRMP that are included in the PoM of the RBMP.

Climate change adaptation measures. When preparing the programmes of measures to the RBMP, the expected climate change and its impacts are taken into account. These measures are aimed at overcoming and mitigating the effects of rising temperatures, decreasing precipitation, changing the

flow of rivers and ecosystems, and drought, on the one hand, and problems related to sudden floods, on the other.

Priorities and objectives in the FRMP

Priority 1: Protect human health.

Objective 1.1. Minimising the number of people affected by flooding;

Objective 1.2. Ensuring rapid drainage of water during intense precipitation and flooding from urban areas;

Objective 1.3. Restoring normal living conditions;

Objective 1.4. Minimising the number of social infrastructure sites affected;

Priority 2: Higher protection of critical infrastructure and businesses.

Objective 2.1. Improving the protection of technical infrastructure sites;

Objective 2.2. Improving the protection of important economic, cultural and historical sites;

Priority 3: Enhancing environmental protection.

Objective 3.1. Improving the protection of sewerage systems;

Objective 3.2. Improving the protection of industrial sites - mainly IPPC and SEVESO sites;

Objective 3.3. Minimisation of affected water protection areas, protected territories and protected zones;

Objective 3.4. Improvement of the water retention capacity of agricultural, forest and riverside areas;

Priority 4: Improvement of population preparedness and responses.

Objective 4.1. Increasing population preparedness for floods;

Objective 4.2. Improving population responses to floods;

Priority 5: Improving the administrative capacity for flood risk management

Objective 5.1. Creating modern regulations for spatial planning and flood risk management;

Objective 5.2. Providing operational information for flood risk management;

Objective 5.3. Increasing the qualification of staff involved in flood risk management;

Objective 5.4. Minimising the risk of watercourse flooding for the entire river basin;

Objective 5.5. Ensuring adequate response of public institutions to floods.

Measures in the FRMP of the BDA. Appendix No. 4 to the FRMP of the BDA

The planned measures listed below apply to the whole of the RBM, and in particular to the regions of Pernik and Kyustendil:

Initiatives for the development of regulations for determining the preventive norms, construction and technical norms for the spatial planning of the territory, the design, implementation and maintenance of the construction works;

Updating the regulations for the maintenance and operation of small dams in order to safely conduct the high waves caused by torrential flooding;

Establishment of a National Real-Time Water Management System;

Extension of the "bottlenecks" such as bridges, etc., which lead to sprinkling of the river flow;

Development and implementation of regional and municipal programs for disaster risk reduction incl. from floods;

Information and wide access to information to the population through the use of modern tools and technologies;

Capacity building of competent authorities - RIEW or ;

Establishment of a mechanism for coordination of actions in the event of flood risk, incl. in a cross-border area;

Cooperation with competent bodies for basin management and flood risk management of other countries;

Conducting training and information campaign on the problems related to the floods;

Increasing the readiness of the population to respond to floods;

Cleaning of river stretches and gullies to ensure the passage of high wave;

An examination of the technical and operational condition of the bridges;

Annual inspection of the technical and operational condition of the dam walls and their facilities;

Preparation of guidelines for the development and preparedness for the implementation of disaster protection plans, including flood protection;

Reconstruction and repair of dams;

Coordination and cooperation between all levels of government (national, basin and local) of the single rescue system;

Development and implementation of regional and municipal programs for disaster risk reduction incl. from floods;

Documentation of events and assessment of flood damage;

Development and updating of disaster protection plans in part floods;

Increasing the readiness of the population to respond to floods;

Preparation of a daily hydrometeorological bulletin. Issuance of flood hazard warnings to the MoEW and the Ministry of Interior.

Cleaning and management of river beds within an urban area;

Constant monitoring of development in the vicinity of floodplain areas;

Building new corrections;

Upgrading of dykes;

Cleaning of river stretches and gullies to ensure the passage of high wave;

Cleaning and management of river beds within an urban area;

Construction of ground-bulk hoist and combination;

Effective management of water levels of dams and retention reservoirs. Prevention of overflow through the crown of the dikes during torrential rainfall in relatively small catchment areas;

Removal of illegal buildings, subversive facilities, fences, stored materials and others within the boundaries of riverbeds or gullies;

Creation of manageable polders and small buffer pools in bay terraces of the rivers.

For the regions on the territory of the Republic of Serbia

There are no significant problems related to the CBCP and TSIM in the Republic of Serbia. According to the risk assessment, low-risk areas for organic pollution and nutrients predominate within the scope of the CBCP. At the same time, many areas have medium risk. Priority and hazardous

substances are predominant in the absence of risk and only in individual areas are the risks medium, e.g. Bor. In the case of hydro-morphological pressures, the risk-free, moderate and at-risk areas are roughly the same. See Figures III. 28 to III.31 - The Water Management Plan of the Republic of Serbia.

The environmental objective of the WFD has been adopted - all water bodies should achieve good status/potential of surface water and WPA for a period of 3 cycles of RBMP.

The general objectives of the WFD are: 1) good environmental/chemical status for GB or good environmental potential and chemical status for HMBW and ABW, 2) achievement of the objectives and standards for WPA in accordance with EU legislation. In addition are foreseen: Extension of the target deadline; Less stringent targets; Temporary deterioration of GB status; Future infrastructure projects with application of Article 4 (7) WFD.

Environmental objectives in the WPA. For GB that fall under the WPA, the targets may be stricter than the required good status. The relevant Directives have not been transposed in the Republic of Serbia. The levels of protection for the respective WPA are included in the act for their announcement.

According to the Spatial Development Plan of the Republic of Serbia 2021 objectives for the protection of DDWS are: The common goal is for the Republic of Serbia to be a unified water economy.

The specific objectives for DDWS are: 1. Water supply from integrated systems with a high degree of reliability; 2. Rationalization of water use and reduction of losses; 3. Protection of all water sources for DDWS; 4. Protection from internal and external "high" waters; 5. Mapping of flood risk zones; 6. Full use of economically significant hydropower potential; 7. Possibilities for drainage and irrigation of all suitable agricultural land - 1,900,000 ha; 8. Renovation and completion of all existing channel systems - there are none in the scope of the CBCP; 9. Provision of ecological drainage under reservoirs and water abstraction in rivers.

Measures

The basis for planning measures is the pressure and impact analysis and assessment of the risk of missing environmental targets. The PoM covers basic measures as well as additional measures.

List of key measures:

1. Construction or completion of WWTP;
2. Reducing pollution by fertilizers from agriculture;
3. Reducing pollution by pesticides from agriculture;
4. Renovation of polluted sites - historical pollution of sediments and groundwater, land;
5. Improvement of the longitudinal continuity of the watercourse - fish passages, demolition of old partitions;
6. Improvement of other hydromorphological conditions of surface BW other than item 5;
7. Improvement of the flow regime and determination of ecological flow;
8. Improving the efficiency of water use in irrigation, industry, energy and households;
9. Establishment of a water price for households with full reimbursement for the costs of the water service;
10. Establishing a water price for the industry with full reimbursement for the costs of the water service;

11. Establishing a price for water for agriculture with full reimbursement for the costs of the water service;

12. Agricultural advisory services

13. Preservation of drinking water, for example the SSZ;

14. Research and improving the knowledge base to reduce uncertainty.

15. Gradual reduction of emissions of priority, hazardous substances;

16. Completion or improvement of industrial WWTPs, incl. farms;

17. Reduction of erosion deposits;

18. Preventing or controlling negative impacts of invasive species and imported diseases;

19. Prevention or control of negative impacts of recreational activities, including fishing

20. Prevention or control of adverse effects from fish farming, etc.;

21. Prevention or control of pollution from urban surfaces, transport and other infrastructure;

22. Prevention or control of pollution from forestry;

23. Natural water detentions;

24. Climate Change adaptation;

25. Prevention of acidification;

For GB "at risk", the PoM contains all the main measures and a number of additional measures described above with numbers: 1 to 7, 12, 14 and 16.

Sectoral objectives and measures are set out in the Water Strategy of the Republic of Serbia - p. 151.

According to the PPRS section 2.5.1.3.3 in the Republic of Serbia it is planned to develop 18 regional water supply systems - Table 23, Thematic Map 3. The scope of the CBCP includes the Upper-South Moravian Water Supply System and the Lower-South Moravian Water Supply System. The water sources are: reservoirs, lake, wells, springs.

Objectives and actions for floods

Strategic objective: Reducing the risk of harmful effects of water.

Operational objective 1: Outflow corresponding to environmental conditions;

Measures to achieve the objective: 1) increasing the throughput of the beds and stability of the shores; 2) minimum hydromorphological changes, on the principle of "natural regulations"; 3) flow through the settlements in accordance with local needs and urban solutions; 4) flow in accordance with technical-economic and environmental conditions, laws, contracts and conventions.

Operational objective 2: Regularly maintained and control of flow and facilities.

Measures to achieve the objective: 1) regular maintenance and control of the beds and water bodies and renovation activities; 2) regular maintenance of the water bodies in accordance with the standards and regulations.

Operational objective 3: Protection and improvement of the water regime in the operation of river deposits.

Measures to achieve the objective: 1) adequate monitoring of the quantity and quality of river deposits; 2) exploitation of river deposits, including commercial, to be carried out only in certain locations, based on a design; 3) minimal hydromorphological changes and renovation after completion

of the operation; 4) systematic maintenance of the regime of river deposits and morphological changes of the bed after operation; 5) prohibition of the exploitation of river deposits in parts of surface water-impaired BW; 6) of medium and small streams - improvement of the coast, shore and extraction of deposits to be carried out integrally.

Objectives and measures on each surface BW are in the RBMP of the RS. Appendix 3.

Cross-border impact

According to the Spatial Development Plan of the Republic of Serbia, at a strategic level it is not possible to approve specific projects that concern cross-border impacts. Only areas of territorial development involving problems in the border zone with other countries can be identified. This is primarily in the field of energy, due to the possible cross-border impact of air, water and the WPA for Fauna and Hieropterofauna.

2.1.4. Subsoil state

- ***Regions in the Republic of Bulgaria***

The Danube region for basin management in its hydrographic scope and morpho-structural plan almost overlaps with the geographical concept of Northern Bulgaria. The small differences come from the inclusion of the river catchment of river Nishava and exclusion of the territory east of the underground watershed of the Upper Jurassic and Lower Cretaceous aquifer, which runs approximately along the western border of Shumen and Dobrich administrative regions. The Danube Region includes two main morphostructural units: The Danube plain and the northern slopes of the Stara Planina chain system.

The Danube plain is characterized by lowland and hilly-plateau relief. In the western sub-area (to the river Vit) predominates lowland and plateau relief with average altitude of 130 m. Flat inter-territorial spaces are reduced with a slight inclination to the river Danube. The right slopes of the river valleys are steep and the left slopes lean. The westernmost Danube tributaries - the Topolovets, Chichilska and Vidbol rivers run in canyon valleys. The middle sub-area (between the river Vit and river Yantra) has a flat hill relief with the development of wide, meandering river beds and a.h. 138 m. East of the river Yantra extends Ludogorsko-Dobrudzha hilly-plateau sub-area, which coincides with the top of the North-Bulgarian flat vault. The flat watersheds of the Ludogorsko plateau gradually rise to the west and transition into the Popovsko-Samuilovsky Heights, located between the spring areas of the river Baniski Lom and Suha river The rivers here have temporary, intermittent flow and are deeply incised in canyon valleys.

The Bulgarian bank of the river Danube is high and steep. It is mainly the result of erosion processes, unlike the Romanian coast, which is flat and built of several accumulation terraces. On our coast from Vidin to Silistra are formed a dozen separate lowlands, representing the floodplain terrace of the river Danube. The Danube lowlands are andigated and have built drainage systems.

The Stara Planina chain system is divided into two parts: Predbalkan and the Main Stara Planina Chain.

The Predbalkan covers a longitudinal strip of pre-mountains located between the Danube Plain and the Sashtinska Stara Planina. The Danube Region for Basin Management considered includes the

western and middle parts of the Predbalkan, i.e. from the river Timok to river Yantra (more precisely to its tributary Stara Reka). The pre-mountainous strip is the widest in the valley of Vit, about 50 km, and in the west and east narrows to 10-15 km. The relief is hilly with culiuous changing structural elevations and decreases (anticlines, synclines and erosion decreases). The meridian flowing rivers Lom, Ogosta, Iskar, Vit, Osam and Yantra cross the mountain hills with deep and narrow gaps, and their longitudinal tributaries form wide anticline and syncline valleys.

The main Stara Planina chain is the widest in its western part, about 40 km, and to the east at the valley of Vit narrows to 20 km and so continues throughout the middle part - to the Stara Reka (Vratnik Pass). The orographic soundness of the Stara Planina chain is emphasized by its average height, which for the western part is 849 m and for the middle part reaches 961 m. In the highest parts of the mountain, at a height of 1800-1900 m. rounded (at peak Botev and peak Paskal) and flat (at peak Ravnets) ridges form, which are cut abruptly from the steep fault slopes below them. At 200-400 m above this resilient hypsometric level rise the rounded peaks of the highest parts of the Stara Planina ridge. The Eastern Stara Planina chain, which is shaped in low mountain and hilly relief, refers to the Black Sea Region for Basin Management.

The morphometric data within the Danube region for basin management show large differences between the relief of the Main Stara Planina chain, which here has an average height of 900 m, and the Predbalkan - 384 m , i.e. 2.3 times lower.

Two of the main tectonic units of Bulgaria - the Moesian Platform and the Alpine Bow System - participate in the geological construction of the Danube region for basin management.

The Moesian platform on morphostructural features largely overlaps with the geomorphological region of the Danube Plain and continues northward beyond the Danube in the Vlashka Plain. In tectonic terms, it is one of the most stable and consolidated territories in the country. It consists of two structural complexes . The lower structural complex consists of pre-Paleozoic and Old Paleozoic, heavily folded, disturbed and metamorphosed rocks. The upper structural complex is the platform cover of powerful sedimentary rocks with almost horizontal layers deposited in the Mesozoic and Neozoic eras. In the construction of the platform cover, the two largest structures - the North Bulgarian arched elevation to the east and the Lomska slope to the west - are of paramount importance. The transition between them is shaped like a monoclinal.

The north Bulgarian arched elevation is outlined by the spatial position and the domed shape of the Upper Jurassic and Lower Cretaceous carbonate complex, encompassing the Ludogorie and reaching to the west the valley of the river Osam, to the north extends to the Danube, and to the south is bounded by the parallel of the river Provadiyska. The length of the structure is about 300 km and its width 85-110 km. The elevation amplitude from the lowest point in Lovech (-1700 m) to the highest - north of Novi Pazar (+300 m) is 2000 m. At least the most hydrogeological importance is attained by the Barremian-Aptian (Lower Cretaceous) and Malm-Valangian (Upper Jurassic - Lower Cretaceous) sediments, which in the southern and central parts of the area are separated by thick layer Hotrovian clay marl, and in the north - due to the facial change of the marl to limestone, form a common carbonate slab.

The Lom slope is a vast negative tectonic structure in the western part of the Moesian platform. Different researchers define it with different stratigraphic and hence different spatial scope. The young

structure has a south-north orientation, from the village of Brusartsi - Lom (Bulgaria) to Vela - Titomirtsi (Romania). The lowest section in our territory is between the rivers Archar and Iskar with a thickness of 650-800 m.

The Predbalkan tectonic zone covers a long strip between the Moesian Platform and the Western Balkan. In it are located in parallel to each other many plicative structures - anticlines and synclines, mainly composed of Mesozoic sedimentary rocks. Only in the cores of the two largest anticlines - the Belogradchik and Teteven are revealed rocks from the Caledonian and Hercina complex. The most favourable environment for the formation of groundwater are the limestone rocks of the middle Triassic, the Upper Jurassic and the Lower Cretaceous (its Urgon facies), and the most unproductive can be considered the so-called Flishki Predbalkan, located east of the Iskar - Vit Descent, occupying the southern departments of the structure and reaching the upper stream of the river Ticha.

The Western Balkan Tectonic Zone comprises the high mountain divisions of the river Timok to the upper stream of the river Yantra (Vratnik Pass). The northern slopes of the structure are connected to the Danube Region for Basin Management and the common waterline of the area runs along the ridge of the mountain. The border with the Predbalkan is marked by the Stara Planina dislocation zone (also known as the Stara Planina front line). In the construction of the Western Balkan Tectonic Zone, the main role is played by the anticlines, the main of which are Berkovska, Svogenska, Central Balkan, Shipchenska and Tvardishka, as well as the Botevvrushki overstep. The cores of these anticlines are revealed on wide areas and are made up of pre-Praleozoic and Paleozoic rocks. However, the mantle cloaks are preserved only in narrow strips of Mesozoic sediments. And here important for hydrogeology are above all the carbonate rocks of the Middle Triassic, the Upper Jurassic and the Lower Cretaceous, which are the medium for the formation of separate significant karst basins.

In the areas under consideration, mining and quarrying is highly developed. Iron, lead-zinc, copper, etc. are more widespread than metal deposits. More significant are the iron mines - Kremikovtsi (Sofia-region) and Chiprovtsi (Montana), for copper, in the paragenesis of silver and gold - mines "Plakalnitsa" (Vratsa), Elatsite and Chelopech (Sofia-region). Of the non-mineral deposits are represented: gypsum (Vidin), fluorine (Montana) rock and rock cladding (Vratsa and Montana). Of the non-metallic deposits were developed mainly coal mines - Pernik, Bobov dol, Katrishte, Chukurovo, Svoge, Dragoman and others. More than 17 uranium sites have been explored and developed, mainly on the territory of Sofia-region and Montana. All mining sites of the uranium industry are now closed and their technical liquidation and biological reclamation are almost complete.

On the territory of Sofia-region and Kyustendil region there are many springs with thermal mineral waters used mainly for balneotherapy, bottling, greenhouses, etc. They are mainly attached to areas with active tectonic regime.

Seismic activity in the considered regions is quite high. In the mid-19th century, the devastating Sofia earthquake happened. After this earthquake, the springs with thermal waters in Ovcha Kupel appeared on the surface. In the 2012 in the area of the city of Pernik is registered an earthquake with a magnitude of 5.7 on Richter.

- ***Regions in the Republic of Serbia***

The geological construction of the Eastern Serbia region consists of two zones: Serbian-Macedonian massif and Carpatho-Balkanidi (**Figure 2.1.4-1)**.

Serbian-Macedonian Massif

It includes two complexes of crystal shale: the lower, heavily metamorphised and pre-Cambrian in age and the upper (Vlasic) complex of green shale with age from Rifey to lower Paleozoic. These rocks are penetrated by granitoids whose age ranges from Paleozoic (Vlajna, Bujanovac) to Tertiary (Surdulica). The position of the granitoid Yastrebac is still in dispute.

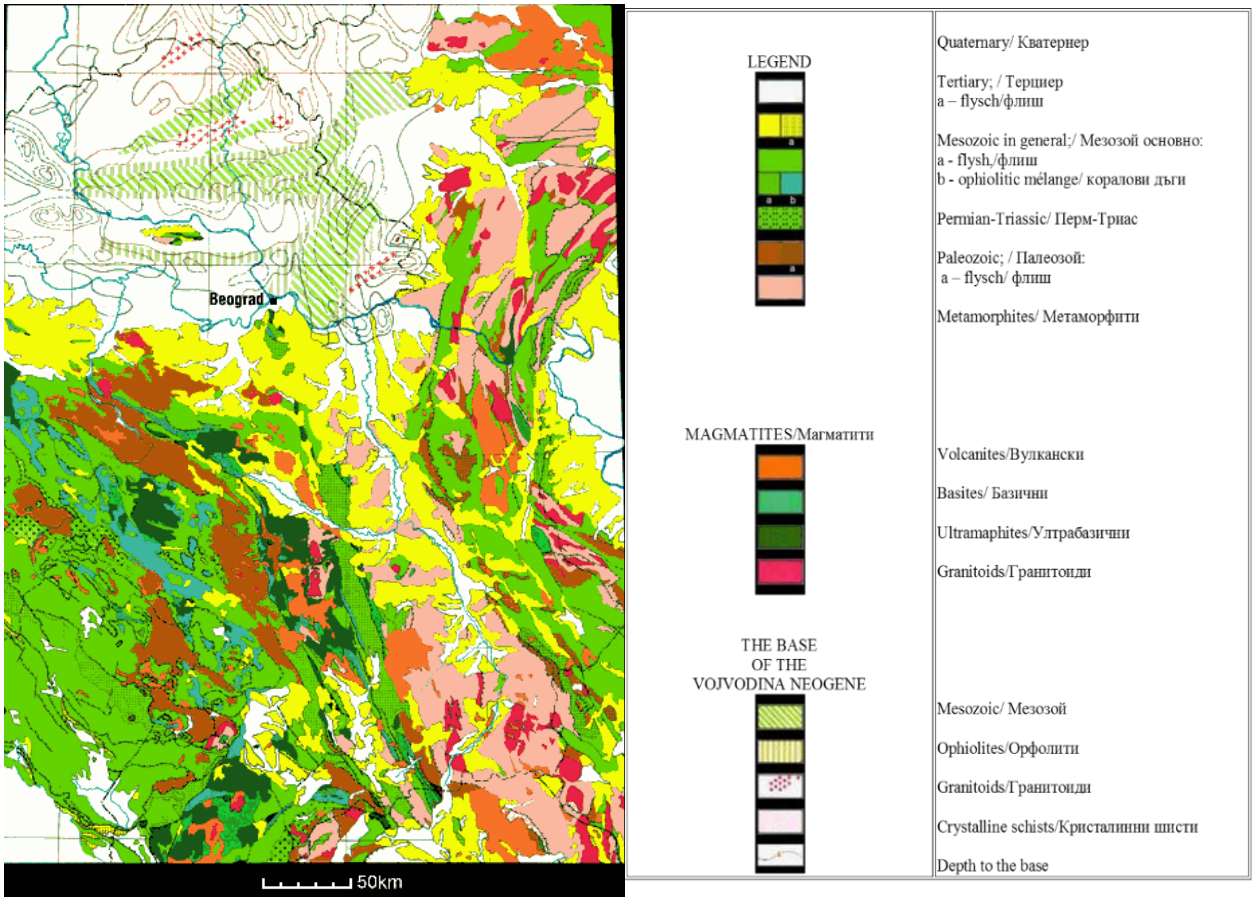


Figure 2.1.4-2 *Geological map of the Republic of Serbia*

Carpatho-Balkanidi

The supergeticum (Golubatsko- Luzhnishka Zone) is made of green slate, Devonian flysch, Permian red sandstone, Mesozoic limestone and Jurassic flysch. It was pushed over Getikum, a large, complex covering that makes up most of the eastern territory of the Republic of Serbia. It is divided into several zones, which in part differ in their geological history and are therefore even interpreted as separate patrons (Suva Mountain, Kuchai, Timok, Tupiznitsa, Porecka Reka, Stara Planina, Vidlic).

The Geticum consists of Proterozoic-Cambrian shale, Ordovician and Silurian metamorphites of low rank, Devonian flysch, Permian and Triassic red sandstone and Midtriassic-Cretaceous limestones,

as well as the Upper Cretaceous volcanic sediment formation in the Timok region. While Romania retains large Getikum klippen (Bahna, Mehedinci), in eastern Serbia only quite small clips of Sip and Tekija crystals are met.

Infrageticum encompasses the ultra-basic elements underlying these clips; it follows the gabroids of Zaglak and Deli Jovan with adjacent metamorphites and the layers of Sinaia.

Dunabicum is an autochthon in terms of these units. The oldest rocks included in it are green shale with a multitude of magmatic veins covered by top carbon layers and a transgressive series of rocks, ranging in age from Lias to Cretaceous. At the end of the Cretaceous, the flysch began its development in the region of Mirok.

Figure 2.1.4-2 shows a simplified geological map with the main lithostructural units, some of which played a dominant role in the origin and distribution of ore mineralizations. Thus these are highlighted:

- Ultra-basic rock massifs, characterizing Triassic-Jurassic Ophiolite Paleo-Rift;
- The volcanic and volcanic-plutonic complexes of the Upper Cretaceous, which led to the copper mineralization of the Carpato-Balkan Metallogenic Province in north-eastern Serbia;
- The Tertiary volcanic-plutonic complexes that characterize the large Serbian-Macedonian metallogenic province, which crosses the Republic of Serbia from the borders of the Republic of North Macedonia and the Republic of Bulgaria in the south-east to the borders of Bosnia and Herzegovina and Croatia in the north-north-west;
- Intrusive granites, the oldest of which are dated as permocarbon and the youngest as Tertiary;
- Quaternary sediments, represented mainly by the molasses of the Pannonian basin in Vojvodina.

Finally, the main discontinuities (faults and incursions), in particular the groups of faults limiting the Vardar zone, are graphically outlined.

Geology is based on the geological map of Yugoslavia on a scale of 1: 500,000 (Federal Geological Institute, 1970) The changes and additions are derived from the geological map of the Republic of Serbia with scale 1: 200,000 (Milovanovic and Ciric, 1968) and from various compilations of maps found in various publications.

Coal is extracted in eastern Serbia in the deposits: Aleksinac, Soko, Vrška chuka, Ljubnica, Boža, Rembas, Morava

A large distribution have copper ores in association with gold and silver. The largest mines are Bor, Borski Reka, Majdanpek, medium - Veliki Kriveli, Lipa, Tserovo, Dumitru Potok, Tsoka Marin, Blagodat, Ruplie and several smaller ones.

Along with Pb-Zn, copper is the main metal ore mineral extracted in the Republic of Serbia, with most of the production coming from deposits in the Bor region in north-eastern Serbia. The deposits of "high sulphidation" type in Bor are already practically exhausted and at the moment it is the porphyry copper that is extracted from the high tonnage/low quality (0.3-0.4% Cu) deposits of Maidanpek, Veliki Krivel, Tserovo and others. These deposits are inherited from the late Cretaceous metallogenic episode, which has also led to many similar deposits in Bulgaria, Romania and Hungary.

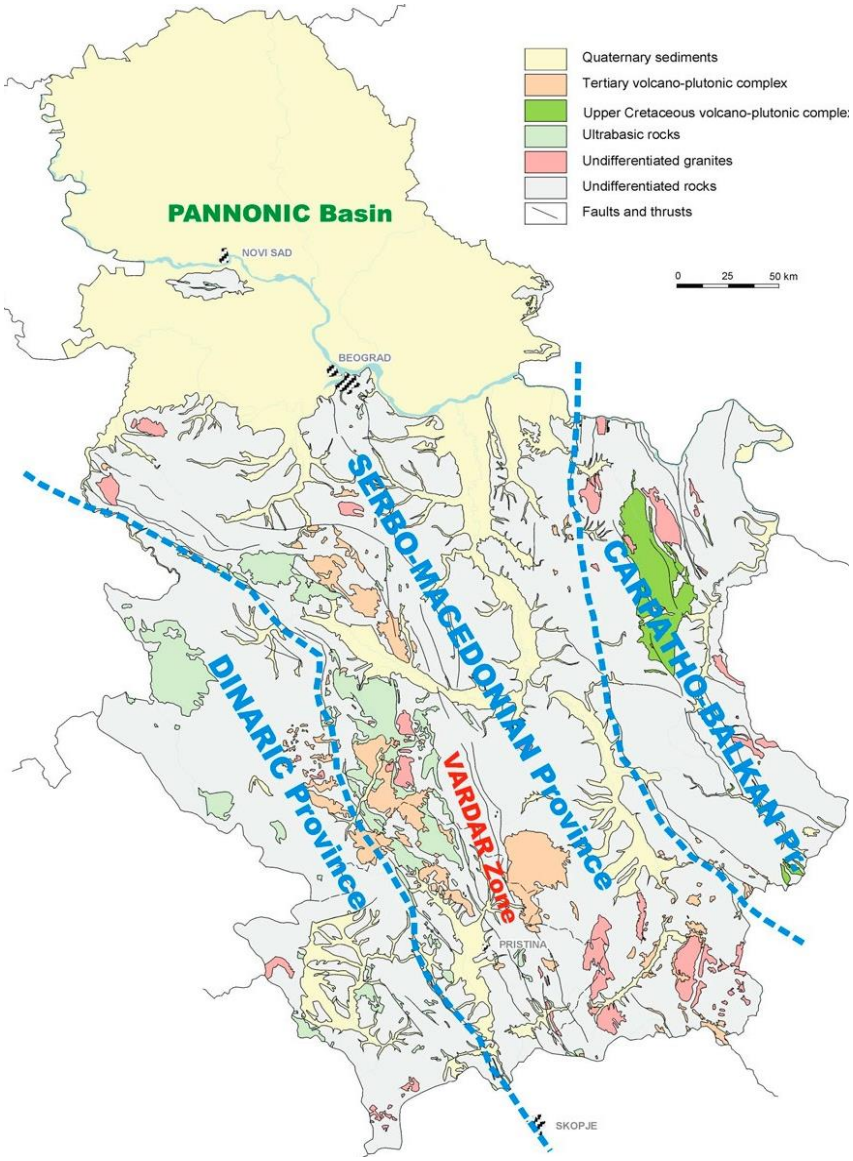


Figure 2.1.4-2 *Lithostructural map of the Republic of Serbia*

The metallic potential of the Bor region is estimated at more than 15 Mt Cu, 700 t Au and 4,500 t Ag. This is one of the highest in Europe, although far behind Polska Silesia (45 Mt Cu) and is of the same order of importance as the South Iberian Pyrenean Belt. Previous production is estimated at almost 6 Mt of copper metal, 300 t of gold and about 1,200 t of silver.

Copper is also extracted as a by-product from the fields of Veliki Maidan, Rudnik and Blagodat with Pb-Zn mineralization.

Deposits with Pb-Zn mineralization, of medium size, such as Veliki Maidan, Rudnik, Tsoka Marin, Ruplije and Blagodat, are scattered throughout eastern Serbia. They are also ores of the substitute type and Skarran deposits associated with tertiary volcano-plutonic events. Besides silver, the main by-products of these deposits are copper, bismuth, cadmium and gold.

The territory of the Republic of Serbia, in particular its eastern parts, is characterised by intense seismic activity.

The Republic of Serbia does not belong to an area with high seismic activity such as the primary zones of tectonic plate collisions (where 90% of all earthquakes occur on the planet Earth), but there were earthquakes whose magnitudes reached 5.9 on the Richter scale. Taking into account the high vulnerability of the built environment and the quality of the soil, such earthquakes can be destructive. [76]Historical records of earthquakes warn of this. The main characteristics of seismicity in Serbia are:

- Strong earthquakes always happen with a new situation at the epicentre;
- The occurrence of the main impact is preceded by an increase in seismic activity in the earthquake zone;
- Release of seismic energy over a period of several years;
- Periods of increased seismic activity alternate with periods of calm.

Earthquakes can also threaten the population, as well as the road infrastructure through landslides on the site.

In 2010, 239 earthquakes were recorded in the territory of Serbia. Of these, four earthquakes have a magnitude of more than 4 on the Richter scale, and one - 5.4. The earthquake with 5.4 on Richter was registered on 03.11.2010 at 00:56:54 AM with a depth of 2 km and was about 10 km north-west of Kraljevo, in the village of Vitanovac, where over 70% of the roofs of the houses were destroyed. The tremor caused the death of two people. The Republican Seismological Institute estimates the material damage amounted to about 1 million euro. In 2011 and 2012, only 79 earthquakes were recorded that did not exceed Richter grade 4.

Summary of the state of the subsoil

Geological and tectonic development of the territory in the cross-border regions of the Republic of Serbia and the Republic of Bulgaria has a similar character. The contemporary relief is varied, present are high and low mountain terrains and well shaped river valleys, hollows and lowlands. Large geological and tectonic structures were developed on the territory of both countries - the Danube Valley, the Stara Planina Chain System and the partially area of the Kraishtidi. The erosion processes are characteristic of the elevated parts of the relief, and the deposition of the silt material is mainly carried out in the valleys, lowlands and water basins.

The metallogenic appearance of cross-border areas takes shape during the Late Alpine epoch, when almost all industrial deposits of endogenous metallic and non-metallic minerals are formed. They are genetically and/or paragenetically related to late-Alpine extensive magmatism. Lead-zinc, manganese, copper in the paragenesis of silver and gold, etc. are more widespread of the metal deposits. Of the non-metallic deposits are developed mainly coal, fluorite, quartz sands, bentonite, rock-cladding, marbles, etc.

[76] *http://extwprlegs1.fao.org/docs/pdf/srb202292.pdf*

Earth's subsoil is one of the components of the environment and is a non-renewable natural resource. Control regarding the protection and environmentally sound use of the subsoil and the underground natural resources, as well as the protection of the environment in the activities of prospecting, exploration and extraction of subsoil in the Republic of Bulgaria is regulated by regulations. The search and exploration for underground resources begins after a decision of the Council of Ministers to grant permission, authorization and contract with the relevant competent ministry. The relevant projects are also prepared and coordinated in accordance with the regulations.

As part of the Balkan Peninsula, the cross-border territories of Republic of Serbia and Republic of Bulgaria are highly threatened by the seismic activity of the earth's subsoil. Earthquakes are natural disasters caused by the impact of seismic waves on the earth's surface. Seismic waves are generated in the process of rupture of the earth's environment due to accumulated stresses - the result of internal earth causes. Earthquakes are the brightest, strongest and fastest manifestation of modern movements in the earth's crust and result from the movement of continental plates. They are concentrated in seismic belts that coincide with the zones of contact and relative movements between the large lithospheric plates. The Balkan Peninsula is the most active node in the Alpine-Himalayan Belt for Europe. In recent years, there has been a significant increase in seismic activity in the Balkans.

2.1.5. Soil state

According to *"The State of Soil in Europe A contribution of the JRC to the European Environment Agency's Environment State and Outlook Report— SOER 2010 Arwyn Jones, Panos Panagos, Sara Barcelo, Faycal Bouraoui, Claudio Bosco, Olivier Dewitte, Ciro Gardi, Markus Erhard, Javier Hervás, Roland Hiederer, Simon Jeffery, Anke Lükewille, Luca Marmo, Luca Montanarella, Claudia Olazábal, Jan-Erik Petersen, Vit Penizek, Thomas Strassburger, Gergely Tóth, Miet Van Den Eeckhaut, Marc Van Liedekerke, Frank Verheijen, Eva Viestova, Yusuf Yigini"* the main soil types in Europe are:

- Albeluvisols: Acidic soils with bleached surface material forming tongues in the ground;
- Calcisols: Soils with significant calcium carbonate deposits;
- Chernozems: Dark, fertile soils with an organic-rich topsoil;
- Fluvisols: Stratified soils occurring mainly in floodplains and tidal marshes;
- Gleysols: Soils saturated with groundwater for long periods;
- Gypsisols: Soils on dry land with significant gypsum deposits;
- Histosols: Organic soils with layers of partially decomposed plant residues;
- Kastanozems: Soils from dry grassland with a humus horizon rich in organic matter;
- Luvisols: Fertile soils with clay accumulation in the ground;
- Leptosols: Shallow soils above hard rock or extremely skeletal soil-forming material;
- Umbrisols: Young, acidic soils with a dark topsoil rich in organic matter;
- Vertisols: Heavy clayey soils that swell when wet and form cracks when dry;
- Phaeozems: Dark, sparingly leached soils with a rich organic soil layer;
- Podzols: Acidic soils with underground accumulations of iron, aluminium and organic

compounds;

- Solonchaks: Soils with salt-enriched surfaces, due to capillary rise of salt groundwater and its active evaporation;
- Stagnosols: Soils with stagnant surface water due to the presence of a free-permeable ground horizon;
- Planosols: Soils with intermittent stagnation of water, leading to a sharp change in texture between the topsoil and the ground, which hinders drainage.

➢ ***Regions in the Republic of Bulgaria***

Classes and types of soil

The soils of the Republic of Bulgaria fall into two European soil-geographical areas: Carpathian-Danubian and Mediterranean, which are essential parts of the Sub-Boreal and Subtropical Soil Sectors of Europe. On the territory of Bulgaria are separated the Lower Danube soil sub-area, which is part of the Carpathian-Danube region and the Balkan-Mediterranean soil sub-area - part of the Mediterranean area.

The soils on the territory of the regions of ***Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil*** fall within the limits of:

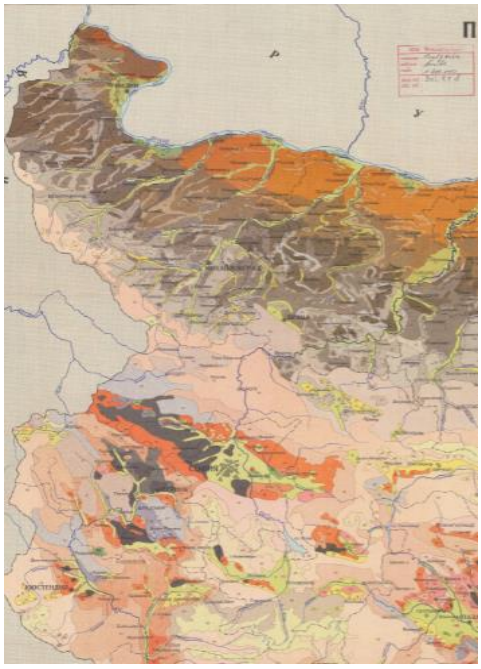
- Carpathian-Danubian region, Lower Danube soil sub-area with the following provinces: Western Lower Danube (1 - Vidin Region); Middle Lower Danube (2 - part of Vratsa Region); Western Predbalkan (6 - Montana Region); Middle Predbalkan (7 - part of Vratsa Region); Stara Planina Medium High (9 - parts of Montana, Vratsa Region) - **Figure 2.1.5-1**;

- **Mediterranean region, the Balkan-Mediterranean soil sub-area** with the following provinces: Sofia-Kraishtinska (11 - Pernik, Kyustendil and Sofia - region); Vitoshko- Srednogorska (18 - Sofia - region) and Osogovo - Belasishka (21 - parts of Pernik and Kyustendil regions).

The following classes and types are presented: Fluvisols - Alluvial - Delluvial Fluvisols; Chernozems; Luvisols - Chromic Luvisols; Cambisols - Dystric - Eutric Cambisols; Cambisols - Umbric Cambisols; Cambisols - Modic Cambisols; Leptosols - Lithosols, Regosols, Rankers and Rendzinas - **Figure 2.1.5-2.**

I – LOWER DANUBE SOIL SUBREGION (within the Carpathian-Danube soil region) with provinces: 1-Western Lower Danube; 2-Middle Lower Danube; 3-Danube-Dobrudzha; 4-Ludogorska; 5-Provadiyska; 6-Werstern Predbalkan; 7- Middle Predbalkan; 8-Eastern Balkan; 9-Middle High Stara Planina; 10-High Stara Planina	II – BALKAN-MEDITERRANIAN SOIL SUBREGION (within the mediterranean region) with provinces: 11- Sofia-Kraishte; 12- Zadbalkanska; 13 – Srednogorska; 14-Srednothracian-Tundzha; 15-Struma-Mesta;16-Eastern Rhodope-Sakar; 17-Strandzha; 18-Vitosha-Sredna gora; 19-Rila-Pirin; 20-Western Rhodopa; 21-Osogovo-Belasitsa; 22-High altitude (Vitosha, RIla, Pirin and Rhodopa)

Figure 2.1.5-1. *Soil and Geographic Areas in Bulgaria*



Key:

	Атлас на почвите в България, 1998	
1	Карбонатни черноземи	Vermi-Calcic Chernozems (Phaeozems)
2	Карбонатни и типични черноземи	
3	Типични черноземи	Vermi-Calcic Chernozems (Phaeozems)
5	Излужени черноземи	Luvic Phaeozems
6	Силно излужени черноземи	Luvic Phaeozems
8	Глинести черноземи	
10	Лесивирани черноземи и сиви горски почви	Luvic Phaeozems and Orthic Luvisols
15	Излужени смолници	Pellic Vertisols
16	Сиви горски	Orthic Luvisols
20	Излужени канелени горски	Chromic Luvisols
31	Алувиални и алувиално ливадни почви	Fluvisols
32	Делувиални и делувиално ливадни почви	Fluvisols
62	Кафяви горски почви	Cambisols
63	Тъмноцветни горски почви	Cambisols
66	Планинско ливадни почви	Cambisols

Figure 2.1.5-2. *Soil map for Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (sample of Bulgarian Soil Map S 1:400,000)*

Land use

Regions: ***Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil*** fall into the "North-West" (*Vidin, Montana, Vratsa*) and "South-West" (*Sofia-region, Pernik, Kyustendil)* statistical regions - level 2 of the nomenclature of territorial units for statistics (NUTS) of the European Union, according to Regulation (EC) No176/2008.

According to *"BANSIC: Load and use of the territory in 2020* total of the whole territory of the regions:

- *Vidin, Montana, Vratsa,* the utilized agricultural area* is 570,325 ha (54.03% of the area of the "North-Western statistical region used for agricultural purposes") of which the total arable land** is 434.937 ha (53.72% of the area of the arable land in the "North-Western statistical region") - **Table 2.1.5-1, Figure 2.1.5-3** and **Figure 2.1.5-4**.

- *Sofia-region, Pernik and Kyustendil,* the area used for agricultural purposes is 420,033 ha (70.33% of the area of the "South-Western Statistical Region used for agricultural purposes") of which the arable land is 146,687 ha (73.44% of the area of the arable land in the "South-Western Statistical Region") - **Table 2.1.5-1, Figure 2.1.5-3** and **Figure 2.1.5.1-4**.

** The utilized agricultural area (UAA) is formed by arable land, permanent crops, nurseries - code 40, permanent grassland and family gardens. In 2020 there was an increase of 0.19% compared to the previous year.*

** * The arable land includes the areas where the crop rotation is applied, temporary meadows with cereals and legumes, fallow land and greenhouses. In 2020 there was an increase of 0.46% compared to the previous year.*

Table 2.1.5-1. *Main load of the territory in the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil in 2020 (MAFF Agrostatistics Department, Results and Analysis, № 381 - October 2020)*

Main categories/ Regions	Grains (incl. forage)	Oil-bearing	Technical	Vegetables and greenhouses	Meadows, annuals and forage (excl. corn)	Fallows	Infield	Family gardens	Permanently grassed areas, meadows and orchards	Perennials	Used agricultural area	Area of agricultural importance
Bulgaria	**2037695**	**1008255**	**70649**	**63720**	**135630**	**161565**	**3477514**	**14231**	**1403988**	**151518**	**5047252**	**5227902**
North-West region	**510297**	**237820**	**2391**	**9893**	**20312**	**28979**	**809692**	**898**	**233193**	**11775**	**1055559**	**110593**
Vidin	52201	43369	1290	1786	1886	5855	106388	397	20940	4168	131893	135664
Vratsa	119104	55842	301	1504	5414	3709	185874		50629	1504	238007	257657
Montana	81728	51055	200	699	2598	6394	142675		55352	2398	200425	206319
South-West region	***99809***	***42826***	***1308***	***8368***	***14788***	***32620***	***199719***	***2663***	***375599***	***19230***	***597210***	***627594***
Kyustendil	13956	4264		1938	2617	10467	33243	1163	55050	7172	96629	100990
Pernik	21573	14738	107	641	3204	4379	44642		62264	534	107439	108187
Sofia region	38633	14736	498	3485	3684	7766	68802	797	143279	3087	215965	219748

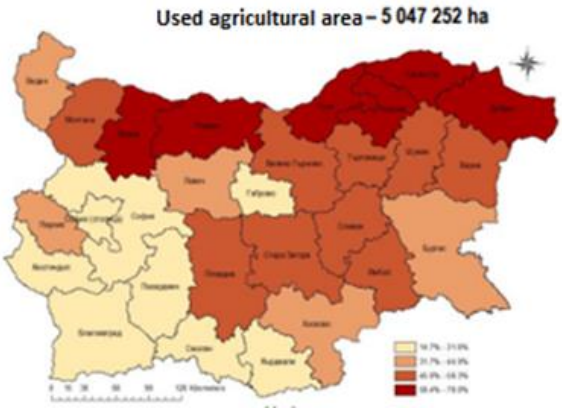


Figure 2.1.5-3. *Utilized agricultural area in Vidin, Montana, Vratsa, Sofia-region, Pernik, Blagoevgrad and Kyustendil - Republic of Bulgaria*

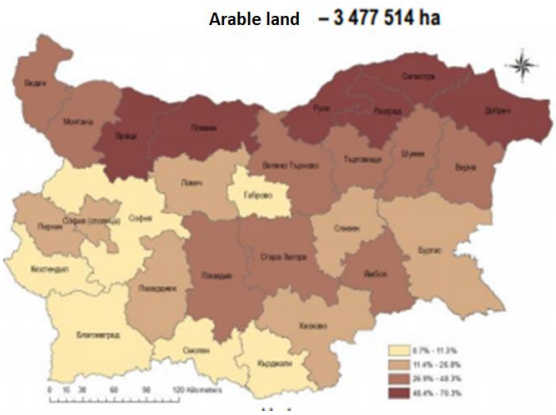


Figure 2.1.5-4. *Relative share of arable land in the regions of Vidin, Montana, Vratsa, Sofia, Pernik, Blagoevgrad and Kyustendil - Republic of Bulgaria*

Source: BANSIC, Results and Analysis, No. 367-2019, MAFF Agrostatistics Department

The soil cover in the area of CBCP and TSIM has a pronounced elevation zonality and a wide variety of relief forms, which provides favourable conditions for agriculture (cereals, technical, legumes, fodder, fruit plantations, vineyards and vegetable crops).

Alongside the favourable conditions in agriculture there are a number of problems such as the fragmentation of the property, irrigation, abandonment of arable land, etc.

The problem of property fragmentation, underdeveloped and depreciated infrastructure in rural areas is a basic one for Bulgaria.

The second problem area is hydro-melioration. It is an important part of planning in agricultural areas, along with the location and shape of properties and the maintenance of the agricultural road network. Along with the restitution process, the institutional framework of the hydro-melioration system was destroyed, which led to the destruction of irrigation systems and a drastic reduction of irrigated areas. This is the main reason for the weak positions of intensive agriculture. This is also against the increasing risks of climate change. Currently, there is no strategy for the development of hydro-melioration. Aware is the need, but there is no policy for integrated development of agricultural territories with other types - urbanized, ecological, forest, water, transport. A close problem area is the infrastructure to protect agricultural lands and national infrastructure from the harmful effects of water. The conditions for the use and drainage of more than 1.5 million acres of agricultural land have been improved. Over 1.4 million hectares of agricultural areas, settlements, business and other sites and national infrastructure are protected from flooding. These are the quantitative facts. The qualitative assessment shows critical physical condition of part of the facilities, old and depreciated drainage systems with insufficient capacity, systemic deficits in resources for reconstruction and maintenance. This negative list continues with more alarming findings:

- Concessions for the extraction of aggregates have led to numerous violations of natural river watercourses and increased risks of coastal erosion and flooding;
- The engineering security of many dykes is impaired by improperly constructed passages;
- There is insufficient coordination between the departments involved in the protection from the harmful effects of water.

After the turmoil of land rehabilitation and the disappearance of old businesses, many lands have been abandoned and desolate.

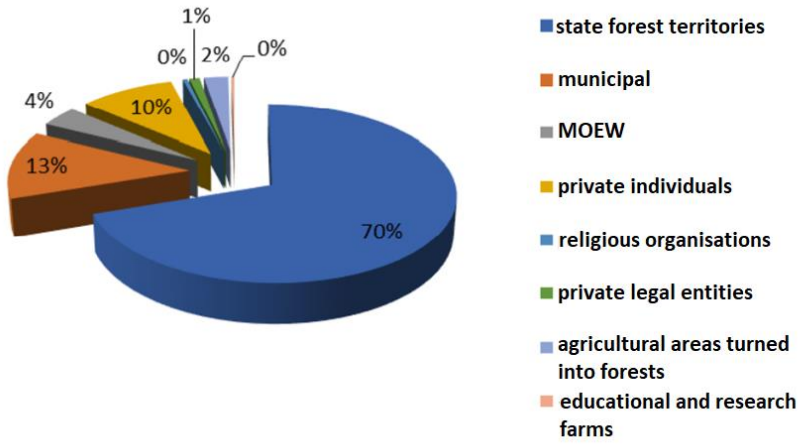
A guiding principle in rural development policy is the protection of soil fertility and overcoming the effects of climate change, to reduce erosion and desertification processes through appropriate hydro-meliorative measures. This will help solve some of the problems of feeding the population.

The land of the highest category should be subject to strict protection from actions of change of purpose and urbanisation. Land resources, the traditional agricultural landscape and biodiversity are part of the country's national wealth. Their conservation, restoration and appropriate management are the main goal for the sustainable development of rural areas in Bulgaria.

Bulgarian forests provide about 85% of the water flow in the country or about 3.6 billion m^3 of resource from clean drinking water. They underpin the green economy and play a significant role in reducing greenhouse gas emissions into the atmosphere, absorbing carbon dioxide and protecting soils from erosion.

As of 31.12.2017, the total area of ***forest territories*** amounted to 4,243 ,35 ha, of which 3,092,262 ha - state forest territories, 2,908,638 ha - forest territories managed by the state enterprises under Art. 163 of the Forest Law; 172,209 ha - forests in national parks, reserves and maintained reserves managed by the MoEW; 11,415 ha - forest territories provided for management of educational and experimental forest holdings; 552,582 ha - municipal forest territories; 424,897 ha - forest territories owned by private individuals; 46,202 ha - forest territories owned by private legal entities; 20,374 ha - forest territories owned by religious communities. Agricultural territories that have acquired the character of a forest within the meaning of Art. 2, para. 1 of the Forest Law have an area of 107,517 ha.

The new challenges for the sustainable development of the EU forestry sector require increasing the contribution to the green economy and addressing the adverse effects of climate change, protecting biodiversity, balancing the growing use of biomass as an energy source with resource efficiency requirements.



Source: Agriculture Report, 2018
Figure 2.1.5-5. *Distribution of forest areas by type of ownership*

Taking into account the expected impact of climate change on the territory of Bulgaria, consisting of persistent drought and desertification, it is necessary to take into account the use of the economic functions of forests in order to protect them, limit the export of deciduous wood and restore deciduous forests.

Soil degradation

Erosion

Soil erosion is recognized as one of the main processes of soil degradation on the territory of Bulgaria. Water erosion affects approximately 40% of the country's territory, while wind erosion (in plains and deforested areas) affects approximately 15% of the country's territory.

Areas subject to moderate and high erosion risk due to waterborne erosion have **increased significantly compared to previous years** and as a total area are estimated at 2,010,223 ha. Data for the *South-West region* indicate that moderate to high (up to 20 t/ha/y of eroded soil) and high risk (up to 40 t/ha/y) of area erosion exists in *Kyustendil region*. The scale of the process can be explained by the complex influence of landscape shaping factors in the western pre-mountains of Stara Planina, Kraishte, Osogovo-Belasishka Mountain Range (varied relief in unsustainable rock materials and variations in the regime of hydro-climatic elements caused by the local features of the topographic surface). An additional factor exacerbating the destructive processes is the high anthropogenic load of landscapes in deforested areas. In *Sofia Region* there is also an increased sensitivity of the landscapes to wind erosion (deflation).

Based on the developed GIS model (Geographic Information System) for assessment of the risk of water erosion within the Project "Building Capacity for Sustainable Land Management" (SLM) the potential and actual risk of erosion[77] has been assessed and for this purpose the soils are classified into

[77] Sustainable Land Management PROJECT, http://unccd-slm.org/

6 categories based on their susceptibility to erosion: 0 - Settlements, waters, rocks; 1 - Very low susceptibility to erosion; 2 - Low susceptibility to erosion; 3 - Medium susceptibility to erosion; 4 - Medium to strong susceptibility to erosion; 5 - Strong susceptibility to erosion; 6 - Very strong susceptibility to erosion.

According to data from the CORINE Landcover project in the South-west Region (SWR) 59.33% of the territory is estimated in category 4, i.e. average to strong susceptibility to erosion (for the country this value is 52.47%); 20.91% of the territory of the region has average susceptibility to erosion (for Bulgaria - 18.45%). Just over 5.14% is the percentage of the territory of the region with strong or very strong susceptibility to erosion (for Bulgaria - 7.2%), and just over 9.3% (for the country 15.77%) of the territory has very weak or weak susceptibility to erosion.[78]

Aquatic erosion. A large part of the territory of the North-western Region (NWR) (*Vidin, Montana, Vratsa*) has a slope of over 18-20%, which is a basic prerequisite for the development of waterborne erosion. Due to the intensive export of nutrients with surface flow, eroded soils are poorer in nutrients compared to non-eroded soils and the efficiency of importing organic and mineral fertilisers is significantly higher.

Areas with hilly and mountainous relief in the NWR, occupied by dark and light grey and podzol sandy-clay soils are the most susceptible to erosion. Carbonate Chernozems and Umbric Cambisols are also highly susceptible to erosion. Between 2014 and 2017, the areas affected by flat water erosion and soil losses remained relatively constant (draft *Integrated Territorial Development Strategy for the North-West Region 2021-2027).*

With the highest intensity of erosion risk in the NWR are the arable lands in the catchments of the river Vit and river Dolen Iskar - 14.0 t/ha/y. After that are the catchments of river Osam - 7.6 t/ha/y, river Ogosta - 4.7 t/ha/y, rivers Ogosta west - 4.3 t/ha/y and river Danube 3.6 t/ha/y.

The greatest relative risk for water erosion of agricultural soils exists for arable land in the regions of *Sofia- region* with an average predicted intensity of 10-12 t/ha/y.

Between 2014 and 2017, the areas in the SWR affected by flat water erosion and soil losses remained relatively constant. According to the map of the actual risk of flat water erosion for the territory of the Republic of Bulgaria for the year 2017 presented by the EEA, the following conclusions can be drawn for the constituent areas of the SWR:

- *Sofia Region* is most affected by the erosion risk, especially in its northern parts, covering the foothills of the southern slope of Stara Planina Mountain;

- in the *region of Pernik*, the soils at high risk of erosion are more dispersively located and with more limited areas;

- *Kyustendil region* has highly endangered areas along the valley of the river Struma, as well as on the fencing slopes of the Kyustendil valley.

[78] The CORINE Landcover project is part of the European programme "Coordination of Environmental Information" (CORINE) and aims to provide compatible geographical information on land cover in the EU countries, http://www.eea.europa.eu/publications/COR0-landcover

The most areas in the South-western region with high erosion risk - grade 7 "strong to very strong", are found in Sofia region - 20,171 ha.

The unregulated extraction of ballast (building materials) from the riverbeds creates a risk for the development of regressive erosion upstream, including physical destruction of the adjacent soils of agricultural lands.

The extent of impact on soils and land of the water *catchment area in Kyustendil* are presented in **Tables 2.1.5-2 and 2.1.5-3**.

Table 2.1.5-2. *Degree of susceptibility of the soil to erosion along the river Gorna Struma, river Dolna Struma*

Degree of susceptibility	river Gorna Struma		river Dolna Struma	
	Area, ha	Area, %	Area, ha	Area, %
Severe	19910.8	3.08	1989.3	0.31%
Very severe	13014.1	2.01	4546.2	-

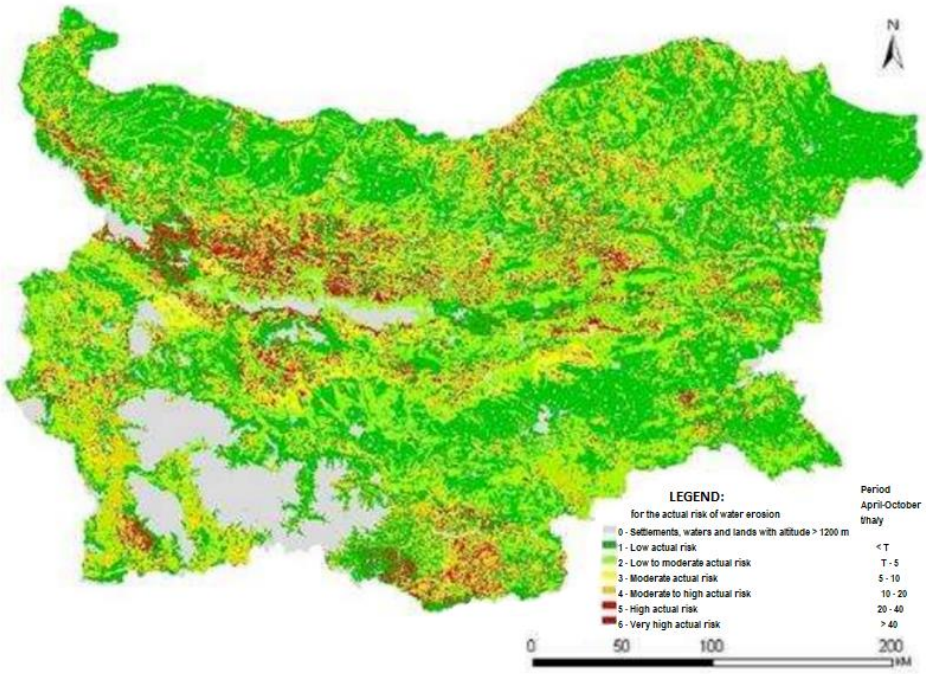
Table 2.1.5-3. *Type of land use of land subject to water erosion along the river Gorna Struma, river Dolna Struma*

Type of territory	river Gorna Struma	river Dolna Struma
Fields	1.5% (76,619.1 ha)	1.9% (25,511.7 ha)
Permanent crops	3.7% (6,907.4 ha)	3.7% (11,084.7 ha)
Grassland	1.0% (33,153.5 ha)	2.1% (43,337.3 ha)
Other agricultural land	1.2% (48,722.3 ha)	1.9% (44,498.0 ha)
Total agricultural land	7.4% (165,402.3 ha)	9.5% (124,431.7 ha)
Forest Territories	0.04% (77,623.0 ha)	0.06% (185,573.3 ha)

Wind erosion. Unlike flat water erosion, which is characteristic of mountainous and hilly conditions, wind erosion occurs mainly in large open and deforested plain areas.

The *north-western region* is slightly affected by wind erosion, and the lands fall into the two groups with the lowest risk. Lands with low wind erosion risk are located mainly in the *regions of Vidin and Montana*. The highest relative risk of wind erosion exists for arable land in the regions of Vratsa (50-60% of the area), followed by Vidin and Montana (40-50% of the area) - **Figure 2.1.5-6**.

In terms of wind erosion, the South-west region is the least affected in the country. The lands here fall into the two groups with the lowest risk of wind erosion. Here predominates land without the risk of wind erosion. A small part is at very low risk of wind erosion. The Sofia field, however, within the boundaries of the region of Sofia is assessed with a high risk of wind erosion (**Figure 2.1.5-7)**.



Source: EEA

Figure 2.1.5-6. *Actual risk of flat aquatic soil erosion 2017*

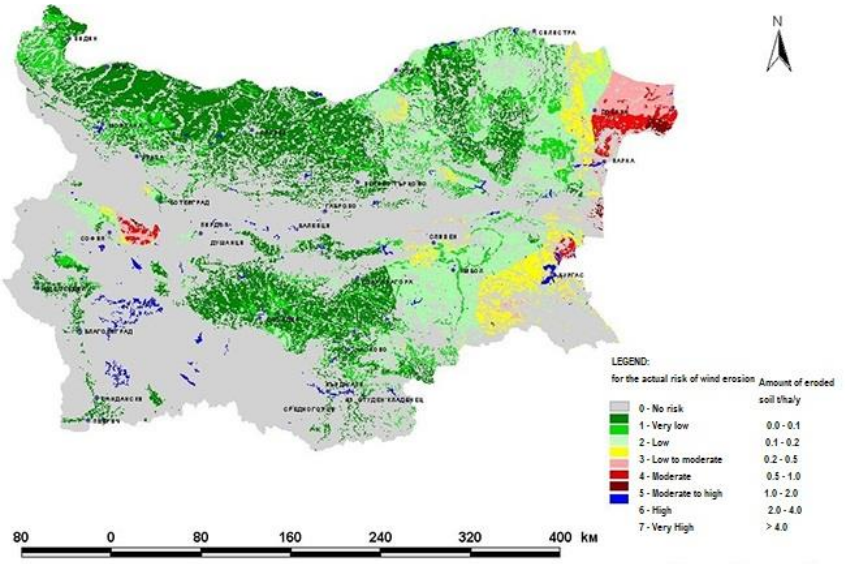


Figure 2.1.5-7. Distribution of actual risk of wind erosion of the soil on the territory of Bulgaria by regions (National Program for Conservation, Sustainable Use and Restoration Of Soil Functions 2020-2030)

Waterborne erosion of land from the forestry fund

The erosion processes in forests, which have been significant in the past, are currently limited or even halted, thanks to the multifunctional management of forests, the mass afforestation, the anti-erosion

facilities built in the forest territories and the constantly increasing forest cover *(National Programme for the Protection, Sustainable Use and Restoration of Soil Functions 2020-2030).*

The estimate of soil losses in forests for 2017 is 1,107,679 tonnes, which is 103,795 tonnes less than the corresponding estimate for 2016. Forest areas with the lowest actual risk of flat erosion prevail (58.5%). In 2017, forested areas from state forest enterprises amounted to 1,745.4 ha, 10% less than the previous year. To protect forest areas from erosion and torrents, 520.8 ha of anti-erosion forest planting were carried out in 2017.

In order to prevent erosion processes, a *Risk Assessment* should be introduced when constructing sites or infrastructure on sloping terrains.

Compaction

The compaction of the top soil layer refers to the compaction of the top 20-35 cm of the soil profile. In most cases, the topsoil has a higher content of organic matter, contains much more roots and maintains much greater biological activity than the subsoil. Also physical processes such as wetting, drying, freezing and thawing are more intense in the topsoil than in the subsoil.

The topsoil is therefore more resistant to compaction than the subsoil. The compaction of the subsoil, usually below 30 cm deep, is often caused by the soil treatment machines (the tractor wheels are in direct contact with the subsoil during ploughing and by the high wheel loads that transmit pressure through the topsoil to the subsoil). Huber et al. (2008) describes five indicators and thresholds for assessing compaction (*Huber, S.; Prokop, G.; Arrouays, D.; Banko, G.; Bispo, A.; Jones, R.J.A.; Kibblewhite, M.G.; Lexer, W.; Möller, A.; Rickson, R.J.; Shishkov, T.; Stephens, M.; Toth, G.; Van den Akker, J.J.H.; Varallyay, G.; Verheijen, F.G.A.; Jones, A.R. (eds.), 2008. Environmental Assessment of Soil for Monitoring: Volume I Indicators and Criteria. EUR 23490 EN/1. Office for the Official Publication of the European Communities, Luxembourg, 339 pp.).*

Incorrect soil treatments - heavy machinery, ploughing at the same depth, not observing the optimal soil moisture, repeated treatments, are the reason for compaction. If not properly applied crop rotations and treatments on sloping terrains will increase the erosion losses of the most fertile layer of soil. Its occurrence in water bodies is the cause of another undesirable process - eutrophication.

There are no monitoring data in the country regarding soil compaction. According to expert estimates, about 506,000 ha (4.5%) of the country's soils are affected by this degradation process.

For soil compaction in the *regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil* there is no available assessment.

Sealing

Soil sealing causes adverse effects or total loss of soil functions and prevents soil from performing important environmental functions. Soil gas, water and energy flows are reduced, which directly affects soil biodiversity. Water retention and groundwater feeding capacities have been reduced, leading to several negative impacts, such as a higher risk of flooding. Reducing the ability of the soil to absorb precipitation leads to a rapid flow of water from sealed surfaces to river channels and damage to the soil by flooding. Overland biodiversity is affected by habitat fragmentation and disruption of ecological corridors. These indirect effects affect areas much larger than the sealed areas themselves.

Built-up land is lost for other purposes, such as agriculture and forestry, as sealed soils are often fertile with good soil properties and in close proximity to existing urban areas. Sealing the soil seems almost irreversible and can lead to unnecessary loss of soil with good qualities. Sealing can lead to soil and groundwater pollution due to the collection of unfiltered effluent from urban and industrial sites. Soil sealing can affect the natural temperature regulation in urban areas. Unsealed areas are cooler than sealed areas. Given that the average temperature in Europe and the number of heat waves are expected to increase, a high level of soil sealing will further exacerbate the already existing urban heat island effect and increase their vulnerability to heat waves *(EEA; 2010a). The European environment — state and outlook 2010: urban environment. European Environment Agency, Copenhagen. EEA; 2010b. The European environment — state and outlook 2010: land use. European Environment Agency, Copenhagen.)*

Solving the problem of soil sealing means solving the problem of land absorption. However, the aim is not to deter economic development or to freeze current land use. Rather, it is about achieving an efficient and sustainable use of the natural resources for which soil is an essential component. In cases identified as best practices, soil quality is an important consideration for any land use project. Where use is unavoidable, it should be directed to lower-quality soils.

On the territory of the *regions of Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil*, the pressure for land grabbing and soil sealing is reduced to a few "hot spots", such as urban, industrial areas (Corinne Land Cover, 2018) - Appendix 1.

For the sealing of soils in the *regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil* there is no available assessment.

Landslides

The reasons for the landslides are deforestation of large areas, uncleaned river beds, heavy rainfall and flooding, overbuilding.

Landslides can lead to deterioration or complete loss of one or more soil functions. Shallow landslides can remove the valuable soil layer, which severely limits the way the land is used.

The accumulation of landslide waste (deluvial sediments) in negative relief forms leads to the disposal and complete cessation of the functions of existing soils in these areas.

In severe cases of landslides, when the entire soil body is removed from its place in situ, all functions of the soil will be lost.

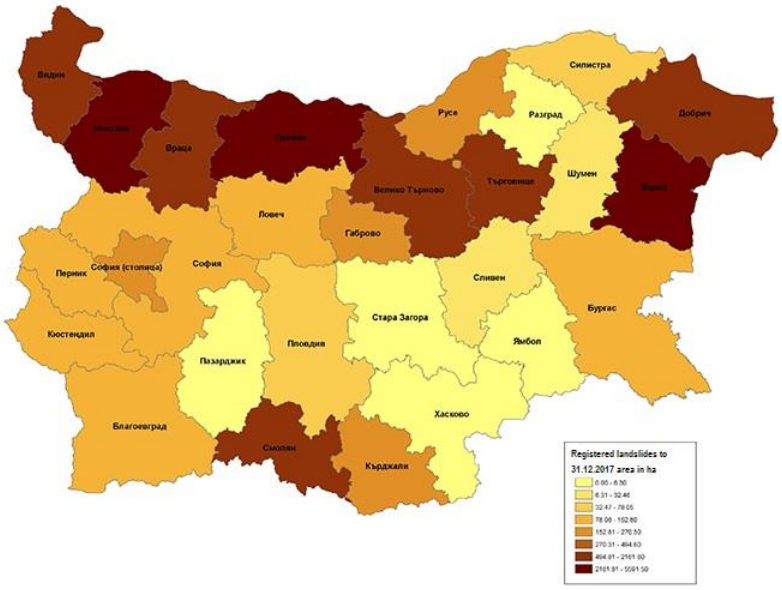
Landslides can also affect mining waste storage facilities (embankments, slurries, tailings ponds), causing deaths and pollution of adjacent soils, surface and groundwater.

The impact of landslides in built-up areas can be significantly reduced through adequate non-structural measures, including the integration of landslide susceptibility/hazard and risk mapping into land use planning activities and the establishment of early warning systems for active landslides *(Hervás, 2003 Hervás, J. (ed.); 2003. Lessons Learnt from Landslide Disasters in Europe. JRC report EUR 20558 EN, Office for Official Publications of the European Communities, Luxembourg, 91 pp.).*

The territorial distribution of areas affected by landslide processes by region is as follows:

- 1,113 landslides occurred in the regions of **Vidin, Montana, Vratsa**, Pleven, Lovech, Gabrovo, Veliko Tarnovo, Ruse, Silistra, Targovishte and Razgrad (registered and monitored by Geoprotection Pleven EOOD);

- 644 landslides occurred in the regions of Sofia (Sofia Municipality), **Sofia-region, Pernik , Kyustendil,** Blagoevgrad, Pazardzhik, Plovdiv, Smolyan, Stara Zagora, Haskovo and Kardzhali (registered and monitored by Geoprotection EOOD - Pernik).



Source: EEA, according to data from MRDPW - Geoprotection EOOD - Varna, Pleven and Pernik

Figure 2.1.5-8. *Areas affected by landslide processes by region in ha at the end of 2017*

The regions of Northern Bulgaria stand out with the most areas affected by landslide activity. At the region level with the largest areas are the regions: **Montana**, Varna and Pleven. They are followed by the regions of **Vidin, Vratsa**, Veliko Tarnovo and Dobrich. The landslide processes in the South-West region are not as widely developed as in the regions of Northern Bulgaria. The affected areas are mainly located on the mountain slopes at the foot of the mountains and in the river valleys, developed mainly on sedimentary rocks. The activation of landslides is directly related to climate change and especially to intense precipitation.

The MRDPW data processed by the EEA in terms of the area of registered landslides at the end of 2017 ranked the regions in the country in 8 groups. In the fourth group, which is average in terms of areas in terms of the development of landslide processes, falls only the region of Sofia, which is not subject to the Programme. All other areas of the SWR are to a lesser extent spreading landslides, a third group.

In recent years, the objective of limiting the risk of the emergence and expansion of landslides and the preliminary control of construction in landslide areas has been achieved.

In order to reduce these damages, the Ministry of Regional Development and Public Works, assisted by its specialized directorate and the three state-owned Geoprotection companies in Varna, Pernik and Pleven, maintains an up-to-date register of landslides, conducts surveys, monitoring and control and monitors the implementation of geoprotection projects.

Salination and acidification

With regard to salination and acidification processes, the analysis shows that the soils in the NWR and SWR are in good ecological condition.

Data from the EEA show that local spread of salted soils is observed in the South-western region. Such are established *in Sofia-region* (Elin Pelin Municipality). The problems can be explained both by the hydromorphic differences and the suppressed natural drainage conditions, as well as by the disruption of the water regime of the soils under the influence of intense anthropogenic load.

Given that this degradation process is observed in limited areas with nearby mineralized groundwater or is secondary to improper fertilization and irrigation, it is not a significant problem for Bulgarian soils *(National Programme for Conservation, Sustainable Use and Restoration of Soil Functions 2020-2030).*

Reduction of soil organic matter (dehumidification)

Soils play an important role in the carbon cycle on the ground, as they contain a large proportion of carbon stocks. This is important not only for the global carbon balance, but also for current and future productive potential. The soils of the agricultural fund differ greatly in their concentration of carbon and related properties. The consequences of dehumidification are the de-structuring of soils, the deterioration of their water-physical and air properties, resulting in a reduction of their productive capacity. Dehumidification increases the risk of erosion processes.

The summary assessment of the humus state of soils in Bulgaria shows that climatic, plant and other soil formation factors in a large part of the country, especially in the plain and slightly hilly, where the arable land fund is concentrated, are favourable for the formation of quality humus (Artinova, N. *2014. Characteristics and grouping by content and composition of humus in the soils of Bulgaria by mathematical and statistical methods. The soil organic matter and soil fertility in Bulgaria)),* but the total amount of humus in Bulgarian soils is not high.

Figure 2.1.5--9 presents a map of soil stockpiles of organic matter in kg/m^2 for the 0-100 cm layer. The highest stockpile is for Chernozemi type and Vertisols type, medium stockpile for Chromic Luvisols type and Dystric - Eutric Cambisols type and low stockpile for pseudo-subpodsols soils.

The reason for the dehumidification is the widespread burning of stubble in Bulgaria, which, in addition to loss of soil fertility, leads to loss of biodiversity. Dehumidification is also associated with other degradation processes and occurs as a result of secondary acidification and salination of the soil. It is related to the removal of the surface soil layer due to the manifestation of erosion processes - water and wind erosion, oxidation of organic carbon due to high aeration in intensive treatments and degradation of the soil structure during soil compaction *(National Programme for Conservation, Sustainable Use and Restoration of Soil Functions 2020-2030).*

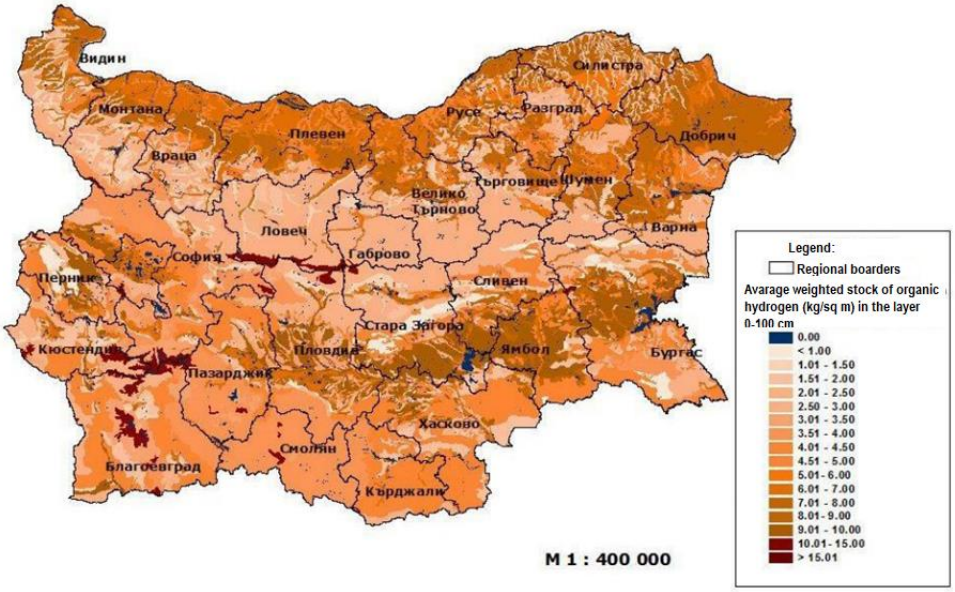


Figure 2.1.5-9. *Soil stock map with organic matter in layer 0-100 cm*

The decrease of the SOM content in the last 20-30 years is due to intensive and monocultural agriculture, non-application of scientifically justified crop rotations, limited application or complete lack of organic fertilization, unbalanced, one-sided fertilization, mainly with nitrogen fertilizers, which negatively affects and is a serious factor for dehumidification due to acceleration of mineralization of the organic substance *(National Programme for Conservation, Sustainable Use and Restoration of Soil Functions 2020-2030).* The reason for the reduction of the SOM is also the strongly reduced livestock farming and the insufficient quantities of manure for the application of organic fertilization.

Pollution

Pollution can seriously affect the soil's ability to perform some of its basic ecosystem functions. Thresholds for most pollutants exist in most countries, but they may vary and often do not take into account the multifunctional use of soil*(Huber et al., 2008 Huber, S.; Prokop, G.; Arrouays, D.; Banko, G.; Bispo, A.; Jones, R.J.A.; Kibblewhite, M.G.; Lexer, W.; Möller, A.; Rickson, R.J.; Shishkov, T.; Stephens, M.; Toth, G.; Van den Akker, J.J.H.; Varallyay, G.; Verheijen, F.G.A.; Jones, A.R. (eds.), 2008. Environmental Assessment of Soil for Monitoring: Volume I Indicators and Criteria. EUR 23490 EN/1. Office for the Official Publication of the European Communities, Luxembourg, 339 pp.)*. In extreme situations where pollutant levels exceed the critical threshold, the soil can be considered "functionally dead".

Pollution from heavy metals and organic pollutants is perhaps the most serious problem, as pollution is practically irreversible. Pollution can affect human health either by direct contact or ingestion through the food chain.

Diffuse pollution by nutrients, fertiliser impurities (e.g. cadmium) and biocides is more concentrated in areas with intensive agricultural production and can have a significant impact on soil biological communities (and thus soil functions), groundwater sources and crop uptake.

Industrial emissions of persistent organic compounds such as PCBs and dioxins into agricultural soil and their subsequent introduction into the food chain can lead to tumours in humans.

In Bulgaria, the norms for the permissible content of harmful substances in soils are determined on the basis of an assessment of the risk to the environment and human health in three levels (Ordinance 3/2008):

1. Precautionary concentrations;
2. Maximum permissible concentrations;
3. Intervention concentrations.

"Precautionary concentration" means the content of a harmful substance in soil in mg/kg, the excess of which does not result in impairment of soil functions and in danger to the environment and human health.

"Maximum permissible concentration" means the content of a harmful substance in soil in mg/kg, the excess of which, under certain conditions, results in a disturbance of soil functions and a danger to the environment and human health.

"Intervention concentration" means the content of a harmful substance in soil in mg/kg, the excess of which results in a disturbance of soil functions and a danger to the environment and human health.

Heavy metal and metalloid content are defined as concentrations taking into account land use type, conservation sites, mechanical composition and soil pH (H2O).

Contents of *persistent organic pollutants and petroleum products* are defined as concentrations without taking into account the type of land use, conservation sites, the mechanical composition and the pH (H2O) of the soils.

In accordance with the National Report on the Condition and Protection of the Environment in the Republic of Bulgaria, 2019, during the period 2005-2016 the soils in the country are in good ecological condition in terms of pollution with heavy metals, metalloids and persistent organic pollutants - PAH, Polychlorinated biphenyls and Chlororganic pesticides.

Pollution by heavy metals and metalloids

Soil pollution with heavy metals has various sources - through dust and rain, industrial waste, automotive waste, agricultural chemicalization, watering agricultural land with waste water, etc.

The relative share of anthropogenously loaded areas (infrastructure, settlements, industrial sites) in the South-West region for 2006 (according to data from the Executive Environment Agency, based on data from the European project CORINE Landcover) is 4.51%, corresponding to 923,427 sq. km of the area (out of a total of 20,468,794 sq. km). This is below the national average (5.03%). The most heavily anthropogenic workloads are the territories of **Pernik region** - 9.97%, **and to a lesser extent Kyustendil region (2.53%) and Sofia region** (**3.69%**).

A detailed study on the content of heavy metals in the arable land of Bulgaria was carried out by the Institute "N. Pushkarov". The localization of sites with established soil pollution from agricultural land is presented in **Figure 2.1.5-10.**

Soil pollution in agricultural lands occurs in:

- North-western region - municipalities of Bregovo, Boychinovtsi, Montana, Mezdra, Vratsa;
- South-western region - Sofia-region, Pernik.

According to data from the monitoring system of the EEA at the MoEW, the content of heavy metals in the soils of the North-western region is below the maximum permissible concentrations.

Figure 2.1.5-10. *Study on the content of heavy metals in the soils of Bulgaria, Institute "N. Pushkarov"*

Pollution of the soil with heavy metals and metalloids from the industry is typical for ***Sofia region***. Here are the areas with permanent soil pollution - the municipalities of Chelopech, Pirdop and Zlatitsa. Polluted with heavy metals are terrains in the lands of the villages of Dolni and Gorni Bogrov and village of Yana, respectively accumulated on the basis of old historical pollution. There is no significant pollution of agricultural land with the elements studied. The data show that there is only a practical risk of pollution in certain areas around the companies and around the tailings ponds of MDK-Pirdop. The studies on the environmental impact of MDK-Pirdop and the soils of the Pirdop-Zlatitsa valley start with the appearance of the first negative processes and damage, i.e. they last for more than forty years. The results of the studies confirm the nature of industrial pollution of agricultural land and plants in relation to the spectrum of the main pollutants (copper, arsenic, cadmium and lead), the main sources of pollution (metallurgical and mining industries), the wide spread of phytotoxicity caused by multifactorial soil acidification, large-scale and mainly atmospheric pollution of plants, significantly limiting traditional livestock farming in the area. Industrial pollution of the valley will present a hazard even if the aforementioned industrial activities are completely stopped or their emissions are minimised and the pollutants already deposited are immobilised. However, all studies take into account the natural geopool, i.e. the naturally higher content of copper, zinc, lead and arsenic (including cadmium at a later

stage) in the soils in the area, which despite the pronounced reduction of air pollution will be observed, albeit in non-toxic quantities for the ecosystem. The content of heavy metals, in addition to copper (Cu), zinc (Zn) and lead (Pb), is below the maximum permitted for arable land, industrial land and green areas. Copper (Cu) content in soils from most monitoring points is above the maximum permissible concentrations for the respective use. The content of arsenic (As) in the soils of the land of Chelopech, in uncultivated land. Increasing amounts of heavy metals and metalloids in the soil also depends on the amounts of soil moisture. This is likely to be due to the higher concentration in less water due to the lack of precipitation than the actual increase in precipitation. This leads to the assumption that pollution may also be due to the extraction of this element by evaporation from lower layers in the drier period of the year to the heavily arid upper soil layers.

On the territory of *Sofia-region* the main contaminants with heavy metals and metalloids in relation to the component "Soils" are mainly "Aurubis Bulgaria" AD, village of Chelopech; Aurubis Bulgaria AD, city of Pirdop; "Elatsite", city of Etropole.

On the territory of *Pernik region* the polluted lands with zinc and lead, according to Council of Ministers Decree No. 50/10.03.1993 (SG, issue 24/26.03.1993), is a total of 2,500 da, distributed as follows: r.a "Carkva", city of Pernik - 1,500 da; village of Kralev dol - 500 da; r.a. "Kalkas", city of Pernik - 500 da. The source of the pollution is referred to as "Stomana" - AD, city of Pernik.

The soils on the territory of *Kyustendil region* are mostly clear of pollutants (heavy metals), with the exception of the lands of the villages of Gyueshevo and Prekolnitsa.

Transport

The construction of new roads or expansion of old ones is related to the need to change the use of new areas of agricultural land. The servitudes of the transport corridors are at risk of erosion, the sewage ditches on the roads are filled, and technogenic pollution and salination occurs during winter cleaning from snow and icing. Air pollution and the consequent pollution of water and soil is the most serious environmental problem posed by transport, especially in large cities. Impacts on soils when building a railway line include physical impacts (e.g. erosion, disruption of integrity and compactness), chemical impacts (pollution caused by emissions) and land-use and resource-related changes. Soil pollution is also the result of spills or emissions from traffic.

A national monitoring system, categorized by levels, has been established to assess the soil status on the territory of the country. By soil monitoring the 1st level of the territory of the individual RIEWs are separate points in which soil sampling is performed. The following indicators shall be monitored: active soil reaction (pH), biogenic elements - Kjeldahl total nitrogen, total phosphorus, organic matter total carbon and organic carbon, volumetric density and 9 heavy metals and metalloids copper (Cu), zinc (Zn), lead (Pb), cadmium (Cd), nickel (Ni), cobalt (Co), chromium (Cr), arsenic (As) and mercury (Hg).

Pesticides

In the implementation of the soil monitoring programme - level III - local soil pollution in the last 5 years (2016-2020), the control bodies of RIEW collect up-to-date information on the state of storage of unfit and prohibited plant protection products, including: the B-B cubes as well as their geographical coordinates.

No land polluted with organochlorine pesticides is registered in the NWR.

Soil pollution with the pesticide beta-hexachlorocyclohexane has been reported in the village of Gabra (*Sofia-region*).

Soil pollution by persistent organic pollutants (POPs) including petroleum products

In terms of soil pollution, the POPs analysis shows that the soils in the NWR and SWR are in good ecological condition. In general, there are no points with registered soils polluted with polycyclic aromatic hydrocarbons, polychlorinated biphenyls and organochlorine pesticides. The exception shall be soils at points where pollution with polyaromatic hydrocarbons has been reported: in the village of Tarnava (*Vratsa region*) - with benzo(b,j,k)fluoranthene and fluoranthene and in the village of Dolni Romantsi (*Pernik region*) - naphthalene.

Limited local soil pollution with petroleum products has been recorded, mainly as spills around service stations, but their sites are sealed and do not pose a hazard to environmental compartments.

Landfills for household and non-hazardous waste

On the territory of RIEW-Sofia there are 31 municipal landfills for household waste with discontinued/stopped operation, some of them have been reclaimed or are in the process of reclamation. Another serious problem is the lack of built-up sites for construction, bulk and biodegradable waste by municipal structures. Their indiscriminate dumping and the formation of unregulated landfills is associated with violations and soil pollution. As an environmental problem on the territory of the RIEW-Sofia, in 2020, the presence of multiple unregulated landfills and the unregulated incineration of waste from individuals in private properties should be considered. Notwithstanding the prescriptions and actions of the controlling authorities, the trend towards the formation of new unregulated waste pollutions on already repeatedly cleaned terrains remains.

With the commissioning of the regional landfills for household waste and the reclamation of existing old landfills, the unauthorized disposal of waste and the pollution of land and soil is stopped.

Radiation state

According to the summary data of the North-western Planning Region, the annual average power values of an equivalent dose of the radiation gamma background for 2018 are between 0,102-0,108μSv/h. The values recorded in 2018 do not differ from those characteristic of the region. The radiological monitoring of uncultivated soils in the 3-30 km zone of NPP Kozloduy did not reveal any change in the site-specific values of natural and technogenic radionuclides in the samples analysed in 2018. The specific activity of Cs-137 is in the range of 0.8-65.2 Bq/kg. Content of technogenic radionuclides in the studied sediments of the river Danube proves that the activity of the Kozloduy NPP does not affect the radiation status of the river Danube.

The summarised data in the SWR* for the annual average power values of an equivalent dose of the radiation gamma background for 2018 do not differ from those characteristic of the region. The radiological monitoring of uncultivated soils did not reveal any change in the site-specific values of natural and technogenic radionuclides in the samples analysed in 2018. Areas with potential pollutants from

the territory of the SWR is subject to periodic control. In 2017, the following exceeds were found by region and municipality:

<u>Sofia region</u>

- Kostenets municipality, village of Ochusha, site "Byalata Voda" - the measured value of U-238 (431 Bq/kg) is 5 times above the background. Site river Ochushnitsa after the site: U-238 (300 Bq/kg), Ra-226 (350 Bq/kg), Ochushnitsa River near the city of Kostenets: U-238 (198 Bq/kg).
- Municipality of Svoge, village of Lakatnik, site Propoynitsa with U-238 (283 Bq/kg).

Pernik Region

- Municipality of Trun, Zlata mine site: U-238 (283 Bq/kg).

Industrial impact - disturbed land and soil

Many of the industrial enterprises in Bulgaria, existing until the 1990s, have been closed, others have been privatized or bankrupt, and restoration activities are being carried out where necessary. However, in individual cases, near industrial plants and near transport corridors, there is an impact on the soils of the extractive industry - non-oil and building materials.

In southern Bulgaria, industry, mining and processing, metallurgy and mechanical engineering are based on high technologies. The diversity of industrial activities in this part of the country is considerably greater. The share of disturbed lands subject to reclamation and remediation at the beginning of the 1990s was significantly higher compared to Northern Bulgaria. These are the disturbed lands from Kyustendil region (Mines "Bobov Dol"), Pernik region (Mines "Pernik"), the mining enterprises in the Srednogorie region (Sofia-region) and others. Large-scale technical and biological reclamation is conducted and/or completed on most disturbed terrains.

There are clear social, environmental and economic dimensions to agricultural policy and to underground wealth policy. It therefore requires an interdisciplinary approach and inter-agency coordination. The extraction and processing of underground resources creates environmental risks and often causes damage in terms of air pollution (mainly dust), soil and water, permanently disrupting the relief and landscape. All this is happening, even though mining developments are a special subject of environmental legislation.

Disturbances and possible soil pollutions can also be expected from energy and the energy transmission network. Cross-border product lines, power lines, gas lines mainly from the North-east to the South-east and South-East and to the Republic of Turkey, Republic of Greece, Republic of North Macedonia and Republic of Serbia, respectively, pass through the territory of the Republic Bulgaria. Along the routes of this network the lands have been reclaimed, but their use has been changed only for the cultivation of herbaceous shallow-rooted vegetation. Some of the power plants (Pernik TPP, etc.) that operate on coal already have built treatment plants.

As of June 2019, the implementation of the "Project for remediation of environmental damage and technical liquidation of disturbed terrains due to the long-standing mining works conducted by the mines "Sedmi septemvri" and "Hristo Botev" at "Mines-Pernik" EAD started. The total area of the grounds is 1,262.5 da.

The data obtained under the Corine project land cover show that the area impaired by quarries and opencast mines in the country for 2012 amounted to 34,877 ha, the area impaired by landfills - 3,287 ha, the area impaired by construction materials - 1,030 ha. The largest areas of impaired land are in the South-east region - 16,712 ha, which are mainly from the disposal of waste from mining activities. In

the *South-West region* the disturbed areas are 9,375 ha, in the South-Central region - 5,106 ha, in the Northeast region - 3,860 ha, and in the *North-West region* - 2,492 ha. On the condition of soils and disturbed terrains, a positive effect is observed: polluted terrains and landfills are reclaimed. The tendency is for the number of unregulated landfills and uncultivated areas from mining activities to decrease *(National Programme for Conservation, Sustainable Use and Restoration of Soil Functions 2020-2030).*

In connection with the increase in the volume of energy resources, energy crops (rapeseed), which occupy large areas with rich soils, most often Chernozems, have been grown on a large scale over the last 10 years. In case of non-compliance with the crop rotation, these soils may lose their fertility.

Flooding - Soil risk

Data from the reports of the West Aegean Region Basin Directorate were used. The risk of flooding is a threat not only to the population and the elements in the urbanised areas (housing, public and industrial buildings, urban infrastructure), but also to the non-urban infrastructure and soil of the lands located near the rivers.

The municipalities with the highest relative proportion of flood threat and impacts on the soil of the North-western region are: *Vidin (Vidin region) and Mizia (Vratsa region).*

The municipalities in the South-western region are the lowest threatened.

The floods damage the soils in the urban environment, the facilities and the sites of the technical infrastructure, hinder transport services and traffic, and in risk areas where there are often illegally built-up neighbourhoods of Roma communities, they can also endanger human life. The National Climate Change Adaptation Strategy Action Plan foresees measures for municipalities to reduce such risks.

To enhance climate security, measures and activities are planned in the NWR to prevent flooding and to combat abrasion and erosion, including strengthening the landslides and the shoreline of the Danube and strengthening and construction of drainage facilities and infrastructure. In order to prevent the development of early warning systems for emerging hazards from floods, fires, landslides, etc., the development of risk management plans and the provision of technical means of protection are envisaged. Of particular importance is the maintenance and conservation of forest resources.

Flood risk is within three territorial boundaries defined by the three degrees of risk - high, medium and low. In the areas of the *South-Western region*, the area characteristic of these territories* is as follows:

Table 2.1.5-4. *Territories at risk of flooding, km^2*

Region	NUTS II Code	Territories at risk of flooding (1000 year wave), sq. km	Relative share, %
South-western	**BG41**	**67.9**	**0.3**
Kyustendil		1,6	0,1
Pernik		5,3	0,2

Sofia - region		16,9	1,3

Source: RBMP

Construction of new industrial areas

The construction of new industrial areas on the territory of the municipalities of Kyustendil and Pernik is planned on the territory of the South-Western region, related to soil disturbance on land with a total area of 490 da, as follows:

- New industrial zone in Kyustendil municipality on 190 da terrain. The site is located 200 m from the road to the Republic of North Macedonia and no more than 1 km from the route to "Struma" motorway.

- New industrial area in the municipality of Pernik. The area is planned to be built in the Karamanitsa neighbourhood on a terrain of 300 da.

In response to the increased demand, new projects are being prepared for industrial parks near Sofia - in the region of Elin Pelin municipality - Ravno Pole, Elin Pelin, Novi Han and Musachevo (Sofia Region).

Land Disruption - Transport Infrastructure and Tourism

Within the boundaries of the North-Western region, it is envisaged to modernize the existing and the construction of new road infrastructure. The construction of the high-speed road Vidin-Sofia, rehabilitation and reconstruction of the Republican road network II and III grade, rehabilitation and reconstruction of the municipal road network and the street network in the settlements are envisaged. Development of transport infrastructure along the other important for the region transport direction - west-east is also planned.

Considering the fundamental role of transport infrastructure as a basic condition for the development of the economy, attracting investment, facilitating population mobility and access to services of a recurrent and episodic nature, and including all settlements in the SWR, it is necessary to improve and optimise it. Part of the main TEN-T network needs to be completed and developed in order to meet the European quality and security requirements for international traffic. In this regard, it is planned in the period 2021-2027 to:

- Completion of Struma Motorway;

- Construction of Motorway "Evropa" and high-speed road "Gyueshevo-Kyustendil-Radomir-Pernik-Sofia";

- Construction of a high-speed road "Rila" along the direction "Kyustendil-Dupnitsa- Samokov-r.j. Bogoroditsa-Trakiya Motorway/Hemus Motorway, included additionally in the comprehensive TEN-T network.

The planned optimization and reconstruction of the roads as a continuous transport axis for the integration of the peripheral border territories along the southern border of Bulgaria and improving the access of the municipalities to their respective regional centre in the zones with the registered worst accessibility in Bulgaria, as well as the modernization of the existing railway network in the Elin Pelin-

Septemvri section are related to additional disturbance of lands of SSF (in many cases arable land) and GF.

Over-exploitation of tourist resources - re-development of the most attractive territories in the mountains around the resort-tourism agglomerations, leads to destruction of valuable landscapes, overloading of transport and technical infrastructure, deterioration of the quality of the environment in particular of the soils, and of the offered tourist services.

Brief summary assessment of the soil status on the territory of the regions in the Republic of Bulgaria

The use of good quality agricultural soils is changing with the expansion of urbanization and the development of infrastructure - construction with residential and commercial sites, construction of industrial logistics zones, modernization of existing ones and construction of new roads (motorways). To prevent soil degradation, special measures for soil protection and management policy are applied, as well as including soil protection issues in other sectoral policies, e.g. agriculture, forestry, water management, transport, etc.

In terms of stockpiling of biogenic elements (organic matter), the country's soils are in good ecological condition.

Areas subject to moderate and high erosion risk due to waterborne erosion have increased significantly compared to previous years and as a total area are estimated at 2,010,223 ha. Data for the South-West region indicate that moderate to high (up to 20 t/ha/y of eroded soil) and high risk (up to 40 t/ha/y) of area erosion exists in Blagoevgrad and Kyustendil regions.

On the territory of the regions of Vidin, Montana, Vratsa, Sofia, Pernik and Kyustendil there are only local cases of polluted soils mainly in industrial areas. The damaged areas are in the places of extraction and processing of raw materials (ores of ferrous and non-ferrous metals, rare metals, coal and aggregates).

In terms of pollution with heavy metals, metalloids and persistent organic pollutants, the country's soils are in good ecological condition. Points exceeding the maximum permissible concentrations of heavy metals and metalloids represent 9.3% of the total number in the country. They fall into the regions of Sofia and Montana.

Exceeds of the specific activity of natural radionuclides have been identified in areas with potential pollutants (mining and uranium mining areas): U-238, Ra-226 and Pb-210 (for untreated soils and sediments) - areas: Pernik and Sofia. The pollution is mainly related to the discontinued mining activity and is of a local nature.

In conclusion, it can be summarized that the soils in the territory are in good ecological condition, which is a prerequisite for the development of intensive agriculture. Measures to prevent and limit the damage caused by erosion processes should be in the lead for the area. This includes informing and assisting farmers in land-use planning, respecting good agricultural and environmental practices and supporting farmers through compensatory payments for activities limiting erosion processes.

Positive findings in terms of restoration of disturbed land have been identified. In the regional scope of RIEW Sofia, a positive result is observed on the condition of the soils and disturbed terrains: reclaimed are polluted terrains, landfills for household waste in 2020

The municipalities with the highest relative proportion of flood threat and impacts on the soil of the North-western region are: Vidin (region Vidin) and Mizia (region Vratsa).

At national level* a number of deficiencies related to soil protection and rational use are reported:

- An outdated database regarding soil mapping in the country. No mapping of sites with naturally elevated geochemical content of heavy metals and local one has been made as a result of anthropogenic activity, which does not allow for proper management of local pollution.
- No sites have been designated in the NEMS and no monitoring of soils in urban environments is carried out.
- No agricultural lands with soil compaction in the country have been identified.
- Inappropriate spatial planning of settlements related to the expansion of cities and infrastructures at the expense of agriculture and forestry or nature, posing a threat to soil sealing.
- Monocultural cultivation of energy crops leads to nutrient losses and soil depletion.
- Increasing erosion losses in the event of disregard of anti-erosion practices in agriculture.
- There are still unregulated landfills at the entrances and exits of the settlements, agricultural areas and green areas in the settlements themselves.

➢ ***Regions in the Republic of Serbia***

The land use and soil condition on the territory of the Republic of Serbia are presented with information from: *The Soil Information System of the Republic of Serbia (SEPA),* as well as *on the basis of the "Soil Status Report" (2009),* which is an integral part of the Environmental Status Report prepared by the Environmental Protection Agency. It is based on the available data for assessing the current situation, but also on recommendations and measures to be implemented in the future management of the land on the territory of the Republic of Serbia.

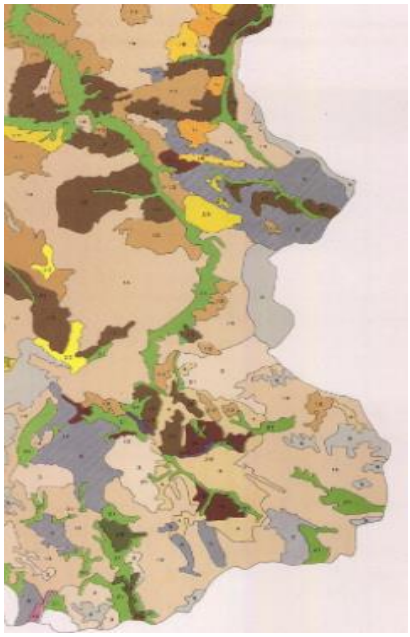
Soils

Soils in regions: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pchinski are represented by the following classes and types: Fluvisols - Alluvial - Delluvial Fluvisols; Chernozems; Luvisols - Chromic Luvisols; Cambisols - Dystric - Eutric Cambisols; Cambisols - Umbric Cambisols; Cambisols - Modic Cambisols; Leptosols - Lithosols, Regosols, Rancers and Rendzinas - **Figure 2.1.5-11.**

Land use

Of the total territory of the Republic of Serbia (88,848 km^2), the surface structure of the main land cover categories is as follows: agricultural land 43,113 km2, forests and forest lands 38,240 km^2, wetlands and water areas 2,377 km^2 and artificial zones and golines 4,757 km^2 (**Figures 2.1.5-12 and** 2.1.5-13**, Table 2.1.5-5)**.

About 48.7% (43,113 km^2) of the territory of the Republic of Serbia is covered mainly with agricultural vegetation. Under intensive agricultural crops (arable land, gardens, vineyards, orchards, raspberries and other perennial crops) there are 32,834 km^2 (37.1%) and 10,279 km^2 (11.6%) under grassy vegetation, which consists mainly of meadows and pastures.



Key

Source: www.sepa.gov.rs.

Figure 2.1.5-11. *Extract from Soil map of Serbia (1:2,000,000), - classification of soils of Yugoslavia (Škorić et al., 1985)*

In line with the geophysical characteristics of the area, which have a decisive influence on the quality of the land, the share of agriculture in total areas, similar to the ratio of intensive crops to grassland ecosystems, decreases from northern to southern and south-eastern regions.

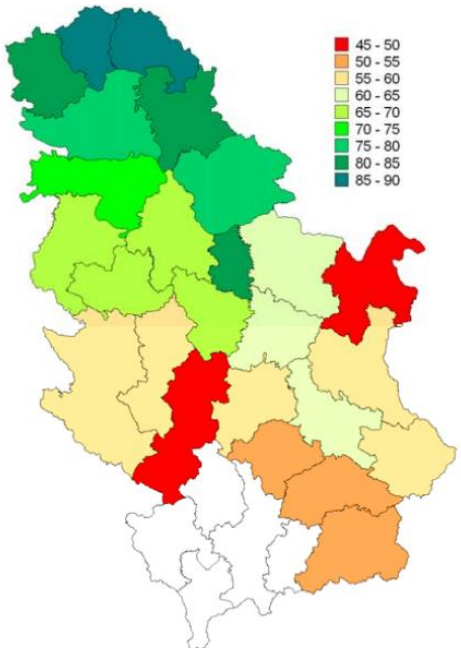


Figure 2.1.5-12 *% of agricultural land in relation to total area*

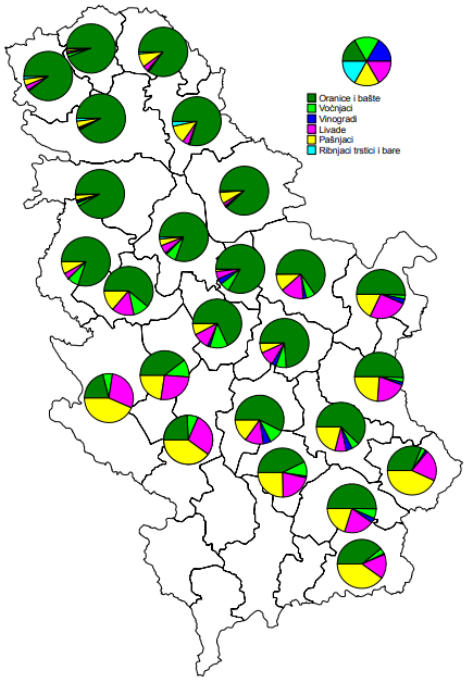


Figure 2.1.5-13. *Agricultural land by category of use*

Source: www.sepa.gov.rs.

Table 2.1.5-5. *Structure of the land cover of the Republic of Serbia*

Подручје- НСТЈ 1, НСТЈ 2	**Површине основних категорија земљишног покривача у km²**							**Удео у ук. територији - %**	
	Укупна територија	Интен-зивне пољоп. култу-ре	Трав-нате повр-шине	Свега доми-нантно пољо-приврe-дно	Шуме и жбуње	Влажна земљ. и водене повр.	Веш-тачке повр.и голе-ти	Интензив. пољо-ривредно земљиште	Трав-нате повр-шине
Република Србија	**88488**	**32834**	**10279**	**43113**	**38240**	**2377**	**4757**	**37,1**	**11,6**
Србија Север	**24839**	**17282**	**762**	**18044**	**3050**	**1982**	**1763**	**69,6**	**3,1**
Београдски регион/област	3234	1408	350	1758	822	118	536	43,5	10,8
Војводина	21605	15874	412	16286	2228	1864	1227	73,5	1,9
Србија Југ	**63646**	**15552**	**9517**	**25069**	**35188**	**394**	**2994**	**24,4**	**15,0**
Шумадија и Зап.Србија	26492	6888	3856	10744	14384	125	1239	26,0	14,6
Јужна и Ист. Србија	26254	6091	3509	9601	15424	226	1004	23,2	13,4
Косово и Метохија	10900	2573	2152	4725	5381	43	751	23,6	19,7

A very dangerous long-term trend for land use in the Republic of Serbia is the excessive occupation of agricultural land for the construction of settlements, infrastructure, industrial zones, etc., which leads to permanent losses of production and ecosystem functions of the land due to its covering (sealing) with a waterproof layer.

Of the other factors that threaten the soils and the quality of the land, the erosion processes, which are presented with different intensity on over 80% of the agricultural land, are at the forefront. Conservative methods of soil treatment and other erosion protection measures are rarely applied.

The organic matter content in most areas is also below the optimal level, especially in the category of arable land and gardens, mainly due to the lack of manure and other organic fertilisers.

More than a quarter of the agricultural land is acidified, mainly due to the uncontrolled use of chemicals. Soil compaction is also common, especially in the most fertile plains, due to inadequate application of heavy machinery and other agrotechnical measures.

The processes of instability on the ground, with the emergence of landslides, collapses and other land movements of various sizes and activities, are present in about 25-30% of the territory of the republic.

The forest cover of the Republic of Serbia amounts to 30.9%, while the optimal forecast forest cover for multifunctional requirements is about 41%.

Table 2.1.5-6. *State of the forest cover*

Подручје НСТЈ 1, НСТЈ 2	Укупна површина (km^2)	Површина шума (km^2)	Шумовитост %
Република Србија	**88.361**	**27.334**	**30,9**
Србија Север	**24.728**	**2.048**	**8,3**
Београдски регион/област	3.222	508	15,7
Војводина	21.506	1.540	**7,1**
Србија Југ	**63.616**	**25.286**	**39,8**
Шумадија и Западна Србија	26.775	10.020	37,4
Јужна и Источна Србија	228.208	10.456	40,3
Косово и Метохија	10.887	4.810	44,2

State forests represent 43% and private forests 57% (of the total afforested area). Seed forests (recovered from seeds) cover an area of 25.4%; forests of shoot origin (recovered from shoots) are 68.1%; forest crops (grown by seed sowing or more often by planting seedlings) are 5.1%; and intensive poplar plantations 1.3%. The area of non-forested land, shrubs and walnut forests covers about 3,824 km^2. The total volume in Serbia's forests is 402,987,417 m^3, and the total annual increase in volume is 10,629,772 m^3.

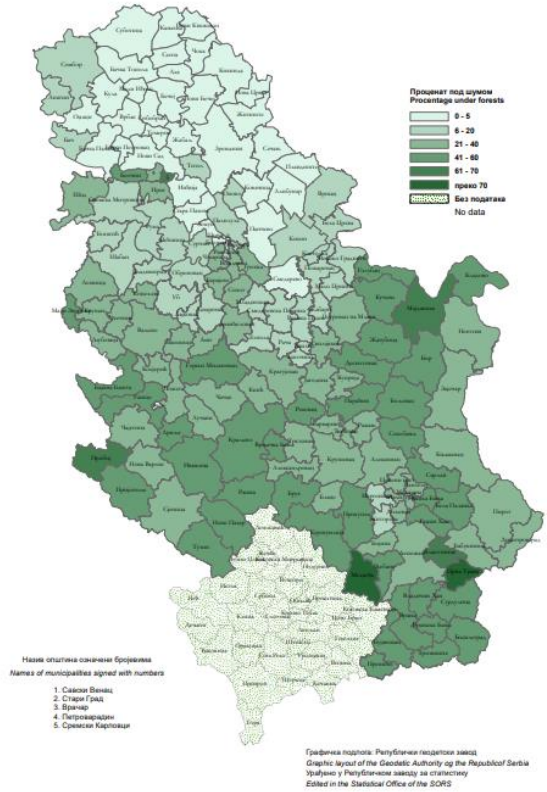


Figure 2.1.5-14. *Forests' area in the total area of municipalities, %*

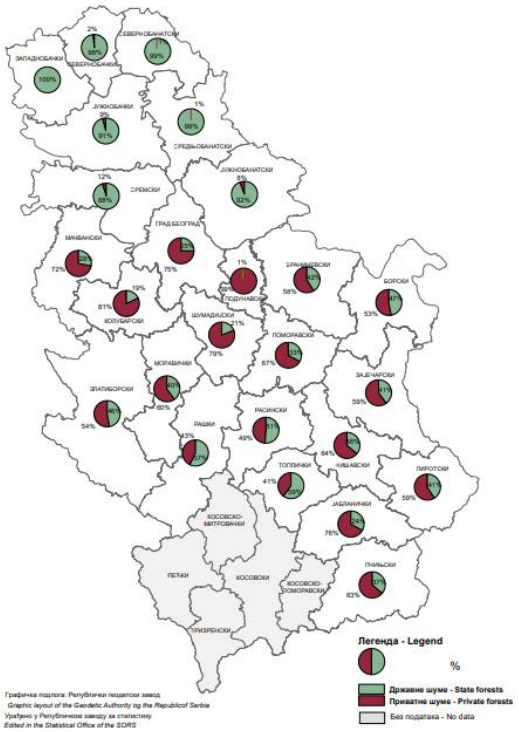


Figure 2.1.5-15. *State and private forests' ratio by area districts, %*

Source: Statistical Yearbook of Serbia, 2020, Belgrade, 2020

Compared to 2018, artificial afforestation increased by 1,530 ha in 2019, an increase of about 199%. The total area afforested in 2019 is 3,077 ha. The area afforested with coniferous trees equals 604 ha, equivalent to about 20% of the total afforested area in 2019. The areas of 2,973 ha and 104 ha are afforested through the public and private sectors, respectively.

Damage caused by fire in 2019 was recorded on an area of 1,079 ha and damage from damaged wood stocks of 3,397 m^3.

Soil fertility

For the assessment of soil fertility, was used report *ИЗВЕШТАЈ О СТАЊУ ЗЕМЉИШТА У РЕПУБЛИЦИ СРБИЈИ ЗА 2015. ГОДИНУ (THE STATE OF SOIL IN THE REPUBLIC OF SERBIA FOR 2015),* as well as the results of the macro-project "*Fertility control and determination of the content of harmful and dangerous substances in the lands of the Republic of Serbia"*, 1993.

A systematic control of the soil fertility status of arable land is carried out in the Republic of Serbia to determine the level of nutrients in agricultural land in terms of ensuring the proper use of mineral and organic fertilizers. The control includes: analysis of the basic chemical properties of

agricultural products: acidity (pH in H_2O and nKCl), $CaCO_3$ (%), humus (%) and available phosphorus (P_2O_5 - mg/100 g) and potassium (K_2O - mg/100 g).

The Macroproject study included the analysis of 5,020 soil samples. The project is funded by the Ministry of Agriculture, Forestry and Water Management and is implemented by the Agricultural Institute in Belgrade in cooperation with the Agricultural Faculty in Zemun - Department of Pesticides and Department of Agrochemicals and Plant Physiology. The aim of the project is to determine the fertility status and the extent of soil pollution in the monitored, coordinated part of the Republic of Serbia. As a result of these extensive works, data were obtained on the main soil fertility parameters (pH in n KCl of the soil, CaCO3, amount of humus and providing the soil with readily available forms of phosphorus and potassium), concentration of heavy metals and trace elements (As, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Zn), pesticide residues in the soil (4.4 DDD, 4.4 DDE, 4.4 DDT, Aldrin, HCH, p HCH, yHCH-Lindane, Diazinon, Dieldrin, Endrin, Endrin Aldehyde, Heptachlor epoxide, Alahlor, Atrazin, Prometrin, Simazin, Terbutrin), as well as the microbiological activity of the soil (total bacteria, dehydrogenase activity of the soil, ammoniators, free nitrogen, fixatives, nitrogenous bacteria, fungi and actinomycetides), etc., 2009).

Soil acidity results show that acid reaction soils dominate in the Republic of Serbia (**Figure 2.1.5-16)**. Of the total number of samples tested, those with an extremely acidic reaction (pH <4.0) were represented by 13%, a strongly acidic reaction (pH 4.0-4.5) by 17%, a moderately acidic reaction (pH 4.5-5.5) by 30%, a weakly acidic reaction (pH 5.5-6.5) by 22% and a neutral and alkaline reaction (pH> 6.5) by 18%.

The most acidic soils were located in different test areas.

Significant complexes are located in the basin of Kolubara, Yadra and Pocerina (pseudo-gley soils), the central part of Sumadia (soils of the type eutric cambisol, or merizable and luvisol).

In eastern Serbia, the soils spread at low altitudes (Luvisols) as well as at high altitudes are highly acidic in the soil solution. (Dystric Cambisols, Calcic Cambisols and Rankers on acidic soil-forming rocks). In the vicinity of the mine Bor soil (Vertisols), Dystric - Eutric Cambisols on andesite and sandstone, and Fluvisols) are heavily acidified by sulphur gas deposition. The region of Serbia-South is dominated by soils with a weakly acidic to acidic reaction, free of carbonates to weakly carbonate, weakly humic to humic, low and very low content of readily available phosphorus, as well as soils with optimal and high content of readily available potassium (**Figure 2.1.5-17)**.

Larger areas with strongly acidic soils are located in southern Serbia, especially in the south of Leskovac. Some areas in Leskovacko and Vranishko Pole, as well as the surrounding hills are under ilimerized and pseudo-gley soils. Most of the highly acidic soils are in the mountainous area, where acidic soil-forming rocks predominate.

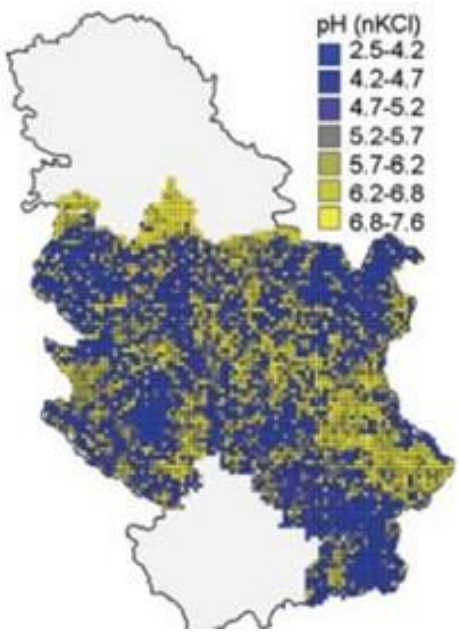


Figure 2.1.5-16. *Reaction of the soil solution (according to the Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

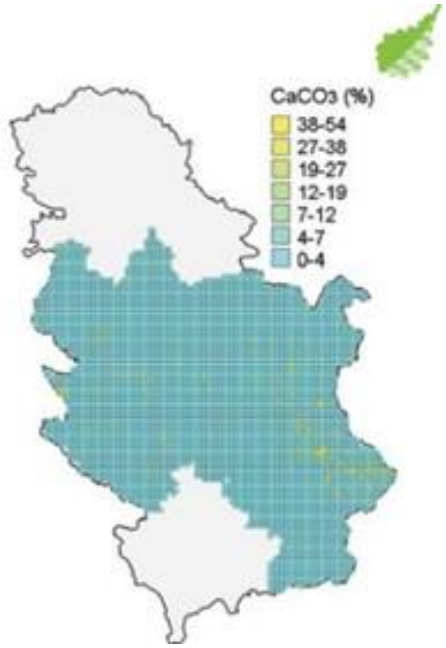


Figure 2.1.5-17. *Carbonate content, % (according to Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

The occurrence of acidic soils in the Republic of Serbia is mainly related to the geological substrate and other natural factors, while the negative anthropogenic impact is particularly pronounced in Bor. In addition, emissions of acid oxides are present in the vicinity of larger cities, power plants and places with a developed chemical industry, but the extent of their impact on soil acidification can only be discussed after more detailed monitoring.

Studies show that strongly acidic soils are most often under forests and grass vegetation (71%). Of the total number of samples in agricultural land, 27% had a very acidic reaction and of the total number of samples under arable land, gardens and perennials 23% had very acidic reactions.

The reaction of the soil is influenced by the content of carbonates. Carbonate soils are present in about 15% of the samples, low carbonate content (up to 5% CaCO3) are 10% of the samples, medium carbonate content (5-10% $CaCO_3$) are about 2.4% and strong carbonate content - about 3% of the soil samples (**Figure 2.1.5-17**). High concentrations of $CaCO_3$ may reduce the absorption of soil micronutrients and phosphorus.

An important indicator of soil fertility is the content and quality of humus. Humic substances adsorb most cations in a plant accessible form. They are a source of nutrients, bind certain harmful elements in inaccessible forms (Al, Cu, Pb) and influence favourably the structure and microbiological activity of the soil.

In the soil samples tested, the humus content ranged from 0,05 to 15% (**Figure 2.1.5-18)**. With a low humus content (below 1.5%) are about 2.7% of the samples; 26% of the samples have an average

humus content in the range of 1.5-3% humus; about 30% of the samples have a humus content above 5% and these are the soils under forest and meadow vegetation.

The available stocks of P_2O_5 in soils are low in most parts of the region. 61% of the samples are characterised by very low content of absorbable phosphorus (≤ 6 mg/100g) and 13% by low content of P_2O_5 (6-10 mg/100g). Most of these areas are on acidic soil under forests, meadows and pastures (about 70%). Of the total number of samples under arable land, gardens and perennial plantations, about 59% are poorly provided with phosphorus - **Figure 2.1.5-19**.

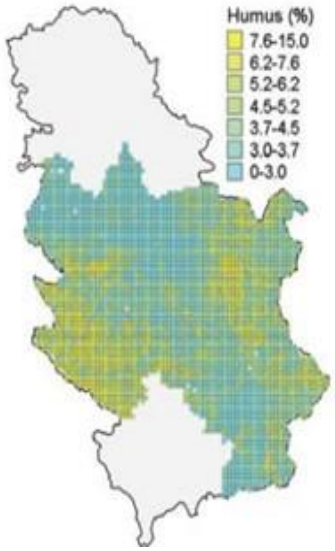


Figure 2.1.5-18. *Humus content, % (according to Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

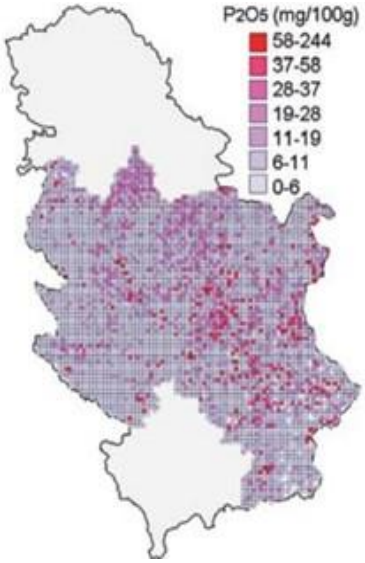


Figure 2.1.5-19. *Supply of soil with absorbable P_2O_5, mg/100g (according to the Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

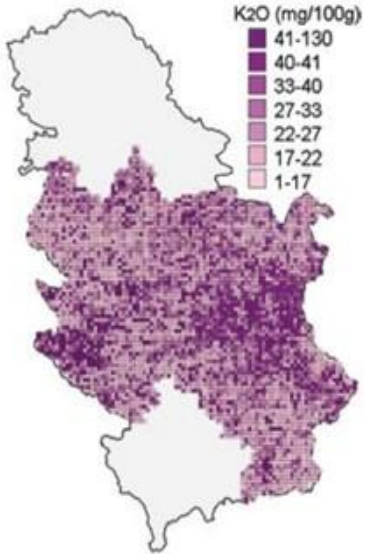


Figure 2.1.5-20. *Supply of soil with absorbable K_2O, mg/100g (according to the Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

Potassium supplementation is significant. Only 14% of the samples were poorly secured with potassium (≤ 12 mg/100g). The samples with medium and high provision levels have the highest numbers (**Figure 2.1.5-20)**. A small number of samples contain very high concentrations (above 50 mg/100 g), which are due to intensive fertilisation of soils under vegetable and fruit crops.

The results of the soil fertility assessment on the territory of the surveyed areas show that about 32% of the soil samples generally have relatively favourable fertility; 38% of the samples are from agricultural land or 50% of the samples from arable land and plantations, while the rest have certain limitations, above all, for a very acidic soil reaction and a very poor phosphorus supply, and much less for a lack of humus.

Soil degradation

The main threats leading to soil degradation in the Republic of Serbia are presented by: erosion, landslides, flooding, watering of polluted industrial waters, urbanisation by non-agricultural land acquisition, reduction of organic matter, soil degradation, soil acidification, soil pollution due to

industrial activity, mining and energy production, excessive use of chemicals in agriculture and compaction of agricultural land.

These indicators are an expanded list of indicators for assessing the risk of soil degradation presented in Regulation on the program for systematic monitoring of the soil quality, indicators for evaluation of soil degradation and methodology for preparation of remediation program "Official Gazette of RS", No. 88/2010): 1) rate of soil erosion risk; 2) rate of soil organic matter decline risk; 3) rate of risk from soil compaction; 4) rate of soil salinization and/or alkalization risk; 5) rate of risk from landslides, except for landslides caused by mining activities; 6) rate of soil acidification risk; 7) rate of soil chemical contamination risk. The regulation was drawn up in implementation of the Soil Thematic Strategy (COM(2006) 231) and a proposal for a Soil Framework Directive (COM(2006) 232).

Erosion

According to the Erosion Map of Serbia (Erosion Map of Serbia, Institute of Forestry and Woodworking, Belgrade, 1983), in the period 1966-1971, erosion of varying intensity affected 76,354.43 km^2 or 86.39% of the Republic of Serbia, while the accumulation zone covered 12,024.71 km^2 or 13.61%. In the past period, the relationship between certain categories of erosion has changed. According to preliminary studies (Lazarevic, R. 2009), water erosion has been reduced by 25-50%, with a 25% reduction characteristic of the main agricultural areas up to 400-500 m high, while a 50% reduction applies to hill-mountain and border areas. According to the same source on the territory of eastern Serbia, to which the municipality of Zaječar belongs, the intensity of erosion is reduced by 50% compared to the period 40 years ago.

In the Republic of Serbia, 86% of its territory is threatened by soil erosion of varying degrees. The hilly and mountainous areas, which make up three quarters of the territory of the Republic of Serbia, are naturally susceptible to soil erosion. Almost all of these regions are exposed to erosion processes and half of them to high intensity erosion. The most endangered region in the Republic of Serbia is the south-eastern part of the country, which is close to the border with Bulgaria (https://www.sciencedirect.com/science/article/pii/S2095633915300277).

All categories of soil erosion are represented on the territory of the Republic of Serbia. The average category of erosion occurs on an area of 9,518.33 km^2, i.e. 10.76% of the territory of the Republic of Serbia is a potential erosion zone (exports of eroded materials in the range of 10 to 20 t/ha/y). The predicted erosion zones, which can be defined as a manifest natural risk, occupy 13.32% of the territory of the Republic of Serbia, i.e. 11,776.27 km^2.

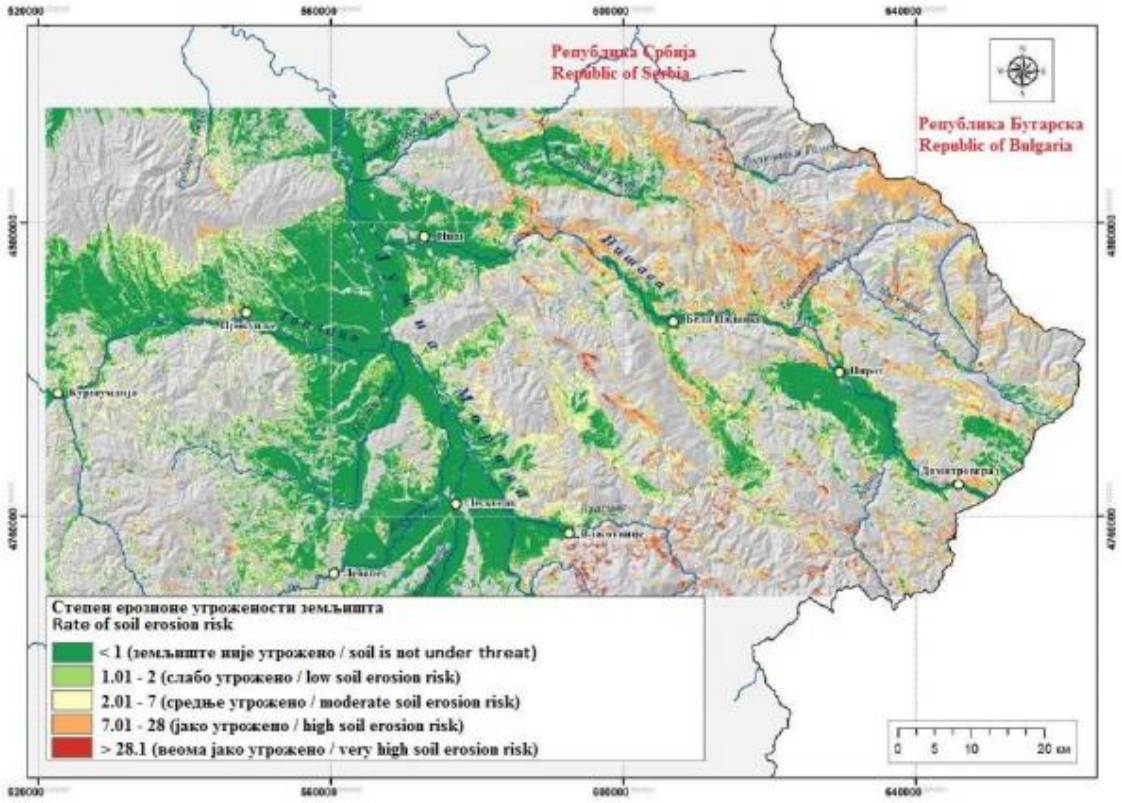
The project "Estimate of the potential agricultural land erosion in the territory of the Republic of Serbia" was financed by the Ministry of Agriculture and Environmental Protection, Directorate for Agricultural Land, and implemented by the Institute for Soil Science, Belgrade. The research area is located in the southeast of the Republic of Serbia, covers the area of 4,267 km^2, which represents 4.83% of the total territory of the Republic of Serbia (**Figure 2.1.5-21**).

Figure 2.1.5-21. Geographical location of the study area

The main objective of the project is to identify areas at risk from erosion and quantify the actual intensity of soil erosion in the surveyed area. Erosion processes of different categories of destructiveness have been determined practically on the whole territory of the Republic of Serbia, and 25- 30% of the territory is covered by potentially instable areas, while 8-10% of the territory is affected by landslides. Annual soil loss in the area surveyed by using USLE model ranges from 0 to 352.00 t ha-1 year-1 with an average value of 8.12 t ha-1 year-1 . Based on the analysis of morphological and physical properties of soil, the average, allowable (acceptable) soil loss of the study area is 5.66 t ha-1 god-1. On the basis of the obtained data, a rate of soil erosion risk is shown by USLE model (**Figure 2.1.5-22**).

Significant part of the territory covering the area of 2,153.75 km² (50.47%), according to OECD classification, has allowable (acceptable) soil loss, low risk is in 21.42% of the territory, 21.74% of the territory is affected by moderate erosion processes, 4.63% of the territory has high risk and 1.73% of the territory has very high risk from erosion. A higher percentage of soil of the study area is not at risk of erosion (51.10%). A high level of erosion risk is detected in the area of 550.84 km² or 12.91% of the territory of the study area, and a very high risk on 63.22 km², i.e. 1.48% of the territory (**Table 2.1.5-7**).

The survey has shown that agricultural land on lower altitudes along the river valleys of South Morava, Nišava, Toplica and Jablanica identified as the regions of intensive agricultural activities, according to the level of soil erosion risk, belong to the group of soils generally not at risk from erosion. A region of semi-intensive agricultural activities characterized by traditional technology of agricultural production and insufficient infrastructure in villages, is designated as area of low and moderate risk.



Source: ИЗВЕШТАЈ О СТАЊУ ЗЕМЉИШТА У РЕПУБЛИЦИ СРБИЈИ ЗА 2015. ГОДИНУ

Figure 2.1.5-22. *Rate of soil erosion risk of the study area*

Table 2.1.5-7. *Rate of soil erosion risk on the study area*

Степен ерозионе угрожености земљишта (СЕУЗ) The rate of soil erosion risk	km^2	%
Земљиште није угрожено Land is not under threat	2.180,46	51,10
Слабо угрожено Low soil erosion risk	620,60	14,54
Средње угрожено Moderate soil erosion risk	851,88	19,96
Јако угрожено High soil erosion risk	550,84	12,91
Веома јако угрожено Very high soil erosion risk	63,22	1,48
Укупно Total	4.267,00	100,00

With regard to the level of soil erosion risk, areas with extensive agricultural activities are characterized by medium and high index of erosion risk, mainly because of the impact of topography and high annual precipitations (**Table 2.1.5-8**).

Table 2.1.5-8 *Rate of soil erosion risk of agricultural regions*

Степен ерозионе угрожености земљишта The rate of soil erosion risk	Рејон интензивне пољопривреде Area of intensive agriculture		Рејон полуинтензивне пољопривреде Area of semi-intensive farming		Рејон екстензивне пољопривреде Area extensive agriculture	
	km^2	%	km^2	%	km^2	%
Земљиште није угрожено Land is not under threat	1.547,56	75,73	571,98	36,22	60,91	9,46
Слабо угрожено Low soil erosion risk	252,01	12,33	319,71	20,24	48,88	7,59
Средње угрожено Moderate soil erosion risk	198,38	9,71	459,48	29,10	194,02	30,12
Јако угрожено High soil erosion risk	41,94	2,05	198,98	12,60	309,92	48,11
Веома јако угрожено Very high soil erosion risk	3,66	0,18	29,07	1,84	30,48	4,73
Укупно Total	2.043,56	100,00	1.579,23	100,00	644,21	100,00

Landslides

Processes of instability of the terrain with occurrences of landslides, rockslides, mudflows and others, of different sizes and activities, are present in approximately 25-30% of the territory of the Republic of Serbia. A very high risk of landslides exists in 11.9% of Serbia's territory, mainly in mountainous areas, and especially in western Serbia, Kosovo and northern Serbia. There is a high risk of landslides in 23.6% of the territory, mainly in hilly and mountainous areas: western Serbia, the lower Danube, the northern part of eastern Serbia, Peshtera and Kosovo.

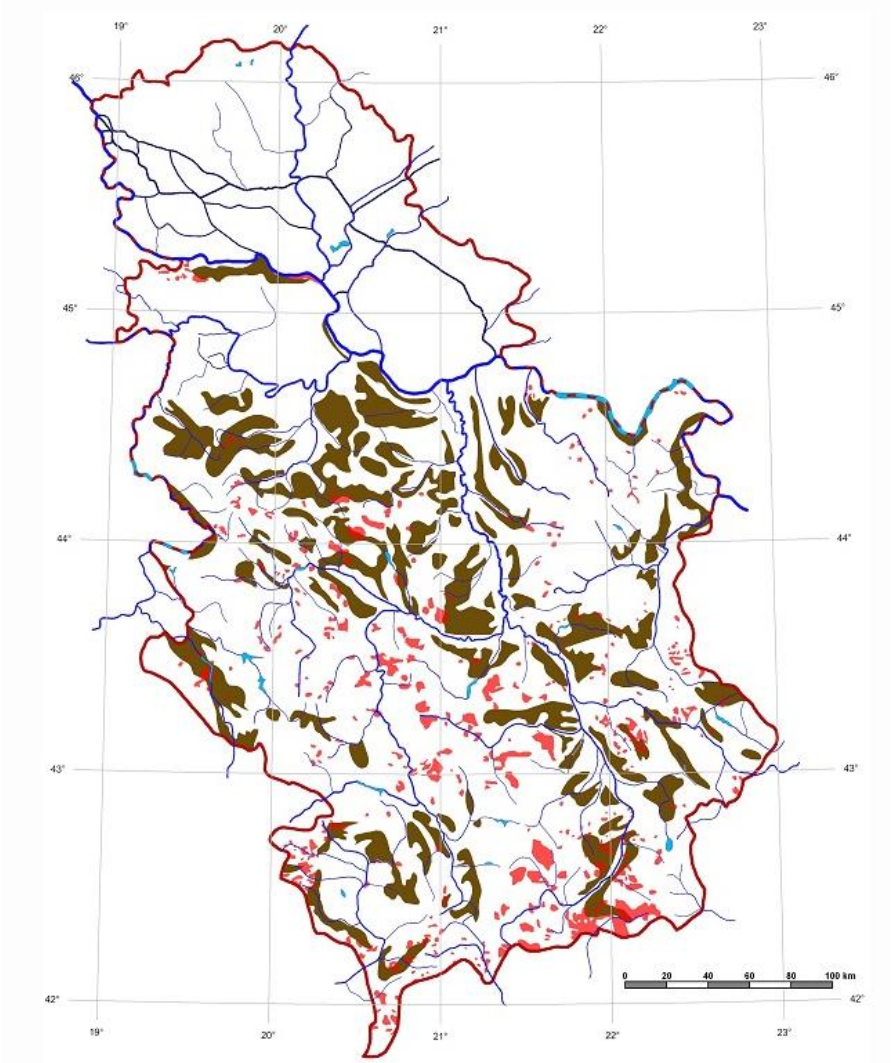


Figure 2.1.5-23. *Map with a breakdown of unstable slopes and areas with strong erosion potential - Republic of Serbia*

In the period May 2015 – February 2016, the following project was implemented: "Harmonization of data on landslides and training of local governments for their monitoring" – BEWARE (BEyond landslide aWAREness). Funding of the mplementation of the project was provided by the Government of Japan through the UNDP office in the Republic of Serbia with the support of the Ministry of Mining and Energy and the Office for Assistance and Rehabilitation of Flooded Areas. The project comprised 27 municipalities affected by floods and landslides in 2014 (24 most affected municipalities in May 2014 and 3 municipalities in eastern Serbia flooded in September 2014).

The Ministry of Mining and Energy is also implementing the project called "Cadastre of landslides and unstable slopes in the territory of the Republic of Serbia" and the survey methodology is compatible with the abovementioned project. One of the goals of the works carried out under this project is elaboration of hazard and risk maps for the purposes of implementation of preventive measures by the competent authorities.

Urbanisation. Acquisition of agricultural land for non-agricultural purposes;

Urban development also leads to changes in the purpose of land use. Analysis of the contribution of certain categories of land use patterns taken up by urban development in the period 1990-2018. The analysis in the Republic of Serbia shows that mainly the purpose of the land under pasture, mixed agricultural areas, as well as forests and forest areas changes (**Table 2.1.5-9)**.

Intense urbanisation caused by urban sprawl is associated with changes in land use.

Table 2.1.5-9. *Origin of urban land, expressed in % of different land categories in which conversion took place*

Categories	**Land acquisition, ha**				
	1990-2000	2000-2006	2006-2012	2012-2018	**Total, ha**
Pastures and mixed agricultural areas	2.818	2.28	1.148	2.93	6.539
Arable land and permanent crops	2.468	939	1.777	0	5.184
Water Bodies	58	0	14	91	164
Bare areas with little or no vegetation	0	0	0	0	0
Natural grassland	12	3	8	0	23
Forests and transitional forest areas	2.094	1.066	1.264	1.768	6.192
Swamps	21	36	30	0	87

Source: Environment in Serbia 2004-2019.

The soil in ***an urban environment*** is particularly threatened because it is negatively exposed to a wide variety of human activities. The study of the state of soils in the urban environment (Niš, Novi Pazar, Kruševac, Užice, Požarevac, Smederevo, Subotica and the municipality of Trstenik) includes the determination of the concentration of hazardous and noxious substances in industrial areas, around congested roads, water source areas, recreational areas, residential areas, pedagogical institutions' areas, agricultural lands and areas near landfills.

The results of the soil pollution study carried out in the period 2005-2018 by the Environmental Protection Agency show that in some places there is an increase in the concentration of certain parameters:

1. soil samples were taken from 154 locations *in the vicinity of industrial* facilities. The results show that 47.7% of the soil samples exceeded the limit concentrations for **Ni**. **Co** concentrations were exceeded in 47% of samples, **Cu at 38,3**%, **Hg** at 23,7% of samples, **Cd** at 22,3% of samples. The concentration of other metals slightly exceeds the limit value;
2. in the *vicinity of busy roads*, the test was carried out in 218 places. Of the total number of samples, it is stated that in 51,8% the concentration of **Ni** exceeds the limit value. An increased **Co** concentration was observed in 41.2% of the samples tested. The content of **Cu** was exceeded in 28.9%, **Cd** in 19.6% of the samples, **Zn** in 14.6% of the samples and **Hg** in 14.4% of the samples;
3. in *samples of agricultural land* situated in close proximity to urban areas, the total heavy metal content of 402 sites is examined. Based on the results obtained, the largest exceed of the limit value

was recorded for **Ni -** in 52.4% of the samples. Concentrations above the limit value have been established for: **Cu** at 29.9% of samples, **Co** at 26.5% of samples and **Cd** at 15.4% of samples;

4. in soil samples near landfills for household waste, 53 sites were tested. The concentration of **Ni** in the soil samples tested exceeds the limit value in 59,6% of the samples. Exceed of **Cu** was recorded in 26.0% of samples and **Cd** in 17.3% of samples.

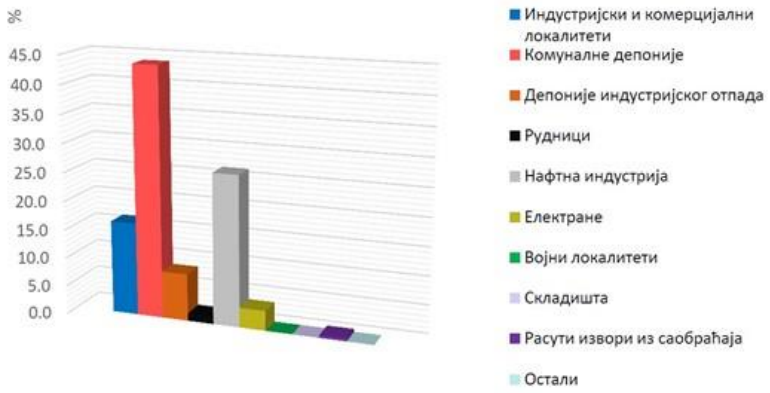
Deviations from the prescribed standards for nickel, copper, cobalt, cadmium, zinc and mercury were recorded in most of the soil samples tested.

Soil testing in urban areas shows that these areas are strongly influenced by man and metals are the most common pollutants. The organic carbon content of the soil decreases and is less than the initial estimated value.

Soil pollution

Soil pollution at local level is represented in areas of intensive industrial activity, unregulated landfills, mines, etc.

Based on the analysis of the content and distribution of potentially harmful and hazardous elements in the soil, it can be concluded that the soil of most of the territory of RS is uncontaminated and suitable for production, with several areas with ecologically endangered hot spots. The largest share of localized soil pollution is found in public utility depots with 43.7%, followed by wells and oil depots with 26.4% and industrial and commercial sites with 16.3% (**Figure 2.1.5-24)**.



Source: Environment in Serbia 2004-2019

Figure 2.1.5-24. *Share of main types of localized sources of soil pollution in the total number of identified settlements (%)*

A total of 709 potentially polluted sites were identified in the Republic of Serbia in 2018 (Figure 2.5.1.2-12). Of these, 52 sites have implemented rehabilitation and renovation activities and 76 sites have been studied in depth (Towards depollution of land in the Republic of Serbia, 2018).

Regarding the concentration and types of pollutants in the soil, the proximity of vulnerable sites, the activity of the site, the size of the complex and the estimated scope of renovation works, all sites where soil pollution has been confirmed are classified in IV group. The group (disturbingly polluted

soil) includes large industrial enterprises where rehabilitation and renovation are needed, which are: Mining and smelting basin Bor, First Five Year Trstenik, Zhelezara Smederevo, ZI Zorka Subotica, PKS Latex Cachak and Viscoza Loznitsa.

In the area of AP KiM there is no regular monitoring of soil quality and tests are carried out in potentially contaminated areas (such as the energy complex in Obilic) within the framework of special programs. Heavy metal concentrations above the permitted levels are not recorded in soil samples, fruits and crops, but high levels of certain metals (Cr, Ni, Pb and Cd) are found in the soil of land not used for agricultural purposes. So far, 26 contaminated, potentially hazardous sites with the character of a "hotspot" with a total area of about 1000 ha have been identified. They are landfills or warehouses: ash (TPP Kosovo A and B), phenol (Obilić), pesticides and fertilizers and rubber (Suva Reka), hazardous industrial chemicals (Peja), asbestos (Han and Elezit), slag (Ferronickel, Glogovac) tailings and waste from non-ferrous metal ore extraction (Kishnitsa, Artan, Golyash, Virgo), waste from flotation processes (Zvecan, Leposavic, Zharkov Stream - Kelmend, Virgo), household waste (Podujevo, K. Mitrovica, Peja, Prizren, Pristina-Miras, Grjilan), industrial waste, zinc metallurgy waste and radioactive substances - strontium, thorium, americium (K. Mitrovica).

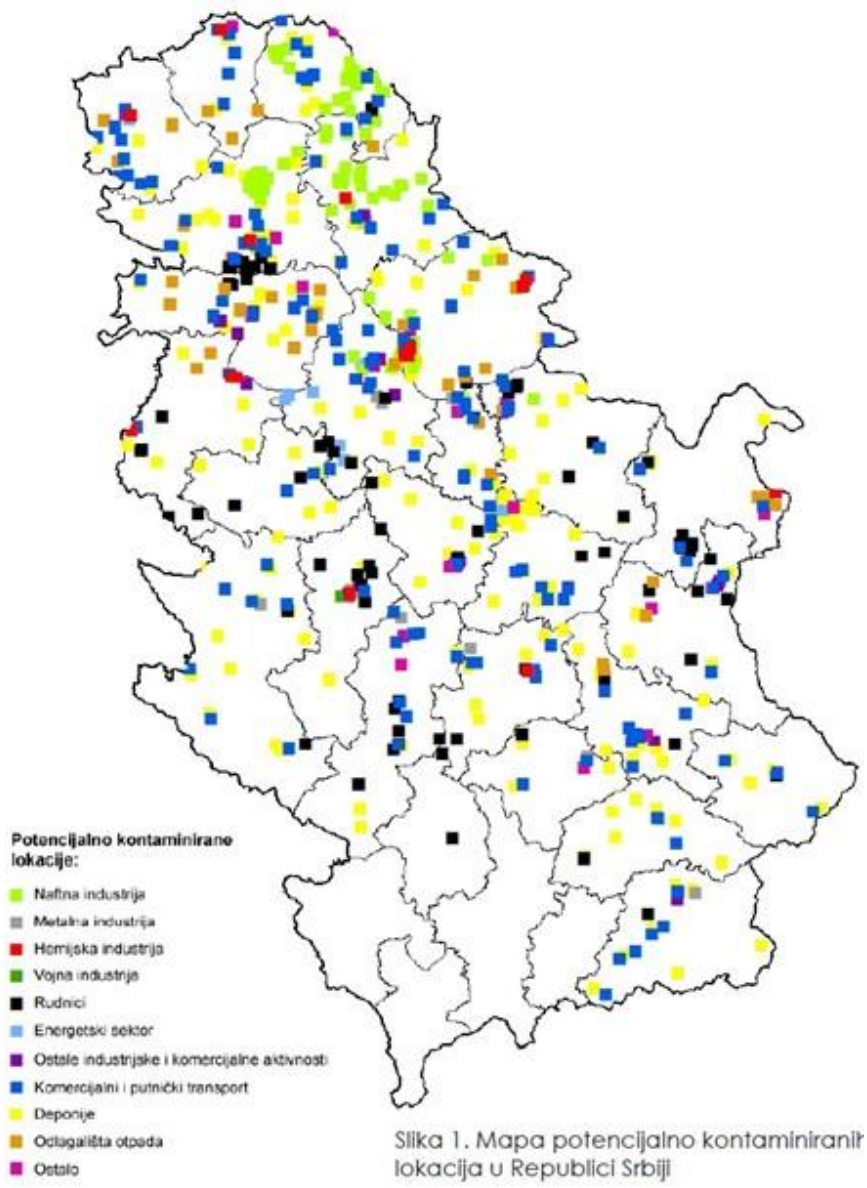


Figure 2.1.5-25. *Map of potentially polluted sites in the Republic of Serbia*

Heavy metals.

The soil pollution results are based on data from Stanje_zemljista.pdf (sepa.gov.rs). Criterion for assessment of the degree of soil pollution with 8 potentially hazardous elements (As, Cd, Cr, Hg, Ni, Pb, Cu, Zn) are the maximum permissible concentrations (MPa) in soils (Службени гласник РС бр. 23/94).

The average **nickel (Ni)** content in soils in central Serbia is 58 mg/kg. At 20% of the samples the concentration exceeds 50 mg/kg (MPCs); about 50% of the samples contain more than 100 mg/kg and 2,3% of the samples have concentrations above 500 mg/kg (**Figure 2.1.5-26)**. The high concentrations of Ni are mainly found in soils formed on rocks with a high natural content of this element, such as those

found in eastern Serbia on the slopes of Deli Jovan (partly made of Gabro and serpentine). High concentrations of nickel are also recorded in the valley of Velika Morava, Kolubara, in some samples in the valley of Sava.

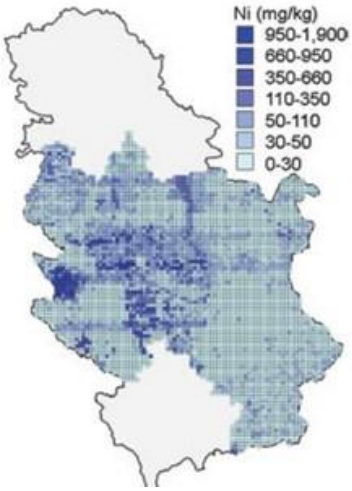


Figure 2.1.5-26. *Content of Ni (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

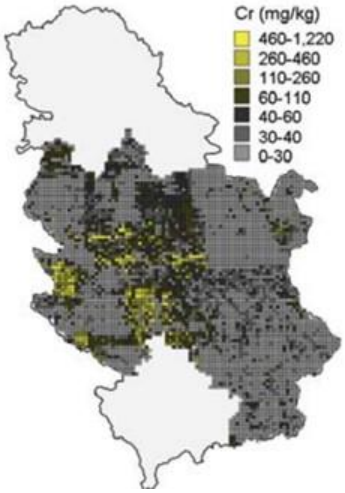


Figure 2.1.5-27. *Content of Cr (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009. Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

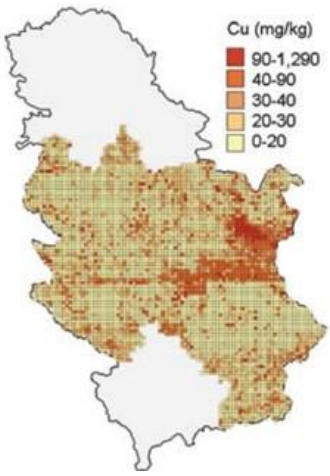


Figure 2.1.5-28. *Content of Cu (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009 Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

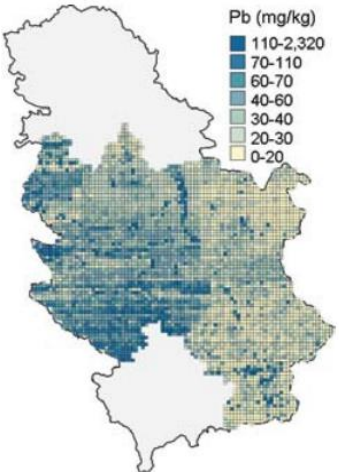


Figure 2.1.5-29. *Content of Pb (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009 Ministry of Environment and Spatial Planning, Environmental Protection Agency)*

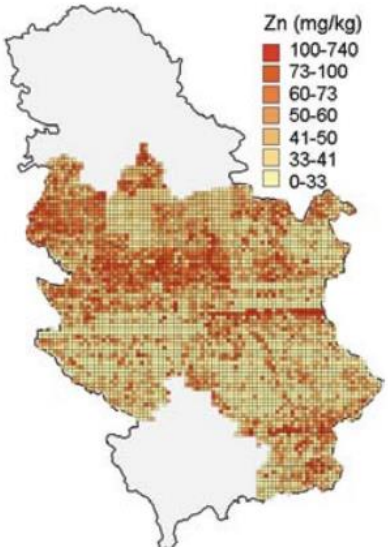


Figure 2.1.5-30. Content of Zn (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009 Ministry of Environment and Spatial Planning, Environmental Protection Agency)

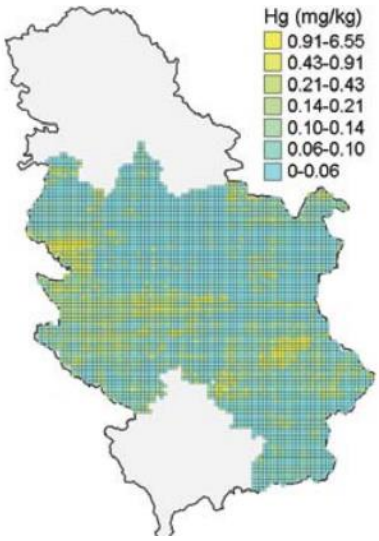


Figure 2.1.5-31. Content of Hg (total form) content, mg/kg (according to Report on the State of the Soil in RS, 2009 Ministry of Environment and Spatial Planning, Environmental Protection Agency)

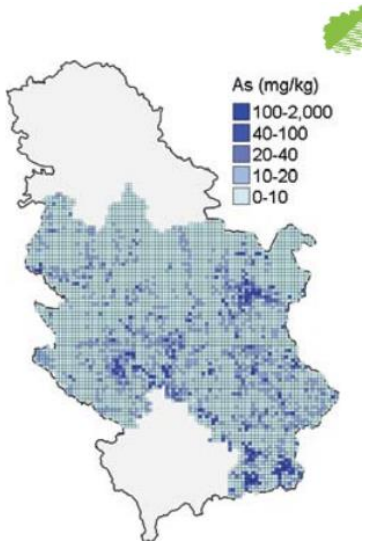


Figure 2.1.5-32. Content of As (total form) in soil, mg/kg (according to Report on the State of the Soil in RS, 2009 Ministry of Environment and Spatial Planning, Environmental Protection Agency)

In 1% of the samples tested, the **chromium (Cr)** content exceeds 500 mg/kg. The average chromium content of soils in Serbia is 48 mg/kg. Its origin depends on the soil-forming rock and the presence of technogenic sources (metallurgy, production of phosphorus fertilizers, etc. (**Figure 2.1.5-27)**.

Copper content (Cu) ranges from 0.1-1219 mg/kg for arithmetic mean 27 mg/kg. The largest number of samples had concentrations up to 50 mg/kg (91.7%); 6.3% had concentrations of 50-100 mg/kg and concentrations above 100 mg/kg were only 2% of the samples. The soils around the Bor mine are with the highest concentration of copper. High concentrations are also found in soils in wine-growing regions as a consequence of the application of herbal remedies (blue stone) - **Figure 2.1.5-28**.

Cadmium (Cd) content in only 1.3% of soil samples exceeds 3 mg/kg, while in 4.6% of samples it is 2-3 mg/kg. The average Cd content in soils in central Serbia is 0.805 mg/kg. Increased concentrations of Cd are found in the Nishava Valley ranges, widely around Bor. The origin of cadmium in soils shall be considered to be: geochemical (deposits of Zn, carbonates, phosphorites, black shale and clays) and/or as a consequence of anthropogenic pollution.

The average content of **lead (Pb)** in soils in Serbia is 40 mg/kg. Higher Pb content (above 100 mg/kg) occurred in 3.4% of the samples, while in 77.7% the arithmetic mean Pb content was characterised by concentrations up to 50 mg Pb/kg (**Figure 2.1.5-29)**.

The concentration of **zinc (Zn)** in only 0,2% of the samples exceeds the MPa at an average arithmetic content of 48 mg/kg. Zinc rarely appears as a soil pollutant in Serbia. On the other hand, 2.7% of the samples contained Zn less than 10 mg/kg (**Figure 2.1.5-30)**, which confirms the results of previous studies that on sandy, carbonate and strongly acidic soils the plants were deficient in zinc.

Mercury (Hg) content in only three samples exceeds the 2 mg/kg concentration, which is toxic to soil and soil micro-organisms. The arithmetic mean Hg content of soils in Serbia is 0.120 mg/kg (**Figure 2.1.5-31)**.

In the studied soils, the average **arsenic content (As)** is 11 mg / kg. Potential pollution (over 25 mg/kg) is present in 5.0% of the samples at different locations around the Bor mine, in several samples in the Timok valley and along the Zhagubitsa-Bor, which are polluted at the same time with other pollutants. In addition, increased amounts of this element have been found in some soils near the coal mines of Resava and Zvornik. Coal is known to contain increased concentrations of arsenic (up to several hundred mg As/kg), so that the As content of soil, precipitated solids and waste water increases in the vicinity of mining and energy plants. Higher As content is also recorded in some samples around Valeva, Chachka, Trstenik and in the Cemerno mountain. In south-eastern Serbia, increased concentrations of As were found in some samples east of Knyazhevac, around Bela Palanka, north of Niš (Kamenica), north-east of Kursumlijska Banja. In addition, in three places: Bosilegrad-Kriva Feia, Bujanovac-Prohor Pchinski monastery and Vranja-Vladichin Han, there are increased concentrations, which are more a consequence of geochemical pollution (**Figure 2.1.5-32)**.

The implemented Macroproject "*Fertility Control and Identification of Hazardous and Harmful Substances in the Soil of the Republic of Serbia*" on the territory of Central Serbia is financed by the Ministry of Agriculture and Environmental Protection and is implemented by the Institute of Soil Science, Belgrade. In the second phase of the project, a study was carried out on the condition and change of the quality of agricultural land in the south and south-east of Serbia, i.e. in the *regions of Nishava, Pirot, Toplica, Jablanica, Zaječar and Rasina.*

The research in the phase VIII/1 covered the area of 350,000 ha and at the phase VIII/2 covered the area of 400,000 ha.

The exceeded maximum permissible concentrations (MPCs) in the regions of Nishava, Pirot, Toplica, Jablanica, Zaječar and Rasina are registered for the following 6 elements: arsenic (As), chromium (Cr), copper (Cu), nickel (Ni), lead (Pb) and fluorine (F).

Exceeded MPCs values in this area were the most common for fluorine (F) and were present in 59.35% of the total number of sites analysed (**Figure 2.1.5-33)**.

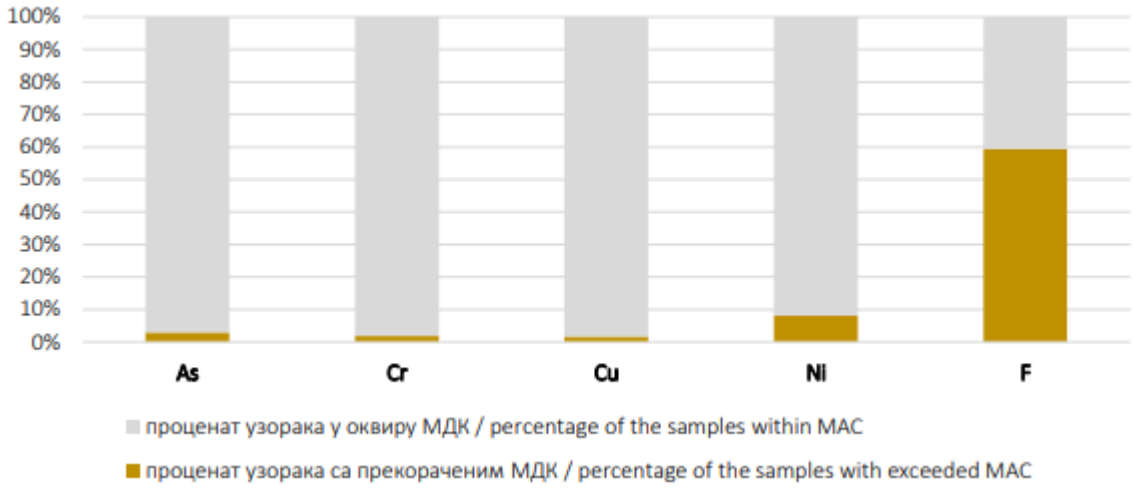


Figure 2.1.5-33. Percentage share of exceeded values

Of the total number (529) of samples analysed in the project implementation, a large part belong to arable land (**Figure 2.1.5-34)**. An overview of the percentage of samples analysed in which the MAC was found to be exceeded for F, Ni, Cu, Cr and As in terms of land use is shown in **Figure 2.1.5-35**.

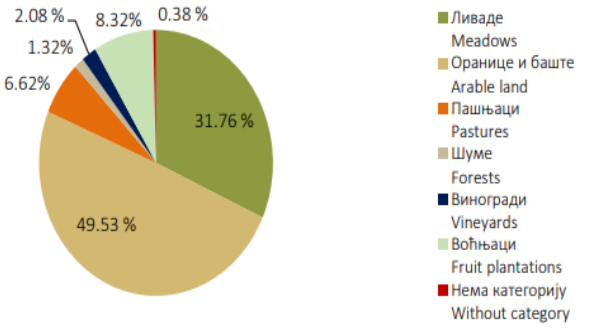


Figure 2.1.5-34. *Percentage share of samples in relation to land use*

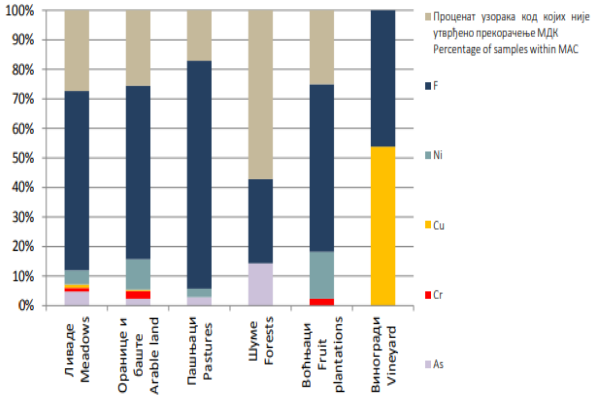


Figure 2.1.5-35. *Percentage share of elements which exceeded MAC in relation to land use*

The results of content and distribution of a studied harmful elements (Pb, As, Cr, Cu, F, Ni and Cd) are shown in Figures 2.1.5-36 - 2.1.5-42.

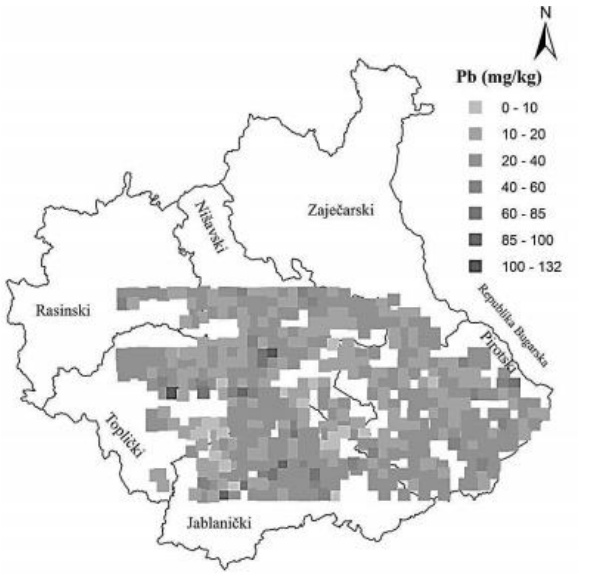


Figure 2.1.5-36. *Content of Pb in the surveyed area*

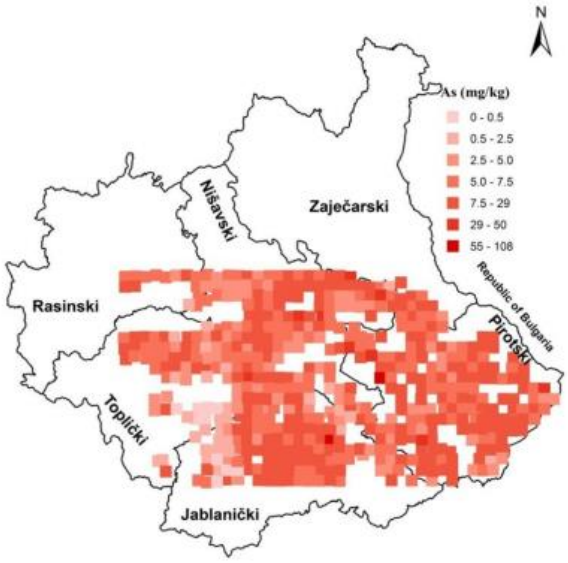


Figure 2.1.5-37. *Content of As in the surveyed area*

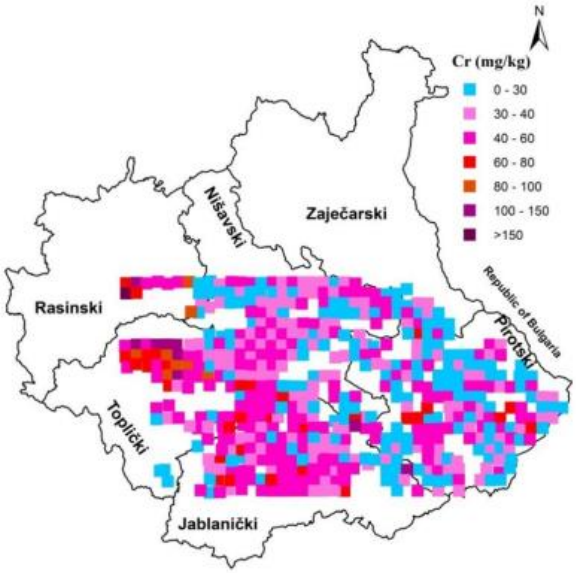


Figure 2.1.5-38. *Content of Cr in the surveyed area*

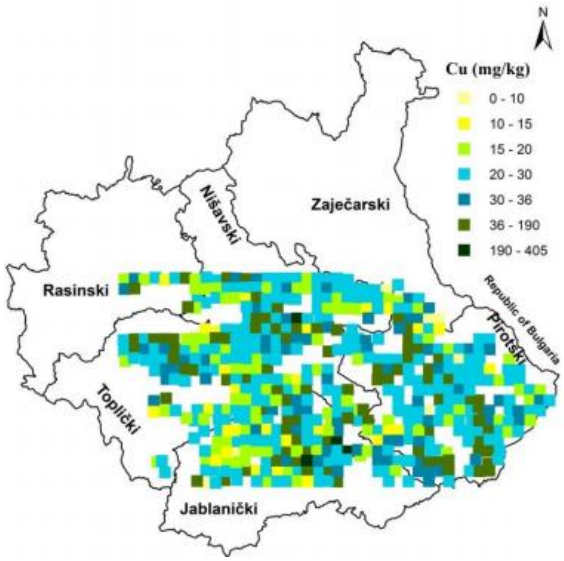


Figure 2.1.5-39. *Content of Cu in the surveyed area*

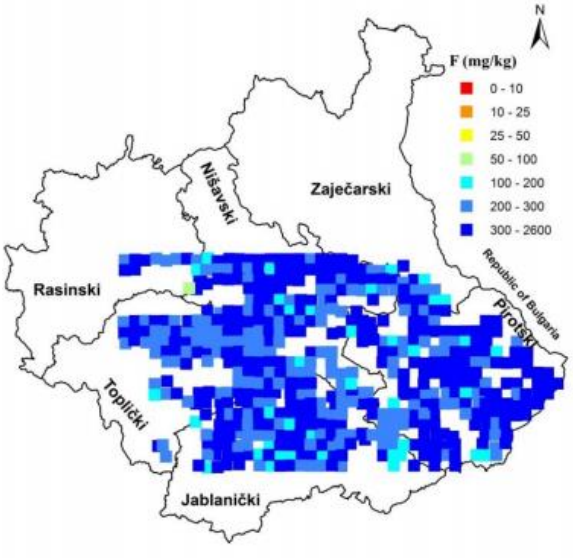


Figure 2.1.5-40. *Content of F in the surveyed area*

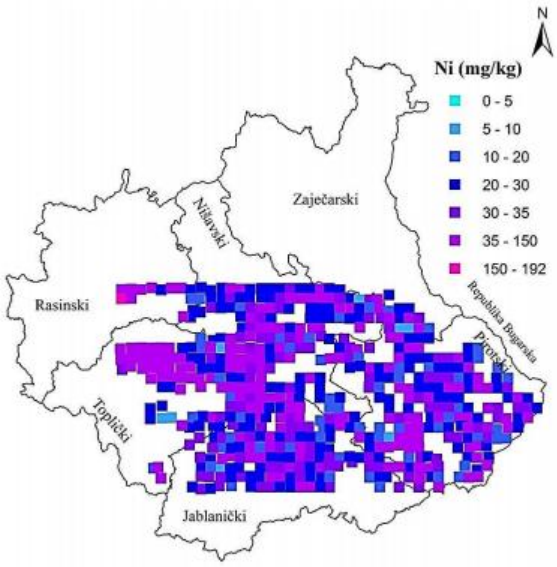


Figure 2.1.5-41. *Content of Ni in the surveyed area*

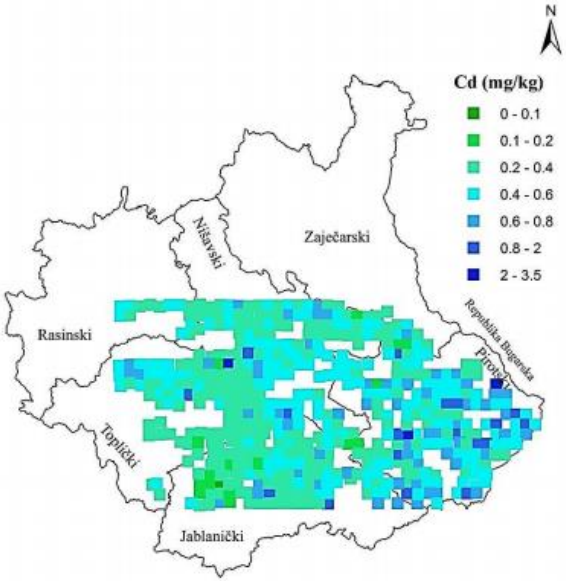


Figure 2.1.5-42. *Content of Cu in the surveyed area*

Pesticides

The programme for the examination of pesticide residues in the soil of central Serbia includes the testing of about twenty compounds, 12 of which are active substances of pesticides, and the remaining isomers and/or toxicologically relevant metabolites. More than half of chlorine-organic pesticides (metabolites) are persistent pesticides that have long been used in agriculture and, above all, for other purposes, but have a high ability to accumulate in soil and are potential environmental pollutants. The active substances used today in plant protection, primarily triazine herbicides, have also been tested.

The results show that the average content of most of the tested compounds in the soil is extremely low. For 13 pesticides and/or products it is in the range of about 2-8 pg/kg.

The corresponding values for the remaining 6 target compounds (diazinon, atrazine, simazine, promethrin, terbutylazine and alachlor) were slightly higher and ranged from 10-15 pg / kg. These values must be considered in the context of the total number of samples in which these compounds are generally detected. The number is very low. Thus, Diazinon was detected only in 11 and Alachlor in 17 of the 1500-1700 samples in which their level was checked. Results are expected as neither Diazinon nor Allahlor are sustainable pesticides. The cross-section of the condition associated with atrazine is slightly different, but not disturbing. This, until recently very common soil herbicide, was found in only 1/3 of the total samples analysed, with an average atrazine content in these soils of about 15 pg/kg and 0.015 mg/kg, which was also expected.

Higher concentrations of DDT, DDD, α-HCH and heptachlor-epoxide have been found in some samples in forest lands or meadows adjacent to forests, which is associated with their use in forest protection.

The results of the study show a low content of tested pesticides in the soils of the Republic of Serbia and indicate that they are not contaminated with pesticide residues.

Disaster Risk

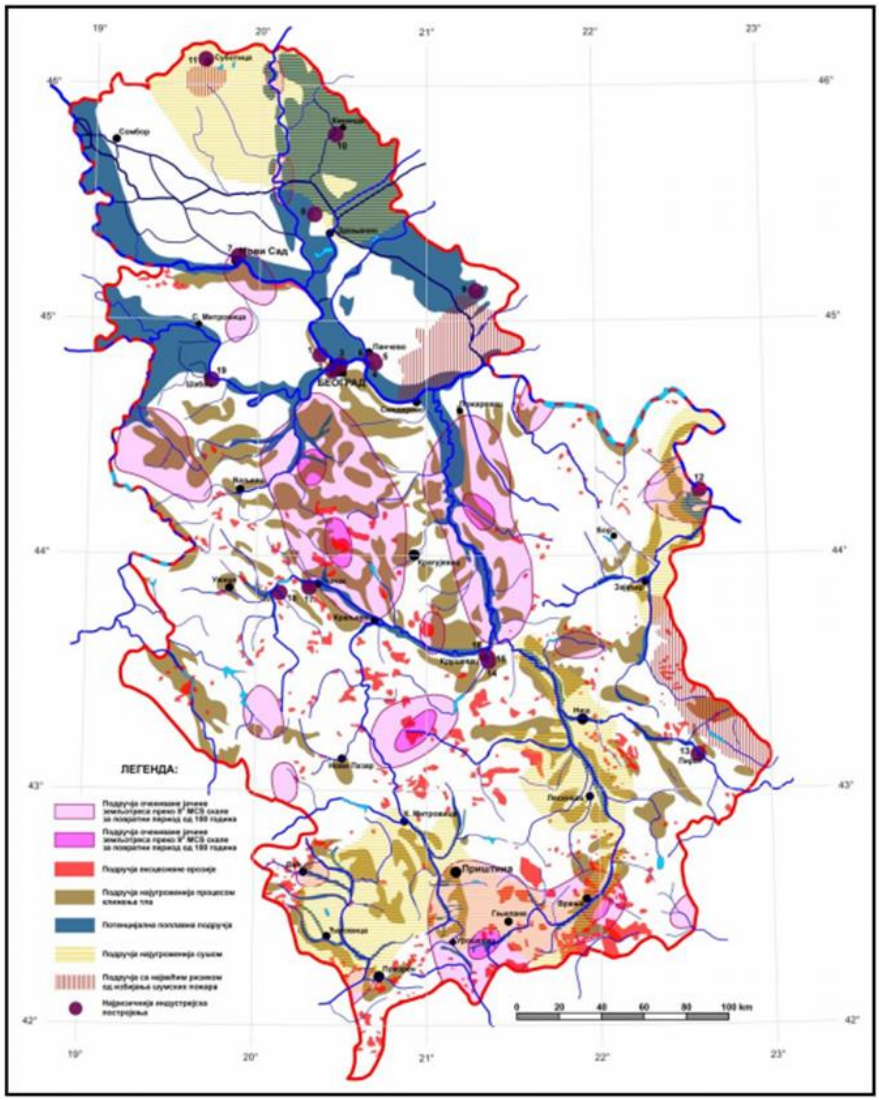
Considering the natural characteristics of the territory of the Republic of Serbia, the following were identified as the most important potential risks of natural disasters caused by natural and anthropogenic factors: lithospheric (seismismic, erosion, landslides), atmospheric (storm, hail, cumulative and intense rainfall, drought), hydrospheric (floods and torrents) and biospheric (forest fires) disasters. In addition to natural disasters, technical and technological accidents occur on the territory of the Republic of Serbia in industrial enterprises and the performance of production activities, storage and transport of dangerous goods, which have a significant share in the consequences for human health, material goods, critical infrastructure and the environment, including soil.

For the territory of the Republic of Serbia, floods and landslides are the most common natural disasters. In the Republic of Serbia, the problem of spillage of large waters occurs in practically all rivers, small and large.

Flood risk management is an obligation under Directive 2007/60/EC for EU Member States.

Potentially flooded areas in the Republic of Serbia cover 16% of the total territory, i.e. an area of about 14,146 km^2 and have about 500 larger settlements and 515 industrial facilities. In addition, 680 km of railway lines and about 4,000 km of roads.

An analysis of the records of forest fires in the forest territories in the period 2009-2016 shows that the largest fire-affected areas are in the eastern and south-eastern part of the Republic of Serbia, especially in the Timok-Bolevac forest region, or in the municipality of Knyazhevac. During the mentioned period, there were 7 fires on the territory of the municipality of Knyazhevac and a total of 558 ha forests were burned. In burnt areas, the risk of soil erosion is increasing.



Source: Spatial Development Strategy of Serbia, 2009

Figure 2.1.5-43. *Synthesized map of the risk of natural disasters and technological accidents on the territory of the Republic of Serbia*

Protection from natural disasters in the Republic of Serbia is a mandatory part of any development plan (planning document) provided for in the Regulations on the content and development of the documentation for spatial planning ("Official Gazette of the RS" No. 60/03, Article 16). With the development of the Strategy for Spatial Development of the Republic of Serbia (2009), but also with the adoption of the Spatial Plan of the Republic of Serbia (2010-2021), more attention is paid to the protection of people and their material goods from natural disasters.

Summary of the state of soils in the regions in the Republic of Serbia

The soil in the Republic of Serbia is heterogeneous and the changes are noticeable at very short distances. They are exposed to both natural (erosion, landslides, floods, fires) and anthropogenic/technogenic factors.

The main features of these conditions can be presented as follows:

- The share of agriculture in total areas, similar to the ratio of intensive crops to grassland ecosystems, decreases from northern to southern and south-eastern regions;

- 86% of the territory of the Republic of Serbia is threatened by soil erosion of varying degrees. The hilly and mountainous areas, which make up three quarters of the territory of the Republic of Serbia, are naturally susceptible to soil erosion. Almost all of these regions are exposed to erosion processes and half of them to high intensity erosion. The most endangered region in the Republic of Serbia is the south-eastern part of the country, which is close to the border with Bulgaria.

- Intensive urbanisation caused by urban sprawl is associated with changes in land use, mainly changing the use of land under pasture, mixed agricultural areas as well as those occupied by forests and forest areas;

- There is a dangerous long-term tendency to use agricultural land for the construction of settlements, infrastructure, industrial zones, etc., which leads to permanent losses of production and ecosystem functions of the land due to its covering (sealing) with a waterproof layer;

- Soil fertility in terms of values of basic chemical properties (pH, $CaCO_3$ content, humus content and absorbable potassium) generally meets the requirements of agricultural crops and vegetable production. The high proportion of weak humic soils (mean content 2.08%) is worrying. The phosphorus content of the studied soils varies considerably (from very low to very high and harmful content). The soils are heavily stocked with digestible potassium. There is no information on the total nitrogen content, which is a major indicator of soil fertility.

- Soil compaction is also common, especially in the most fertile plains, due to inadequate application of heavy machinery and other agrotechnical measures;

- The acidification of soils on the territory of Serbia is the result of the action of: natural factors (soil-forming rock, climate and vegetation type) and influenced by human activity (Bor mine, agriculture).

- Heavy metals in soils are geogenic (natural), technogenic (extraction and processing of non-ferrous metal ores, coal metallurgy, phosphorus fertilizer production, agriculture) and anthropogenic (near landfills for household waste and urban environment, near busy road arteries) origin. In areas of intensive industrial activity, unregulated landfills, mines, agricultural land and congested roads, **local** exceeds of the maximum permissible concentrations have been recorded for: nickel, copper, cadmium, zinc, cobalt and mercury. In an urban environment with the highest exceed rate (MPCs) in soil are: cadmium, copper, cobalt, mercury and nickel.

- There is no soil pollution with pesticide residues.

- High risk of fires and floods causing soil erosion.

The concept of sustainable land management has an important agri-environmental and socio-economic dimension and, in order to preserve the land, monitor its condition and use, identify sensitive areas and determine the extent and characteristics of pollution. In order to monitor the state of soil and land on the territory of the Republic of Serbia, it is necessary to ensure constant monitoring of certain pollutants and polluted materials (mining substrates) which cause soil degradation and which have a significant impact on the environment and human health.

2.1.6. Biodiversity state

- ***Regions in the Republic of Bulgaria***

General information

The characteristic geographical situation of the country, combined with the complex paleogeographic and paleoclimatic past, the diverse relief and climate, the presence of freshwater basins and the Black Sea outlet, as well as the diverse landscapes and geosystems formed are the main factors determining the rich diversity of species, communities and natural habitats in Bulgaria. According to the biogeographical zoning of Europe adopted in connection with the requirements of Directive 92/43/EEC (Habitat Directive) and the Emerald network established under the Berne Convention, the territory of Bulgaria falls within the scope of the Alpine, Continental and Black Sea biogeographical regions.

The wide variety of climatic, geological, topographic and hydrological conditions in Bulgaria predetermines one of its first places in Europe by the richness of biodiversity, which is represented by:

- *Lower plants***.** The analysis of scientific papers and published data on the algoflora of Bulgaria for the period 2014-2018 shows that new data on the composition and distribution of algae in the country have been accumulated, leading to an increase in the number of established taxa; a total of 5,493 species of algae, varieties and forms of 777 genuses and 9 departments have been identified. The number of algae taxa included in the Red List of Microalgae represents 14% of the total biodiversity of Bulgaria, and together with the Red List of macroalgae taxa, all conservation algae species in the country account for 15% of the total biodiversity;

- *Moss flora***.** The Bulgarian moss flora numbers 705 species, which is over 40% of Europe's moss flora, of which 83% are found in Rila and Pirin. Of these, 251 species are included in the Red List of Mosses in Bulgaria;

- *Higher flora*. According to the current data, Bulgaria has a total of 4,064 species of higher plants belonging to 921 genuses and 159 families. As a result of the floristic surveys carried out in recent years, 127 species (51 of them foreign) have been registered in the country and 11 species that are new to science have been described. Seventeen subspecies have also been reported for the first time for the country, two of them new to science. The largest in number of species are the family Asteraceae with about 480 species, Poaceae with about 330 species, Fabaceae with about 290, Caryophyllaceae with about 260, Rosaceae with about 210, Brassicaceae with about 183, Scrophulariaceae with about 156. Of the plant genuses in Bulgaria with particular species richness are distinguished the genus *Hieracium* s.l. (Runyanka) with about 80 species, *Carex* (Ostritsa) with about 66 species, *Centaurea* (Metlichina) - about 65, *Trifolium* (Clover) - 60, *Silene* (Plyuskaviche) - 50, *Verbascum* (Lopen) - 45, and others (Petrova et al., 2005). The majority of the species in our flora, about 3,330, are spontaneously distributed in the plains and mountains of the country in more or less natural or human-modified habitats. They form the group of autochthonous plants. More than 500 species of representatives of 93 families, mainly perennial herbaceous plants, shrubs and trees of this group, are dominants and subdominants in plant communities. These are mainly representatives of the families of cereals, acid grasses, legumes, complex flowers, pink flowers, etc. (Apostolova, Slavova, 1997). With a small number of species, but with a

defining participation as dominants and edifiers in mountain ecosystems, are woody representatives of the families Aceraceae (Maple), Fagaceae (Beech), Pinaceae (Pine), Tiliaceae (Lime) with the participation of sadominants and asectors from Betulaceae (Birch), Cornaceae (Dryan), Oleaceae (Olive), Rosaceae (Pink), Salicaceae (Willow), Ulmaceae (Elm), etc. The biological spectrum of the Bulgarian flora is dominated by herbaceous perennial and annual plants, a total of about 3,540 species. Trees (88 species), shrubs (236 species) and semi-shrubs (35 species) form the group of phanerophytes. The richest phanerophytic flora is Stara Planina and the Rhodope Mountains with 210 species, or 58% of the variety of trees and shrubs in the country is represented in these mountains. There are 164 phanerophytes in Rila, 148 in Vitosha Mountain. In the mountains the greatest species richness of trees and shrubs in the belt of xerothermic, mesophilic and xeromezophilic oak and hornbeam forests, whose upper limit reaches about 900 (1000) m. (Including Strandzha, Sakar and Eastern Rhodopes, which are within the scope of the programme under consideration).

The majority of the species in our flora, about 3,330, are spontaneously distributed in the plains and mountains of the country in more or less natural or human-modified habitats. They form the group of autochthonous plants. More than 500 species of representatives of 93 families, mainly perennial herbaceous plants, shrubs and trees of this group, are dominants and subdominants in plant communities. These are mainly representatives of the families of cereals, acid grasses, legumes, complex flowers, pink flowers

A little more than 500 species of trees, shrubs and herbaceous plants are restricted in the Bulgarian flora. Some of them are Bulgarian or Balkan endemics, others are rare plants, remnants of ancient flora or species whose main ranges are outside Bulgaria. In Bulgaria they have a small number of populations, sometimes in single deposits, often in the border floristic regions of the country or in the high mountains. Many of these species, included in this edition, are protected by the Bulgarian Biodiversity Act. The specificity of the Bulgarian flora is largely determined by the Bulgarian and Balkan endemic plants. This is 498 species or 12.8% of the species wealth of the country. The Bulgarian endemics are 186 species, the Balkan ones - 312. Particularly rich in endemic species are the larger families such as: Asteraceae, Scrophulariaceae, Caryophyllaceae, Poaceae, Borraginaceae, Liliaceae, Ranunculaceae and others. (Petrova et al., 2005). With a relatively large number of endemics are distinguished genuses such as *Anthemis*, *Arenaria*, *Centaurea*, *Chamaecytisus*, *Colchicum*, *Erysimum*, *Festuca*, *Poa*, *Tulipa*, *Verbascum*, as well as genuses characterized by wide intra-species and inter-species variability with local processes of introgressive hybridization in polyploid and agamous complexes, such as: *Achille*, *Alchemilla* , *Hieracium* , *Viola* , *Taraxacum* etc. Most endemics have small ranges, some species have very limited distribution, with small populations and a high level of threat. The most Bulgarian and Balkan endemics are found in the Rhodopes, Pirin, Rila, Stara Planina. Endemic plants are an emblematic symbol of the Bulgarian flora and one of the most sensitive and vulnerable links in the country's natural ecosystems.

In the Red List of higher plants in Bulgaria are included 801 species (almost 20% of the higher flora), of which 557 species are included in Appendix 3 of the BDA.

Another group of plants, about 560 species, are weeds and ruderals, most widespread in places changed under the influence of human activity. Some of them have been in their present habitats for

millennia, related to the development of human culture since the early settlement of the Bulgarian lands. Others, such as *Datura stramonium*, Galinsoga *parviflora*, *Impatiens glandulifera*, Malcolmia *africana*, Oxalis *dillenii*, *Xanthium spinosum*, enter later as a result of the resettlement and migration of humans and animals, the development of trade and tourism, of processes that continue now. The latter category includes the so-called invasive species, which are displaced quickly and occupy free habitats or displace autochthonous species.

- *Mushroom-like organisms***.** Mushroom-like organisms (oomycetes, hyphohitrides, etc.) are identified in the *kingdom* of Straminipila on the basis of cell wall construction, flagellate apparatus, mitochondria, biochemical traits and molecular biology. Genuine mushrooms (chitrides, zygomycetes, glomerulomycetes, non-lichenized and lichenized baggy mushrooms and basidiomycetes) are included in the kingdom of *Fungi*. Mushrooms can be characterized as eukaryotic, heterotrophic organisms that suck nutrients from the environment in a dissolved form. Due to the specifics in their nutrition, they stay closer to the animal kingdom than to the plant kingdom (Denchev et al., 2005).

The following table presents the assessment of mycota in Bulgaria by taxonomic groups.

Table 2.1.6-1 *Assessment of mycota in the Republic of Bulgaria*

Taxonomic groups	Types, number
Oomycetes, hyphohydrides, chitrides, zygomycetes	> 180
Ascomycetes (non-lichenised and lichenised)	> 1 600
Basidiomycetes	about 1,600
Urediniomycetes	374
Ustilaginomycetes	118
Anamorphic fungi	> 1 000
Total Species Established	> 4 870

A total of 215 species are included in the second edition of the Red List of mushrooms in Bulgaria (37 critical endangered species, 105 endangered species, 40 vulnerable species, 14 endangered species, and 19 species with insufficient data). The number of conservationally significant mushroom species that are included in the Red Book of the Republic of Bulgaria is 149 species, of which 37 are critically endangered, 104 are endangered and 8 are vulnerable.

- *Invertebrates.* Currently, over 30,360 species have been established in Bulgaria, belonging to 251 orders and over 1740 families. It is estimated that this is about 50% of the invertebrates in the country. The Red Book includes articles and 51 species of invertebrates, of which 39 species are "Critically Endangered", and Appendix 3 of the BDA includes about 40 species. In general, the Bulgarian invertebrate fauna is insufficiently studied. Only some single-celled (shellfish rhizopods), some parasitic worms (trematodes, cestodes, nematodes, acanthocephalus), vertebral worms, crustaceans, spiders, molluscs, molluscs and individual insects (mayflies, dragonflies, straight-winged, semi-hard-winged, net-winged, hard-winged, broodstock, butterflies, etc.) have been studied comparatively well. The number of species, orders and classes of individual types of invertebrates established so far in Bulgaria is presented in the following table.

Table 2.1.6-2 *Faunistic Diversity of Invertebrates in Bulgaria*

Types*	Classes (pc.)	Orders (pc.)	Species (pc.)

Sarcomastigophora	8	28	~ 580
Labyrinthomorpha	1	1	3
Sporozoa	1	5	~ 270
Microspora	2	4	27
Ascetospora	1	1	2
Myxozoa	1	1	47
Ciliophora (Infusoria)	3	19	~ 680
Spongia (Porifera)	1	3	29
Cnidaria	3	5	32
Ctenophora	2	3	3
Platyhelminthes	4	21	~ 830
Gastrotricha	1	2	40
Nematoda	2	14	~ 970
Rotifera (Rotatoria)	3	4	~ 290
Nematomorpha	1	1	8
Acanthocephala	3	6	52
Kinorhyncha	1	2	4
Entoprocta (Kamptozoa)	1	1	2
Annelida	5	15	~ 240
Ectoprocta (Bryozoa)	2	3	25
Phoronida	1	1	1
Nemertea	1	2	26
Tardigrada	2	4	34
Arthropoda	9	62	~ 24 720
Mollusca	3	18	445
Echinodermata	1	2	4
Chaetognatha	1	1	3
Hemichordata	1	1	1
Total	**65**	**230**	**~ 30 000**

- *Vertebrates.* About 800 vertebrate species are known in Bulgaria: 2 species of round-lipped, 4 species of cartilage fish, 213 bone fish, 19 species of amphibians, 37 reptiles, 430-435 species of birds and 97 species of mammals. In recent years - 2014-2018, the species composition has been supplemented and updated - a new species of bony fish - Serranus hepatus *in the Black* Sea has been described. As a result of the proof of two new species of frogs for the country (*Pelophylax* lessonae and *Pelophylax* bedriagae), as well as due to the taxonomic changes, it can be considered that the modern composition of the class of amphibians includes at least 24 species of two orders - the tailed amphibians are represented by 8 or 9 species (the only known population of *Triturus macedonicus* in Bulgaria is of unclear species), and the frogs - by 16 species. The Reptilian class includes a total of 37 species - the tortoises are 5 species (one of them - the red-eared tortoise is not an autochthonous species, the lizards are 16, the species of 4 families, the snakes are also 16 species of 5 families).

A total of 442 animal species are categorized in the Red Book of the Republic of Bulgaria. 30 species are listed as “Extinct” (EX), 87 are categorised as “Critically Endangered” (CR), 107 as

"Endangered" (EN), 137 as "Vulnerable" (VU), 14 are categorised as "Nearly Endangered" (NT), 42 as "Mildly Affected" (LC) and 25 as "Insufficient Data" (DD). 444 species (including birds) are included in Appendix 3 of the BDA.

- Plant communities. From a plant-geographical point of view, the vegetal cover of Bulgaria is a complex of communities with a boreal, medium European (most widespread), degree (second in distribution), arctic, alpine, Balkan (including Mediterranean) and local character. Vegetation is made up of representatives of all environmental groups in terms of the water factor. Species vary widely in terms of thermal factor and edaphic conditions. The acidity of the base rock and soils is in some cases one of the primary conditions for the development of one or other plant species and determines the structure of phytocenoses. In the mountains of Bulgaria are developed all the belts, separated in Central Europe, without level. According to the available sources of information and the existing phytosociological data regarding the syntaxonomic diversity of vegetation under the Brown-Blanquet School (Braun-Blanquet 1964) in Bulgaria, 39 classes, 67 orders, 94 unions, 218 associations, 48 sub-associations and 36 communities can be identified. Of these, 90 habitats are subject to conservation according to Appendix 1 of the BDA (respectively Appendix I of the Habitats Directive) - 92 according to the last report of Bulgaria under Art. 17 of the said Directive (not yet included in Appendix I of the BDA).

A special place in the vegetal cover of Bulgaria has the phytocenoses of the South Euxin species, located in the Eastern Balkan Mountains in Strandzha, which falls within the scope of the program. The forests of *Fagus orientalis* and *Quercus polycarpa* are a complex set of Southern Euxinian and Middle European species: *Rhododendron ponticum, Laurocerasus officinalis, Daphne pontica, Vaccinium arctostaphylos, Trachystemon orientalis, Calluna vulgaris, Festuca drymeja, Acer platanoides, A. campestre, Carpinus betulus, Tilia tomentosa, Quercus cerris, Crataegus monogyna, Poa nemoralis* and other

Vegetation in the areas covered by the CBCP and TSIM

The territory of Bulgaria belongs to the Holarctic floristic kingdom and, based on the spectrum of floral elements, refers to three plant geographic areas: European deciduous forest area, Eurasian steppe and forest steppe area and Mediterranean sclerophilous forest area with 5 provinces, 28 counties and 80 regions.

According to geobotanical zoning (Iv. Bondev, 1997 - **Figure** 2.1.6-1) of the three plant areas in which the Republic of Bulgaria falls, the territory covered by the CBCP and TSIM falls into two of them - the *European deciduous forest area* (in green in the figure) and the *Eurasian steppe and forest area* (in yellow in the figure).

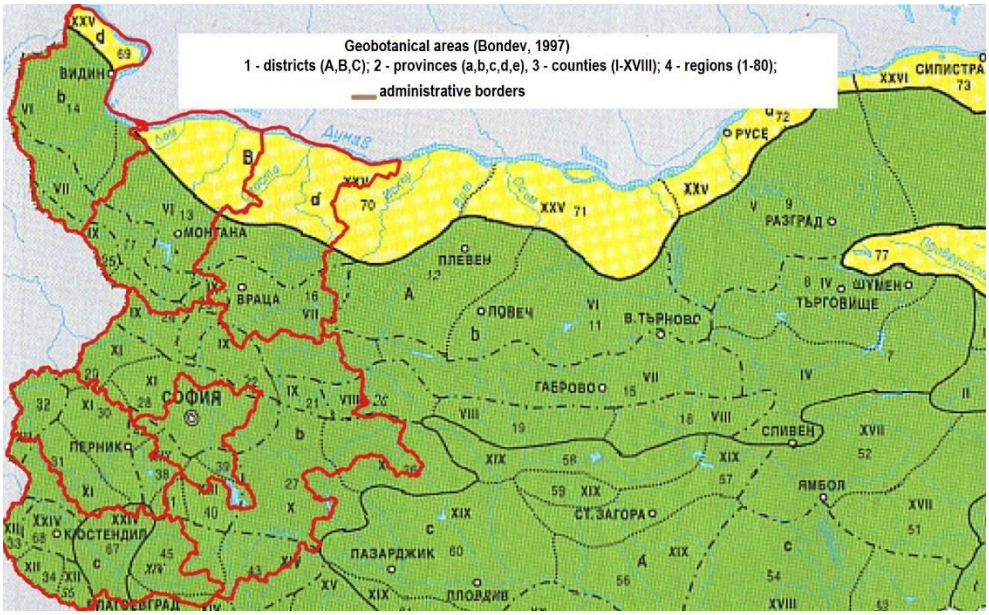


Figure 2.1.6-1 *Geobotanical zoning (under Bondev, 1997)*

The **Eurasian Steppe and Forest region in Bulgaria** is represented by the Lower Danube Province, which is divided into the Near Danube *region, Dobrudzha region and Novopazarski region*, with the CBCP and TSIM occupying part of the Near *Danube region*, which is generally characterized by an almost forest-free space used for agricultural cereals and vineyards. There are also remnants of former forests with mainly cerris oak and virgiliev oak, less often than hairy oak. In some places, secondary forest communities have been formed with the domination of a Carpinus orientalis or Fraxinus ornus, etc. Due to the presence of carbonates in the loess and carbonate Chernozems in the degradation of the forests, there are also many bushes with a predominance of Cotinus coggygria. Grass formations with dominance of Chrysopogon gryllus, Dichanthium, Poa bulbosa, etc. are also formed on the forest-free sections. The most important steppe elements found here are the Camphorosma monspeliaca, *Salsola ruthenica*, *Paeonia tenuifolia*, *Amygdalus nana*, *Chamaecytisus* danubialis, *Paliurus spina-christi*, *Fritillaria orientalis*, *Scutellaria altissima*, *Phlomis herba-ventis ssp. pungens*, *Galium* hamifus. Of all the mentioned species up to now, single in the middle of the cultivated areas between fields with different crops and in mined areas to the irrigation facilities in places there is the Cotinus coggygria. The Near *Danube Region* is divided into four regions, of which Novoselski and Zlatia regions fall within the territorial scope of the programme. In the Novoselski region, only in separate places were leftover xerothermic forests with domination of Fraxinus ornus or bush communities - of the Chamaecytisus bush. The Zlatia region was formerly occupied by forests of *Quercus virgiliana* and *Quercus pubescens*. At present, there are remnants of forests with the predominance of mostly *Fraxinus ornus*, less commonly of *Quercus cerris* and *Quercus pubescens*. In many places there are also artificial plantations of *Robinia pseudoacacia*. Typical steppe species are *Camphorosma* monspeliaca, *Potentilla pirotensis*, *Chamaecytisus danubialis*, a Balkan endemic. Some of the conservationally significant plant species characteristic of the two areas of the Near Danube *region* under consideration are: *Sedum stefco*,

Alkanna tinctoria, *Centaurea arenaria*, Nuphar *lutea*, Nymphaea *alba*, Nymphoides peltata, Salvinia *natans*, Senecio paludosus, Utricularia *vulgaris*, *Allium* angulosum and others.

The European deciduous forest area is characterised by the vegetation of the temperate zone, with the main indigenous vegetation represented by deciduous, summer-green, leafy forests in winter, mainly of European and Eurasian origin. The six administrative regions under consideration are in ***the Illyrian province*** and, to a small extent***, in the Macedonian-Thracian province.***

The Illyrian province occupies mainly mountainous territories, being divided into a total of 13 geobotanical regions. The area of the CBCP and TSIM covers:

- *Danube hilly-plane region*, which includes large spaces in the southern part of the Danube plain - from the middle course of the river Yantra to the Serbian border. The majority of the territory is occupied by agricultural lands, but about 30% of the site is represented by xerothermic cerris oak with Hungarian oak and Hungarian oak with cerris oak forests, which are mainly shoot and low-grade. In many places in these forests, especially on calcareous terrains in the hills, the Carpinus orientalis has settled. In the vicinity of places, secondary xerothermic shrub communities have formed from Paliurus spina – christi, as well as xerothermic herbaceous phytocenoses of *Chrysopogon gryllus*, *Dichantium ischaemum*, *Poa bulbosa* and annual grasses (terophytes) such as Psilurus *incurvus*, some clover, etc. Mesoxerophytic grass formations with a predominance of pasture ryegrass (*Lolium perenne*), Dichanthium, Poa bulbosa and often Cynodon dactylon, Polygonum *aviculare*, etc. have been formed in the area. In wetter places along the rivers there are very limited forest residues with dominance of oak, maple (*Acer cannpestre)*, elm, *Acer tataricum* and others. In some places these terrains have been transformed into meadows with mesophytic grass vegetation. More specific species in this region are a number of steppe floral elements and especially relevant endemics and subendemics such as the *Chamaecytisus* kovacevii and the *Ch. danubialis*, Oenanthe, etc. The region is divided into four geobotanical regions and the Montana and Vidin regions fall within the territorial scope of the programme. The plain sections of the Montana region are also covered with residual forests of cerris oak with Hungarian oak, but in the hilly parts (Pastrina) and on the slopes south-west of Cherven bryag predominate highly degraded forests of hairy and virgilian oak, in places with cerris oak and especially with bald hornbeam and xertothermic grass formations of Chrysopogon gryllus, Dichanthium, Poa bulbosa, etc. The Vidin region is dominated by mixed forests of cerris oak with Hungarian oak, but in the northwestern part there are cleaner cerris oak forests. Usually in the protruding areas in drier habitats, Hungarian oak predominates, and in the lowered areas in higher moisture - cerris oak. In the area of Gradets, also between Dimovo and the river Danube on the northern slopes is also visible with individual trees or groups of trees from the Moesian beech. In this area there are degraded forest cenoses dominated by the bald hornbeam, as well as xerothermic grass vegetation from the Chrysopogon gryllus, Dichanthium, Poa bulbosa.
- *Predbalkan region.* It occupies the space from the upper part of the catchment of the river Yantra to our western border. The shape of its vegetal cover is determined by the tree and shrub formations, represented by Hungarian oak, cerris oak, bald hornbeam, etc. and less

often by silver lime, hornbeam, durmast, beech. Today, these species are remnants of vast forests that have existed in the past. The region is characterized by extremely large species and plant diversity, well represented relict and endemic (Bulgarian and Balkan) species. Tertiary relicts are: *Haberlea rhodopaensis*, *Ramonda serbica* growing on the cracks of shady rocks mostly in the forests, Ostrya carpiniflora, *Corylus colurna*. On dry terrains, almost in the entire region are present: *Acer monspessulanum, Fagus sylvatica ssp. moesiaca.* under which grows the relict species *Prunus laurocerasus.* The following endemic species of Illyrian flora shall be found: *Silene velchevii, Eranthis bulgaricus, Sedum steftscho, Chamaecytisus neicheffii, Crocus reficulatus*. Of the endemic Macedonian-Thracian flora elements, the following are found: *Medicago rhodopaea, Chamaecytisus frivaldskyanus, Seseli rhodopaeum, S.degenii, Oenanthe millefolium*. The Predbalkan region is divided into three regions: Troyansko - Tarnovski, Mezdrenski and Belogradchicki. In this case, the territorial scope of the program is occupied by the Mezdren and Belogradchik regions. The Belogradchik region occupies the space between Vratsa Mountain and the western border of Vrashka chuka. The vegetation is extremely diverse, in most cases xeromesophyte vegetation is predominant, as follows: dominated by *Quercus dalechampii, Carpinus betulus, Fagus sylvatica ssp. moesiaca* with an impurity of the relict tree species *Corylus colurna*; xerothermic heavily thinned and degraded *Acer* monspelianum, *Fraxinus ornus* and *Carpinus orientalis* forests dominate the sunny slopes and herbal parts of calcareous hills (marl and limestone); the tertiary relict *Ramonda serbica*, and in shady wooded places the endemic species *Eranthis bulgaricus* (on the hill Vrashka chuka). The Mezdrensky region covers the territory between Teteven (the upper course of the river Vit) and the village of Kravoder on the river Botunya (west of Vratsa). Mixed forests of cerris oak and Hungarian oak predominate, but there are also xerothermic forests of hairy oak and mixed forests of hairy oak with bald hornbeam. On the site of more severely degraded forests are formed shrubs of Paliurus spina and secondary forests of bald hornbeam with predominance of Fraxinus ornus and Acer monspelianum. On wetter northern slopes are spread forests of Quercus dalechampii, in places with common hornbeam, field maple and silver lime. In this region the Bulgarian endemic - Silene velcevii is spread.

- *Western Balkan region*. It covers the territory of the upper part of the river Malki Iskar to the Belogradchik Pass on our western border. In this region there is also alpine vegetation made up of formations of Sesleria comosa, Festuceta airoides, Agrostis rupestris, etc., as well as subalpine vegetation of Pinus mugo, green alder, Silesian willow, secondary formations of Siberian juniper, blueberries, Bruckenthalia, etc., as well as grass formations of Festuca valida, Nardus stricta, Agrostis capillaris, etc. The coniferous forest vegetation from the spruce formation and the beech belt from the beech formation in the lower parts of the mountain is relatively well represented, where in some places the common durmast, the common hornbeam, the maple, the Acer heldreichii or the mountain maple, etc. A number of Balkan (about 35 species) and Bulgarian endemics, such as*Sempervivum* erytraeum, Chamaecytisus kovacevii, *Viola balcanica*, *Campanula moesiaca*, *Kentranthus kellerri*,

Rubus oblongoobovatus are also involved in the construction of the plant cover in this region. The western Balkan area is divided into five regions: Etropolsky, Rzhano-Murgashki, Vrachanski, Koznitsa-Komsky and Midzhursky. In this case, all five are presented within the scope of the CBCP Bulgaria-Serbia, with the Midzur Region closest to the Bulgarian-Serbian border and encompassing Chiprovska, Sv. Nikolska and Yazovska Mountains. The species found in it are distributed on both sides of the border. The vegetation cover in this area is too diverse. In the highest places, there is grass vegetation rich in alpine floral elements such as the Sesleria comosa, Avenula *versicolor*, *Vaccinium* uliginosum and others, and more limited - shrubs of Pinus mugo, green alder (in places almost impassable shrubs). West of Midzhur peak quite a large massif is covered with coniferous forests (Chuprene reserve) of spruce, in places mixed with fir and beech, lower with forests of durmast and hornbeam. The ridge parts are home to herbaceous vegetation of the *Luzula* luzoloides, *Lerchenfeldia* flexuosa and abundantly protected species of *Anemone narcisiflora*. In many places is also found the legally protected plant Erythronium dens-canis or *Lilium jankae*. The Koznitsa-Komski region is next in the vicinity of Serbia as the Koznitsa, Ponor and Berkovska Mountains with the highest point peak Com (2,016 m). In this area, fragmentary alpine vegetation is spread from the Sesleria comosa, Festuceta airoides, Agrostis rupestris, etc., as well as subalpine vegetation from Pinus mugo, green alder, Silesian willow and secondary shrubs from Siberian juniper, blueberries (black, red and blue), *Arctostaphylos uva-ursi* and grass formations from Festuca valida, Nardus stricta and rarely *Festuca paniculata*. Peatlands with corresponding peaty vegetation of Sedges - *Carex acute*, *C. nigra*, C. echinata, Eriophorum, sphagnum mosses, etc., including the insectivores - Pinguicula *balcanica*, very rarely the *Drosera rotundifolia* in the Boishte area below the peak Com are also found. Here there are also coniferous forests of spruce and fir and mostly forests of common beech, and lower and Moesian beech, hornbeam and durmast forests. Above Berkovitsa there are relict (some researchers believe that they are adventitious) chestnut forests (*Castanea sativa*). The endemic species - Bulgarian blackberry and Astragalus wilmottianus - are also found in this region. The Vratsa region is characterized by diverse vegetation with predominance of beech forests - common beech and Moesian beech, and on the southern slopes and xerothermic forests with domination of bald hornbeam. In this region is also found the Bulgarian endemic centrantus, spread over taluses, where it forms its phytocenoses. Rzhano-Murgashki region has a relatively diverse plant cover with a predominance of mesophytic forests, built from the formation of beech and Moesian beech, as well as from xeromesophytic forests of common hornbeam and common durmast. The Etropole region is characterized by beech forests of common beech and Moesian beech, common durmast, mixed forests of durmast and hornbeam, birch (*Betula pendula*) and others.

Overall, the above five floristic regions constitute the fora of the Western Balkan Mountains, in which 134 species of moss have been identified, which make up 18% of the Bulgarian moss flora, but their real number is assumed to be at least double. Bryopsida predominate - 71 species, followed by Marchantiopsida 49 species. The European Red Data Book lists *rare*

Lophozia ascendes, Scapania verrucosa, Grimmia caespiticia and vulnerable species *Neckera pennata*. In addition to these 4 species, 9 more species are included in the national Red List. Three of them are found in the country only here - *Rhabdoweisia crispata, Grimmia elatior and Fabronia ciliaris.* The other 6 species have only one more locality in Bulgaria. Of the conservationally significant species (CSS) 8 inhabit rocks, 2 species - peatlands, 2 species - old beech forests and 1 species - wet clay soils. In the high flora, the species diversity is very large - 1,658 species, and it accounts for more than 45% of the Bulgarian flora. The endemic species and subspecies are 178, of which 10 are Bulgarian and 121 Balkan endemics. Ramonda *serbica* is one of 16 endemic relics of the Balkan Peninsula. A representative of a tropical family of plants, a remnant of the Tertiary, in the region with its only deposits in the country and the northernmost - in its range. The number of CSS is huge - 330. At least 8 species, 56 European and 85 national, are endangered globally. There are relatively few protected species in Bulgaria - 65.

- *Srednogorski region* - covers Sashtinska and Ihtimanska Sredna Gora. The plant cover is made up of mesophytic forest ecosystems of common beech and Moesian beech and xeromesophytic forest ecosystems of common hornbeam and common durmast. Only in the lower parts are characteristic also xerothermic forests of mildew with cerris oak, and in places due to degradation and erosion processes, secondary forest cenoses with predominance of bald hornbeam and secondary grass cenoses with predominance of Agrostis capillaris. In this region Balkan and Bulgarian endemics also found a shelter such as the *Minuartia bulgarica*), *Geum rhodopaeum* and *Peucedanum vittijugum ssp. minutifolium*. Sredna gora is a refuge (refugium) also of the Tertiary relict of *Habarlea rhodopaensis*. This region includes two geobotanical regions - the Sashtinska Sredna Gora Region and the Ihtiman-Sredna Gora Region**,** which occupy to a greater or lesser extent the easternmost parts of Sofia-region. The Ihtiman - Sredna Gora region has a relatively diverse vegetation cover with dominance of xeromesophytic forest vegetation from common hornbeam and common durmast, xerothermic forest ecosystems mainly from Hungarian oak and in places mixed with cerris oak. Mesophytic phytocenoses with predominance of beech are less prevalent. Due to forest degradation, secondary xerothermic forest cenoses with a predominance of bald hornbeam have appeared somewhere. Mesophytic forest ecosystems of beech - common and Moesian, and xeromesophytic forest ecosystems dominated by common durmast and common hornbeam predominate in the Sashtinka Sredna gora region, and only on the periphery of the area at a lower height are there xerothermic forest ecosystems dominated by Hungarian oak and cerris oak.
- *Sofia region*. It covers the Sofia Field, the southern foothills of the Western Stara Planina Mountains to the border with Serbia, Viskyar, Graovo region, the Golo Bardo and Cherna gora hills, Zemenska and Konyavska planina. The region is characterized by extremely diverse flora and vegetation, which is mainly due to the diverse edaphic conditions - siliceous and calcareous terrain, diverse mesoclimate under the influence of various exposures. In CBCP and TSIM fall all four geobotanical regions comprising this region: Sofia, Chepansko-

Zavalski region, Graovsko-Chernogorski and Konyavsko-Zemenski**.** The Sofia region occupies the entire Sofia Field and the southern slopes of the Sofia Mountain and Murgash. Currently, the lands in Sofia field are agricultural with natural mesophyte grass vegetation (meadows). The majority of the southern slopes of Sofia Mountain are covered with xerothermic grass vegetation with dominance of Dichanthium, Poa bulbosa, *Festuca valesiaca* and others. The area is home to Bulgarian endemics - Crocus variegatus, Dianthus urumoffii Stoj. et Acht., Sedum tuberiferum and Astragalus wilmottianus. The Chepansko-Zavalski region stretches west from the Sofia Field to the border with Serbia and the Zavalska Mountains. The larger territory is now agricultural land, and hills unsuitable for agriculture are covered with grassland ecosystems (pastures), with siliceous terrains dominated by the formations of Chrysopogon grullus, Dichanthiumischaemum and Poa bulbosa. On calcareous terrains calciferous grass formations with dominance of *Festuca stojanovii*, Vallesian fescue, *Bromus riparius, Agropyron cristatum* and Agropyron brandzae *Artemisia alba, Teucrium montanum, Alyssum* tortuosum, *Stipa capillata, Astragalus* onobrychis, and in some places low (step) wild almond are developed. The Bulgarian endemics - Minuartia bulgarica and Tulipa uromoffii, Juhnea tzar-ferdinanclii are also found in this region. Graovsko - Chernogorski floristic region was occupied in the past mostly by xerothermic forests of *Quercus pubescens* and *Quercus virgiliana*, in places with impurities of *Quercus cerris* and less commonly *Quercus frainetto*. On the hilly roasted places and now there are remnants of these forests, and on the northern slopes there are remnants of *Fagus sylvatica ssp. moesiac*a, *Carpinus orientali*), *Q. sessiliflora*. Today, grass formations are formed outside the agricultural lands, with siliceous terrains dominated by the formations of *Chrysopogon gryllus, Dichanthium ischaemum, Poa bulbosa*, and calcareous terrains also include *Stipa capillata*, as well as a number of other species. Some forest ecosystems, such as those of the cerris oak, partly of beech - on the northern slopes of Konevska Mountain, are better preserved in the Konyavsko-Zemen region. On the southern slopes, sections of forests of the hairy oak have survived, but in most cases they have been replaced by secondary forests and shrubs of the bald hornbeam. In Konyavsko-Zemenska Mountain there is steppe vegetation with the participation of characteristic species and especially communities of the narrow-leaved Astragalus angustifolius. In this region is also found the relict species water hornbeam and endemic for the country species Campanula versicolor Andrews, Tulipa uromoffii and Verbascum.

- *Vitosha region.* It covers the Vitosha, Lozenska, Plana, Verila and Lyulin Mountains. The vegetation cover is very diverse. In the highest part (Cherni Vrah, 2,290 m) there are alpine and arcto-alpine elements such as the Sesleria comosa, Festuceta airoides, Agrostis rupestris and other species, which together with the cenoses of *Vaccinium* uliginosum form phytocenoses with alpine character. However, a clear alpine belt has not been formed. In most cases, alpine plants also form phytocenoses with species in the subalpine belt, for example with the Festuca valida predominantly found in this belt. The subalpine belt is better delineated, but its potential vegetation, which was Pinus mugo, is almost destroyed and in its

place was formed secondary vegetation of Siberian juniper, blueberries and grass formations of Festuca valida, etc. The coniferous belt is represented fragmentarily with the formation of Picea abies, and in the lower regions of the Plan - with the formations of white pine. The formation of beech, which occupies the largest spaces in the county, is better developed. The xeromesophytic vegetation of Q. sessiliflora, hornbeam and least, in the lowest regions, is represented fragmentarily by the xerothermic vegetation with a predominance of Quercusfrainetto and Q.cerris. In the county there are 50 species of Balkan endemics and several species of Bulgarian endemics, such as *Alopecurus* riloensis, *Luzula glabrata ssp. deflexa*, Minuartia bulgarica, Dianthus urumoffii Stoj. et Acht and *Jasione bulganca*. From this region, 5 geobotanical regions - Vitosha Region, Lozen Region, Plana Region, Verila Region and Lyulin Region fall within the territorial scope of the CBCP and TSIM. Vitosha region occupies the territory of Vitosha. The vegetation is too diverse, made up of alpine and arcto-alpine floral elements, of subalpine elements that make up the subalpine plant belt - without the main potential element Pinus mugo, but with secondary shrub and bush vegetation of Siberian juniper, blueberries, Arctostaphylos uva-ursi and grass vegetation of Festuca valida, Nardus stricta, etc. To a large extent, peat vegetation has been preserved in the Torfeno branishte reserve, made of Sedges, Eriophorum, including sphagnum mosses. In the lower parts there are natural spruce, beech, durmast, gorun, hornbeam and mixed forests of durmast with cerris oak, durmast with hornbeam, maple, hirkan maple, mountain ash, etc. The lowest, on the southern and south-western slopes, there are xerothermic forests with dominance of Quercusfrainetto, etc. On Vitosha are preserved and forests of birch, some of which were formed during the Holocene. Tertiary relics such as the Pinus peuce, glacial relicts such as *Salix lapponum* and others are preserved. There are more than 50 species of Balkan and several species of Bulgarian endemics on Vitosha mountain. The Lozen region occupies Lozen Mountain. Forest vegetation of durmast, hornbeam and mixed of durmast and hornbeam, separate spots of Moesian beech and xerothermic forests of Quercusfrainetto in places with cerris oak, as well as secondary vegetation of bald hornbeam predominate. The Plana region covers the Plana and the Samokov field along the river valley of river Palakaria. The main plant cover is made up of beech and white pine forests and less than durmast forests. A relatively large territory is occupied by secondary cenoses made up of *Corylus avellana*. In the Samokov field now in the region of the river Palakaria has mainly wet meadows and arable land. The Verila region is dominated by beech and durmast forests, but secondary Populus tremula forests are also found. Some of the forests have been transformed into xeromesophytic grass cenoses (grassland). Lyulin region occupies Lyulin Mountain. Beech forests, small areas of durmast and mixed forests of durmast with hornbeam predominate here. A negligible part is occupied by xerothermic forests of Quercusfrainetto and secondary vegetation dominated by *Carpinus orientalis*.

- *Western Bulgarian Border Mountain region***.** It is divided into six geobotanical regions, four of which fall within the territorial scope of the programme, as they are located adjacent to the country's border with Serbia. About 65 species of Balkan endemics, 4 species of

Bulgarian endemics - *Verbascum anisophyllum*, *Tulipa urumoffii* and others are distributed in the county. Forests of Fagus sylvaticasubsp. *moesiaca*, *Quercus dalechampii*, *Quercus cerris*, *Quercus frainetto* and coniferous forests predominate. Geobotanical regions included in the composition of the region, which fall within the scope of CBCP and TSIM are Znepolski, Lisetsko-Kamenitski, Osogovski and Vlahinski. The Znepolski region is occupied by Ruy, Znepole, Karvav Kamak hill, Milevska Mountain (the eastern part of Kraishte). Beech, durmast and cerris oak forests predominate, less often mixed forests of durmast and hornbeam. 38 Balkan and Bulgarian endemics are growing in the region. Lisetsko-Kamenitski region occupies a relatively small area of territory with a predominance of durmast forests, with a low prevalence of beech and cerris oak with Hungarian oak forests. The Osogovo region occupies the territory of the Bulgarian part of the Osogovska Mountain. Beech and durmast forests predominate in places and with hornbeam. In the northern part of the region is preserved coniferous forest of spruce, and in the central part - remnants of white pines, and in the southern part - mostly black pine forests (*Pinus nigra*). In the highest parts of the mountain (peak Ruen) occur alpine floral elements such as the Sesleria comosa, Festuceta airoides, *Sibbaldia procumbens*, *Poa cenisia*, etc., where they form phytocenoses of small size. The subalpine belt is dominated by shrubs of *Juniperus pygmaea*, and especially large spaces are occupied by *Chamaecytisus absinthoide*). In the lowest parts of the region are preserved on separate sections xerothermic formations of Hungarian and cerris oak, rarely of hairy oak. In many places, however, xerothermic forests have degraded and gradually the bald hornbeam has settled in them. The relict species water hornbeam is a priority in the north-western part of the region. The Vlachin region includes Vlahina Mountain and the easternmost part of Osogovska Mountain. There's too much uniform plant cover. Durmast predominate with low participation in the vegetal cover of the beech formation. Cherborovi forests are preserved in the region, some of which are in the Gabra Reserve. In some places, there are also fragments of xerothermic forests with dominance of the hairy oak, less commonly of Hungarian oak. The relict species Ostrya *carpinifolia* is also found.

- *Rila region* (northern part of Rila within the range of Kyustendil region and Sofia region). The vegetation cover is diverse. In the highest parts, alpine and arcto-alpine vegetation is formed. In some places, rocky and scree vegetation was formed from *Sanifraga sp.div.* The subalpine belt has a well pronounced formation of *Pinus mugo, Alnus viridis, Salix carpeta, Salix cinerea, Salix silesiaca*. In the specific highland or cool, mainly glacial-relict flora of this region there are many holarctic species. In Rila they find a shelter in different refugia about 70 species of Balkan endemics and relicts, 25 species of Bulgarian endemic plants such as the *Secale montanum*, Luzula glabrata ssp. deflexa, Minuartia bulgarica, *Silene* velenovskyana, Sedum tuberiferum, Sedum stefco, Sedum costo, Sempervivum erytraeum, *Potentilla regis-borisii*.

The vegetation ***in the Macedonian-Thracian province*** is diverse, represented primarily by xerothermic species - Hungarian oak, cerris oak, hairy and virgilian oak, bald hornbeam. The province

includes eight geobotanical regions, with the Gornostrumski *region*, which is divided into two geobotanical regions - Blagoevgrad and Kyustendil. CBCP and TSIM cover the Kyustendil region. In general, the Gornostrumski region is in the valley of the river Struma north of the Kresna Gorge to the Kyustendil Field, including the area between Dupnitsa and Bobovdol. Most of the land is covered by arable land. The rest of the space is covered by residual xerothermic forest, shrub and grass formations dominated by hairy and virgilian oak, Hungarian oak, cerris oak, mixed with bald hornbeam somewhere, and in the deep reaches on northern slopes in places in the forests there is also the relict species Ostrya *carpinifolia*. The shrub communities are mainly composed of red juniper and Paliurus spina, and the grass cover on the dry slopes - mainly of Dichantium ischaemum, Poa bulbosa, in places of the plant with the participation of many annual grasses (terrophytes). In floristic terms, the region is not very rich. Only 17 diagnostic floral elements were identified — 12 Illyrian, 1 Macedonian-Thracian and 4 steppe species. Kyustendil region occupies the Kyustendil field, where only in places there are small sections left with forests of xerothermic species of oak and hornbeam.

The following figure presents the distribution of conservation plants and mushrooms in the Bulgarian part of the administrative territorial scope of the program - regions of Vidin, Montana, Vratsa, Sofia, Pernik and Kyustendil. As is evident from it, the largest number of species with conservation value are concentrated in the region of Western Stara Planina, Vitosha, Lozenska Planina, Golo Bardo, Zemen, Rila and part of the Western Border Mountains (south of Western Stara Planina).

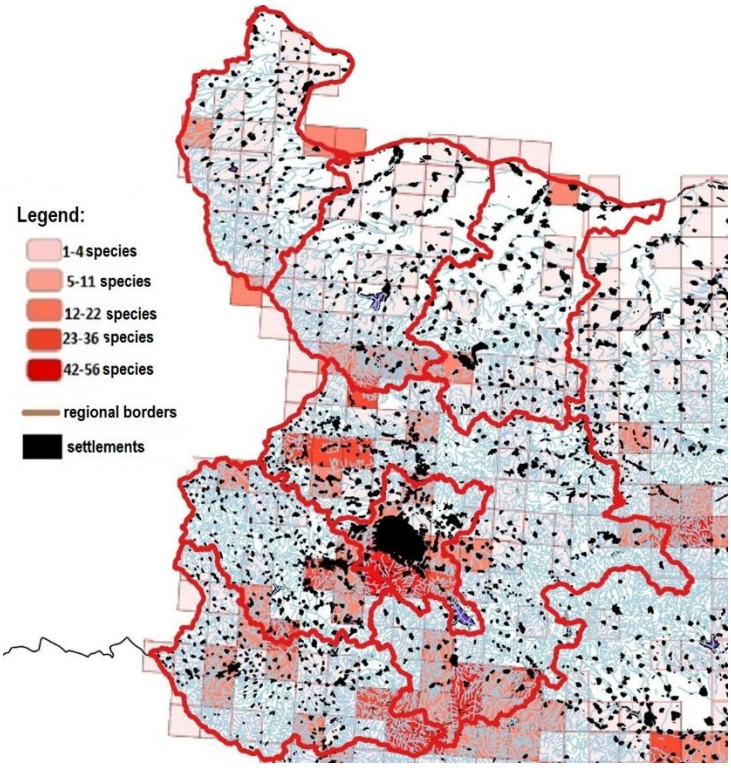
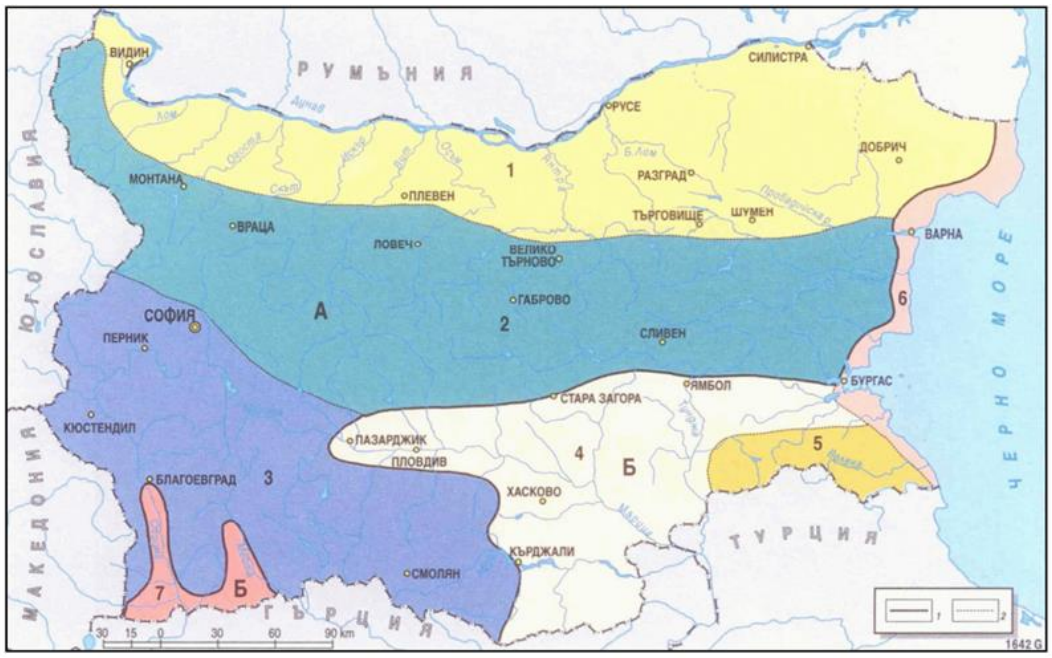


Figure 2.1.6-2 *Distribution map of the species of plants and mushrooms in UTM 10 km grid of the Red Data Book of the Republic of Bulgaria.*

Regarding the state of vegetation, species and their populations in the territory under consideration, human activity leading to direct (destruction) and indirect (change of environmental conditions and fragmentation) impact of species (soil sealing related to the construction of sites and development of infrastructure - especially in the area of larger settlements such as Sofia and Pernik, pollution, change of the water regime due to drainage or construction of meliorative facilities, development of intensive large-scale agriculture, etc.) is identified as the main limiting factors. Since there are developed tourist sites within the scope of the CBCP in a number of places, the tourist flow (especially in Vitosha mountain) is also not an unimportant factor, which has a negative impact on the plant world. The effects of climate change - drought, forest fires and other extreme weather phenomena - are also becoming increasingly important.

Fauna in the territorial scope of the CBCP and TSIM

In zoogeographical terms, the terrestrial fauna of Bulgaria refers to the Palearctic zoogeographical area of the Holarctic kingdom. Due to the fact that Bulgaria is located mainly in the Euro-Siberian zoogeographical sub-area, but also borders the Mediterranean zoogeographical sub-area, there are two main zoogeographical complexes in the country: northern (Euro-Siberian) formed by cold-resistant animal species and southern (Mediterranean) including many warm-loving species, the area under consideration being entirely within the Euro-Siberian sub-area **- Figure 2.1.6-3:**



1 - border between the Eurosyberian (A) and Mediterranian (Б) territory; *2* - border between the zoological geographical regions: 1. Danube region; 2. Stara planina regioin; 3. Rila-Rhodope region; 4. Thracia region; 5. Strandzha region; 6. Black sea region; 7. Struma-Mesta region.

Figure 2.1.6-3 *Zoogeographical regions (Georgiev, 1980)*

According to the figure, the six areas covered by the program on the territory of Bulgaria fall into three faunistic regions: Danube, Stara Planina and Rilo-Rhodope:

- **Danube region.**

It covers the territory of the Danube Plain, Ludogorie and the southern part of the Dobrudzha Plateau (without its coast). Most species in the fauna here are Euro-Siberian and European elements. The rest are dominated by species with a holarctic and palearctic distribution. One example of this is the spiders, among which there are almost no Mediterranean species. The continental climate is the reason for the greater diversity of animal groups such as amphibians, while reptiles are much poorer. Endemics among the above-ground fauna are almost absent, while in the underground are found 2 Balkan and 4 Bulgarian endemics. Dobrudzha fauna can be attributed mainly to the steppe faunistic complex, which here is characterized by a whole series of typical steppe elements (egrets, locusts, mammals). The nesting birds are most similar to those on the Black Sea coast - 85.6%. Here, Mediterranean birds are the least represented compared to other zoogeographical regions, with northern species more than 4 times more than southern species.

In the Danube Region within the range of Vidin region and Montana region the best studied type of fauna is the vertebrate, which covers species typical of the low and flat parts of the country, including the Danube Plain. In the case of fish, the species *Alburnoides bipunctatus, Aspius aspius, Barbus barbus, Barbus petenyi, Carassius carassius, Leucaspius delineates, Rhodeus amarus, Romanogobio kessleri, Cobitis elongate, Cobitis elongatoides, Misgurnus fossilis, Sabanejewia balcanica, Gymnocephalus schraetzer, Silurus glanis, Proterorhinus marmoratus* may be identified as of greater interest.

As regards the remaining vertebrates, for the area under consideration in the Danube plain covered by the programme (predominantly open grass and grass shrub territories, including agro-landscapes, but also forests, tree and shrub patches and strips and shrub communities, this being a significant territory), according to data similar to the current development for this part of the country, the following species can be identified as characteristic:

Amphibians (Amphibia)

1. *Salamandra salamandra (*L.)
2. *Triturus vulgaris (L.*)
3. *Triturus cristatus (Laur*.)
4. *Bombina bombina (*L.)
5. Pelobates *fuscus* (Laur.)
6. Pelobates *syriacus balcanicus* Karaman
7. *Bufo bufo (*L.) - very rare
8. *Bufo viridis Laur*. - incl. in the settlements
9. *Hyla arborea* (L.)
10. *Rana ridibunda* Pallas
11. *Rana esculenta* L.

Reptiles (Reptilia)

1. *Emys orbicularis* (L.)

2. *Anguis fragilis* L.
3. *Lacerta viridis* L.
4. *Lacerta (Podarcis) muralis Laur*.
5. *Lacerta taurica* (Pallas)
6. *Coluber jugularis* L.
7. *Elaphe longissima Laur*.
8. *Elaphe quatuorlineata sauromates* (Pallas) - according to literature and reports
9. Natrix *natrix (*L.) - more associated with the river
10. Natrix *tesselata Laur*.

Birds (Aves)

1. *Podiceps cristatus* (L.)
2. *Podiceps ruficollis* (Pallas)
3. *Podiceps griseigena (*Boddaert)
4. *Podiceps nigricollis* (Brehm)
5. Hedgehog (*Podiceps auritus* (L.)) - during the autumn-winter period (pair with young in the "Mominbrodsko blato" in June 2010)
6. *Phalacrocorax carbo* (L.)
7. (Halietor *pygmeus* (Pall.)
8. *Ciconia ciconia* (L.) - food-seeking individuals - nests in settlements
9. *Ciconia nigra (L.*) - more common during seasonal migrations
10. *Nicticorax nicticorax (*L.)
11. *Ardea cinerea* L.
12. *Ardea purpurea* L.
13. *Casmerodius albus* (L.) - more numerous during the autumn-winter period
14. *Egretta garzetta* (L.)
15. *Ardeola ralloides* (Scopoli)
16. *Botaurus stellaris* (L.) - during the autumn-winter period
17. Ixobrichus *minutus* (L.)
18. *Plegadis falcinellus* (L.)
19. *Platalea leucorodia* L.
20. *Anas platyrhynchos* L.
21. *Anas querqueddula* L.
22. *Anas crecca* L. - during the autumn-winter period
23. *Anas strepera* L.
24. *Anas acuta* L.
25. *Anas penelope* L.
26. *Anas (Spatula) clypeata* (L.) - during the autumn-winter period
27. *Netta rufina* (Pallas)
28. *Aythya ferina* (L.)
29. *Aythya nyroca* (Guldrnstadt)
30. *Aythya fuligula (*L.)
31. *Mergus albellus* L. - during the autumn-winter period
32. *Mergus serrator* (L.) - during autumn-winter period
33. *Tadorna tadorna* (L.)
34. *Tadorna ferruginea* (Pallas)
35. *Anser albifrons* (Scopoli) - autumn-winter period
36. *Anser eritropus (*L.) - during the autumn-winter period
37. *Anser albifrons* (L.) - during the autumn-winter period

38. *Anser fabalis* (Latham) - during the autumn-winter period
39. *Branta ruficollis* (Pallas) - rare - during the autumn-winter period
40. *Cygnus olor* (Gmelin) - during the autumn-winter period
41. *Cygnus cygnus* (L.) - during autumn-winter period
42. (*Milvus migrans* (Boddaert)
43. *Milvus milvus* (L.)
44. *Buteo buteo* (L.)
45. *Buteo lagopus* (Pontoppidan) - during the autumn-winter period
46. *Buteo rufinus* (Cretzschmar) - according to literature and reports
47. *Accipiter gentilis* (L.) - migrating individuals
48. *Accipiter nisus* (L.) - migrating individuals - more numerous during the autumn-winter period
49. *Accipiter brevipes* (Severrtzow) - rare migrating individuals during the seasonal migrations
50. *Pernis apivorus* (L.) - individuals migrating during seasonal migrations
51. *Circus aeruginosus* (L.)
52. *Circus pygargus* (L.) - during the autumn-winter period
53. *Circus cyaneus* (L.) - during the autumn-winter period
54. *Circus macrourus* (Gmelin) - during autumn-winter period
55. *Aquila pomarina* Brehm
56. *Hieraaetus pennatus* (Gmelin)
57. *Circaetus gallicus* (Gmelin)
58. *Haliaeetus albicilla* (L.)
59. *Pandion haliaetus* (L.) - more common during seasonal migrations
60. *Falco subbuteo* L.
61. *Falco columbarius* L. - during the autumn-winter period
62. *Falco vespertinus* L.
63. *Falco tinnunculus* L.
64. *Falco naumanni* Fleischer
65. *Falco peregrinus* Tunstall - during the autumn-winter period
66. *Perdix perdix (*L.)
67. *Coturnix coturnix* (L.)
68. *Phasianus colchicus* L. *ssp.*
69. *Fulica atra* (L.) - during the autumn-winter period
70. *Galinula chloropus* L.
71. *Rallus aquaticus* L.
72. *Porzana porzana* (L.)
73. *Porzana parva* (Scopoli)
74. *Porzana pusilla* (Pallas)
75. *Crex crex* (L.)
76. *Burhinus oedicnemus* (L.)
77. *Glareola pratincola* (L.)
78. *Vanellus vanellus* (L.) -especially during seasonal migrations
79. *Charadrius dubius* Scopoli - in river and riverside habitats
80. *Tringa erythropus* (Pallas) - during the autumn-winter period - around water basins
81. *Tringa totanus* (L.) - around water basins
82. *Tringa nebularia* (Gunnerus) - during the autumn-winter period - around water basins
83. *Tringa ochropus* L. - during the autumn-winter period
84. *Tringa glareola* L. - around water basins
85. *Scolopax rusticola* (L.) - during the autumn-winter period
86. *Gallinago gallinago* (L.) - very rare - during migration - around water basins

87. *Gallinago gallinago* (L.) - during seasonal migrations and in the autumn-winter period - around water basins
88. *Limnocriptes minimus* (L.) - very rare - during seasonal migrations - around water basins
89. *Limosa limosa* (L.) - during the autumn-winter period - around water bodies
90. *Arenaria interpres* (L.) - around water bodies
91. *Calidris alba* (Pallas) - during seasonal migrations - during seasonal migrations - around water bodies
92. *Calidris marine (Brunnich*)- during seasonal migrations - around water basins
93. *Philomachus pugnax* (L.) - during seasonal migrations - around water basins
94. *Larus cachinans* Pallas - for water basins
95. *Larus canus* L. - for water basins
96. *Larus ridibundus* L. - for water basins
97. *Chlidonias hybrida* (Pallas) - for water basins
98. *Chlidonias leucoptera* (Temminck) - for water basins
99. *Chlidonias niger* (L.) - for water basins
100. *Sterna hirundo* L. - for water basins
101. S*terna albifrons* Pallas - for water basins
102. *Columba livia f. domestica* (Gmelin) - in populated areas
103. *Columba oenas* L. - rare
104. *Columba palumbus* L.
105. *Streptorelia turtur (*L.)
106. *Streptopellia decaocto* (Frivaldsky) - in settlements
107. *Cuculus canorus* L.
108. *Caprimulgus europaeus* L.
109. *Asio otus* (L.)
110. *Asio flammeus* (Pontoppidan) - during the autumn-winter period
111. *Athene noctua* (Scopoli) - mainly in populated areas
112. *Strix aluco* L.
113. *Otus scops* (L.) - incl. in the settlements
114. *Bubo bubo* (L.) - mainly in search of food
115. *Apus apus (*L.)
116. *Apus melba* (L.) - during seasonal migrations
117. *Alcedo atthis* L. - for water basins
118. *Coracias garrulus* L.
119. *Merops apiaster* L.
120. *Upupa epops* L.
121. *Picus viridis* L.
122. *Picus canus* Gmelin
123. *Dendrocopos major* (L.)
124. *Dendrocopos syriacus* (Ehrenberg) - predominantly in settlements
125. *Dendrocopos medius* (L.)
126. *Dendrocopos minor* (L.)
127. *Jynx torquilla* L.
128. *Melanocorypha calandra* (L.) - very rare
129. *Calalndrella cinerea* (Gmelin) - very rare
130. *Alauda arvensis L.*
131. *Galerida cristata* (L.)
132. *Lullula arborea* (L.)
133. *Hirundo rustica* L.
134. *Hirundo dahurica* L. - rare
135. *Delichon urbica (*L.)

136. *Riparia riparia* (L.) - rare
137. *Motacilla flava feldeggi* Michaheles
138. *Motachilla alba* L.
139. *Motacilla cinerea* Tunstall - during the autumn-winter period
140. *Anthus trivialis (L.*) - during seasonal migrations
141. *Anthus pratensis (L.*)
142. *Anthus campestris* (L.)
143. *Anthus spinoletta* (L.) - during the autumn-winter period
144. *Anthus cervinus (*Pallas) - during the autumn-winter period
145. *Troglodytes troglodytes* (L.) - during the autumn-winter period
146. *Oenanthe oenanthe (*L.)
147. *Saxicola rubetra (*L.) - during seasonal migrations
148. *Saxicola torquata (*L.)
149. *Luscinia luscinia (*L.)
150. *Luscinia* megarhynchos Brehm- incl. in settlements
151. *Erithacus rubecula* (L.)
152. *Turdus merula* L. - more common during the autumn-winter period
153. *urdus viscivorus* L.
154. *Turdus philomelos* Brehm - more common during seasonal migrations
155. *Turdus pilaris* L. - during autumn-winter period
156. *Turdus iliacus* L. - during the autumn-winter period
157. Locustella *luscinioides (*Savi)
158. Locustella *fluviatilis* (Wolf)
159. *Locustella naevia* (Boddaert) - during seasonal migrations
160. *Acrocephalus paludicola* (Vieillot) - during seasonal migrations
161. *Acrocephalus schoenobaenus (*L.)
162. *Acrocephalus scirpaceus (*Hermann)
163. *Acrocephalus palustris* (Bechstein)
164. *Acrocephalus arundinaceus (*Bechstein)
165. *Hippolais pallida* (Hemp. & Ehr.))
166. *Hippolais icterina (*Vieillot)
167. *Sylvia nisoria* (Bechstein)
168. *Sylvia atricapilla* (L.)
169. *Silvia communis* Latham
170. *Sylvia curruca* L.
171. *Sylvia borin (*Boddaert)
172. *Phylloscopus collybita (*Vieillot) - in forests
173. *Phylloscopus sibilatrux* (Bechstein) - during seasonal migrations
174. *Phylloscopus trochilus* (L.) - during seasonal migrations
175. *Regulus regulus* (L.) - during the autumn-winter period
176. *Regulus ignicapillus* (Temminck) - during the autumn-winter period
177. *Parus caeruleus* L. - incl. in settlements
178. *Parus major* L) - incl. in settlements
179. *Parus lugubris* L. - rare
180. *Parus palustris* L. - rare
181. *Aegithalus caudatus* (L.)
182. *Remiz pendulinus* L.
183. *Sitta europaea* L.
184. *Muscicapa striata (*Pallas)
185. *Ficedula albicollis* Temminck - during seasonal migrations

a. *Ficedula albicollis albicollis* Temminck
b. *Ficedula* albicollis *semitorquata* (Homeyer)
186. *Ficedula hypoleuca* (Pallas) - during seasonal migrations
187. *Lanius collurio* L.
188. *Lanius minor* Gmelin
189. *Lanius* excubitor L. - during autumn-winter period
190. *Corvus corone cornix* L.
191. *Corvus corone corone* L.
192. *Corvus frugilegus* L. - numerous in the autumn-winter period
193. *Corvus corax* L. - rare - more frequent encounters with individuals during the autumn-winter period
194. *Corvus monedula* (L.) - in search of food, incl. in settlements
195. *Pica pica* (L.)
196. *Garrulus glandarius (*L.)
197. *Oriolus oriolus* (L.)
198. *Sturnus vulgaris L.*
199. *Passer montanus* L.) - in search of food
200. *Passer domesticus* L. - in search of food
201. *Passer hispaniolensis* (Temminck)
202. *Carduelis chloris* (L.)
203. *Carduelis* carduelis (L.)
204. *Carduelis spinus* (L.) - during the autumn-winter period
205. *Acanthis cannabina* (L.)
206. *Fringilla coelebs* L.
207. (*Fringilla montifringilla* L. - during the autumn-winter period
208. *Pyrrhula pyrrhula* (L.) - during the autumn-winter period
209. *Coccothraustes coccothraustes* (L.)
210. *Emberiza calandra* L.
211. *Emberiza citrinella* L. - during the autumn-winter period
212. *Emberiza cirlus* L. - during the autumn-winter period
213. *Emberiza melanocephala* Scopoli
214. *Emberiza schoeniclus* L.

Mammals (Mammalia)

1. *Erinaceus concolor (*Martin)
2. *Talpa europaea* L.
3. *Neomys anomalus* Cabrera
4. *Crocidura leucodon* (Hermann)
5. *Crocidura suaveolens* (Pallas)
6. *Lepus capensis* L. (*Lepus europaeus* Pallas)
7. *Spermophylus* (*Citellus) citellus* L.
8. *Glis glis* (L.)
9. *Dryomys nitedula* (Pallas)
10. *Microtus arvalis* Pallas
11. *Arvicila terrestris (L.*)
12. *Ondatra zibethicus* (L.)
13. *Apodemus agrarius* Pallas
14. *Sylvaemus sylvaticus (*L.)
15. Sylvaemus *flavicollis (*Melchior)
16. *Micromys minutus* (Pallas)

17. *Mus musculus musculus* (L.) - in settlements but also outside
18. *Mus spicilegus* Petenyi - in settlements, but also outside
19. *Rattus rattus* L. - in settlements
20. *Rattus norvegicus* (Berkenhout) - in settlements
21. Nannospalax *leucodon* (Nordmann)
22. *Canis fammiliaris* L. - homeless individuals
23. *Canis aureus* L.
24. *Vulpes vulpes* L.
25. *Nyctereutes procyonoides* (Gray)
26. *Felis sylvestris* Schreber
27. *Felis domestica L.* - homeless individuals
28. *Meles meles* (L.)
29. *Lutra lutra* (L.)
30. *Mustela nivalis* L. - incl. in settlements
31. *Martes foina Erxl*. - incl. in settlements
32. *Mustela putorius* L. - incl. settlements
33. *Mustela eversmanni* Lesson
34. *Vormela peregusna (Guldenstaedt*)
35. *Sus scrofa* L.
36. Cervus elaphus L.
37. *Capreolus capreolus* (L.)

As can be seen from the above list, more than 270 vertebrate species, including 11 amphibian species, 10 reptile species, 214 bird species and 37 mammal species, can be identified as characteristic in the scope of the CBCP and TSIM in the Danube Region. This composition can be assessed as rich, which is the reason for the diversity of habitats in the region - mainly agro-landscapes also open terrains with a small amount of tree and shrub vegetation, individual shrub communities, forests, including riverside strip forests, forest spots and forest crops, reservoirs and large rivers, settlements and other anthropogenized territories. However, the species listed above should not be considered to be the complete (definitive, minimally possible) composition of the vertebrate fauna in this area, and this is most relevant for birds, as during seasonal and other migrations a number of other species may still be recorded here.

Most of the species are included in Appendix 3 of the BDA (almost all reptiles and birds and most amphibians).

- **Stara Planina region.**

The region as a whole includes the territory of Stara Planina, Predbalkan and Sredna Gora.

The predominant composition of the fauna in the area is of Euro-Siberian or European type, while the Mediterranean species, due to the barrier role of Stara Planina, are few in number. In the Western Stara Planina Mountains, the insectivorous mammals of the first category are 81%, while only 18% of the second. Nesting birds of the first category are 60% and of the second category is 19% whili in butterflies the percentage is 53% and 35%, respectively. Palearctic and Euro-Siberian species have significant dominance over the Mediterranean sea in all the altitude zones of the area. In the oak belt, the Heteroptera of the first category are 78%, in the beech belt they are already 97% and in the spruce belt they reach 100%. In the case as a whole, parts of the investment intention fall within all three belts.

The Mediterranean species of the same group of insects are respectively 18%, 3% and completely absent in the last belt.

In general, this area is very rich in endemics, in terms of invertebrates. Their number in the Western Stara Planina is 197. In the above-ground fauna, there are more endemics among snails, myriapods, locusts and beetles. In this region the underground fauna is the richest represented in Bulgaria. Among them are 11 Balkan and 109 Bulgarian endemics.

In the fauna of the region there are also a significant number of Carpathian elements (e.g. some snails, centipedes, locusts, etc.), which are lacking in the rest of Bulgaria. This is due to the paleogeographical links between the Stara Planina chain and the Carpathians.

In closer proximity the territory of the programme covers the western part of the region, which is most representative of the biodiversity of Western Stara Planina and Western Predbalkan. In the period November 2002 - February 2003 the most complete information on biodiversity for this part of the country was collected from the representative office of REC - Budapest in Bulgaria and the Bulgarian-Swiss program for conservation of biodiversity in connection with a proposal for the designation of Western Balkan Nature Park. According to the data collected, the species richness and conservation significance of biodiversity in the area in terms of fauna was found to be as follows:

Invertebrate fauna:

The greatest diversity was found in butterflies and beetles - 727 and 534 species, respectively. There are 134 spider species and 117 molluscs. The total number of endemic species is 81 (26 local, 9 Bulgarian and 45 Balkan endemics). The most endemic taxa have beetles - 15 local and 18 Balkan endemic species and subspecies, but the share of endemics in the total number of species in the groups is highest for molluscs - 22 species (6 local and 4 Bulgarian endemics), which makes up 19% of their species composition. The relict species are 60 - 18 tertiary and pre-glacial and 42 glacial relicts. The first group of relics are mainly related to the cave fauna and the ancient geological history of the area. (The troglobinous species are 13, the troglophilous - 18). The second group of relics formed as species during the periods of the icing, and are now inhabitants of the high-mountain no-light zone and the forests of the upper belt. The total number of conservation significant species (CSS) is 275: butterflies 77, spiders 72, beetles 52, molluscs 38, straight-winged 18, dragonflies and net-winged of 9 species.

Vertebrate fauna:

Fish

In the area studied are found 29 species or 44% of the species composition of the ichthyofauna in the Danube and its tributaries to the west of river Iskar. The most representatives of the Cyprinus carpio family - 18 species. The endemic subspecies is the mountain *Cottus gobio haemusi*. Conservatively significant are nine species. Globally threatened (the category "lack of information") are *Gobio kessleri, G.* uranoscopus, *Sabanejewia balcanica* and Neogobius *fluviatilis*. The *G. uranoscopus* and *Sabanejewia balcanica* are included in the EU Habitats Directive, Appendix II, which requires the conservation of their habitats. It also includes *Barbus meridionalis* petenyi, Rhodeus serceus *amarus*, *Cobitis taenia* and European bullhead, one endangered for Bulgaria and in even greater danger in the region. The European Red Data Book of vertebrates records the native form of *Salmo trutta fario*.

Amphibians and reptiles

11 amphibian species (69% of the Bulgarian amphibian fauna) and 16 reptile species (47% of the reptile fauna) have been reported for the area. For CSS are defined *Triturus cristatus*, *Hyla arborea*, Emys orbicularis and *Testudo hermanni*, and the four species in the World Red List in the category "almost endangered species", *Elaphe longissima*, recorded in the European Red Data Book of vertebrates, *Bombina variegata*, included in Appendix II of the EU Habitats Directive and *Triturus alpestris*, species of the national Red Data Book with only locality in the Balkan Mountains. In addition to the Bombina variegata, Appendix II of the Habitats Directive lists the two species of turtles and Triturus cristatus. Strictly protected species under the Berne Convention are Triturus cristatus, Bombina variegata, *Lacerta viridis* and the tree frog. Appendix IV of the Habitats Directive recommends strict protection also for Bombina variegata, *Rana dalmatina*, *Podarcis muralis*, *Lacerta agilis*, *L. viridis*, *Ablepharus kitaibelii*, Natrix tesselatta and *Vipera ammodytes*, which, with the exception of *Rana dalmatina* in Bulgaria, are included in Appendix 3 of the BDA.

Birds

136 bird species breed in the region and 61 species have been identified during migration, wintering and wandering. Nested ornithofauna accounts for about 55% of the country's population and 36% of the European population. Most species are of the order Sparrow (songbird), followed by those of the order Falcons (raptors). Balkan endemic subspecies are *Eremophila alpestris balcanica*, *Prunella collaris subalpinus* and the Bulgarian Parus lugubris. 37 are CSS. Songbirds and raptors predominate strongly - 13, respectively species, then there are hen birds with 5 species. Globally threatened are *Aquila heliaca* and *Crex crex*, and about 30 species have unfavorable breeding status in Europe. Among them in the category "endangered species" are *Neophron percnopterus*, *Buteo rufinus*, *Falco cherrug* and *Ficedula semitorquata*. In the Bulgarian Red Data Book, in addition to 13 endangered species in the world and in Europe, there are recorded *Tetrao urogallus*, *Columba oenas* and *Dryocopus martius*. The first two species are on the verge of extinction in the area. Appendix 1 of the EU Birds Directive lists 25 species, 18 species are listed in Appendix II of the Bonn Convention, 12 species in the CITES Appendixes, 29 species are strictly protected under the Berne Convention and 33 under Bulgarian legislation.

Mammals

Bats, especially cave species, are well studied in the area. 21 species or 70% of the species wealth of the country are determined Of the Rhinolophidae there are 4 species, of the genus *Myotis* - 9. 9 species are listed in the World Red List of Endangered Animals (IUCN): *Rhinolophus ferrumequinum, R. hipposiderus, R. euryale, R.* blasii, *Myotis myotis, M. bechsteinii, M. emarginatus, M.* capaccinii and *Miniopterus schreibersii*. In addition to these 9 species, *M. blythii* and Plecotus *auritus*, which are relatively rare species in the country, are defined as conservation species. The first of these is also included in Appendix II of the EU Habitats Directive, as well as all 9 globally threatened species. All bat species are protected under the Bulgarian legislation. Bats were found in 51 caves and precipices in the studied area. The old forests are the habitat of the R. hipposiderus and Plecotus auritus, but this type of habitat has not been studied in relation to bats and at least 2 more globally threatened species can be expected - *Nyctalus* leisleri and *Barbastella barbastellus*.

Of the small mammals, including Insectivora, Rodentia and Lagomorpha, 23 species are known for the region. The number of species in order shall be: 8, respectively 14 and 1. The hunting species are the *Sciurus vulgaris* and *Lepus europaeus*. More than half of the rodents are endangered and CSS. The *Spermophilus citellus* and Nannospalax leucodon are vulnerable species of the World Red List, and *Glis glis, Dryomys nitedula, Muscardinus avellanarius*, as well as Chionomys *nivalis*, a glacial relict in our fauna, are "almost endangered species" from the same list. The Sylvaemus *uralensi*s should also be recognised as CSS, despite insufficient information about it; its population in the Ponor Mountains is unconditionally relict and cut off from the range of the species in Central Europe. There are 17 species of large mammals (predators and ungulates) in the region. **However, the bear (*Ursus arctos*) appears very rarely from Serbia, where the animals penetrate from the Southern Carpathians through the Danube. The lynx (*Lynx lynx*) passes this route through Bulgaria**, but the many data from eastern Serbia, including from Stara Planina Mountain, already point to the process of forming a population, part of which are the animals passing in the study area. The wolf (*Canis lupus*), the jackal (*Canis aureus*) and the fox (*Vulpes vulpes*) are common species in the region, and the wolf is a conservation species. Other CSS are *Vormela peregusna peregusna* and the otter (*Lutra lutra*) placed in the World Red List in the category "vulnerable species", also the wild cat (*Felis silvestris*) included in the European Red Data Book of vertebrates, and *Martes martes*, a species of the national Red Data Book. Wild ungulates are not CSS, but they constitute the trophic base of the wolf and lynx and the stability of their populations is important for the conservation of both predators. The total number of CSS mammals is 25: 11 species of bats, 8 species of small bats and 6 species of large mammals (except the bear).

- **Rilo-Rhodope Region.**

The mountains of Rila, Pirin, Slavyanka, Western Rhodopes, Osogovo-Belasitsa Mountain range, the mountains of Kraishte, Vitosha and Lyulin, as well as the hollows and valley declines located between them, in this case Vitosha, Lyulin and Kraishte, parts of Rila and the northernmost part of Osogovo-Belasitsa Mountain range are all within the scope of the program. Here Euro-Siberian and European species in general predominate considerably over the Mediterranean ones. Only in the Kyustendil valley, on the slopes of the Osogovo and Konevska Mountains, the Mediterranean influence on the fauna is well expressed through the adjacent Strumsko-Mestenski region. Therefore, compared to Euro-siberian and European rodent species, 19% of the rodents found there are Mediterranean. In the north, this southern influence gradually diminishes and in the vicinity of Tran almost disappears. The Rhodopes region has the most relict invertebrates. In Rila there are 96 species, in Vitosha - 85, in Pirin - 71, in the Western Rhodopes - 49. Most of them are glacial relicts, all of which are typical Arcto-alpine elements. The largest number of them are found in Rila - 39, in Pirin - 19 and in Vitosha - 18. The number of rare invertebrate species is also significant. Interestingly, in terms of breeding birds in this region as a whole, the percentage of Euro-Siberian species is the highest for the whole of Bulgaria - 27.7%. A characteristic feature of the region is its high endemism. While in butterflies it is at the subspecies level, in snails and beetles it is at the subgenera and genera level. The most endemic invertebrates are known from Pirin - 235 species and subspecies, from the Western Rhodopes - 232, from Rila - 225. In the over-ground representatives of Oniscoidea is only 5% endemic, while Trechinae beetle runners have more than 50%. Regarding endemics among underground fauna, the region ranks

second in Bulgaria: there are 6 Balkan endemics and 28 Bulgarian endemics. The closest resemblance is the typical underground fauna with the Thracian region - 9.5%. The number of endemics varies from one mountain to another. Most of them are in the Western Rhodopes, about twice as many as in any other high mountains in the region. In the fauna of Rila and Pirin there are quite common endemics, while in the Western Rhodopes they are quite different. Among the mountains listed above, Vitosha Mountain (adjacent to Lyulin Mountain) and Rila Mountain are of most interest.

Vitosha.

Invertebrate fauna:

The faunistic diversity of the terrestrial invertebrates of Vitosha is assessed by the model groups: Protozoa, Araneae, *Orthoptera,* Neuroptera, Lepidoptera, Diptera, Mollusca. They are representative in taxonomic, faunistic and conservation terms and illustrate well the diversity of invertebrates. Of these Vitosha model groups, 804 species and subspecies were identified. The species identified represent about 63% of the estimated 1,300 species in the area. The relative proportion of species in the individual groups to the total number is very different, depending on the nature of the group and its study. The groups of protozoa, spiders and butterflies are the most numerous. Only the Rhopalocera are included in the butterfly group**,** so the number of Lepidoptera is much higher. Only Tachinidae***, representing only one family,*** are covered from Diptera. The evaluation and analysis of the data for the different groups shows that: the prevalence and study of groups in the different parts of the mountain is uneven. Of the 804 invertebrate species found on Vitosha, Lucanus cervus, *Rosalia alpina, Euphydryas aurinia, Austropotamobius torrentium, Paracaloptenus caloptenoides, Phengaris nausithous, Polyommatus eroides, Eriogaster catax, Euplagia quadripunctaria, Ophiogomphus cecilia, Morimus funereus, Lycaena dispar* are included in Appendixes 2 and 3 of the Biodiversity Act. 90 species are rare (stenotopes), 27 are endemic, 13 are relict and 33 species are included in global and European lists of endangered species (IUCN, CORINE). Most of these species are found in butterflies (5 - IUCN, 17 - CORINE). In the case of net-winged, 4 species are known to be present in the IUCN and CORINE lists. They are found only in single habitats in Seveniya (Kamendelski) part of the mountain. In spiders and molluscs, only one species **(***Eresus cinabarinus* -IUCN, *Segmentina nitida* - IUCN, CORINE*)* was found, included in the world and European lists. No such taxa were identified in the other groups.

Rare (stenotopic) taxa inhabit single fields in small populations. In most cases, they are attached to a limited type of biotope.

A total of 90 taxa from the model invertebrate groups indicated were considered rare. Their percentage is highest in spiders (31), where the most characteristic examples are the species living on rock and rock habitats in the highest parts of the mountain.

The protozoa and molluscs are relatively well represented. In primates, the most characteristic species inhabit the water catchment area of the *Plateau (Cyclopyxis pirini, Nebela americana, N. tubulata*)**.** In molluscs, water forms are the most sensitive. These are: *Soosia diodonta* found at Boyana Falls, *Pisidium milium, Anisus* spirorbis and *A. Vorticulus***,** inhabiting Boyana Lake.

In the other groups, the percentage of rare (stenotopic) taxa is very low, but this is due to poor study.

Vertebrate fauna:

Fish

There are few reservoirs on Vitosha Mountain, especially those with standing waters - there are several small artificial lakes and Studena Dam, which is on its border. Rivers emanating from the park are of importance in terms of fish fauna. In the rivers on the territory of the mountain are established 9 species of fish: *Salmo trutta fario*, *Onchorincus mykiss*, *Salvelinus fontinalis*, *Phoxinus phoxinus*, *Barbus cyclolepis*, *Barbus meridionalis petenyi*, *Sabanejewia aurata balcanica*, *Cottus gobio haemusi*, *Barbatula bureschi*. Of these, three species are included in Appendix 2 of the BDA. Two species - the Barbus cyclolepis and Sabanejewia aurata balcanica - are Balkan endemics. The Cottus gobio haemusi is a Bulgarian endemic and is actually threatened with extinction. The Salmo trutta fario, the Phoxinus phoxinus and the Cottus gobio haemusi are glacial relicts. Both species are rare (stenotopic) taxa. Barbus meridionalis petenyi is included in Appendix III of the Berne Convention and Appendixes II and V of EU Directive 92/43.

Herpetofauna (amphibians and reptiles)

Herpetofauna (amphibians and reptiles) includes 22 species (42.13% of those established on the territory of Bulgaria).

- Amphibians - 10 species (3 species of tails and 7 species of frogs);
- Reptiles - 12 species (6 species of lizards and 6 species of snakes).

With regard to its zoological characteristic, the Vitosha herpetofauna can be divided into three categories:

- Glacial relicts - 3 types: *(Lacerta vivipara*, *Vipera berm* and possibly *Rana temporaria***;**
- Species of Mediterranean origin penetrating far north - 2 species: *Ablepharus kitaibelii* and *Vipera ammodytes;*
- Middle and southern European species that are widespread on the Balkan Peninsula and its adjacent territories - the remaining 17 species. Numerous types of Vitosha are: Salamandra salamandra, *Rana ridibunda***,** *Rana temporaria***,** *Lacerta vivipara***.**

Of the amphibians in Appendix 2 of the Biodiversity Act are included 5 species, in Appendix 3 are included 7 species and in Appendix 4 - 2 species. Of the reptiles occurring in the park, 10 species are included in Appendix 3 of the Biodiversity Act. The Berne Convention (Appendix 2) includes 4 species of amphibians - *Bombina variegata***,** Hyla arborea, Bufo viridis Laur, *Rana dalmatina* and 6 species of reptiles Ablepharus kitaibelii, Coronella austriaca, Elaphe longissima Laur., Vipera ammodytes, *Podarcis muralis* and *Lacerta viridis***.**

Mammals

Small mammals on the mountain are relatively well studied. The species composition is typical for the mountainous regions in Bulgaria. European and European-Siberian species are best represented in zoogeographical terms. In total, 22 species were identified - representatives of 3 orders, 8 families and 2 subfamilies. The numbers of small mammals throughout the territory are high. Appendix 2 of the Biodiversity Act includes the *Citellus citellus***,** Appendix 3 includes the *Erinaceus concolor***,** Muscardinus avellanarius and some others. Rare (stenotopic) taxa are 3 types: Neomys fodiens, Neomys anomalus Cabrera and *Chionomys nivalis***.** The **Chionomys nivalis** is also a glacial relict. The list of

endangered species for Vitosha, according to the CORINE program, includes Muscardinus avellanarius, Nannospalax leucodon, Neomys fodiens, Neomys anomalus Cabrera. Globally endangered, according to the IUCN list are two species - the Citellus citellus and the Nannospalax leucodon. They belong to the category of globally endangered European endemics. These two species are included in the European Red Data Book of European Vertebrates. The Citellus citellus is included in Appendix II (strictly protected species) of the Berne Convention and another 12 species are included in Appendix III.

So far, 13 bat species or about 40% of the species inhabiting the country have been identified on Vitosha Mountain. Out of a total of 13 species, 3 species belong to the family Rhinolophidae and 10 to the family. Vespertilionidae. The largest number of species (10) are registered in the Bosneshki Karst region. *Rhinolophus* hipposideros dominates all year round**.** It's found all the time in the caves in the area. Maximum numbers have been observed in the Duhlata Cave. All 13 bat species are included in Appendix 2 and Appendix 3 of the BDA.

In the case of large mammals, in the mountain are found almost all typical of the mountains in the country predators and wild ungulates. It should be noted that populations of some species have been restored in the last decades after being almost completely destroyed at the beginning of the century. 15 species breed in the park - 10 species of predators and 5 species of ungulates. The bear *(Ursus arctos)* was completely killed in the early 1920s. The population was restored by individuals who crossed the Verilla Bridge from Rila. The species inhabits the southern and south-western parts of the park ("Vitoshko" SHF and the part of DL Samokov) and the Bistrishko Branishte reserve. Less or more badger, otter, black ferret, European pine marten, Beech marten, weasel, wild cat, roe deer, deer, fallow deer, wild boar and wild goat are represented from the rest. Of the large mammals found on Vitosha 5 are included in Appendix 2 of the Biodiversity Act - wolf, brown bear, spotted ferret, wild goat and otter, and the brown bear, otter, European pine marten, weasel and spotted ferret are in Appendix 3 of the Act. Six species of large mammals are included in the list of globally threatened species (IUCN Red List of Threatened Animals), the European Red Data Book (Red Data Book of European Vertebrates). The European sub-species of *Vormela peregusna peregusna,* for whose conservation Bulgaria is primarily responsible (more than 50% of the population in Europe), is included in the IUCN list of globally threatened species as "vulnerable". The European Red Data Book includes the bear, the wolf, the otter and the wildcat. The list of endangered species under the CORINE programme includes 4 species - wolf, wild cat, otter and bear. In the Red Data Book of Bulgaria - Volume 2 - animals as an "endangered species" is included the European pine marten.

Birds

There are 181 bird species found in the region of Vitosha. Along with the species occurring in the wetlands located immediately adjacent to the borders of the mountain, part of which occur in migration and wanderings, the number reaches 236.

The nesting ornithofauna of Vitosha is represented by 120 species. In zoogeographical terms, species from the moderate latitudes of the northern hemisphere predominate (palearctic - 43, european - 17, european Turkestan - 16, holarctic - 12 and paleomontan - 4). They make up 51% of the ornithofauna nesting in the park. The share of "southern" species (Mediterranean - 6, representatives of the Old World fauna - 4, Turkestan Mediterranean - 5, Indo-African - 4, Paleoxeromontan - 3 and

Turkestan - 1) is 13% and is greater than in Rila due to the lower altitude. The Siberian ornithofauna is represented by 1 species, the Siberian Canadian of 2 species, the cosmopolitan ornithofauna of 1 species and the ornithofauna - unknown type of 1 species.

The valley of the river Struma plays the role of an ecological corridor from the south, and in the last 20-30 years there has been a penetration of the territory of the park of species with southern spread.

Table 2.1.6-3 *Species diversity of Vitosha birds*

Order	**Number of taxa**	
	Families	Types
1. Ciconiiformes	2	5
2. Falconiformes	2	24
3. Galliformes	1	6
4. Gruiformes	1	2
5. Charadriiformess	3	7
6. Columbiformes	1	5
7. *Cuculiformes*	1	2
8. *Caprimulgiformes*	1	1
9. Strigiformes	2	8
10. Apodiformes	1	3
11. Coraciiformes	4	4
12. *Piciformes*	1	10
13. *Passriformes*	19	100
Total:	**39**	**187 ***
Note: ** - birds occurring in the wetlands immediately adjacent to the boundaries of the mountain area are not included, some of which occur in the wetlands during migrations and wanderings.*		

Of the 236 species established in the region (Vitosha with adjacent wetlands) of birds, 207 species are included in No. 2 of the Biodiversity Act, 107 species are included in Appendix No. 3 of the same Act and in Appendix No. 4 - 23 species.

In Europe, a total of 170 species are included in Appendix II (130 species) and Appendix III (36 species) of the Berne Convention.

17 species are included in the list of endangered species under the CORINE programme. 69 species are included in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) as species which will benefit from international cooperation for their conservation and management.

Rila.

Invertebrate fauna:

The faunistic diversity of invertebrates in the mountain is assessed by model groups of invertebrates: Protozoa, Nematoda, Rotatoria, Tardigrada, Arachnida, Crustacea, Hyriapoda, Insecta,

Mollusca. Of these groups, 2,934 species and subspecies were identified in the park, covering 312 rare (stenotopic) species, 242 endemic species, 244 relicts, 41 species included in global and European lists of endangered species (IUCN, E/ECE/1249, BC, CORINE). The number determined, however, represents about 50-55% of the estimated 7,000 species in the area. The relative share of species in the individual groups to the total number is very different, which depends mainly on their study.

Vertebrate fauna:

The known species and sub-species diversity of vertebrates in Rila is as follows: fish - 5 taxa, amphibians and reptiles - 20 taxa, birds - 99 taxa, mammals - 48 taxa (small mammals - 22 taxa, bats - 10 taxa and large mammals - 16 taxa) or a total of 172 taxa.

Of particular conservation interest are 162 taxa or more than 90% of all known vertebrates from Rila. The following table shows the number in the different groups - endemics, relics protected in Bulgaria, in the Red List of IUCN, in the European Red List of animals and plants threatened with extinction in the world, in the lists to the Bern and Bonn Conventions, in the lists to the Birds Directive, the EU Habitats Directive.

Table 2.1.6-4 *Species of special conservation interest*

Species of special conservation interest									
	Endemics BG	BAL	Relics	Protected in Bulgaria	IUCN	European Red List	Bern conv.	Bon conv.	Dir. 92/43/EEC Дир.2009/147/EC
Fish	2	2	-	-	3	-	2	-	2
Herpetofauna	-	1	3	11	1	-	20	-	4
Birds	-	3	5	87	3	3	94	-	33
Bats	-	-	-	10	3	1	10	10	7
Small mammals	-	-	-	1	6	2	10	-	1
Large mammals	-	2	-	6	4	6	15	-	4
Total	**2**	**8**	**8**	**121**	**24**	**15**	**158**	**17**	**51**

- ***Regions in the Republic of Serbia***

General information

The Republic of Serbia is characterized by high genetic, species, and ecosystem diversity. The highland and mountainous regions of the Republic of Serbia, as a part of Balkan Peninsula, are one of six European biodiversity centres. Moreover, in terms of the wealth of its flora, the Republic of Serbia is potentially one of the global centres of plant diversity. Although the Republic of Serbia's 88,361 km^2 represent only 2.1% of European territory, biodiversity of different groups of organisms remains high.

The Republic of Serbia hosts:

- 39% of European vascular flora;
- 51% of European freshwater fish fauna;
- 49% of European reptile and amphibian fauna;

- 74% of European bird fauna;
- 67% of European mammal fauna;

The following biomes are found in the Republic of Serbia: steppe zonobiome, deciduous forests zonobiome, coniferous forests zonobiome and zonobiome of high mountain tundra. The Republic of Serbia has heterogeneous flora and fauna, which includes both widespread and endemic species (Balkan, local and stenoendemic).

Diverse climatic vegetation zones, including a large number of extrazonal, intrazonal and azonal ecosystems, such as wetlands, peat lands, salt marsh lands and sands, strongly influence the high biodiversity of the Republic of Serbia. During the last ice age the territory of modern Serbia provided numerous refugia (parts of a species' range less influenced by climate change) for a number of species. As a result, Serbia is inhabited by many relict and endemorelict species.

The Republic of Serbia's genetic resources are very rich and include a large number of autochthonic cultivated plant and domestic animal species. Genetic resources important for food and agriculture are maintained through traditional agricultural systems or in *ex-situ* conditions.

Even though more than 1 200 plant communities have been described in the Republic of Serbia, it is assumed that there are actually between 700 and 800 plant communities. Balkan endemics comprise approximately 14.94% of Serbian flora (547 species), while local endemics comprise 1.5% (59 species).

Species diversity in the Republic of Serbia is not well researched or documented, as evidenced by a review of information on described species within the five kingdoms of living things (*Monera* - prokaryotic organisms; *Protista* - all algae, protozoa, as well as water and slime moulds; *Fungi* - fungi; *Plantae* - plant life, and *Animalia* - animals):

- *Diversity of algae.* Limited information is available concerning the diversity of freshwater algae - there are reported around 1 400 species;
- *Diversity of fungi and lichens.* The situation is similar with the *Fungi* kingdom. Although reports indicate that between 3,000 and 6000 species of macromycetes exist in the Republic of Serbia, only 625 have been described. Recent research on lichen diversity (*Lichenes*) indicates that there are 586 species of lichens found in the Republic of Serbia.
- *Diversity of flora.* The *Plantae* kingdom is probably the most researched kingdom in the Republic of Serbia. There are 400 species of moss widespread in the Republic of Serbia *(Bryophyta)* and a total of 3 662 taxa (rank of species and subspecies) of vascular flora (*Pterydophyta*, *Pinophyta* and *Magnoliophyta*).
- *Diversity of invertebrate fauna.* Data on invertebrate species diversity within the *Animalia* kingdom in the Republic of Serbia is available for roundworms *(Nematodes)* - 139 species, *Anostraca*, *Notostraca* and *Conchostraca* - 18 species, *Amphipoda* - 33 species. Additional data related to species diversity in other groups of animals is available for the former FR Yugoslavia, but incomplete for the Republic of Serbia.
- *Diversity of vertebrate fauna.* Data on vertebrate species diversity within the *Animalia* kingdom in the Republic of Serbia is available for amphibians (*Amphibia*) - 21 species, reptiles (*Reptilia*) - 25 species, birds *(Aves)* - approximately 360 species and mammals (*Mammalia*) - 94 species.

- *Ecosystem (plant community) diversity*. Nearly all characteristic terrestrial biomes of Europe (and four of the world's twelve terrestrial biomes) are found within the territory of the Republic of Serbia. The Republic of Serbia's ecosystem diversity may be observed through diversity of vegetation and plant associations, which represent the primary structural and production component of all land ecosystems. The territory of the Republic of Serbia is characterized by a diversity of habitats, hence a diversity of biocenoses that makes this region a significant European centre of ecosystem diversity. A map of the natural potential vegetation of the Republic of Serbia presents an "ecosystem mosaic" composed of forests, shrubs, meadows, swamps, marshes and lakes. The Republic of Serbia's vegetation contains between 700 and 800 plant communities (associations) that have been classified into 114 orders, 59 classes and 10 basic types of climate zonal ecosystems and three pedoclimate types of land ecosystems. The Republic of Serbia has harmonized its national nomenclature with international community standards on the basis of the EUNIS classification system. The Republic of Serbia's ecosystems are characterized by the presence of both endemic and relict plant associations. Most plant associations with endemic features are found within rocky areas, mountain glades and rock creeps. A number of ecosystems contain many endemic species and therefore rank highly in terms of conservation attention. These include thermopile serpentine stone grounds, Pannonian salty grounds, mountain peat land, high greenery and mountain mezophile meadows. The forest and shrub communities with endemic woody plants are of particular importance within the Republic of Serbia. These include *omorika* spruce forests *(Piceion omorikae*), Fritillaria gracilis *(Pinion heldreichii*), Pinus peuce *(Pinion peucis),* Greek maple *(Aceretum heldreichii, Aceri- Fagetum* type), polidominating forests with Pancic acer (e.g. *Fago-Aceri intermedii-Coryletum colurnae, Querco- Aceri intermedii-Coryletum colurnae and Fraxino-Aceri intermedii-Coryletum colurnae),* hazelnut seedlings *(Fago- Corylenion colurnae)* and lilac shrub land *(Syringion),* among others.

The Republic of Serbia developed its first Red Book - *Red Data Book of Flora of Serbia* in 1999, covering extinct and critically endangered plant species. This list contains 171 plant taxa (species and subspecies), which comprise approximately 5% of the total flora in the Republic of Serbia. Of that number, four taxa endemic to the Republic of Serbia have become extinct; 46 taxa have been extirpated from the Republic of Serbia, but can be found in neighbouring areas or in *ex-situ* conditions (botanical gardens); 121 species are highly endangered, with a high probability of disappearing from the region in the near future or becoming extinct if not given appropriate attention.

The second Red Book - *Red Book of Butterflies for Serbia* was published in 2003. The butterfly red list report evaluates the conservation status of 57 species of butterflies, accounting for 34% of butterfly fauna in the Republic of Serbia. The report identifies one extinct species of butterfly, Fenton's Wood White *(Leptidea morsei*), and several endangered species, including Alpine Grizzled Skipper *(Pyrgus andromedae),* Swallowtail *(Papilio machaon),* Eastern Dappled White *(Euchloe ausonia*), Almond-eyed Ringlet and Yellow-spotted Ringlet *(Erebia alberganus* and *Erebia manto*), Apollo *(Parnassius Apollo*), Danube Clouded Yellow *(Colias myrmidone*), Lesser Purple Emperor *(Apatura ilia)* and Purple Emperor *(Apatura iris*), False Heath Fritillary *(Melitaea diamina*) and Lesser Marbled Fritillary *(Brenthis ino).*

With regard to vertebrates, only a preliminary red list of species - *Preliminary List of Species of*

Vertebrate Red Book was published in 1990-1991. This list provides a starting point for the development of a comprehensive vertebrate red list for the Republic of Serbia. The list identifies one species of cyclostomes and 30 species of fish, 22 species of amphibians, 21 species of reptiles, 72 species of mammals and a large number of birds (353 species) as being threatened and in need of conservation attention.

Also a List of protected species is established by the Regulation on Proclamation and Protection of Strictly Protected and Protected Species of Wild Plants, Animals and Fungi ("Official Gazette of the Republic of Serbia", Issue 5/10). Accordingly wild species that are endangered, or may become endangered, and that are particularly significant for genetic, ecological, eco-systemic, scientific, health and economic reasons, shall be protected as strictly protected wild species or protected wild species.

The following wild species may be declared as protected: 1) vulnerable wild species; 2) endemic species; 3) indicator, key and umbrella species; 4) relict species; 5) internationally significant and protected wild species; 6) species that are not endangered, but can easily be confused with an endangered species, due to appearance. There are a total of 868 protected wild species of plants, animals and mushrooms (see the next Table). Of the species listed above, 112 species of plants and animals are under use and trade control.

Table 2.1.6-5 *Protected wild species in the Republic of Serbia*

Fauna	**Order**	**Family**	**Species**
Mammals *(Mammalia)*	6	14	30
Birds *(Aves)*	9	12	35
Reptiles *(Repilia)*	2	2	2
Amphibians *(Amphibia)*	1	1	3
Fish *(Pisces)*	8	10	34
Invertebrata	14	40	154
• Spiders *(Arachnida)*	1	4	4
• Insects*(Insecta)*	10	33	145
• Snails *(Gastropoda)*	1	1	3
• Annelids *(Annelidae)*	2	2	2
Animals	40	79	258
Fungi	6	10	37
• Fungi	5	9	26
• Lichens	1	1	11 (3 + 8 species of genus *Usnea)*
Plants	43	78	573
• Mosses *(Bryophyta)*	3	6	10
• Ferns *(Pteridophyta)*	5	8	9
• Seed plants *(Spermatophyta)*	35	64	554 (514+ 32 species of genus *Alchemilla* and 8 species

There are a total of 1,760 strictly protected wild species of algae, plants, animals and fungi (see next Table).Strictly protected wild species may be declared in the following cases: 1) species extinct in the Republic of Serbia and reintroduced through a reintroduction programme; 2) extremely endangered

wild species; 3) endangered wild species; 4) relict; 5) local endemite; 6) stenoendemite; 7) internationally significant and protected wild species; 8) species requiring strict protection for other reasons.

Table 2.1.6-6 *Strictly protected wild species in the Republic of Serbia*

Fauna	Order	Family	Species
Mammals *(Mamalia)*	4	15	50
Birds *(Aves)*	17	57	307
Reptiles *(Reptilia)*	2	6	18
Amphibians *(Amphibia)*	2	6	18
Fish and Lampreys *(Pisces* and *Cephalaspidomorphi)* ( )	8 (1)	10 (1)	30 (4)
Invertebrates	27	95	609
• Spiders *(Arachnida)*	3	10	73
• *Branchiopoda*	1	2	4
• *Chilopoda*	1	1	2
• *Diplopoda*	4	6	27
• *Entognatha*	2	7	25
• Insects*(Insecta)*	9	51	377
• *Malacostraca*	3	8	35
• Mollusks *(Mollusca)*	1	1	1
• Snails *(Gastropoda)*	2	8	60
• Annelids *(Annelidae)*	1	1	5
Fauna	60	189	1032
Fungi and Lichens	15	31	75
• Fungi	7	17	38
• Lichens	8	14	37
Plants	56	100	628
• Mosses *(Bryophyta)*	12	15	47 (24 + 23 species of genus
• Ferns *(Pteridophyta)*	5	9	22
• Seed plants *(Spermatophyta)*	39	76	559
Algae	5	7	25
• Charales *(Charophyta)*	1	2	15
• Red algae *(Rhodophyta)*	4	5	10

The most important local and regional centres of ecosystems and biodiversity in the Republic of Serbia are found within its mountain ranges: Kopaonik, Tara, Sar Mountain, Prokletije, Stara Mountain and Suva Mountain. It is also necessary to mention important refugial areas, which represent critical areas for preserving biological diversity during times of widespread climate change. These include canyons and gorges, such as Djerdap Gorge, Sicevac Gorge and the Drina Canyon, as well as the river valley of Pcinja in southern Serbia and other areas with large numbers of endemic, relict and endemorelict plant communities. Specific centres of ecosystem diversity located in AP Vojvodina must be stressed here, with their continental sand, steppe and salty ground communities that are only found in several areas: Deliblato and Subotica-Horgos Sands, “mosaic” salty grounds in Banat and Backa.

Although implementation of comprehensive management at the ecosystem level is necessary, such management is insufficient for the protection of all biological diversity. Ecosystem management may conserve the majority of species in an ecosystem, but some specialized species require special habitat conditions and specialized management regimes. In such cases, comprehensive ecosystem management may actually be inappropriate for the protection of the type of species in question. Thus, there will be situations in which specialized management regimes must be developed specific to the survival needs of at-risk species.

Recent findings in biological diversity protection have demonstrated that maintaining local populations at minimal viable levels may be inadequate for the longterm survival of a species, especially with regard to "highly interactive species", such as predators and other keystone species. Thus, appropriate goals for conservation must be established at both ecosystem and species levels.

Vegetation in the areas covered by the CBCP and TSIM

For the territory of Serbia there is no data that a geobotanical zoning has been made similar to that for Bulgaria by Bondev in 1997. The areas covered by the programme cover the eastern part of Serbia, which is generally mountainous and semi-mountainous, with the western border mountains in Bulgaria also being part of these mountainous regions - including the Western Stara Planina, through which practically the entire north-western border between Bulgaria and Serbia passes (the Western Stara Planina is with northwest-southeast extension, and is bounded to the west by the valleys of the rivers Targovishki Timok and Visochitsa - right tributary of Nishava in Serbia), Vidlic Mountain (90% in Serbia and 10%, also part of the Western Stara Planina), Ruysko-Verila Mountain (Ruy, Ezdimirska Mountain, Greben Mountain, Elovishka Mountain, Leshnikovska Mountain, Tsarichka Mountain, Erulska Mountain, Rudina Mountain, Penkyovska Mountain, Chudinska Mountain), Milevsko-Kosovoska Mountain range (Milevska, Zemenska Mountain, Konyavska and Kobilska Mountain), Osogovska Mountain and Vlahina Mountain. In view of this, it can be assumed that in general the main floral elements common to the *Western Balkan floristic region*, the *Sofia floristic region* (Chepansko-Zavalski and Konevasko-Zemen regions) and the Western Bulgarian *border mountain floristic region* in Bulgaria are also found in the Serbian scope of the programme. Stara Planina (within the boundaries of the Stara Planina Nature Park), Vidlic Mountain, Shlivovicka Mountain ("Shlivovich vis") and the region around Bosilegrad (the Serbian part of Kraishte) should be mentioned as more interesting in the Serbian part for which in-depth studies of the flora have been done. All four are located subsequently adjacent to or close to the northern to southern part of the Bulgarian-Serbian border, so that the available data on vegetation in them can be considered more or less representative for eastern and south-eastern Serbia, occupied as mentioned above mainly with mountain and semi-mountain areas.

Stara planina. Stara planina is located in Eastern Serbia, on the border with Bulgaria, and is part of the vast Balkan massif. As a morphological entity it is bounded by the valleys of Beli and Trgoviški Timok, and Visočica, and to the east by the state border. Stara planina mountain has been protected via Nature Park "Stara planina" ("Official Gazette of RS", No. 19/1997) in order to conserve, in the interest of science, education and promotion of culture and sustainable economic and demographic development, the exceptional value of the plant and animal life, places expressing the exceptional

geological diversity of the area, such as certain forms of relief, special phenomena of surface and groundwaters and rock formations that are structurally, paleontologically, stratigraphically and mineralogically significant, the beauty and diversity of landscapes, the cultural values represented by medieval monasteries and other immovable cultural property, objects of folks architecture, traditional tools, occupations and customs of the local population. The nature park is located in the municipalities Zaječar, Knjaževac, Pirot and Dimitrovgrad. It is a treasure of sediments of different ages, from Paleozoic to Cenozoic, faunistically and floristically documented, due to which the profiles or entire zones representing geo-heritage of universal value have been distinguished. The relief of the area is extremely morpho-hydrologically intersected, whereby numerous mountain streams enrich the landscape features. The Bigar creek valley, the Temštica meanders, the Midžor and Babin zub are the prominent sites here. The most powerful spring on Stara planina is Jelovica spring, which has the appearance of an "eye" formed in a small basin. The presence of 1190 plant species, which accounts for 34 percent of Serbia's total flora, has been identified on Stara planina. In addition, Stara planina is one of the major centers of tertiary and glacial endemic relict species. Specific species of the Stara planina mountain are, for example, bellflower (*Campanula calyciliata*), the local endemite of this massif, and Pančić's ragwort (*Senecio pancicii*), the central Balkan endemite in Serbia present only on Stara planina. The Serbian ramonda (*Ramonda serbica*) is one of the sixteen endemic relicts of the Balkan Peninsula. Of the diverse forest and herbaceous communities of particular interest are the communities of mountain peat bogs on the Jabučko ravnište, Babin zub and in the area of Arbinje. In Stara Planina is recorded the existence of:

- about 1200 species and subspecies of higher plants. The problem of insufficient research is also present in the flora, so the assumptions of the biologists are that on Stara Planina the total flora amounts to at least 2000 taxa;
- at least 115 endemic plant species;
- over 100 protected and strictly protected species;
- more than 50 species on the list of endangered European flora;
- 52 species of forest, bushy and herbaceous plant communities;
- 59 lichen species out of a total of 406 known species in Serbia;
- 1000 different forms of macromycetes can be found on the Stara Planina Mountain;
- The bryophytes flora in the territory of Stara Planina counts 344 species and a large number of them are under different forms of protection. The structure of bryophyte is dominated by mosses (281 species), but there are also liverworts (63 species); .

Vidlič Mountain. A relatively spacious, limestone massif of Vidlič Mountain, mostly located in eastern Serbia rises above the Pirot, occupying a NW-SE direction up to the border, and continuing trough the territory of Bulgaria. Vidic is a mountain that belongs to the Balkan mountain range. It is a part of the Pirot and Dimitrovgrad municipalities. One group of authors considers Vidlic as a branch of Stara Planina Mountain. Another group of authors believes that it makes a separate orographic and tectonic unit. Environmental factors have caused flora and vegetation complexity, diversity and specificity of Vidlic mountain, characterising by vertical and horizontal distribution of plant species and communities. On the Vidlic vertical profile,two altitude forest vegetation belts are characteristic: a belt

of oak forest that is 300, 400 m up to 1000 and 1100 beech forests of 1000 and 1100 m above sea level, up to the highest mountain peak which is 1413 m. On the basis of detailed, multi-year field study and review of literature material, it was found that the vascular flora of the study area makes 1265 species and subspecies, arranged in 55 orders, 93 families and 442 genra. Divisio of ferns (Pteridophyta) is presented with a total of 12 species (one species from the section Lycopodiophyta (class Selaginellopsida), 3 species of horsetail-section Equisetophyta (class Equisetopsida), one species of the divisio Psilotophyta (class Ophioglossopsida) and 7 species of fern division Polypodiophyta (class Polypodiopsida). Testa (Spermatophyta) is presented with 1253 species (7 species of divisio Pinophyta and 1246 species of Pinopsida Angiosperms species division Magnoliophyta). The largest number of genera and species is present in the family Asteraceae, while genus *Carex* is the richest in species. Vidlic flora is characterized by largest share (45% of total taxa) of hemicryphytes. The high presence of hemicryphytes, which fits into the range of Serbia flora, and in ecological sense is closer to the floras of the temperate zone. In addition to the dominant Euroasian influence on the mountain Vidlič flora, powerful impact is achieved by the Pontic region and weakened Mediterranean influences that comes from the valley of Sruma river through Sofija field. Presence of mountain flora elements is registered, witnessing strong contact with the floras of E and SE Serbia limestone mountains on one side and Stara mountains on the other side. There are recorded 25 endemic taxa, representing 8,71% of the total number of Balkan endemic flora of Serbia, representing 1,98% of total flora of Vidič mountain. A large number of data on distribution of significant and rare representatives of Serbian flora are recorded (*Ophrys insectifera, Orchis pallens, Galanthus elewesii, Paeonia peregrina, P. tenuifolia, Prunus tenella, Ribes multiflorum, Euphrasia hirtella, E. Illyrica, Malcolmia serbica, Salvia austriaca* etc.).

Sljivovicki Vis. The region of East Serbia between Nis and Pirot, including the considered area, was recognized even in the mid-19th century as one of the richest parts of Serbia from a floristic viewpoint. In spite of this fact, some very important parts of that territory, for example, the inaccessible distant limestone peaks and cliffs have remained so far out of the scope of botanical studies and are poorly known from floristic, phytocoenological and phytogeographic viewpoints. Certain mountain massifs, including Mt Sljivovicki Vis, are still insufficiently explored in these aspects. The mountain is situated in the central part of the Balkan Peninsula, in East Serbia, in the area between the valley of river Nisava and the massif of Mt. Suva Planina. This mountain chain of medium height includes: Malo Kurilo (388 m), Veliko Kurilo (545 m), Popov Vrh (798 m), and Sljivovicki Vrh (1256 m). The ridge of Mt Sljivovicki Vis, stretching in the northwest- southeast direction, connects Mt Suva Planina with Mt Belava and separates the valleys of Bela Palanka (river Nisava) and river Koritnica. As the floristic richness and diversity of the East Serbian flora are well-known, it was assumed that Mt Sljivovicki Vis could also be interesting and rich from a floristic viewpoint. This opinion was supported by the geographical position of the mountain in the Western Moesian Province within the Balkan Floristic Subregion and the Central European Floristic Region. The limestone-based, eroded slopes of Mt Sljivovicki Vis characteristic for this part of Serbia provide a habitat for numerous Pontian and Submediterranean plants. Floristic investigation of Mt Sljivovicki Vis is performed in the period 2002-2006. The vascular flora of Mt Sljivovicki Vis includes 811 plant taxa at the species and subspecies level. They belong to 376 genera and 81 families of vascular plants. The phylum Magnoliophyta is

represented by 802 taxa, or 98.9% of the total flora. The class Magnoliopsida is the most numerous, with 673 taxa (about 83% of the total number of species). The class Liliopsida is represented by 129 taxa (15.9% of the total number of species). The taxonomic analysis of the flora shows that Compositae is the family with the largest number of species (86 species), followed by the families *Legumi nosae* (75) and *Gramineae* (62). The dominant genera in the flora of Mt Sljivovicki Vis are *Trifolium* (13 species), *Veronica* (13), *Lathyrus* (13), and *Vicia* (12 species).

The floris tic range of Mt Sljivovicki Vis differs from the floristic ranges of Serbia and the Balkan Peninsula.The greatest deviations in percentage from the floras of Serbia and the Balkan Peninsula exist in the families Compositae and Cyperaceae. The poorer representation of the family Compositae in the area of Mt Sljivovicki Vis is explained by the insufficient level of research into the family Compositae, particularly of the genus *Hieracium* as the most taxon-rich genus in the Balkans. The family Cyperaceae is poorly represented, indicating the insignificantly present Boreal influence on the florogenesis of that area. The suggested reason is an absence of appropriate habitats, mostly inhabited by species from this family.

The analysis of the entire floristic range of Mt Sljivovicki Vis has shown that the most species-rich group is the Mediterranean-Submediterranean distribution type, with 169 species (20.8%). The second best-represented distribution type in the studied area's flora is the Central European distribution type with 164 species (20.2%). The high percentage of the Central European plants may be connected to the availability of suitable habitats, such as the mesophilous and meso-xerophilous forests and their derivatives (mesophilous meadows). The Mediterranean-Submediterranean-Pontian distribution type with 139 species (17.1%) is the third best-represented distribution type. The Eurasian distribution type participates in the floristic range of Mt Sljivovicki Vis with 13.7% (111 species). The plants belonging to the Pontian distribution type claim 88 species (10.9%). The Central-South European mountain distribution type is represented by 48 species (5.9%). The Cosmopolitan distribution type is represented by 42 species (5.2%) and the Holarctic distribution type by 26 species (3.2%). The Boreal distribution type is represented by 13 taxa (1.6%) in the study area.The adventive and cultivated plants accounted for 1.4% (11 species) and represented a conditional cho rological category.

The flora of Mt Sljivovicki Vis included 25 endemic taxa with ranges limited to the territory of the Balkan Peninsula. According to their phytogeographic position, the endemic taxa of Mt Sljivovicki Vis were classified into four distribution types: Central European, Mediterranean-Submediterranean, Pontian and Central-South European mountain types (including two distribution subtypes: South European mountain and Central European mountain). The phytogeographic analysis has shown that most endemic taxa belonged to the Mediterranean-Submediterranean distribution type. The endemic species includes: Middle European distribution type - *Acer intermedium, Fagus moesiaca*; Mediterranean-submediterranean distribution type - *Scabiosa fumarioides, Hypericum rumeliacum, Orobanche esulae, Trifolium dalmaticum, Thymus praecox* subsp. *jankae, Salvia amplexicaulis, Acanthus balcanicus, Lamium bifidum* subsp. *balcanicum, Centaurea chrysolepis, Eryngium palmatum, Linaria rubioides* subsp. *nissana*; Pontian distribution type - *Pulsatilla montana* subsp. *bulgarica, Astragalus wilmottianus*; Middle-Southern-European mountain distribution type - *Micromeria cristata, Sesleria latifolia, Dianthus cruentus, Viola tricolor* subsp. *macedonica, Achillea ageratifolia* subsp.

serbica, Edraianthus serbicus, Genista subcapitata, Centaurea napulifera subsp. nissana, Knautia drymeia subsp. *nympharum, Trifolium medium* subsp. *balcanicum*; In the area of Mt Sljivovicki Vis there ape 38 taxa (4.7% of the total flora) of relict species, such as *Prunus tenella, Ranunculus illyricus, Waldsteinia geoides, Lilium martagon, Crataegus pentagyna*, etc. The area of Mt Sljivovicki Vis is characterized by intensive and varied anthropogenic activity, which threatens the plant life. Three threatened taxa from the area were included in the World Red List: *Astragalus wilmottianus, Delphinium fissum* and *Scabiosa fumarioides*. Two plant taxa, *Delphinium fissum* and *Scabiosa fumarioides,* are included in the European Red List. There are 17 taxa in the species group of international importance while 48 species could be placed in some threatened status category at national level.

Krajiste region (in SE Serbia). The Bosilegrad surroundings, well known under the name Krajiste, is a mountain region in the central part of the Balkan Peninsula, situated in the remotest parts of southeast Serbia, and with most of it in west Bulgaria. The boundaries of this region in Serbia follow the line of a mountain ridge, with the following highest peaks: Krvavi Kamik (1737 m), Mt Vardenik (Pandzin Grob 1664 m; Ravniste 1703 m; Golemi Vrh 1753 m; Obrsina 1734 m; Golema Ravnica 1744 m), Mt Besna Kobila (Besna Kobila 1923 m; Patarica 1672 m; Majorsko Cukle 1627 m) and Mt Dukat (Skrstena Straza 1666 m; Kolevo Gumno 1715 m; Golemi Vrh 1831 m). The massifs of these mountains form the catchment area of river Dragovistica, which is a tributary of river Struma and is one of the few rivers in the Aegean Sea catchment from Serbia. The state border between Serbia and Bulgaria cuts through the region that includes Mt Milevska (1736 m) and Mt Rudina (1240 m), as well as the spacious foothills to the south from the Ribarci border pass. The flora of Bosilegrad surroundings has been studied since the beginning of the 20th century. The most significant breakthrough in the studies of the flora and vegetation of the Serbian part of Krajiste was made during the last three decades. The analysis of flora at some specified localities in the area of the Bosilegrad surroundings (Mt. Besna kobila, Mt. Rudina, Mt. Milevska, etc.) showed characteristically a very rich flora composed of diverse elements in origin and age. The endemic plants are among the plant groups important for understanding the florogenetic tendencies and phytogeographic characteristics of each region.

On the basis of the complete list of plant taxa inhabiting the Bosilegrad surroundings, a list of 59 Balkan endemic taxa (46 species and 13 subspecies) was prepared, including some local endemics (also known from the eastern part of Krajiste in the Republic of Bulgaria). Generally they are sorted out between seven different types from the group of Balkan endemics. The results of the analyses have shown that most (33.9%) endemic flora in the Bosilegrad surroundings is represented by the Illyrian-Scardo-Pindho-Moesian endemics.

The life forms spectrum of the endemic flora of the Bosilegrad surroundings can be divided into four main types. The biological spectrum of the endemic flora shows a pronounced hemicryptophyte character of this area. Hemicryptophytes represent 63% of the total number of endemics. This situation almost completely matches the representation of hemicryptophytes in the endemic flora of the adjacent Vlasina upland plain. Domination of hemicryptophytes in the biological spectrum of the endemic flora of the Bosilegrad surroundings completely matches the influences of the cold mountain climate. Within this life form, the best represented type is that of stem hemicryptophytes (*hemicryptophyta scaposa).* On

the other hand, in the region of lower mountains and hills, especially in the habitats with warm limestone substrate, the herbaceous *(chamaephyta herbosa)* and semi-woody *(chamae phyta suffrutescentia)* forms of chamaephytes become more important; as a group they represent 20% of the whole endemic flora. The group of therophytes is quite frequent in apperance, as they grow in similarly dry habitats, together with the various species of chamaephytes. More than half of the endemic taxa (35) develop mostly on silicate substrates, where they are present within various types of vegetation.

Most endemic taxa, such as *Sesleria comosa, Cyanus velenovskyi, Allium melanantherum, Armeria rumelica, Achillea chrysocoma, Carduus kerneri* subsp. *scardicus, Dianthus cruentus* subsp. *cruentus, Digitalis viridiflora, Festuca valida, Knautia midzorensis, Silene sendtneri, Verbascum adamovicii,* and *Viola tricolor* subsp. *macedonica* are recorded in the herbaceous vegetation of the high-mountain pastures from the alliances *Poion violaceae* and *Festucion valido-paniculatae (Seslerietalia comosae, Juncetea trifidi),* in the silicate heathlands from the alliances *Bruckenthalion spiculi foliae* and *Vaccinion uliginosi (Vaccinietalia, Vaccinio-Piceetea*), and in the mountain meadows from the alliances. *Chrysopogoni-Danthonion calycinae (Brometalia erecti, Festuco-Brometea)* and *Armerio-Potentil lion (Armerietalia rumelicae, Festuco-Brometea).* A smaller number of endemics, such as *Minuartia bul garica,* are recorded in the rock-dwelling vegetation from the Carpathian-Balkan alliance *Silenion lerchenfeldianae (Asplenietalia septentrionalis, Asplenietea trichomanis),* which inhabits the high mountain tops of the region.

A certain number of extremely rare, mostly Moesian endemics, is characteristic of the vegetation developing around streams and springs, which belongs to the syntaxonomic alliances *Cardamino-Montion* (*Montio-Cardaminetalia, Montio-Cardaminetea), Rumicion balcanici, Geion coccinei,* and *Cirsion apendic- ulati (Cirsietalia appendiculati, Mulgedio-Aconitetea).* This type of vegetation is a characteristic trait of the high siliceous mountains of Krajiste and includes such species as *Rumex balcanicus, Geum rhodopeum, Silene asterias,* and other endemics.

Important habitats of the endemic flora in this region are bare rocks and stony ground, screes and pastures on limestone, as well as dry pastures on narrow silicate beds. Such areas are situated in the hilly and low-mountain region in the southeastern part of the Bosilegrad surroundings in Serbia (Mt Rudina and its foothills), which is distinct in geomorphological and geological sense, and is under the influence of a warmer climate from the Aegean Mediterranean. Finally, numerous reports have recorded 33 endemic species on the Rudina massif, including 14 species that appear exclusively on carbonate substrate. Most endemic taxa from this area are recorded in the vegetation of xerophilous pastures and steppe-like vegetation, belonging to the alliances *Seslerion rigidae (Seslerietalia juncifoliae, Festuco-Seslerietea*) developing on limestone, *Armerio-Potentillion (Armerietalia rumelicae, Festuco-Brometea)* developing on limestone and/or silicate, and *Scabioso-Trifolion dalmatici (Astragalo- Potentilletalia, Festucetea vaginatae)* developing on siliceous substrate. In terms of appearance in this region's endemic flora, another important alliance is *Edraiantho graminifolii-Erysimion comatae (Potentilletalia caulescentis, Asplenietea trichomanis*) and it's association *Edraiantho serbici-Anthylletum aureae* that grows in the cracks of limestone rocks. The role of edificator species in this association is played by the endemic species *Edraianthus serbicus* and *Anthyllis aurea.*

Some more or less intriguing or conservationally significant plant species (included in the annexes of international conventions or lists, or endemic), which, in addition to the Bulgarian border territory, may be found in the area of its Serbian part within the scope of the programme, are: *Acanthus balcanicus, Acer heldreichii, Agrimonia eupatoria, Alchemilla bulgarica, Alchemilla erythropoda, Alchemilla straminea, Alchemilla viridiflora, Allium cupanii, Alyssoides graeca, Androsace hedraeantha, Androsace obtusifolia, Anemone narcissiflora, Anemone sylvestris, Angelica pancicii, Angelica sylvestris, Anthemis macrantha, Aquilegia nigricans, Aquilegia vulgaris Arabis nova, Arctostaphylos uva-ursi, Aristolochia clematitis, Asplenium lepidum, Astragalus monspessulanus, Astragalus pubiflorus, Astragalus wilmottianus, Atropa bella-donna, Aubrieta intermedia, Betonica scardica, Bromus moesiacus, Bupleurum apiculatum, Bupleurum flavum, Bupleurum praealtum, Cachrys alpina, Campanula bononiensis, Campanula trachelium, Campanula versicolor, Castanea sativa, Centaurea arenaria, Centaurea rupestris, Cephalanthera damasonium, Chamaecytisus kovacevii, Chamaecytisus supinus ssp. velenovsky, Clematis alpina, Convallaria majalis, Dactylorhiza sambucina, Daphne cneorum, Deschampsia caespitosa, Digitalis laevigata, Digitalis viridiflora, Drosera rotundifolia, Echium vulgaris, Edraianthus serbicus, Epipactis helleborine, Eryngium palmatum, Erysimum cheiranthoides, Erysimum comatum, Euphorbia amygdaloides, Ferula heuffelii, Festuca stojanovii, Fibigia clypeata, Fritillaria orientalis, Galanthus elwesii, Genista pilosa, Gentiana acaulis, Gentiana lutea, Gentiana punctata, Gentianella bulgarica Gentianella praecox, Geranium tuberosum, Geum rhodopaeum, Glechoma hederacea, Goniolimon tataricum, Hepatica nobilis, Huetia cynapioides, Jasione bulgarica, Jovibarba heuffelii, Juniperus sabina, Knautia arvensis, Lamium album, Laserpitium krapfii, Lathyrus grandiflorus, Lathyrus niger, Ligustrum vulgare, Lilium jankae, Limodorum abortivum, Melampyrum bihariense, Menyanthes trifoliata, Mercurialis ovata, Micromeria cristata, Minuartia velutina, Morina persica, Oenanthe lachenalii, Ononis adenotricha, Ophrys apifera, Orchis papilionacea, Orobanche serbica, Paeonia peregrina, Parietaria erecta, Pastinaca hirsuta, Peucedanum oligophyllum, Plantago subulata, Poa sylvicola, Polygala hospita, Polygala supina, Polygonatum latifolium, Potentilla chrysantha, Potentilla pilosa, Primula veris, Pulmonaria mollis, Pulsatilla montana ssp. balcana, Ramonda serbica, Ranunculus fontanus, Rosa pumila, Rubus oblongoobovatus, Ruscus aculeatus, Ruscus hypoglossum, Sanguisorba officinalis, Saponaria officinalis, Sedum maximum, Sedum tuberiferum, Senecio pancici, Senecio subalpinus, Sesleria latifolia, Sibbaldia parviflora, Silaum silaus, Soldanella carpatica, Sorbus aria, Spiranthes spiralis, Stachys germaninica, Stachys serbica, Streptopus amplexifolius, Symphyandra wanneri, Tanacetum corymbosum, Taxus baccata, Teucrium chamaedrys, Thalictrum foetidum, Tilia rubra, Tragopogon balcanicus, Trifolium medium ssp. balcanicus, Trinia glauca ssp. carniolica, Trollius europaeus, Tulipa urumoffii, Utricularia minor, Verbascum eriophorum, Verbascum jankaeanum, Verbascum urumovii, Vicia dumetorum, Vicia pisiformis, Vicia truncatula, Viola balcanica, Viola gracilis, Viola orbelica, Viola pyrenaica, Vitis sylvestris.* Potential species of Appendix II of the Habitats Directive (Directive 92/43/EEC), which are also found in the Bulgarian part near the border, are Himantoglossum *caprinum, Echium russicum, Dicranum viride, Buxbaumia viridis and Tozzia carpathica*.

Fauna in the territorial scope of the CBCP and TSIM

As also pointed out in the flora characteristic, the six Serbian areas of the programme in general cover the eastern part of the Republic of Serbia, which is mainly occupied by mountain and semi-mountainous massifs and to a lesser extent by valley fields between them (for example, west of Niš). The border region between Bulgaria and Serbia is also almost entirely mountainous (with the exception of a small stretch in the Danube Plain region), with the western border mountains in Bulgaria also entering to a greater or lesser extent into the composition of the Serbian mountain massifs - including the Western Stara Planina, through which practically the entire north-western border between Bulgaria and Serbia passes (in Bulgaria to the west it is bounded by the valleys of the rivers Targovishki Timok and Visocica - a right tributary of Nishava in Serbia), the Vidlic mountain (90% in Serbia and 10% in Bulgaria, also part of the Western Stara Planina), the Ruysko-Verila mountain range, the Milevsko-Konavska mountain range, the Osogovska mountain and the Vlahina mountain. In view of this, it can be assumed that, in general, the animal species characteristic of the Stara Planina *faunistic region* (in particular, the Western Stara Planina Mountains) and the *Rhodope Faunistic Region* (in particular, the Kraishte Mountains and the Osogovo-Belasishka Mountains) are, in general, also largely characteristic of the eastern part of Serbia. Accordingly, it can be provisionally divided into a northern section corresponding in Bulgaria to the Stara Planina region and a southern section corresponding in Bulgaria to the Rilo-Rhodope region, as follows:

- **Northern section (including the regions of Bor, Zajecar, Nišavski, Pirotsky)**.

Here the main part occupies the north-western end of the Stara Planina chain in Serbia and the Serbian Carpathians, both of which are paleogeographically connected, which is due to the presence of a significant number of Carpathian elements (e.g. some snails, centipedes, locusts, etc.) in the area (including in the Western Stara Planina in Bulgaria).

According to the available studies, in this part of Serbia and mostly in Stara planina, the fauna includes one type of cyclostomi (predecessor of fish), 26 species of fish, 9 species of amphibians, 15 species of reptiles, 205 bird species and 61 species of mammals, or the total of 311 species of vertebrates.

The fauna of fishes and lampreys is rather poor. This list will be expanded with few more species following further detailed research, but, in general, because of the character of the relief and hydrography of the terrain, these waters are inhabited by a small number of species, mostly of the middle-barbel river region, while the fishes of the lower – cyprinid river region are practically lacking.

Of about 45 species of amphibians and reptiles present in Serbia, the fauna of the Stara Planina Mt. (24) comprises around 53%, and it is realistic to expect at least 5 more species, which would raise the proportion to over 64%. The diversity of the mammals of the Stara Planina (61) is characterised with a remarkable richness: over 63% of the fauna of Serbia, and it is expected that the true number is even larger. Therefore, the numerical parameters of the species diversity of amphibians, reptiles, and mammals place the Stara Planina Mt. within the important areas in Serbia from the aspect of biodiversity protection.

The birds of the Stara Planina Mt. are the best-studied faunal group. A total of 205 species were recorded on this mountain, of which 154 are nesting species, and it is expected that at least 40 more species will be found. The determined ornithofauna of the Stara Planina Mt. includes 60% of all bird species of Serbia, and it is expected that the real richness will comprise as much as 72%. Fact that is

even more important is that there are more bird species on the Stara Planina Mt. than in any other close mountain region, and for the number of nesting species this massif is the richest of all 5 national parks in Serbia. The ornithofaunistic values of the Stara Planina are almost unique at both the national and the international level, so that this mountain complex represents one of the most important mountain centres of the bird diversity in Europe.

The noteworthy characteristic of the fauna of the Stara Planina Mt. is the pattern of altitudinal gradient change of tetrapod vertebrates species diversity in relation to the principal vegetation zones. The oak belt covers the largest part of the territory of the Stara Planina Mt. in Serbia, and it is inha-bited by a strikingly large number of species (246 spp., or 85%). For this reason, the oak belt represents the greatest challenge in effective protection and conservation of the faunal diversity of the Stara Planina Mt., which is as well characterised by the greatest degree of degradation (similarly to other related regions in Serbia). The beech belt also covers a significant portion of the area, which is however inhabited by a significantly smaller segment of the recorded fauna (133 spp., or 46%). The number of species in other altitudinal belts further decreases: the belt of Norway spruce is inhabited by 104 species (36%), the subalpine belt by 53 species (18%), and the alpine belt by only 14 species (0.5%).

The recorded fauna of the troglobiont invertebrates comprises 32 species of arachnids (Pseudoscorpiones, Araneae, Opiliones, Acari), 5 species of Isopoda, 2 species of Diplopoda, and 16 species of Hexapoda (primarily Coleoptera, Orthoptera, and Collembola). Generally, eastern parts of Serbia, including this area, are considered as relatively poor, compared to the most important centres of troglobiont faunal diversity in the Balkans. The southern sector of the Stara Planina Mt. is characterised with a highly developed karstic relief, with numerous subterranean objects – caves and pits, insufficently studied from the aspect of biospeleology, so that it can be assumed that the faunal richness, particularly of the cavernicolous species with very narrow distribution, is much higher than currently determined.

This review also includes 17 species of non-troglobiont insects with the international protection status, primarily from the orders Lepidoptera and Coleoptera. So far, 17 species and 3 subspecies were determined as local or regional endemics of the Stara Planina Mt. Five more species and one subspecies of arthropods, as well as two subspecies of vertebrate taxa are delimited in the distribution to the area of the Balkans, and a total of four species and one species have somewhat wider distribution (occurring in the neighbouring areas as well).

The degree of endemism among the vertebrate groups is relatively low, contrary to the troglobiont invertebrates where it is considerably high – as much as 50% of the recorded representatives. For many of them the relic character of their ranges could be assumed. The fact that a large number of taxa are protected under various protection regimes, both national and international, has a specific importance for the evaluation of the character of this area, considering the determined faunal composition of the studied groups. The number of such taxa is particularly high among vertebrates, with the global IUCN threat status (298 vertebrate species, of which 9 in higher threat categories), the status in European red books and lists (12 vertebrates, 15 invertebrates), the status in the Habitat Directive (49 vertebrates, 14 invertebrates), the status in the Bern Convention (272 vertebrates, 12 invertebrates), the

status in the Bonn Convention (115 vertebrates), the status in the CITES lists (42 vertebrates, 1 species of invertebrates), the status in the Wild Birds Directive (102 species), the regional IUCN threat status (279 vertebrates, 88 in higher categories; 24 invertebrates, 4 in higher categories), the status in national red books and lists (278 vertebrates, 18 invertebrates), and the status of protection in the national legislative (288 vertebrates, 7 invertebrates). Of all listed groups,the species with high threat status at the global (9) and/or regional levels (92) have the highest importance. Certainly, the most important species on the Stara Planina Mt., according to these criteria, are *Falco cherrug*, *Falco naumanni*, *Aquila heliaca*, *Rhinolophus euryale*, *Myotis capaccini*, *Myotis emarginatus* and *Spermophyllus citellus*.

As more significant to a different extent in the conservation attitude of species characteristic for the border region between Bulgaria and Serbia in their respective biotopes (most of which are included under different regime in the annexes to some international conventions for the protection of biodiversity, as well as in the IUCN Red List, including species endemic for the region), it is necessary to indicate in particular:

Invertebrate

Apatura ilia, Apatura metis, Bacillidesmus bulgaricus, Beronia micevi, Brenthis hecate, Bulgaroniscus gueorguievi, Callimenus macrogaster, Calosoma sycophanta, Carabus intricatus, Chrysopa walkeri, Coenonympha rhodopensis, Duvalius papasoffi, Erebia alberganus, Erebia medusa, Erebia oeme, Erebia orientalis, Formica rufa, Glaucopsyche alexis, Gortyna borelli, Hemerobius atrifrons, Lithobius lakatnicensis, Molops robustus, Neptis rivularis, Neptis sappho, Niphargus bureschi, Oryctes nasicornis, Paranemastoma bureschi, Parnassius apollo, Parnassius mnemosyne, Pheggomisetes globiceps, Pieris ergane, Plebeius sephirus, Protoleptoneta beroni, Pseudophilotes vicrama, Saga pedo, Scolitantides orion, Serboiulus spelaeopilus, Trechus merkli, Trichoniscus anophthalmus, Typhloiulus bureschi, Zerynthia polyxena. Of the species also included in Appendix II of Directive 92/43/EEC (the Habitats Directive), it is necessary to indicate: *Austropotamobius torrentium, Carabus hungaricus, Carabus variolosus, Cerambyx cerdo, Cordulegaster heros, Eriogaster catax, Euplagia quadripunctaria, Lignyoptera fumidaria, Lucanus cervus, Lycaena dispar, Morimus funereus, Nymphalis vaualbum, Ophiogomphus Cecilia, Osmoderma eremita, Paracaloptenus caloptenoides, Polyommatus eroides, Rhysodes sulcatus Rosalia alpina, Unio crassus*.

Fish

Alburnoides bipunctatus, Barbatula barbatula, Gobio gobio, Leuciscus cephalus, Noemacheilus barbatulus, Salmo trutta fario. Of the fish also included in Appendix II of the Habitats Directive, it is necessary to indicate: *Barbus meridionalis, Cobitis taenia, Cottus gobio, Rhodeus amarus, Romanogobio kesslerii, Romanogobio uranoscopus, Sabanejewia aurata.*

Amphibians

Bufo viridis, Hyla arborea, Pelobates fuscus, Rana dalmatina, Rana graeca. Bombina variegata, Triturus cristatus and *Triturus karelinii* should also be listed in Appendix II to the Habitats Directive.

Reptiles

Ablepharus kitaibelii, Coronella austriaca, Elaphe longissima, Lacerta agalis, Natrix tessellata, Podarcis muralis, Vipera ammodytes. Of the reptiles also included in Appendix II of the Habitats Directive, it is necessary to indicate: *Emys orbicularis, Testudo graeca, Testudo hermanni*.

Mammals

Eptesicus serotinus, Felis silvestris, Hypsugo savii, Martes martes, Nyctalus noctula, Pipistrellus pipistrellus. Mammals also included in Appendix II of the Habitats Directive shall indicate: *Barbastella barbastellus, Canis lupus, Lutra lutra, Lynx lynx, Mesocricetus newtoni, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis emarginatus, Myotis myotis, Rhinolophus euryale, Rhinolophus blassi, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Rhinolophus mehelyi, Spermophilus citellus, Ursus arctos, Vormela peregusna.*

Birds

Alauda arvensis, Athene noctua, Carduelis cannabina, Carduelis chloris, Columba palumbus, Corvus monedula, Emberiza cirlus, Emberiza melanocephala, Erithacus rubecula, Erithacus rubecula, Fringilla coelebs, Galerida cristata, Hirundo rustica, Jynx torquilla, Luscinia megarhynchos, Miliaria calandra, Miliaria calandra, Monticola saxatilis, Otus scops, Parus caeruleus, Parus caeruleus, Parus lugubris, Perdix perdix, Picus viridis, Prunella collaris, Pyrrhocorax graculus, Regulus regulus, Saxicola torquata, Sylvia atricapilla, Tichodroma muraria, Turdus merula, Turdus philomelos, Turdus torquatus. Of the birds included in Appendix II of the Habitats Directive, it is necessary to indicate: *Accipiter brevipes, Accipiter gentilis, Accipiter nisus, Actitis hypoleucos, Aegolius funereus, Alcedo atthis, Alectoris graeca graeca, Anas clypeata, Anas crecca, Anas platyrhynchos, Anas querquedula, Anthus campestris, Aquila chrysaetos, Aquila clanga, Aquila heliaca, Aquila pomarina, Ardea cinerea, Ardea purpurea, Aythya ferina, Aythya nyroca, Bonasa bonasia, Botaurus stellaris, Bubo bubo, Burhinus oedicnemus, Buteo buteo, Buteo rufinus, Calandrella brachydactyla, Caprimulgus europaeus, Charadrius dubius, Ciconia ciconia, Circaetus gallicus, Circus aeruginosus, Circus cyaneus, Circus pygargus, Coracias garrulus, Crex crex, Dendrocopos leucotos, Dendrocopos medius, Dendrocopos syriacus, Dryocopus martius, Egretta alba, Emberiza hortulana, Falco cherrug, Falco columbarius, Falco naumanni, Falco peregrinus, Falco subbuteo, Falco tinnunculus, Ficedula parva, Ficedula semitorquata, Fulica atra, Gallinago gallinago, Gallinula chloropus, Gyps fulvus, Hieraaetus pennatus, Himantopus himantopus, Ixobrychus minutus, Lanius collurio, Lanius minor, Larus cachinnans, Lullula arborea, Melanocorypha calandra, Merops apiaster, Milvus migrans, Neophron percnopterus, Nycticorax nycticorax, Pandion haliaetus, Pernis apivorus, Phalacrocorax carbo, Picus canus, Podiceps cristatus, Podiceps nigricollis, Porzana parva, Porzana porzana, Porzana pusilla, Rallus aquaticus, Strix uralensis, Sylvia nisoria, Tachybaptus ruficollis, Tetrao urogallus, Tringa ochropus, Vanellus vanellus.*

- **Southern division (including Toplički, Jablanički, Pczyński regions).**

The Ruy-Verila Mountain Range, the Milevsko-Konavska Mountain Range, the Osogovska Mountain, the Vlahina Mountain and most of all the so-called "Kraishte" occupy a large part here. On Serbian territory it includes the Tumlaska (Ostrozub, 1,546 m), Gramada (1,719 m), Cemerica (Cemernik, 1,638 m), Crnook, Vardenik (1,875 m), Musul (Peak Besna kobila 1,922 m, highest point of the whole region), Doganica (1,829 m), Dukat (1,871 m) and Strazha (1,547 m) and numerous valley extensions and hollows - Vlasinska, Bosilegradska, etc. Therefore, it can be considered that, like the *Rilo-Rhodope faunistic region* in Bulgaria, representatives of mainly Euro-Siberian and European species are distributed here.

As more significant species (most of which are included under different regimes in the Appendices to certain International Conventions for the Protection of Biological Diversity, as well as in the Red List of IUCN, including species endemic for the area) characteristic of the indicated mountain ranges and massifs (and especially in the border region between Bulgaria and Serbia) in their respective biotopes, it is necessary to indicate in particular:

Invertebrate

Apatura ilia, Argna macrodonta rumelica, Brachydesmus cristofer, Brachydesmus herzogowinensis trifidus, Brenthis hecate, Calosoma sycophanta, Carabus cavernosus, Carabus gigas, Centromerus lakatnicensis, Coenonympha rhodopensis, Colias caucasica, Dociostaurus kraussi, Duvalis beshkovi, Erebia medusa, Erebia pronoe, Formica rufa, Glaucopsyche alexis, Lithobius lakatnicensis, Maculinea alcon, Melitaea aurelia, Melitaea trivia, Mentissela rebeli, Molops piceus osogovensis, Molops robustus parallelus, Neptis Sappho, Nevrorthus apatelios, Niphargus sp., Parnassius apollo, Parnassius mnemosyne, Pieris ergane, Pseudophilotes vicrama, Pterostichus brevis, Pterostichus vecors, Raphidia ulrikae, Scolitantides orion, Thymelicus acteon, Trechus priapus, Zerynthia polyxena. Of the species also included in Appendix II of Directive 92/43/EEC (the Habitats Directive), it is necessary to indicate: *Austropotamobius torrentium, Cerambyx cerdo, Euplagia quadripunctaria, Lucanus cervus, Lycaena dispar, Morimus funereus, Osmoderma eremita, Paracaloptenus caloptenoides, Rosalia alpina, Unio crassus*.

Fish

Alburnoides bipunctatus, Barbatula bureschi, Chondrostoma vardarense, Gobio gobio, Leuciscus cephalus, Oxynoemacheilus bureschi, Phoxinus phoxinus, Salmo macedonicus, Salmo trutta, Salmo trutta fario. Of the fish also included in Appendix II of the Habitats Directive, it is necessary to indicate: *Barbus cyclolepis, Rhodeus amarus, Sabanejewia aurata.*

Amphibians

Bufo viridis, Hyla arborea, Rana dalmatina, Rana graeca, Rana temporaria, Triturus alpestris. Bombina variegate and Triturus karelinii of the amphibians should also be listed in Appendix II to the Habitats Directive.

Reptiles

Ablepharus kitaibelii, Coluber caspius, Coronella austriaca, Elaphe longissima, Lacerta agalis, Lacerta trilineata, Lacerta viridis, Natrix tessellata, Ophisaurus apodus, Podarcis muralis, Podarcis taurica, Vipera ammodytes. Of the reptiles also included in Appendix II of the Habitats Directive, it is necessary to indicate: *Elaphe sauromates, Emys orbicularis, Testudo graeca и Testudo hermanni*.

Mammals

Felis silvestris, Hypsugo savii, Lepus capensis, Martes martes, Martes foina, Nyctalus noctula, Pipistrellus pipistrellus. Mammals also included in Appendix II of the Habitats Directive shall indicate: *Barbastella barbastellus, Canis lupus, Lutra lutra, Lynx lynx, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis myotis, Rhinolophus euryale, Rhinolophus blassi, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Spermophilus citellus, Ursus arctos, Vormela peregusna.*

Birds

Alauda arvensis, Athene noctua, Carduelis cannabina, Carduelis chloris, Corvus monedula, Emberiza cirlus, Emberiza melanocephala, Erithacus rubecula, Fringilla coelebs, Galerida cristata, Hirundo rustica, Jynx torquilla, Luscinia megarhynchos, Miliaria calandra, Monticola saxatilis, Oriolus oriolus, Otus scops, Parus caeruleus, Parus lugubris, Picus viridis, Pyrrhocorax graculus, Regulus regulus, Saxicola torquata, Sylvia atricapilla, Turdus merula, Turdus philomelos, Turdus torquatus. Of the birds included in Appendix II of the Habitats Directive, it is necessary to indicate: *Accipiter gentilis, Accipiter nisus, Aegolius funereus, Alcedo atthis, Alectoris graeca graeca, Anthus campestris, Aquila chrysaetos, Aquila pomarina, Ardea cinerea, Bonasa bonasia, Bubo bubo, Buteo rufinus, Caprimulgus europaeus, Caprimulgus europaeus, Ciconia ciconia, Ciconia nigra, Circus pygargus, Coracias garrulus, Crex crex, Dendrocopos medius, Dendrocopos syriacus, Dryocopus martius, Egretta alba, Emberiza hortulana, Falco cherrug, Falco peregrinus, Falco subbuteo, Falco tinnunculus, Gallinago gallinago, Hieraaetus pennatus, Lanius collurio, Lanius minor, Lullula arborea, Merops apiaster, Pernis apivorus, Phalacrocorax carbo, Picoides tridactylus, Picus canus, Sylvia nisoria.*

Summary of the state of biodiversity:

The cross-border area concerned is very rich in plant and animal species, including high conservation status at national and international level, with a large number of endemics and relicts (glacial and tertiary).

The main threats to biodiversity are the change in the natural environment resulting from possible future development of road and other connecting infrastructure, pollution, climate change, changing the water regime, logging, poaching and other threats related to habitat change and affecting the animal species characteristic of the habitat.

2.1.7. Protected areas and protected territories

- ***Regions of Vidin, Montana, Vratsa, Sofia, Pernik and Kyustendil (Republic of Bulgaria)***

<u>Protected areas of the European Natura 2000 Network</u>

Natura 2000 is a pan-European network of protected areas aimed at ensuring the long-term survival of Europe's most valuable and endangered species and habitats, in line with key international environmental and biodiversity agreements.

It should be built in all EU member states and is set as a requirement in the accession of EU candidate countries.

Places within the ecological network are defined in accordance with two main environmental Directives of the European Union - Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as the Habitats Directive) and Directive 2009/147/EC on the conservation of wild birds (hereafter referred to as the Birds Directive).

The process of establishing the Natura 2000 ecological network in Bulgaria started in 2002 with the adoption of the Biodiversity Act (BDA**)**, which introduces the norms of the two European directives. Currently, the network of protected areas in Bulgaria includes:

- 120 protected areas for the conservation of wild birds, covering 23.1% of the territory of Bulgaria;

- 233 protected areas for conservation of natural habitats, covering 30.3% of the territory of Bulgaria

Overall, the Bulgarian part of the European ecological network Natura 2000 amounts to 34.4% of the territory of the country, which ranks the country on one of the first places in Europe in this regard.

The process of issuing orders under the BDA for declaring protected areas for the conservation of wild birds has been completed **(**"Special Protection Areas" - SPAs**)**, and at the moment Bulgaria is in the process of completing orders for declaring protected areas for habitats - the zones without issued orders are designated as "Areas of Community Importance" (ACIs), and the zones with completed order process are designated as "Special Conservation Areas" (SCAs).

The six regions cover completely, to a greater, lesser or very small degree **92 protected areas of the Natura 2000 ecological network** (four of the protected areas are also designated under the Habitats Directive and the Birds Directive). These data are presented in the two figures below and in the table below:

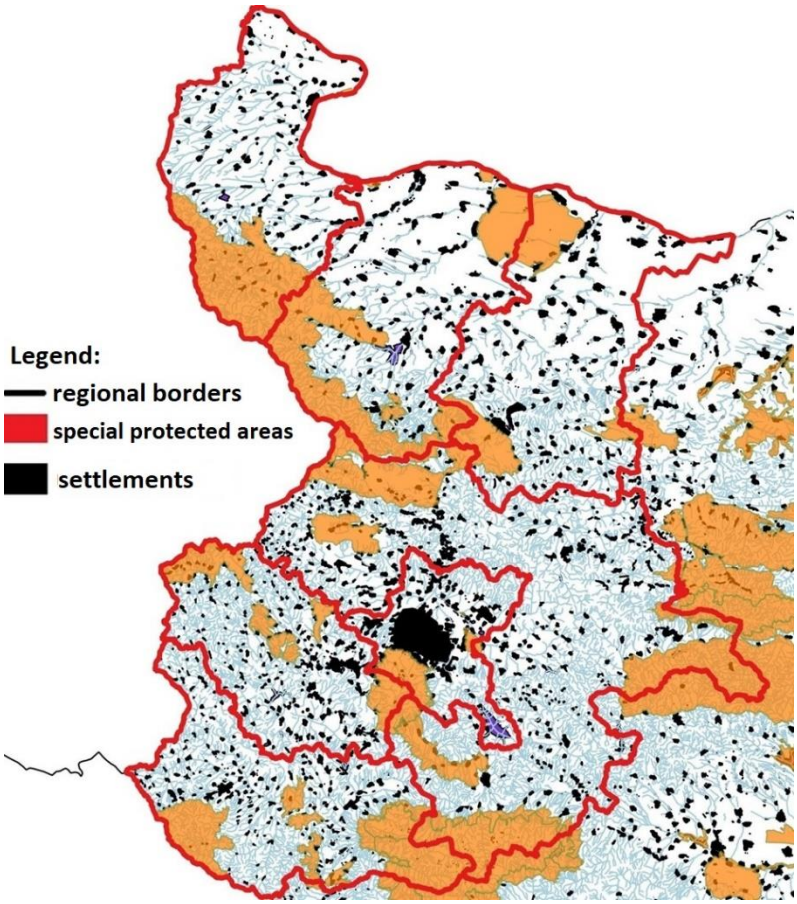


Figure 2.1.7-1 *Map of the SPAs in Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil regions*

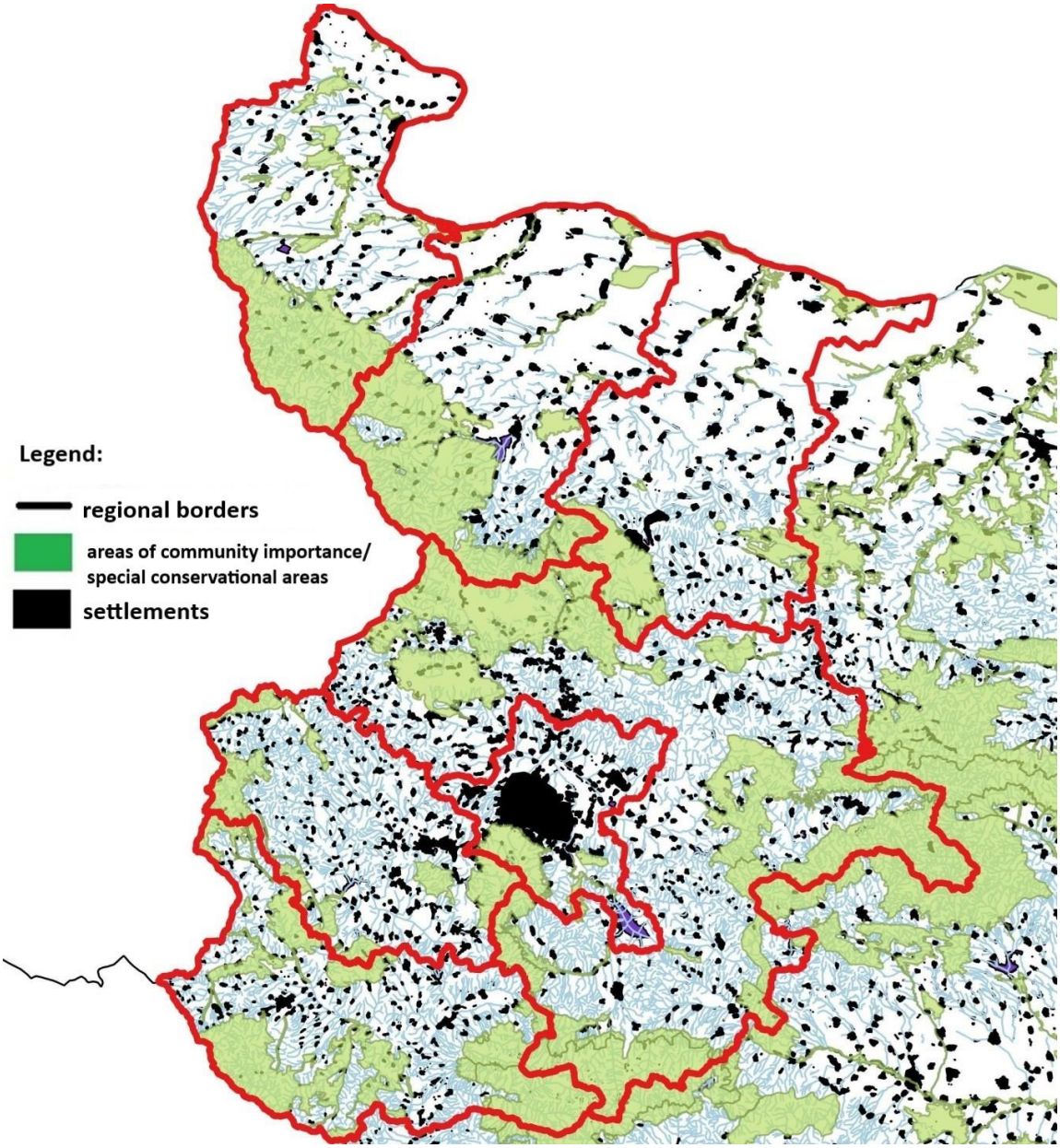


Figure 2.1.7-2 *Map of the ACIs and SCAs in the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil*

Table 2.1.7-1 *Natura 2000 sites on the territory (in whole or in part) of the regions of Vidin, Montana, Vratsa, Sofia, Pernik and Kyustendil*

Table No. ....

No by order	Code	Bulgarian name	Latin name	Type*	Announcement Order	SG No.
1.	BG0000113	Витоша	Vitosha	SPA&SAC	РД-763/28.10.2008г., изм. РД-271/31.03.2021г.	ДВ бр. 99/18.11.2008г., ДВ бр. 41/18.05.2021г.
2.	BG0000496	Рилски манастир	Rilski manastir	SPA&SAC	РД-886/25.11.2013г., изм. РД-283/31.03.2021 г.	ДВ бр. 107/13.12.2013г., ДВ бр. 45/28.05.2021г.
3.	BG0000495	Рила	Rila	SPA&SAC	РД-764/28.10.2008г., изм. РД-259/31.03.2021г.	ДВ бр. 100/21.11.2008г., ДВ бр. 40/14.05.2021г.
4.	BG0000519	Моминбродско блато	Mominbrodsko blato	SAC	РД-1047/17.12.2020г.	ДВ бр. 21/12.03.2021г.
5.	BG0000507	Делейна	Deleyna	SAC	РД-1043/17.12.2020г.	ДВ бр. 19/05.03.2021г.
6.	BG0000524	Оризището	Orizishteto	SAC	РД-263/31.03.2021г.	ДВ бр. 41/18.05.2021г.
7.	BG0000165	Лозенска планина	Lozenska planina	SAC	РД-1027/17.12.2020г.	ДВ бр. 19/05.03.2021г.
8.	BG0000182	Орсоя	Orsoya	SAC	РД-318/31.03.2021г.	ДВ бр. 49/11.06.2021г.
9.	BG0000527	Козлодуй	Kozloduy	SAC	РД-296/31.03.2021г.	ДВ бр. 47/04.06.2021г.
10.	BG0001042	Искърски пролом - Ржана	Iskarski prolom - Rzhana	SAC	РД-276/31.03.2021г.	ДВ бр. 43/21.05.2021г.
11.	BG0000314	Ребро	Rebro	SAC	РД-1019/17.12.2020г.	ДВ бр. 17/26.02.2021г.
12.	BG0000336	Златия	Zlatia	SAC	РД-336/31.03.2021г.	ДВ бр. 53/25.06.2021г.
13.	BG0000340	Цар Петрово	Tsar Petrovo	SAC	РД-1046/17.12.2020г.	ДВ бр. 21/12.03.2021г.
14.	BG0000523	Шишенци	Shishentsi	SAC	РД-1053/17.12.2020г.	ДВ бр. 21/12.03.2021г.
15.	BG0000594	Божия мост - Понора	Bozhia most - Ponora	SAC	РД-262/31.03.2021г.	ДВ бр. 41/18.05.2021г.
16.	BG0000533	Острови Козлодуй	Ostrovi Kozloduy	SAC	РД-298/31.03.2021г.	ДВ бр. 48/08.06.2021г.
17.	BG0000322	Драгоман	Dragoman	SAC	РД-265/31.03.2021г.	ДВ бр. 43/21.05.2021г.
18.	BG0000517	Портитовци - Владимирово	Portitovtsi - Vladimirovo	SAC	РД-295/31.03.2021г.	ДВ бр. 47/04.06.2021г.
19.	BG0000339	Раброво	Rabrovo	SAC	РД-1026/17.12.2020г., изм. РД-281/31.03.2021г.	ДВ бр. 19/05.03.2021г.

20.	BG0000498	Видбол	Vidbol	SAC	РД-1037/17.12.2020г.	ДВ бр. 19/05.03.2021г.
21.	BG0000500	Войница	Voynitsa	SAC	РД-1039/17.12.2020г.	ДВ бр. 19/05.03.2021г.
22.	BG0001014	Карлуково	Karlukovo	SAC	РД-329/31.03.2021г.	ДВ бр. 53/25.06.2021г.
23.	BG0000497	Арчар	Archar	SAC	РД-1035/17.12.2020г.	ДВ бр. 19/05.03.2021г.
24.	BG0001375	Острица	Ostritsa	SAC	РД-321/31.03.2021г.	ДВ бр. 52/22.06.2021г.
25.	BG0000301	Черни рид	Cherni rid	SAC	РД-338/31.03.2021г.	ДВ бр. 54/29.06.2021г.
26.	BG0001037	Пъстрина	Pastrina	SAC	РД-352/31.03.2021г.	ДВ бр. 56/06.07.2021г.
27.	BG0000374	Бебреш	Bebresh	SAC	РД-1048/17.12.2020г.	ДВ бр. 21/12.03.2021г.
28.	BG0000522	Видински парк	Vidinski park	SAC	РД-332/31.03.2021г.	ДВ бр. 54/29.06.2021г.
29.	BG0001389	Средна гора	Sredna gora	SAC	РД-274/31.03.2021г.	ДВ бр. 43/21.05.2021г.
30.	BG0001040	Западна Стара планина и Предбалкан	Zapadna Stara planina i Predbalkan	SAC	РД-268/31.03.2021г.	ДВ бр. 44/25.05.2021г.
31.	BG0001017	Кървав камък	Karvav kamak	SAC	РД-347/31.03.2021г.	ДВ бр. 57/09.07.2021г.
32.	BG0001012	Земен	Zemen	SAC	РД-328/31.03.2021г.	ДВ бр. 53/25.06.2021г.
33.	BG0001043	Етрополе - Байлово	Etropole - Baylovo	SAC	РД-275/31.03.2021г.	ДВ бр. 43/21.05.2021г.
34.	BG0001011	Осоговска планина	Osogovska planina	SAC	РД-304/31.03.2021г.	ДВ бр. 49/11.06.2021г.
35.	BG0000624	Любаш	Lyubash	SAC	РД-1033/17.12.2020г.	ДВ бр. 19/05.03.2021г.
36.	BG0000587	Варкан	Varkan	SAC	РД-102/09.02.2015г.	ДВ бр. 17/06.03.2015г.
37.	BG0000552	Остров Кутово	Ostrov Kutovo	SAC	РД-239/16.04.2015г.	ДВ бр. 39/29.05.2015г.
38.	BG0000526	Долно Линево	Dolno Linevo	SAC	РД-1020/17.12.2020г.	ДВ бр. 17/26.02.2021г.
39.	BG0000134	Чокльово блато	Choklyovo blato	SAC	РД-377/15.05.2020г.	ДВ бр. 50/02.06.2020г.
40.	BG0000295	Долни Коритен	Dolni Koriten	SAC	РД-385/15.05.2020г.	ДВ бр. 50/02.06.2020г.
41.	BG0000593	Билерниците	Bilernitsite	SAC	РД-374/15.05.2020г.	ДВ бр. 50/02.06.2020г.
42.	BG0000199	Цибър	Tsibar	SAC	РД-697/25.08.2020г.	ДВ бр. 81/15.09.2020г.
43.	BG0000532	Остров Близнаци	Ostrov Bliznatsi	SAC	РД-696/25.08.2020г.	ДВ бр. 81/15.09.2020г.
44.	BG0000304	Голак	Golak	SAC	РД-1016/17.12.2020г.	ДВ бр. 16/23.02.2021г.
45.	BG0000308	Верила	Verila	SAC	РД-337/31.03.2021г.	ДВ бр. 54/29.06.2021г.
46.	BG0000636	Ниска Рила	Niska Rila	SCI		
47.	BG0000521	Макреш	Makresh	SAC	РД-1050/17.12.2020г.	ДВ бр. 21/12.03.2021г.

48.	BG0000166	Врачански Балкан	Vrachanski Balkan	SAC	РД-1031/17.12.2020г.	ДВ бр. 19/05.03.2021г.
49.	BG0000298	Конявска планина	Konyavska planina	SCI	-	-
50.	BG0000313	Руй	Ruy	SCI	-	-
51.	BG0001013	Скрино	Skrino	SCI	-	-
52.	BG0000487	Божите мостове	Bozhite mostove	SCI	-	-
53.	BG0000503	Река Лом	Reka Lom	SCI	-	-
54.	BG0000508	Река Скът	Reka Skat	SCI	-	-
55.	BG0000509	Цибрица	Tsibritsa	SCI	-	-
56.	BG0000518	Вертопски дол	Vartopski dol	SCI	-	-
57.	BG0000601	Каленска пещера	Kalenska peshtera	SCI	-	-
58.	BG0000617	Река Палакария	Reka Palakaria	SCI	-	-
59.	BG0000631	Ново село	Novo selo	SCI	-	-
60.	BG0000294	Кършалево	Karshalevo	SCI	-	-
61.	BG0001307	Плана	Plana	SCI	-	-
62.	BG0000614	Река Огоста	Reka Ogosta	SCI	-	-
63.	BG0000528	Островска степ - Вадин	Ostrovska step - Vadin	SAC	РД-297/31.03.2021г.	ДВ бр. 47/04.06.2021г.
64.	BG0000334	Остров	Ostrov	SAC	РД-1022/17.12.2020г.	ДВ бр. 17/26.02.2021г.
65.	BG0000494	Централен Балкан	Tsentralen Balkan	SPA&SAC	РД-559/05.09.2008г., изм. РД-260/31.03.2021г.	ДВ бр. 84/26.09.2008г., ДВ бр. 41/18.05.2021г.
66.	BG0001493	Централен Балкан - буфер	Tsentralen Balkan - bufer	SAC	РД-272/31.03.2021г.	ДВ бр. 46/01.06.2021г.
67.	BG0000332	Карлуковски карст	Karlukovski karst	SPA	РД-788/29.10.2008г.	ДВ бр. 105/09.12.2008г.
68.	BG0002001	Раяновци	Rayanovtsi	SPA	РД-569/05.09.2008г.	ДВ бр. 84/26.09.2008г.
69.	BG0002004	Долни Богров - Казичене	Dolni Bogrov - Kazichene	SPA	РД-573/08.09.2008г.	ДВ бр. 84/26.09.2008г.
70.	BG0002005	Понор	Ponor	SPA	РД-547/05.09.2008г.	ДВ бр. 83/23.09.2008г.
71.	BG0002006	Рибарници Орсоя	Ribarnitsi Orsoya	SPA	РД-565/05.09.2008г.	ДВ бр. 84/26.09.2008г.
72.	BG0002007	Остров Ибиша	Ostrov Ibisha	SPA	РД-514/22.08.2008г.	ДВ бр. 78/05.09.2008г.

73.	BG0002008	Остров до Горни Цибър	Ostrov do Gorni Tsibar	SPA	РД-552/05.09.2008г.	ДВ бр. 83/23.09.2008г.
74.	BG0002009	Златията	Zlatiyata	SPA	РД-548/05.09.2008г.	ДВ бр. 83/23.09.2008г.
75.	BG0002053	Врачански Балкан	Vrachanski Balkan	SPA	РД-801/04.11.2008г.	ДВ бр. 105/09.12.2008г.
76.	BG0002067	Остров Голя	Ostrov Golya	SPA	РД-511/22.08.2008г.	ДВ бр. 78/05.09.2008г.
77.	BG0002079	Осогово	Osogovo	SPA	РД-780/29.10.2008г.	ДВ бр. 103/02.12.2008г.
78.	BG0002089	Ноевци	Noevtsi	SPA	РД-808/06.11.2008г.	ДВ бр. 108/19.12.2008г.
79.	BG0002090	Берковица	Berkovitsa	SPA	РД-842/17.11.2008г.	ДВ бр.1/06.01.2009г.
80.	BG0002099	Кочериново	Kocherinovo	SPA	РД-770/28.10.2008г.	ДВ бр.102/28.11.2008г.
81.	BG0002100	Долна Козница	Dolna Koznitsa	SPA	РД-810/06.11.2008г.	ДВ бр. 108/19.12.2008г.
82.	BG0002101	Мещица	Meshtitsa	SPA	РД-809/06.11.2008г.	ДВ бр.108/19.12.2008г.
83.	BG0002104	Цибърско блато	Tsibarsko blato	SPA	РД-558/05.09.2008г.	ДВ бр. 84/26.09.2008г.
84.	BG0002107	Бобошево	Boboshevo	SPA	РД-781/29.10.2008г.	ДВ бр. 104/05.12.2008г.
85.	BG0002108	Скрино	Skrino	SPA	РД-782/29.10.2008г.	ДВ бр. 104/05.12.2008г.
86.	BG0002112	Руй	Ruy	SPA	РД-554/05.09.2008г.	ДВ бр. 83/23.09.2008г.
87.	BG0002114	Рибарници Челопечене	Ribarnitsi Chelopechene	SPA	РД-553/05.09.2008г.	ДВ бр. 83/23.09.2008г.
88.	BG0002084	Палакария	Palakaria	SPA	РД-133/10.02.2012г.	ДВ бр. 26/30.03.2012г.
89.	BG0002002	Западен Балкан	Zapaden Balkan	SPA	РД-119/09.02.2012г.	ДВ бр. 20/09.03.2012г.
90.	BG0002054	Средна гора	Sredna gora	SPA	РД-273/30.03.2012г.	ДВ бр. 32/24.04.2012г.
91.	BG0002129	Рила буфер	Rila bufer	SPA	РД-229/11.03.2020г.	ДВ бр. 24/17.03.2020г.
92.	BG0002128	Централен Балкан - буфер	Tsentralen Balkan bufer	SPA	РД-321/04.04.2013г.	ДВ бр.46-47/21.05.2013г.

***Key:**
- SAC (*Special Areas of Conservation*) - protected areas under the Habitats Directive with an order for announcement under the BDA.
- SCI (*Sites of Community Importance)* - protected areas under the Habitats Directive for which no order for announcement under the BDA has yet been issued as of 13.08.2021 (adopted only by a decision of the Council of Ministers);
- SPA (*Special Protected Areas*) - the protected areas under the Birds Directive with an order for announcement under the BDA;

In general, the main objectives of the declaration of protected areas for birds are in the following guidelines:

- Conservation of habitats of bird species subject to conservation in protected areas, their populations and distribution within the boundaries of the areas to achieve and maintain their favourable condition;
- Improvement of the habitats of bird species subject to conservation in areas where favourable conditions are required;
- Maintenance of habitats of other bird species subject to conservation in the areas;

The species of birds that are subject to conservation in the above-mentioned areas and are respectively included in Appendix I of Directive 2009/147/EC and Appendix 2 of the BDA are presented in the Natura 2000 Standard Forms of the Areas, which are generally available in the Information System for Natura 2000 Protected Areas on the web address http://natura2000.moew.government.bg/. Besides the forms in the system are published orders for declaring areas, digital borders and other important information.

The main objectives of the Habitats Directive are set out in the following guidelines:

- Conservation and maintenance of the types of natural habitats and species subject to conservation of the areas, including their populations and distribution within the areas in order to achieve and maintain their favourable conservation status;
- Conservation of the area of natural habitats and the habitats of species and their populations subject to conservation within the protected areas;
- Conservation of the real state of natural habitats and the habitats of species subject to conservation within the protected areas, including the species' natural composition, characteristic species and environmental conditions of those;
- Restoration, if necessary, of the area and natural state of priority natural habitats and habitats of species, as well as of populations of species subject to conservation within the protected areas;
- Improvement of structure and functions where necessary of natural habitats and improvement of habitats of species for which this is necessary;
- If necessary, improvement or restoration of natural habitat types and habitats of species and their populations for which this is necessary;

The types of natural habitats that are subject to conservation in the above-mentioned areas and are respectively included in Appendix I of Directive 92/43/EEC and Appendix I of the BDA, as well as the species subject to conservation included in Appendix II of the same Directive and Appendix 2 of the BDA are presented in the Natura 2000 Standard Forms of the Areas, which are generally available in the Information System for Natura 2000 Protected Areas on the web address http://natura2000.moew.government.bg/. In addition to the forms in the system are also published the decisions of the Council of Ministers for the adoption of the areas, their orders for announcement, digital borders and other important information.

Protected areas under the PAA.

Since 1933, when the first protected territory in Bulgaria was declared - the Silkosia Reserve in Strandzha, and in 1934 the first national park on the Balkan Peninsula - Vitosha, a consistent policy for expanding and strengthening the network of protected areas has been implemented.

At the moment, 1017 protected territories have been declared in Bulgaria, covering approximately 5.27% of the country's territory. According to the PTA, the protected territories fall into 6 categories: reserves (55), national parks (3), natural landmarks (344), maintained reserves (35), nature parks (11) and protected localities (569).

Protected territories and their effective protection contribute to the fulfilment of the requirements of a number of international conventions and agreements to which Bulgaria is a party:

Bulgaria is among the first countries to accede to the Ramsar Convention on Wetlands, signed without obligation to ratify in implementation of Council of Ministers Decision No 389 of 18 November 1974, which entered into force for Bulgaria on 24 January 1976, as amended by the Protocol signed in Paris on 3 December 1982 and which entered into force for Bulgaria on 27 February 1986.

In the list of the Convention on Wetlands of International Importance (Ramsar sites), Bulgaria is represented by 11 wetlands, representing approximately 0.45% of the country's territory as in this case none of them falls within the scope of Kyustendil Region and Blagoevgrad Region.

The following figure presents the location of all PTs categories within the territorial scope of the two regions, and after it is presented their list.

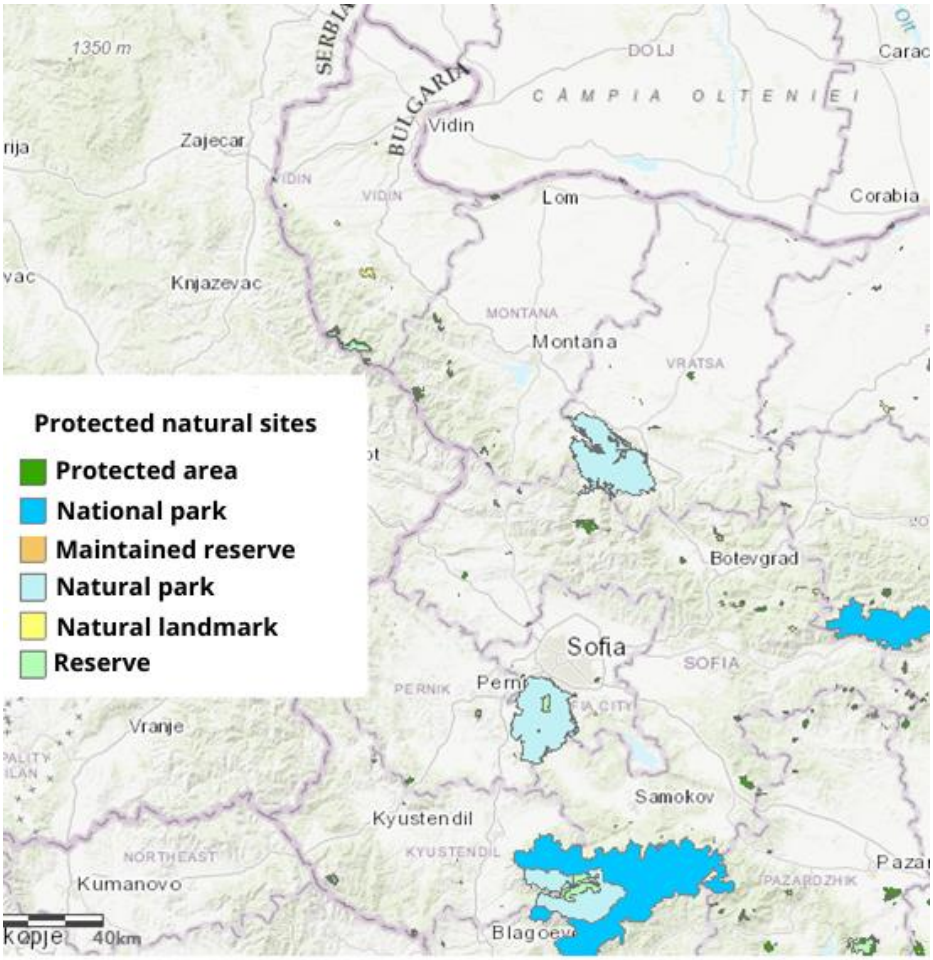


Figure 2.1.7-3 *Map of PT categories in Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil regions*

Within the scope of the six regions, 67 natural landmarks are registered, which by region are distributed as follows:

- Vidin region - 8;
- Vratsa region - 13;
- Montana region - 5;
- Sofia region - 28;
- Kyustendil region - 9;
- Pernik region - 4.

Table 2.1.7-2 *Protected territories in the areas covered by the CBCP and TSIM (excluding the "natural landmark" category*)

Name	Purpose of the announcement	Order No РД	Date of announcement	SG	Area (ha)	Region
National Parks						
Tsentralen Balkan	To preserve forever for the benefit of society complexes of self-regulating ecosystems and their inherent species diversity, habitats of rare and endangered species and communities, characteristic and remarkable landscapes and objects of non-living nature, which are of global importance for science and culture.	843	31.10.1991	93/1991	72021,1	Lovech, Gabrovo, Plovdiv, **Sofia - region** Stara Zagora
Rila	To preserve forever for the benefit of society complexes of self-regulating ecosystems and their inherent species diversity, habitats of rare and endangered species and communities, characteristic and remarkable landscapes and objects of non-living nature, which are of global importance for science and culture.	114	24.02.1992	20/1992	81046,0	Blagoevgrad, **Sofia – region Kyustendil,** Pazardzhik
Nature parks						
Vitosha	To declare strict security perimeter and nature park with the reserves in it, forests and pastures - yaylaks in Vitosha mountain.	349	14.07.2000	66/2000	27078,075	**Sofia- region** Sofia city **Pernik**
Vrachanski Balkan	Not specified in the announcement order.	934	22.07.2003	73/2003	30129,9	Vratsa Montana Sofia- region
Rilski manastir	Maintaining the diversity of ecosystems and protecting their biodiversity.	310	26.06.2000	56/2000	27370,7	Kyustendil
Reserves						
Skakavitsa	Virgin white fir plantations.	508	28.03.1968	76/1968	70,8	Kyustendil

Gornata koriya	Natural habitat of primary beech, fir-tree-beech and spruce forests in Western Stara Planina, aged 140-180 years Rare and endangered species of birds - Western capercaillie, Spotted nutcracker, Crossbill, rock eagle, included in the Red Data Book of the Republic of Bulgaria.	508	28.03.1968	76/1968	161	Montana
Chuprene	The only compact natural spruce relict forests in Western Stara Planina, spruce-fir-tree-beech dendrocenoses. rare representatives of the fauna - Western capercaillie, Hazel grouse, Crossbill, Spotted nutcracker, European crested tit, etc.	358	9.2.1973	21/1973	1451,9935	Vidin
Crna Reka	Primary beech communities.	876	25.11.1980	101/1980	196,4305	Kyustendil
Vratsa karst	Unique karst complex with picturesque landscapes, geomorphological landmarks, unique cave fauna, relict and sub-Mediterranean plant species and communities, Balkan endemics, 20 species of plants included in the Red Data Book of Bulgaria.	854	10.8.1983	72/1983	1438,9	Vratsa
Ibar	Pinus mugo forests, deposits of relict flora and rare animal species.	148	26.2.1985	26/1985	2248,6	Sofia- region
Rilomanastirska Gora	Primary forest ecosystems of coniferous and mixed fir-tree and beech forests, habitats of rare and endangered species.	307	10.4.1986	34/1986	3671,7779	Kyustendil
Central Rila Reserve	Extensive forest formations, highland grass vegetation, endemic and relict species.	114	24.02.1992	20/1992	12393,7	Sofia- region
Supported Reserves						
Gabra	Natural population of black pine - typical only for this area.	Decree 6660	5.12.1949		86,9521	Kyustendil
Ostritsa	A natural deposit of valuable plant specimens.	318	20.2.1961	31/1961	135,988	Pernik
Uchilishtna gora	Century old oak forest.	4019	12.6.1963	13/1966	134,6842	Sofia- region
Bogdan	Century old beech forest.	775	29.3.1972	30/1972	113,4	Sofia- region
Ibisha	Characteristic Danube island communities - flooded forests and swamps inhabited by protected species of plants and animals.	794	8.10.1984	71/1984	34,4716	Montana
Protected areas						
Lakatnik rocks	Preservation of rock formations	407	09.02.1966	35/1966	83,6	Sofia- region
Bukova usoyna	Preservation of centuries-old beech forest.	3700	29.12.1972	13/1973	16,2	Sofia- region

Kopren-Ravno Buche-Kalimanitsa-Deyanitsa	Preservation of a characteristic landscape	3751	30.11.1973	101/1973	575,5134	Montana
Treskavets	Example of a perfectly conducted anti-erosion event	4526	17.11.1975	98/1975	1097,3	Sofia- region
Dreneto	Conservation of habitats and nests of gray herons and white storks.	779	19.10.1979	92/1979	33	Sofia- region
Bachishte	Preservation of scenic natural views and typical for the area vegetation	753	13.08.1981	74/1981	223,6	Sofia- region
Belikata	Conservation of a natural habitat of birch	754	13.08.1981	75/1981	132,7	Sofia- region
Daneva mogila	Preservation of a characteristic river landscape and a group of centuries-old trees	413	10.05.1982	43/1982	4,9	Vratsa
Aldomirovsko blato	Conservation of natural habitats of protected and rare species of waterfowl and plant associations of 40 species of higher plants	506	09.05.1989	43/1989	129,4	Sofia- region
Habitat of rare birds and plant species - Rechka	Conservation of natural habitats of protected and rare species of birds	170	16.02.1990	18/1990	94,1	Vratsa
Muhalnitsa	Conservation of marshland and adjacent areas - habitat of *Rana temporaria* L.	328	08.05.1992	43/1992	1,9	Sofia- region
Usketo	Conservation of natural spruce forest in Stara Planina.	802	23.10.1992	90/1992	1,9054	Montana
Uruchnik	Conservation of natural spruce, beech-spruce and beech plantations in the upper mountain zone of Stara Planina.	802	23.10.1992	90/1992	51,2348	Montana
Choklyovo blato	Conservation of natural habitats of rare and endangered birds and peat habitat.	1022	30.12.1992	7/1993	320	Pernik
Vran kamak	Preservation of the natural habitats of protected and rare species of birds and plants included in the Red Book of the Republic of Bulgaria and the European Red List of Endangered Species.	259	17.07.1995	69/1995	60,6	Sofia- region
Century-old beech forest - Monastery of St. Luka	Conservation of beech forest	420	14.11.1995	105/1995	1,3	Kyustendil
Orsoya fish farms	Conservation and maintenance of populations and habitats of protected, rare and vulnerable species of flora and fauna.	898	22.11.2001	110/2001	147,1783	Montana

Shumaka	Conservation of habitats and populations of plant species with limited distribution in nature. Conservation of the rare plant species *Pulsatilla pratensis*.	899	22.11.2001	110/2001	0,5	Montana
Vezhdata	Preservation of the deposit of the plant Centranthus kellereri, Bulgarian endemic and relict. Preservation of a territory with a characteristic landscape (rock wreath and scree)	151	21.02.2003	26/2003	62,6	Vratsa
Barikadite	Conservation of centuries-old beech forest and characteristic landscape with deciduous forest and meadow communities.	332	31.03.2003	42/2003	119,7	Sofia - region Plovdiv
Aramliets	Preservation of a characteristic landscape.	411	03.04.2003	42/2003	140,8	Sofia Sofia Pazardzhik
Vola	Preservation of a characteristic landscape.	637	26.05.2003	60/2003	101,7	Vratsa
Borovanska mogila	Preservation of a characteristic landscape.	638	26.05.2003	60/2003	198,8	Vratsa
Kozloduy	The preservation of a landscape resulting from the harmonious coexistence of man and nature.	639	26.05.2003	60/2003	10	Vratsa
Borov kamak	Preservation of centuries-old beech forest with mixed origin on karst terrain on a large slope.	640	26.05.2003	60/2003	164,6	Vratsa
Koritata	Preservation of the natural habitat of Paeonia peregrina. Protecting a remarkable landscape.	641	26.05.2003	60/2003	2	Vratsa
Cochumina	Conservation of a habitat of the water lily	642	26.05.2003	60/2003	2,5	Vratsa
Gola bara	Conservation of a habitat of the water lily	643	26.05.2003	60/2003	2	Vratsa
Kalugerski grad - Topolite	Conservation of the Stratiotes aloides plant.	644	26.05.2003	60/2003	0,2	Vratsa
Tepeto	Preservation of the natural habitat of Paeonia peregrina.	646	26.05.2003	60/2003	6	Vratsa
Shumnatoto tepe - 2	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1052	18.08.2003	86/2003	1	Sofia- region
Eleshnichki Monastery	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1053	18.08.2003	86/2003	3,5	Sofia- region
Benkovskata cave	Preservation of centuries-old beech forest.	1054	18.08.2003	86/2003	4,1	Sofia- region

Chakarovi polyani	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1055	18.08.2003	86/2003	6,3	Sofia- region
Eledzik	Preservation of natural beech forests.	1056	18.08.2003	86/2003	668	Sofia- region
Romaniya	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1057	18.08.2003	86/2003	0,1	Sofia- region
Pantata	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1058	18.08.2003	86/2003	0,1	Sofia- region
Manastirska koriya	Preservation of a unique beech forest around the monastery of “Sv. Sv. Kiril and Metodiy" aged between 120 and 140 years.	1059	18.08.2003	86/2003	40	Sofia- region
Urvich	Conservation of seed oak forests.	1060	18.08.2003	86/2003	93,3	Sofia- region
Halmcheto	Conservation of a territory with a characteristic landscape. Preservation of a plantation of black pine.	1061	18.08.2003	86/2003	16	Sofia- region
Monastery Sveta Troytsa	Preservation of natural beech forests.	1062	18.08.2003	86/2003	63,3	Sofia- region
Vartopa	Preservation of centuries-old beech forest.	1063	18.08.2003	86/2003	5,4	Sofia- region
Sveti Spas	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1064	18.08.2003	86/2003	3	Sofia- region
Plenshtitsa	Preservation of a natural 80-year-old fir tree plantation.	1065	18.08.2003	86/2003	3,9	Sofia- region
Cherkovishteto	Conservation of mixed coniferous and deciduous natural crop.	1066	18.08.2003	86/2003	8,7	Sofia- region
Golyamoto gradishte	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1067	18.08.2003	86/2003	2	Sofia- region
Malkoto gradishte	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1068	18.08.2003	86/2003	2	Sofia- region
Kaleto	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1069	18.08.2003	86/2003	0,8	Sofia- region
Trayanova Fortress	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1070	18.08.2003	86/2003	0,2	Sofia- region
Shumnatoto tepe - 1	Conservation of a territory with a characteristic landscape that is the result of harmonious coexistence of man and nature.	1071	18.08.2003	86/2003	1,5	Sofia- region

Kitkata	Conservation of vulnerable and rare plant communities - centuries-old forest of summer oak.	1078	21.08.2003	86/2003	1,4579	Montana
Vrashka chuka	Conservation of rare, protected and vulnerable plant species.	1079	21.08.2003	86/2003	68,2794	Vidin
Lipaka	Conservation of habitats of endangered, vulnerable and rare plant species.	1080	21.08.2003	86/2003	13,3719	Vidin
Rakovishki Monastery	Conservation of a territory with a characteristic landscape, which is the result of harmonious coexistence of man and nature and providing an opportunity for tourism.	1082	21.08.2003	86/2003	28,0707	Vidin
Izvora	Preservation of the remains of a centuries-old oak forest - 22 centuries-old trees, and the environment necessary for their existence.	256	06.06.2000	51/2000	1,7164	Sofia- region
Ravnensko gradishte	Conservation of characteristic landscape and conservation and maintenance of habitat conditions of protected plant species, such as Spurge-laurel, and vulnerable plant species, such as Erythronium dens-canis and Ruscus aculeatus; providing opportunities for development of ecotourism.	565	02.06.2005	62/2005	186,03	Montana
Sto ovtsi	Conservation of habitats of protected species of plants (Galanthus nivalis L., Martagon Lily) and animals (Testudo hermanni, eagle, etc.), rock communities and characteristic landscape.	926	24.10.2005	94/2005	289,84	Montana
Ostrov Kutovo	Conservation of habitats of rare and vulnerable plant (snowflake) and animal species (nocturnal, grey and small white heron, Dalmatian and pink pelican, Platalea leucorodia, small and large cormorant, etc.).	291	10.04.2007	49/2007	118,3348	Vidin
Tsibar Island	Conservation of habitats for nesting, wintering and resting during migration of protected bird species (Sterna hirundo L., Sterna albifrons Pallas, Eurasian oystercatcher, Dalmatian pelican, mixed heron colony, etc.):	292	10.04.2007	49/2007	101,4757	Montana
Visoka mogila	Re-categorized from the buffer zone of a maintained Uchilishtna gora Reserve	504	12.07.2007	72/2007	164,3	Sofia- region
Nevida	Re-categorized from the buffer zone of a maintained Bogdan Reserve	508	12.07.2007	72/2007	121,2	Sofia- region
Belite kladentsi	Re-categorized from the buffer zone of a maintained Ostritsa Reserve	529	12.07.2007	72/2007	128,1	Pernik
Zeleniya rid	Re-categorized from the buffer zone of Crna Reka Reserve	503	12.07.2007	72/2007	258,3	Kyustendil
Samarite	Re-categorized from the buffer zone of the Gornata Koria Reserve	417	18.06.2007	61/2007	107,1464	Montana

Chuprenski buki	Re-categorized from the buffer zone of Chuprrene Reserve	509	12.07.2007	72/2007	553,0604	Vidin
Islands Bliznatsite	Conservation of habitats of endangered, rare and vulnerable animals (Platalea leucorodia, night heron, small white heron, grey heron, small cormorant and large cormorant) and plant species (snowflake, euphorbia lucida, Aristolochia rotunda L.)	928	28.12.2007	9/2008	11,237	Vidin
Midzhur	Preservation of a characteristic landscape, including alpine pastures and cliff beavers, as well as habitats of protected and rare plant species, such as: *Lilium jankae*, *Anemone narcissiflora*, *Clematis* alpina, *Rhodiola rosea*, Swertia *punctata*, *Tozzia carpathica*, etc.	136	23.02.2009	36/2009	159,3092	Vidin
Koritata	Conservation of the plant species *Trichocolea tomentella* and its habitat	834	14.11.2011	101/2011	0,88	Montana
Golo bardo - habitat of Ophrys insectifera L.	Conservation of the plant species *Ophrys insectifera* L. and its habitat.	453	08.06.2012	38/2012	10,6182	Pernik
Shabovitsa	Conservation of the plant species - *Trichocolea tomentella* and its habitat.	642	14.08.2012	75/2012	6,691	Montana
Gluharchevidna zhaltitsa	Conservation of the plant species Leontodon *saxatilis* Lam. and its habitat.	643	14.08.2012	75/2012	0,8	Montana
Habitat of Convolvulus althaeoides L.	Conservation of the plant species *Convolvulus althaeoides* L. and its habitat.	34	16.01.2013	14/2013	1,4308	Vidin
Habitat of Centaurea finazzeri Adamovic	Conservation of plant species - *Centaurea finazzeri Adamovic* and its habitat.	432	15.05.2013	51/2013	40,2121	Kyustendil
Habitat of Verbascum anisophyllum Murb. - village of Tsarvenyano	Conservation of the plant species - *Verbascum anisophyllum* Murb. and its habitat.	433	15.05.2013	51/2013	22,357	Kyustendil
Artemisia chamaemelifolia Vill. - village of Brakyovtsi	Conservation of the plant species *Artemisia chamaemelifolia* Vill. and its habitat.	547	09.07.2013	67/2013	78,0959	Sofia- region

Habitat of Plantago maxima Jacq. - village of Buchin prohod	Conservation of the plant species *Plantago maxima* Jacq. and its habitat.	644	15.08.2013	80/2013	6,9789	Sofia- region
Salix rosmarinifolia L.	Conservation of the plant species *Salix rosmarinifolia* L. and its habitat.	646	15.08.2013	80/2013	18,1527	Sofia- region
Habitat of Lathyrus palustris L. - village of Buchin prohod	Conservation of the plant species *Lathyrus palustris* L. and its habitat.	647	15.08.2013	80/2013	2,15	Sofia- region
Habitat of Verbascum anisophyllum Murb. - village of Vukovo	Conservation of the plant species *Verbascum anisophyllum* Murb. , and its habitat.	638	14.08.2013	89/2013	9,7005	Kyustendil
Habitat of Lycopodiella inundata - village of Dragoychintsi	Conservation of the plant species - *Lycopodiella inundata* and its habitat.	143	18.02.2014	24/2014	8,4427	Kyustendil
Kalna matnitsa	Preservation of valuable representatives of cave invertebrates: *Vandeloniscellus bulgaricus*, *Trichoniscus anophthalmus* (Isopoda), Paranemastoma radewi (Opiliones), *Porrhomma convexum, Hoplopholcus forskali, Meta menardi, Metellina merianae, Nesticus cellulanus* (Araneae), *Chthonius sp., Roncus mahnerti* (Pseudoscorpiones), *Lithobius lakatnicensis* (Chilopoda), *Trachysphaera sp., Typhloiulus bureschi* (Diplopoda), *Ceratophysella armata* (Collembola), *Duvalius beroni* (Coleoptera: Carabidae) , *Bryaxis beroni* (Coleoptera: Pselaphidae), *Mycetaea hirta* (Coleoptera: Endomychidae), A*theta macroptera, Que dim mesomelinus skoraszewskyi* (Coleoptera: Staphylinidae); typical underground dwellers: two species of crustaceans - the representative of the sub-class Copepoda - *Diacyclops languidoides* (s. lat.) and the isopod *Sphaeromides bureschi*; habitats of 6 species of bats of conservation importance: *Rhinolophus ferrumequinum*, *Rhinolophus* hipposideros, *Rhinolophus euryale*, *Myotis blythii*, *Myotis* capaccinii and *Miniopterus schreibersii*.	348	25.05.2017	50/2017	22,5712	Vratsa

Kashkavalya	Conservation of six conservationally important species of plants - *Achillea ageratifolia*, *Achillea* clypeolata, *Edraianthus serbicus*, *Anthyllis aurea*, Festuca oviniformis, *Festuca stojanovii* and their habitat.	558	04.08.2017	70/2017	16,7348	Pernik
Paeonia tenuifolia	Conservation of the plant species - *Paeonia tenuifolia* and its habitat.	592	28.08.2017	85/2017	13,52	Sofia- region
Alepu Swamp	Preservation of the natural habitats of protected and rare waterfowl, as well as the only locality of the Trápa nátans on the Black Sea coast	474	30.07.2018	76/2018	176,6318	Burgas
Serapionova Cave	Conservation of habitats of bat species of national and European importance: *Rhinolophus ferrumequinum*, *Rhinolophus* hipposideros, *Rhinolophus euryale*, *Myotis myotis*, *Myotis blythii*, *Miniopterus schreibersii*, *Myotis* capaccinii, as well as species of invertebrates, including the troglobinous insect *Beskovia bulgarica*.	212	06.03.2020	45/2020	0,221	Vratsa

- ***Regions in the Republic of Serbia***

Proposed protected areas of the European ecological network Natura 2000 (Emerald network, ornithologically important sites - OIS, etc.).

As mentioned above, Natura 2000 is a pan-European network of protected areas aimed at ensuring the long-term survival of Europe's most valuable and endangered species and habitats, in line with key international environmental and biodiversity agreements. It should be built in all EU member states and is set as a requirement in the accession of EU candidate countries. Since Serbia is not a member of the Union, there are no officially established and adopted by decisions of the EC lists of protected areas (PA) under Natura 2000, but as a candidate member it prepares for the process of identifying and proposing such by preparing appropriate proposals. In this regard, the country has adopted the approach to use the already adopted protected areas under national legislation, the established areas of the Emerald Network (Ecological network to conserve wild flora and fauna and their natural habitats of Europe), the established ornithological sites under Birdlife (IBAs), the established important plant sites (IPAs), important bird sites (PBAs), Ramsar sites and some others that are part of the National Ecological Network of Serbia.

Emerald network is a network of areas of special conservation interest designated to preserve the network of natural habitats and it is developed on the territory of the Parties to Bern Conventions. The main motive behind the development of this network is to contribute to the ecological network Natura 2000 in countries that are not member states of the European Union, using as much as possible similar methodological approach. The Emerald Network is based on the same principles as the Natura 2000 Network and is formally seen as a preparation stage in the implementation of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, the Habitats Directive, within the process of European integrations. In order to ensure maximum consistency between the two processes, lists of species of plants and animals listed in the Appendices of the Convention have been harmonized with the lists of species in the Annexes to the Habitats Directive and the Birds Directive, i.e. Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds, first adopted in 1979 - Council Directive 79/409/EEC. The Emerald Network in Serbia is an ecological network comprising Areas of Special Conservation Importance (ASCI), i.e., spatial entities and habitats of special national and international importance in terms of biological diversity conservation. A total of 61 areas in the Republic of Serbia have been nominated for inclusion in the Emerald Ecological Network with area of 1,019,269.31 ha which represents 11.54% of the territory Serbia. They are an integral part of the national ecological network. The areas nominated are particularly important for the protection and conservation of wild plant and animal species and their habitats. 19 of these areas are located totally or partially within the territorial scope of the districts of the program in East Serbia according the next Figure and the list after it. This areas overlap with another protected sites from the national ecological network of Serbia according the given list.

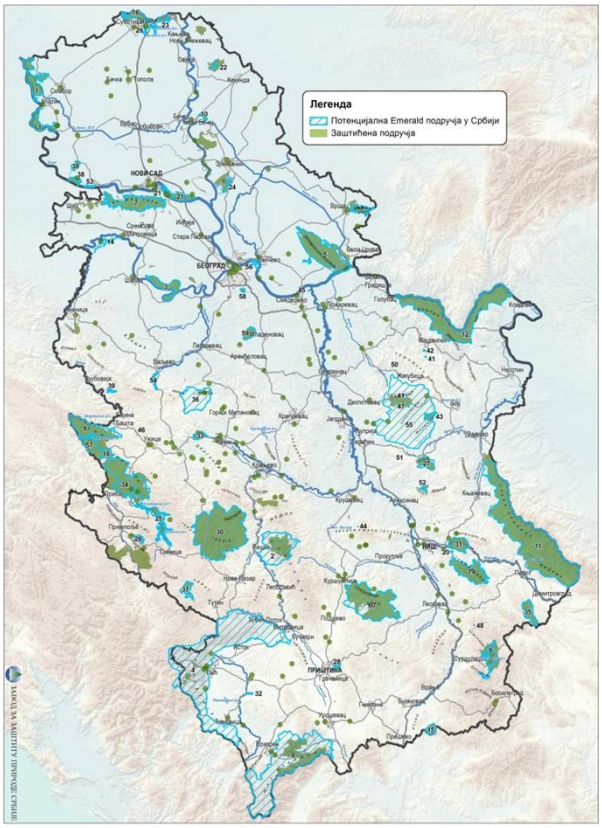


Figure 2.1.7-4 *National Emerald Network of Republic of Serbia*

Table 2.1.7-3 *List of potential "EMERALD AREAS" in the scope of the CBC region*

No.	Site Code	Site Name	National Status Protection	Ramsar	MAB	IPA	IBA	PBA
6	RS0000006	VLASINA	PIO			x	x	x
11	RS0000011	STARA PLANINA	PP			x	x	x
12	RS0000012	ĐERDAP	NP			x	x	x
15	RS0000015	DOLINA PČINJE	PIO			x	x	
19	RS0000019	SUVA PLANINA	UPZ-SRP			x	x	x
20	RS0000020	JELAŠNIČKA KLISURA	SRP			x		
27	RS0000027	RTANJ	RPP-UPZ- SRP			x		x

35	RS0000035	JERMA	UPZ-SRP			x		x
41	RS0000041	FELJEŠANA	StPR- UPZ- RP					
42	RS0000042	MUSTAFA	StPR					
43	RS0000043	LAZAREV KANJON	SP			x		x
44	RS0000044	PROKOP	RP					
47	RS0000047	VINATOVAČA	ORP					
48	RS0000048	ZELENIČJE	StPR- UPZ- SRP					
51	RS0000051	MALA JASENOVA	StPR- UPZ- SRP					
52	RS0000052	OZRENSKE	PNL- UPZ- PIO					x
55	RS0000055	kUČAJSKE	PI					x
60	RS0000060	RADAN	PI					x
61	RS0000061	BUSOVATA	StPR					

Legend:

NP - National Park, PIO - Landscape of Outstanding Features, PNL - Landscape of outstanding beauty, PP - Nature Park, RPP - Regional Nature Park, RP - Nature Reserve, ORP - General Nature Reserve, SRP - Special Nature Reserve, StPR- StPR - Strict Nature Reserve, SP - Monument of Nature, UPZ - Protection under way, PI - Preliminary research, Ramsar - Ramsar Site, MAB - Biosphere Reserve, IPA - Important Plant Area, IBA - Important Bird Area, PBA - Prime Butterfly Area

In the process of integration into European Union the Republic of Serbia is obliged and committed to respond to the requirements of the EU, including implementation of the two most important directives on nature - Habitats Directive and Bird Directive which are the grounds for the establishment of the Natura 2000 network. The identified Emerald areas, the important areas for birds (IBAs), plants and butterflies can certainly serve as good basis for their implementation.

In 2009 42 **Important Bird Areas (IBA)** with the total coverage of 1 259 624 hectares, which represents 14.25% of the territory of the Republic of Serbia have been identified (Puzovic et

al., 2009). Furthermore, 62 areas of **Important Plant Areas (IPA)** have been defined and they encompass a surface of 747 300 ha or 8.5% of the territory of the Republic of Serbia. Also, 40 areas of **Prime Butterfly Areas (PBA)** have been identified. The total surface of all PBA surfaces is 903 643 hectares, which represents 10.2% of the territory of the Republic of Serbia. **Ten Ramsar sites** cover total area 615 22 ha or 0.7% of territory. The area of the proposed Prime Hoverfly Area outside of the Nationally Protected Area is small (1.36% of the national territory), but its protection would greatly improve hoverfly conservation by increasing the inclusion of hoverfly habitats for previously unprotected species and by including hoverfly biodiversity hot spots.

According the next figure the Important Bird Areas that are totally or partially within the territorial scope of the districts of the program in East Serbia are: Djerdap, Mala Vrbica, Gornje Pomoravlje, Resavska klisura, Zlotska klisura, Rtanj, Kopaonik, Sicevacka klisura, Jerma, Suva planina, Stara planina, Vlasina, Pcinja.

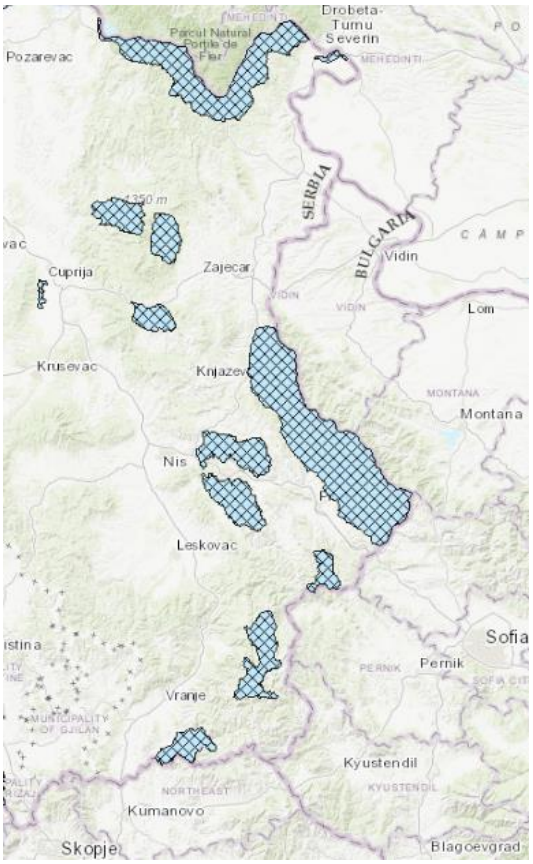


Figure 2.1.7-5 *Map of IBA sites in the territorial scope of the program in East Serbia*

According the next figure the Important Plant Areas that are totally or partially within the territorial scope of the districts of the program in East Serbia are: Djerdap, Kladovo-Radujevac, Veliki Krs and Stol, Klisura Lazareve reke, Rtanj, Sicevacka klisura, Lalinacka slatina, Suva

planina, Sljivovicki vis, Jelasnicka klisura, Stara planina, Klisura Jerme, Vlasinska visoravan, Dolina Pcine, Rujan, Rudune.

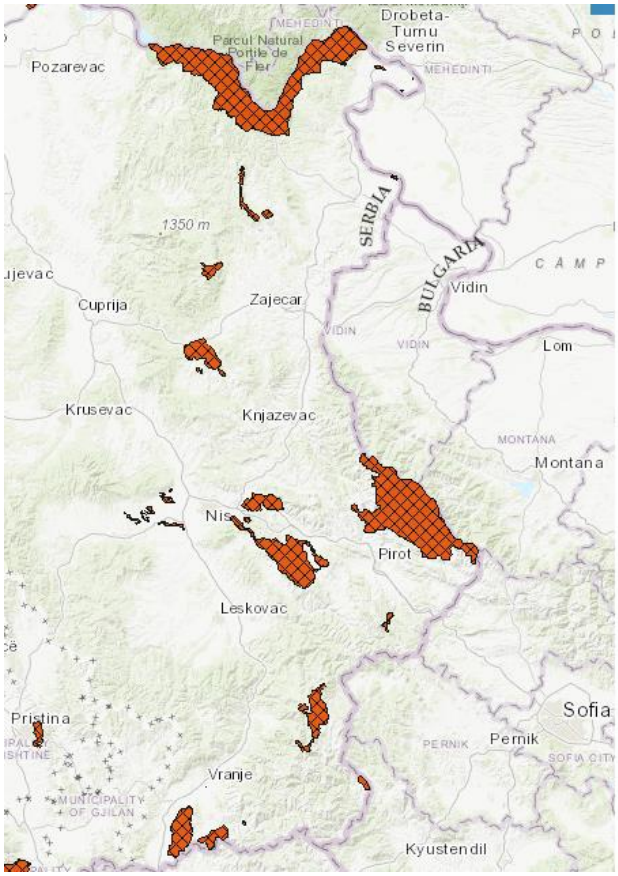


Figure 2.1.7-6 *Map of IPA sites in the territorial scope of the program in East Serbia*

On the next figers are presented and the Prime Butterfly Areas (PBA) and the Ramsar sites ("Vlasina" reservoir) within the territorial scope of the districts of the program in East Serbia.

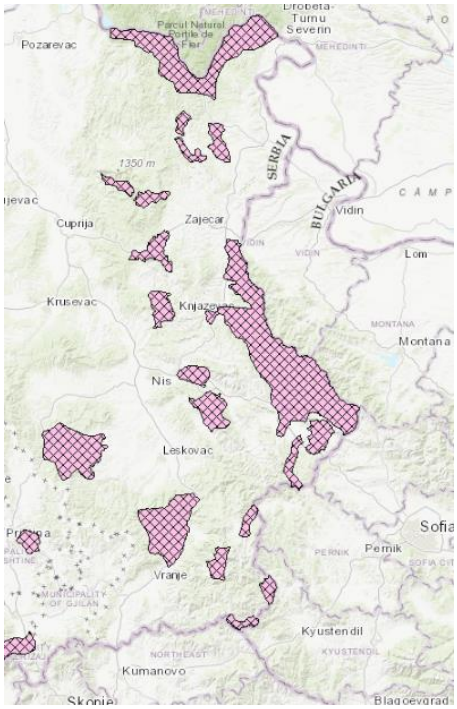


Figure 2.1.7-7 *Map of PBA sites in the territorial scope of the program in East Serbia*

Figure 2.1.7-8 *Map of Ramsar sites in the territorial scope of the program in East Serbia – "Vlasina"*

The territorial scope of the program in East Serbia comprises the Vlasinsko reservoir (created in 1949) and surrounding gently rolling hills, jagged shore, wet meadows, peat bogs, and

the valley of the River Vlasina, along with two islands and several narrow and elongated peninsulas with many meadows and birch thickets, giving the site a characteristic and unique appearance. The peat island and peat bogs represent one of the most important refuges of the boreal flora in southern Europe in general. The site harbors many rare and threatened vegetal and animal species. More than 125 bird species are recorded, amongst them the endangered corncrake (*Crex crex*) which nests every year within the site and on sloping meadows of the surrounding mountains, as well as a colony of sand martins (*Riparia riparia*) with around 300 active nests, unique in this biogeographical region. Prior to creation of the reservoir, the Vlasinsko Blato, or peat bog, was considered the largest peat bog in the Balkans and one of the largest in Europe.

It should be borne in mind that the final adoption of the lists of PAs proposed by the candidate member states by the EC takes place within the framework of the discussions during the so-called biogeographical seminars, which are part of the so-called Natura 2000 Biogeographical Process. Representatives of the scientific community from the EU Member States (MS), representatives of the relevant ministries of MS, representatives of some responsible European institutions (European Thematic Centre for Biodiversity of the European Environment Agency) and other stakeholders take part in these discussions with opinions and proposals. In these discussions, the lists of proposed PAs may undergo significant adjustments due to a change in the boundaries of the restricted areas or as a result of the removal of existing ones or the inclusion of new ones. Therefore, at this stage, the areas considered above with the potential to be included in the future ecological network Natura 2000 of Serbia should not be considered as definitive, but only as hypothetical.

Protected areas under the national legislation of the Republic of Serbia

The Republic of Serbia has recently taken steps to reinforce its biodiversity conservation framework and is seeking to develop better ecological representation and a sustainably funded Protected Areas system. The former national Spatial Plan (1996-2008) prescribed the expansion ofprotected areas to encompass 10% of the territory by 2010, in order to ensure better ecosystem representation in the PA system. The Law on the Spatial Plan of the Republic of Serbia from 2010 until 2020 envisages the protection of biodiversity and landscapes as strategic priorities, while protecting 10% of the country's territory remains one of the goals.

The legal framework for protected areas is elaborated in the Law on Nature Protection. Seven types of protected areas have been defined by this law and there are three levels of protection within protected areas. The seven basic types of Protected Areas (PAs) in the Republic of Serbia include: (1) strict nature reserves, (2) special nature reserves, (3) national parks, (4) monument of nature, (5) protected habitat, (6) landscape of outstanding features and (7) nature parks.

The country's five national parks comprise approximately 30% of the area under protection in the Republic of Serbia. All national parks have two main functions: 1) protection of nature, i.e. implementation of necessary measures for the conservation of rare species and habitats, and 2)

utilization of forests. As a result of limited government funding for conservation activities, the public enterprises managing national parks are in a conflicting situation that requires they exploit natural resources in order to finance the conservation of natural resources. This financial and programmatic tension leads to compromises that are not necessarily in the best interests of bio diversity conservation.

At present, the network of protected areas in Republic of Serbia comprises 464 areas proclaimed under the Law on Nature Protection as follows:

Table 2.7.7-4 *Protected areas in Republic of Serbia (Source: IUCN, 2019)*

National protected area type	Number	Land surface/km²
National Parks	5	1502.24
Nature Parks	16	2143.59
Protected Landscape	20	656.06
Reserves – Strict and Special Nature Reserves	70	1341.69
Nature Monument	349	129.33
Protected Habitat	4	14.14
Total	**464**	**5787.05**

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A map of the currently existing national protected areas in the territorial scope of the program in East Serbia is given on the next figure.

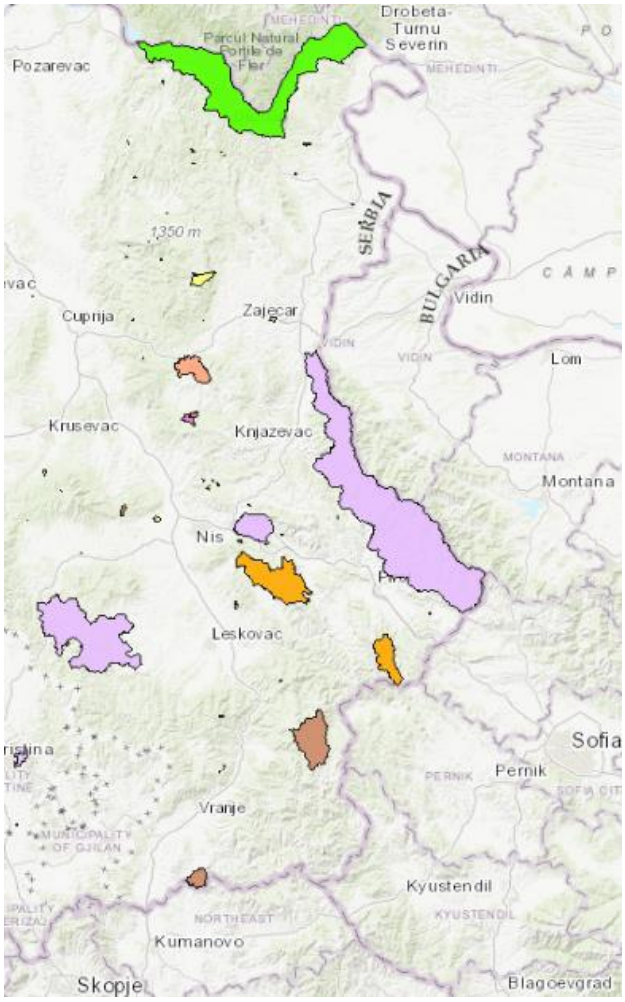


Figure 2.1.7-9 *Map of the current National network in the territorial scope of the program in East Serbia*

As it could be seen from the above map the protected areas (including the area of their total territorial range) are overlapped by the Emerald sites, Important Bird Areas, Important Plant Areas and Prime Butterfly Areas (PBA) that have already been considered above. **In the table of the Emerald sites also is provided a list of the categories under the national status protection covered by the program in East Serbia.**

Certain protected areas which have been established by the Law on Nature Conservation, witha primary goal of conservation of biodiversity, as well as areas of international importance (Emerald network sites, IBA, IPA, PBA, Ramsar areas, border areas of ecological importance and certain areas of habitat types and wild species habitats) are a part of the ecological network of Serbia presented on the next figure.

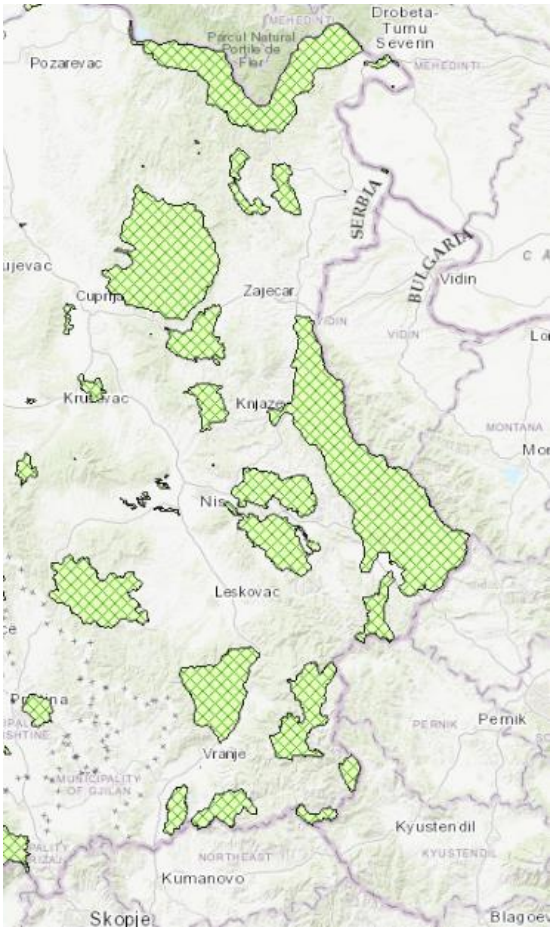


Figure 2.1.7-10 *Map of the ecological network of Serbia in the territorial scope of the program*

Summary of the state of the protected areas and territories:

The territory of the cross-border region, both in the Bulgarian part and in the Serbian part, is rich in valuable natural territories under legal protection. In this regard, all future activities of the CBCP and TSIM concerned should take into account the management regimes in accordance with the regulations of the country concerned, as well as the regulations and administrative acts for the adoption and notification of protected areas and zones, as well as the management plans, if any.

2.1.8. Landscape state

A *European Landscape Convention* plays an essential role in the protection of the landscape, in addition to national legislation. The main objective of the Convention is to preserve the European cultural and natural heritage, which defines the shape of the pan-European landscape. Another objective of the Convention is to demonstrate that the natural and cultural components of the landscape can be protected and strengthened even without their being declared monuments. The two main aspects of the Convention are:

- the recognition of the value of all components of the landscape and their importance for ensuring the quality of life of people and their originality;
- the active role of society in the perception and assessment of the landscape.

In modern landscapes, it is important to take into account the degree of landscape change from anthropogenic interference, sometimes causing a disturbance of the natural equilibrium and the need to preserve and restore the natural features of the landscape concerned. On this basis, landscapes can be divided generally into:

- ***natural*** landscapes - they are formed under the influence of natural factors and do not fall under the influence of human activity. As evidenced by the analysis of biodiversity, protected areas and territories within the cross-border area, there are extremely diverse natural habitats, with a specific, valuable natural landscape - in most cases, with a specific legal conservation status.

- ***anthropogenic*** landscapes - they are the result of human activity, which changes to varying degrees some of the natural components, forming their specific character and structure. Anthropogenic landscapes include most of the modern landscapes on the ground, including in the considered cross-border territory.

The landscape **characteristic** of the cross-border area is as follows:

- ***Regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria)***

Regarding the landscape in the Republic of Bulgaria, there are two established Bulgarian State Standards (BDS), set as part of the Bulgarian national procedure.

- *BDS 17.8.1.01-88 Nature protection:* Landscape definitions and definitions - "natural landscapes", "landscape structure", "vertical and horizontal landscape links", "landscape resilience", "anthropogenic landscapes", "anthropogenic impact on the landscape", "landscape use mode", "landscape pollution", "landscape management", "landscape protection", "landscape restoration" and "landscape conservation";
- *BDS 17.8.1.02-89 Nature protection: Classification of the landscape - classifies* the types of landscape according to their conservation and rational use.

According to the Landscape zoning under G. Petrov, 1997, the area of the six regions is located on parts of three landscape regions and six landscape sub-areas - North Bulgarian Zone of the Danube Plain (North and South Danube sub-areas), Stara Planina region (West Stara Planina sub-area) and South Bulgarian Mountains and Caves region (Vitoshko-Ihtimanska, Krayshtenska and Osogovo-Srednostrumska sub-areas).

As classes of landscapes, the area is characterized by inter-mountain plain and lowland landscapes, hob landscapes and mountain landscapes.

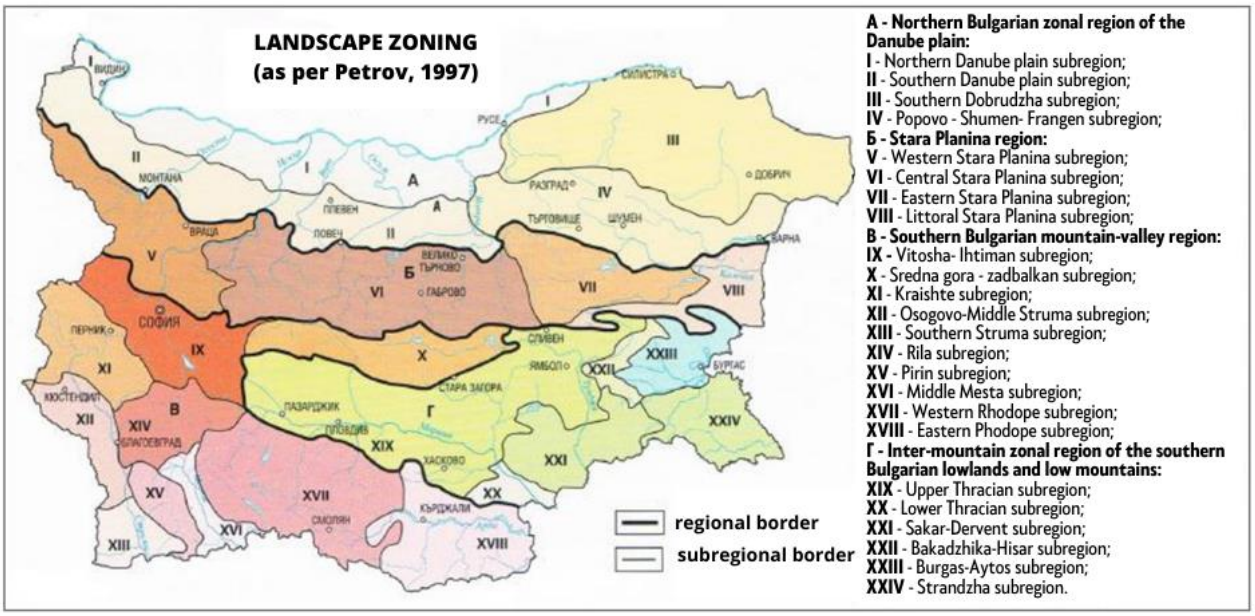


Figure *2.1.8-1 Landscape zoning map (Petrov 1997)*

The westernmost ***and lowest parts of the Danube plain fall from the northern and southern Danube sub-areas*** within the scope of the CBCP and the TSIM. The average altitude is 130 meters. The catchment areas between the rivers that flow into the Danube are occupied by low hills, plains and plateaus, called zlatias. They have steep western and sloping eastern slopes, contrary to the region's narrow canyon valleys. The area falls entirely within Class I Plain and pre-mountain-hilly landscapes, type: 1. Plain and hilly, moderate semi humid landscapes (Velchev et al. 1992). Characteristic subtype: flat-hilly, woodland landscapes (denudation-erosion landscapes on loess, defined by forest formations developed on soil cover from ordinary fayo-terrestrial soils and non-irrigated arable lands on gley Chernozem soils - Vidin plateau; denudation-erosion landscapes on Quaternary loess deposits - in the Bregovo- Novoselska part of the Vidin lowland; accumulative plain and meadowland landscapes - overbay terraces of the Vidin lowland). The area is significantly anthropogenised.

The western Stara Planina sub-area has a varied relief, predominantly hilly, with the hills being oblong and oriented in a north-easterly direction. They are characterized by paleau ridges and deep cut valleys and river valleys. Due to its transitional location and diversity in terms of relief, hydrogeological and climatic conditions and rock substrate, the area bears the markings in addition to the mountain landscapes from the south, as well as those of the woodland landscapes on the hilly plateaus and plains in the north. Forest and agricultural landscapes predominate. There are also preserved meadow (extremely small percentage, representatives of the naturally preserved landscapes) and pasture (in the hilly part of the region) landscapes.

The area, especially the mountain slopes, is relatively poorly affected by anthropogenisation. Only agricultural anthropogenisation has manifested itself more sensitively, by partially eradicating

natural forest and woodland landscapes on more levelled and flat relief forms, replacing them with agro-landscapes.

Vitoshko-Ihtiman subarea is characterized by an exceptional variety of morphostructures - high and medium high mountains, hills, hollows, plains and fields, rivers and river valleys, reaches, ravines, gorges, etc., respectively a variety of types and subtypes of landscapes. In this subarea, a large number of factors determine favourable conditions for anthropogenization - natural conditions, geographical location. The main directions of anthropogenization and anthropogenic landscapes are agriculture, urbanization, infrastructure, communications, industry, etc. Thus, the existing landscapes in Vitoshko-Ihtimanska Landscape Subarea, including in the Sofia valley, are fully covered by the specified main categories of landscapes included in the adopted in 1995 (according to the requirements of the draft European Landscape Convention), Charter for Sustainable Development of the Bulgarian Landscapes. These are: naturally preserved landscapes, forest landscapes, agricultural landscapes, water landscapes, urban landscapes, communication landscapes, industrial landscapes and recreational landscapes.

The Kraishte sub-area is characterized by mostly mountainous and hollow landscapes. Of the mountainous landscapes are characteristic landscapes of moderately humid mountain forests, sub-type landscapes of mid-mountain deciduous forests and secondary meadows, group landscapes of mid-mountain deciduous forests on carbonless sedimentary rocks. Of the hollows - type landscapes of the temperate continental meadow-steppe and forest-steppe hollow bottoms, sub-type landscapes of the meadow-steppe mostly equal bottoms of the inter-mountainous hollows, a group of landscapes of the meadow-steppe bottoms of the inter-mountainous hollows on unbound Quaternary deposits with a high degree of agricultural uptake and landscapes of the meadow-steppe bottoms of the inter-mountainous hollows with paleogenic and non-sandy loamy deposits and with a high degree of agricultural uptake.

Osogovo-Srednostrumska subarea is also characterized by two main classes of landscapes - mountain and hollow. Of the mountain-type landscapes of the moderately humid mountain forests, sub-type landscapes of the mid-mountain deciduous forests and secondary meadows, a group of landscapes of the mid-mountain deciduous forests on massive and metamorphic rocks. Of the hollow-type landscapes of the sub-Mediterranean meadow-steppe and meadow-steppe bottoms, sub-type landscapes of the meadow-steppe mostly flat bottoms of the inter-mountain hollows with unbonded Quaternary deposits with a high degree of agricultural absorption.

In the area of the landscape sub-areas considered, the areas covered by the CBCP and TSIM are dominated (as average values) by agricultural areas and agro-landshafts, respectively.

Technogenic landscapes as a type of anthropogenic landscapes - associated with the direct destruction of natural landscapes with adverse consequences for the environment as a whole - are the most unfavourable indicators - soil sealing mainly related to transport infrastructure and other sites. There are also existing mineral extraction sites in the area, which also have a significant negative impact on the landscape.

The area is rich in **sensitive natural landscapes** - protected areas and protected territories (discussed in detail in ***item 2.1.7 of the EAR***). The number of **cultural landscapes** (discussed in ***item 2.1.10 of the EAR) is also significant.***

- ***Regions of Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski (Republic of Serbia)***

According to *the Recent Landform Evolution The Carpatho-Balkan-Dinaric Region (Chapter 13 Recent Landform Evolution in Serbia), Springer, 2012,* the Republic of Serbia can be divided into two large geographical units - Vojvodina Plains and Southern Hilly Mountains.

In the plains of the north are characterized river and aeolian processes, which formed characteristic relief forms on loess, and in the south of the rivers Sava and Danube are characterized erasable gullies, river, karst, fluvio-karst forms of relief. Negative geological phenomena, including erosion, landslides, volcanic activity, have played a major role in the modern relief. They are also associated with faster formation - examples are rock falls, natural bridges and rock peaks.

The modern relief is the result of the combined action of endogenous and exogenous processes during the Neotectonic period, which in today's territory of the Republic of Serbia began in the early Pliocene. Since then, endogenous processes have been manifested through moderate elevations and descents, movements in different directions and with different intensities, directly affecting exogenous processes and their intensity of action in space and time. **Figure 2.1.8-3** shows the most significant relief types and basic relief shapes.

Figure 2.1.8-2 *Geographical location of the Republic of Serbia with location of specific landscape forms*

Deluvial-Proluvial Landforms

Among all active geomorphic processes, intensive sheet wash and gully erosion cover the largest area. Gullies, the predominant erosional features, are widely distributed over the entire area. Their lengths may even reach 1 km, while the depths range from several meters to several tens of meters (e.g., in the Kolubara River catchment – Dragićević 2007 ; Dragićević et al. 2008). In the foothills of the areas prone to intensive sheet wash and gully erosion, there are vast deluvial-proluvial mantles and alluvial fans of various dimensions (from several meters to tens of kilometers).

Colluvial (Gravity) Landforms

Colluvial processes or mass movements play a considerable part in shaping the slopes of Serbia. Intensive landsliding is enhanced by abundant sheet and rill erosion and the undercutting of slopes by temporary fl ows. Landslides mostly occur in regolith , while the landslides in bedrock are rather uncommon. In Serbia, the largest landslides (in area and depth) are formed in Tertiary sediments . Their depth can exceed 10 m. Some of the most signifi cant landslides are situated in the zone of the direct impact of the Danube and Sava Rivers. Serbia is one of the countries with the highest density of landslides in Europe. The slopes with numerous active, temporarily stabilized or reclaimed landslides are often densely populated and bear significant infrastructure (highways, regional roads, railways). Apart from natural causes, human activity is also influential. During construction works, slope stability is endangered, and in certain cases, stabilized or reclaimed landslides are reactivated. Besides landslides, other colluvial forms of Serbia are talus cones and rockfalls (rockslides), mainly on steep escarpments of carbonate rocks.

Fluvial Landforms

Permanent rivers often form marshes, swamps, oxbow lakes, and other similar features on valley floors and their sedimentation differs from channel accumulation. In the north, in Vojvodina, where thick sediment sequences dominate, the drainage network is sparse and permanent streams have extremely wide valley floors. The rivers are meandering and transitional towards marsh morphology. In central and southern Serbia, the river courses in insoluble rocks form valleys of normal type and a very dense , integrated drainage network . In the areas composed of soluble rocks (limestones and dolomites), surface drainage is disintegrated and, if present, runs through canyons and gorges. In such geological settings, the fl uvial process is closely linked to karstifi cation (fluvio-karstic landforms). Fluvial and marsh processes in Serbia result in a variety of landforms : various types of valleys, trains of river terraces, entrenched meanders, river captures, vast alluvial plains, point bars, river islands, alluvial fans, marshes, swamps, oxbow lakes, etc.

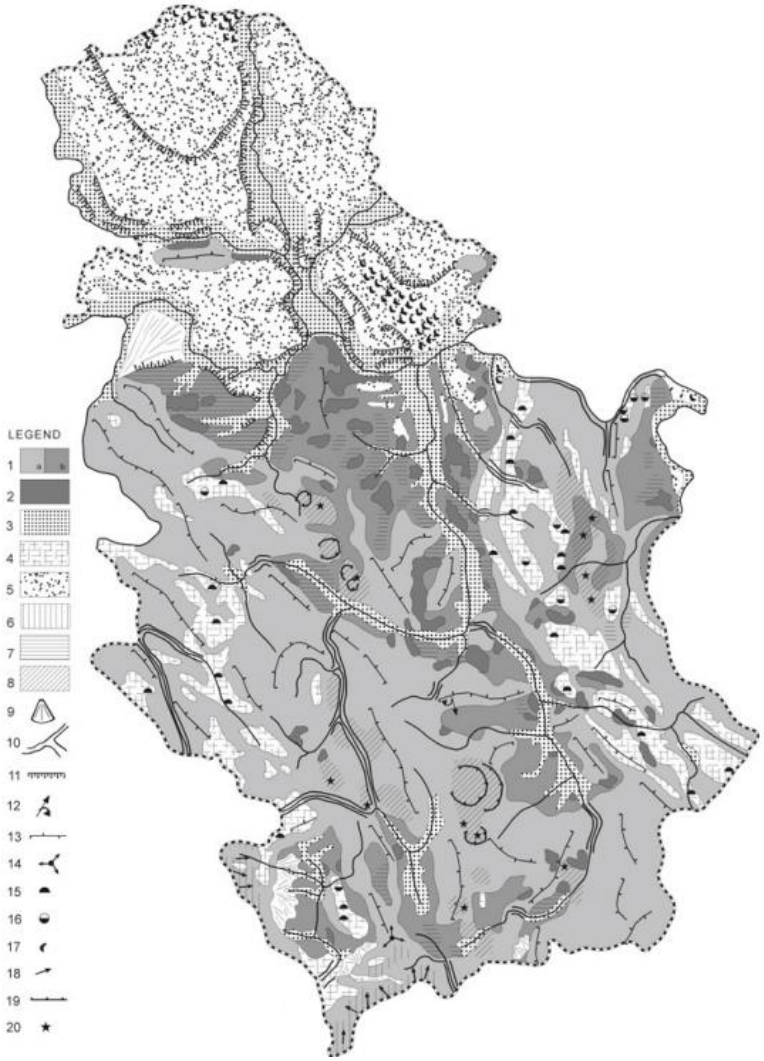
Karstic and Fluvio-Karstic Landforms

All karst landforms characteristic of the classical Dinaric karst morphology – karren, dolines, uvalas, and poljes – are present in Serbia, but with moderate dimensions and density. Among the various Serbian karst areas, the number, types and sizes of forms vary with microclimatic conditions, the proportion of insoluble components and local structural

characteristics. One of the peculiar characteristics of Serbian karst is a relatively large number of natural bridges (especially in eastern Serbia) and intermittent springs (both in western and eastern Serbia). Most of the larger Serbian caves are found in contact karst. The vertical extension of the caves explored so far is up to 300 m. Several deep siphonal springs are found on the foothills of karst massifs (e.g., the spring Krupajsko Vrelo in eastern Serbia, dived to −123 m), an evidence of deep karstwater circulation.

Fossil Landforms

The present-day landscape in Serbia is not only a result of active exogenous processes, but an ever-changing combination of endogenous and exogenous forces. Landforms of formerly active processes are still recognizable and influence the operation of active processes. Aeolian sediments cover a considerable part of Serbia, but are exposed to heavy destruction by active fluvial and slope (deluvial, proluvial, and colluvial) processes.



Key

1- Deluvial-proluvial relief	*6- Glacial and periglacial relief*	*11- Terrace riser*	*16- Vertical cave*
2- Colluvial relief	*7- Relief of marine and lacustrine origin*	*12- River piracy*	*17- Fossil dune*
3- Fluvial relief, including marshes	*8- Volcanogenic relief*	*13- Ridge*	*18- Direction of Pleistocene glacier movement*
4-Karst relief	*9- Alluvial fan*	*14- Triple drainage divide*	*19- Caldera remnants*
5-Aeolian relief	*10- Gorges and canyons*	*15- Cave*	*20- Volcanic neck*

Figure 2.1.8-3 *Variety of relief*

In the area of CBCP and TSIM, agricultural areas, respectively, followed by forest landscapes, are predominant (as an average). Information on the land use is presented in ***item 2.1.5*** of the EAR.

Technogenic landscapes as a type of anthropogenic landscapes - associated with the direct destruction of natural landscapes with adverse consequences for the environment as a whole - are the most unfavourable indicators - soil sealing mainly related to transport infrastructure and other sites. There are also existing mineral extraction sites in the area, which also have a significant negative impact on the landscape.

The area is rich in **sensitive natural landscapes** - proposed for protected areas and protected territories (discussed in detail in ***item 2.1.7 of the EAR***). The number of **cultural landscapes** (discussed in ***item 2.1.10 of the EAR) is also significant.***

Landscape state summary:

The location, relief and climatic features of the cross-border area contribute to its great landscape diversity. Low mountain, hollow and lowland landscapes predominate, as do anthropogenic - mainly agricultural in relation to natural landscapes. The richness of the natural landscape area, including specific and sensitive landscapes, places high demands and not few restrictions on the activities that can be carried out in that territory.

2.1.9. Tangible assets state

Tangible assets are a component of the anthropogenic environment that will be affected by the provisions of the CBCP and TSIM, and they were also subject to the territorial analysis prior to the preparation of the documents. The assets related to the CBCP and TSIM for the purposes of the valuation are grouped as follows:

1. *Transport infrastructure, including TEN-T network, road, rail, Eurovelo 13, BCP, airports, waterways*
2. *Information and Communication Technologies (ICT)*
3. *Water Supply and Sewerage*
4. *Waste - the state in terms of waste management is addressed in item **2.1.12 of the EAR**.*

5. *Renewable energy sources.*
6. *Tourism*
7. *Cultural infrastructure - the state is examined in* ***item 2.1.10. of the EAR.***
8. *Building fund (public, including educational, health, social, etc. infrastructure);*
9. *Urban infrastructure, including pedestrian and bicycle infrastructure; parks and playgrounds; sports infrastructure.*

Transport infrastructure

Road and rail network

Two of the main corridors of the TEN-T network with extensions to third countries pass through the territory of the cross-border region, as follows:

1. The Rhine-Danube corridor provides the main east-west link throughout Continental Europe. Following its route along the Danube, it connects Strasbourg and southern Germany with the cities of Central Europe to reach its climax in the Black Sea port of Constanta (Republic of Romania).
2. "Orient/East-Med" corridor connecting Northern Germany (Hamburg-Berlin) with Eastern Europe (Prague-Bratislava, Budapest-Timisoara-Craiova-Sofia) and South-east Europe (Sofia-Thessaloniki-Athens/Piraeus).

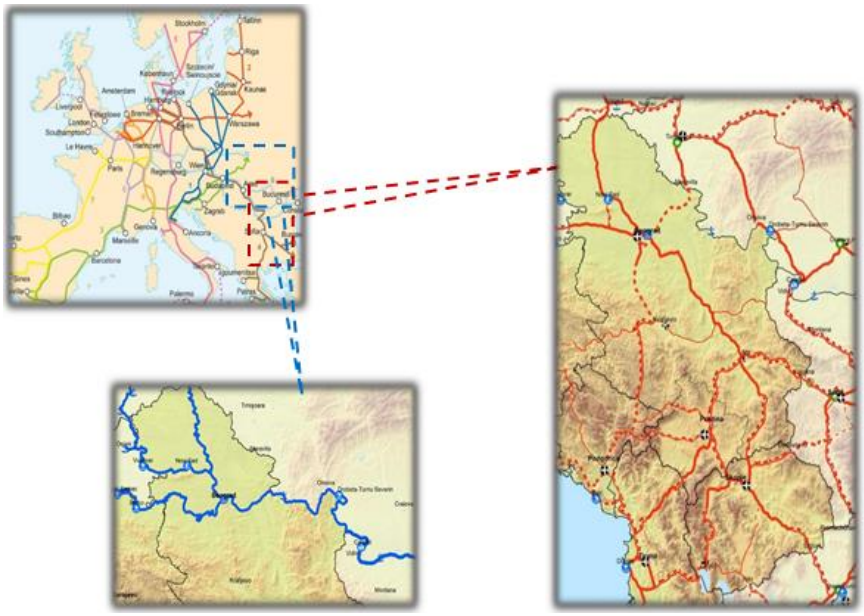


Figure 2.1.9-1 *TEN-T network*

Source: https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html?corridor=4&layer=8,9
https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html

The Bulgarian part of the CBC region is served by the following routes, part of the main TEN-T network:

- ***A2 - Hemus motorway***: *Sofia -Veliko Tarnovo - Varna, partially covering the route from Sofia via Veliko Tarnovo and Ruse to Bucharest, which also belongs to the main TEN-T network.*
- ***A3 - Struma motorway***: *Sofia - Pernik - Blagoevgrad - "Kulata" BCP, covering part of the "Orient/East-Med" corridor*
- Of importance for the territory is also the ***A6 motorway"Evropa"*** *- border with the Republic of Serbia - Sofia*, with a planned length of 66 km, from which is built only the part "Northern speed tangent" with a length of 16.5 km. The motorway is part of the main TEN-T network on the territory of the country, but has not yet been built entirely;
- ***railway line 1:*** *Kalotina - Sofia - Plovdiv - Svilengrad - the state border with Turkey and Greece*, which is part of the *Orient/East-Med* corridor;
- ***railway line 2:*** *Sofia - Mezdra - Pleven - Levski - Gorna Oryahovitsa - Targovishte - Shumen - Varna*;
- ***railway line 5:*** *Sofia-Vladaya-Pernik-Radomir-Dupnitsa-Blagoevgrad-Kulata (border with Greece);*
- ***railway line 6:*** *Voluyak-Batanovtsi-Radomir-Kyustendil-Gyueshevo (border with the Republic of North Macedonia).*

The analysis of the structure of the road network in the different regions of the Bulgarian part shows that four of the regions have a relatively low share of highways and first class roads built on their territory, which is below the national average (18.4%), namely 11.6% for Vidin, 10% for Vratsa, 9.1% for Montana and 15.7% for Pernik. Only two of the regions Kyustendil and Sofia have a higher share of motorways and first-class roads built on their territory, with respectively 20.8% and 30.2%.

The crossing of the two corridors "*Orient/East-Med*" and "*Rhine-Danube*" through the area of the CBC, places the territory in a favourable position for integration both nationally and in European terms, in terms of transport connections conducting transit flows and ensuring the integration of the road and railway network with those of the neighbouring countries.

According to another main European classification, the following major international routes pass through the territory within the scope of the CBCP and TSIM - ***Trans-European Transport Corridor No. 4*** *Dresden/Nuremberg - Prague - Vienna/Bratislava - Gyor - Budapest - Arad - Constanta/Craiova - Sofia/Thessaloniki - Plovdiv* - ***Istanbul, Trans-European Transport Corridor No. 7*** *with direction: "Rhine-Main-Danube",* ***Trans-European Transport Corridor № 8*** *with direction: Bari/Brindisi - Otranto/Otranto Strait - Port of Durres/Port of Vlora - Tirana - Elbasan - Kjafasan - Struga - Kicevo - Gostivar - Tetovo - Skopje - Kumanovo - Kriva Palanka - Deve Bair - Kyustendil - Sofia - Plovdiv* - ***Burgas/Varna and Trans-European Transport Corridor No. 10***

with direction Salzburg - Ljubljana - Zagreb - Belgrade - Niš - Sofia, some of which overlap with the corridor of the main TEN-T network of the EU "*Orient/East-Med*" and "*Rhine-Danube*".

According to data from the National Statistical Institute as of 31.12.2020 on the territory of the region of Vidin is built 612 km road network, of which:

- ***Republican first-class road*** with a total length of the territory of the region - 71 km, including ***Route I-6 /E79/***, with direction - Romania border - ferry Vidin - bypass Vidin - Dimovo - Ruzhintsi - Montana border.
- ***Republican second-class roads,*** with a total length of the territory of the region of 91 km, of which:
  - ***Road II-11*** - /bypass Vidin -Dimovo/-Simeonovo-Botevo-Archar- Montana border, length 23.2 km;
  - ***Route II-12*** - bypass Vidin - Inovo- Bregovo- border Serbia, length 26.0 km;
  - ***Route II-14*** - bypass Vidin -Kula-Vrashka chuka-border Serbia, length 41.8 km.
- ***The Republican third-class roads*** through the Vidin region have a total length of 450 km.

According to data from NSI as of 31.12.2020 108 km of railway lines have been built on the territory of Vidin region, including 93 km have been electrified. The main railway line for servicing the area with railway transport is: ***railway line 7*** *Sofia - Mezdra - Montana - Vidin*, which is included in the comprehensive TEN-T network on the territory of the Republic of Bulgaria - corridor *Orient/East-Med*. The railway network is the second most important to provide transport access and service to the population in Vidin.

The transport system in Vidin covers a relatively well-developed road network, water, rail, and the potential for development of air transport. This implies opportunities for the development of intermodal transport and the establishment of the area as a transport and logistics hub.

An important factor for cross-border connectivity is river transport and related activities. Relevant for the territory ***Port of Lom*** and ***Port of Oryahovo***, which are part of the port area Vidin and are included as ports for inland waterways in the extensive TEN-T network of the *Rhine-Danube* corridor;

The crossing of the two ***Trans-European Transport Corridors No. 4 and No. 7*** on the territory of the regions of Montana and Vratsa is a prerequisite for a good transport accessibility and connectivity of this part of the region. The two corridors conduct international transport flows in the west-east direction along the direction of the main TEN-T network - *"Orient/East-Med" and "Rhine-Danube*" and in the north-south/south-east direction as a link between the Danube River and the Aegean Sea.

According to data from the National Statistical Institute as of 31.12.2020 on the territory of the Montana region there is a 614 km road network, of which:

- ***Republican first-class road*** with a total length of 56 km on the territory of the region, including ***Route*** I-1 (E79) "Romania - Vidin - Dimovo - Montana - Vratsa - Mezdra - Sofia

- Blagoevgrad -Simitli - Kulata - Greece border". The road is part of Trans-European Transport Corridor 4.

- ***Republican second-class roads,*** with a total length of the area of 158 km, of which:
  - ***Route II-81*** "Lom - Montana - Sofia", the second in importance after the first-class E-79, connecting the regional city of Montana with the Port of Lom, the capital and the interior of the country as an alternative connection of the Trans-European Transport Corridor No. 4 through the Petrohan Pass
  - ***Route II-11*** "Vidin - Dimovo - Lom - Oryahovo", which mainly serves the municipality of Lom and the municipality of Valchedram from the northern territory of the region as part of the Danube coastal road;
  - ***Route II-13*** "Montana-Borovan-Knezha-Pleven" provides connections with the neighbouring regions of Vratsa and Pleven.
- ***The Republican third-class roads*** through the Montana region have a total length of 400 km.

According to data from NSI as of 31.12.2020 on the territory of Montana there are 114 km of railway lines that are electrified. The railway infrastructure in the region is represented by the main ***railway line 7*** Sofia - Mezdra - Montana - Vidin, and the railway infrastructure of the region is complemented by two railway branches: Branch Brusartsi - Lom and Branch Boychinovtsi - Montana-Berkovitsa.

According to data from the National Statistical Institute as of 31.12.2020 on the territory of the region of Vratsa there is a 649 km road network, of which:

- ***Republican first-class road,*** with a total length of the territory of the region of 65 km, including ***Route*** I-1 (E79) "Romania border - Vidin ferry - Dimovo - Montana - Vratsa - Mezdra - Sofia - Blagoevgrad -Simitli - Kulata - Greece border". The road is part of Trans-European Transport Corridor 4.
- ***Republican second-class roads,*** with a total length of the area of 231 km, of which:
  - ***Route II-15*** - Vratsa-Oryahovo, which connects the regional centre with the city of Oryahovo and the ferry complex "Oryahovo - Beket" located there;
  - ***Route II-13*** - provides the connection of the Pleven region with the international road E 79, towards the city of Vidin. The road connects the cities of Byala Slatina and Krivodol and the villages located in this section;
  - ***Route II-11*** - located along the Danube River and provides connection of the riverside cities of Oryahovo, Miziya and Kozloduy with the regions of Montana and Pleven.
- ***The Republican third-class roads*** through the Vratsa region have a total length of 353 km.

According to data from NSI as of 31.12.2020 on the territory of the region of Vratsa there are 112 km of railway lines fully electrified, including 67 km are double. The railway network on

the territory of Vratsa Region covers sections of the main ***railway line 2*** - Sofia - Mezdra - Pleven - Levski - Gorna Oryahovitsa - Targovishte - Shumen - Varna, which is included in the TEN-T network as a connection between the capitals of Sofia and Bucharest and ***railway line 7*** "Sofia - Mezdra - Montana - Vidin", included in the European Agreement on the most important lines for international combined transport and associated sites. The two railway lines, together with the main ***railway line 5*** Sofia - Vladaya - Pernik - Radomir - Dupnitsa - Blagoevgrad - Kulata (border with Greece), form the route on Bulgarian territory along the direction of ***Trans-European transport corridor 4***.

According to data from the National Statistical Institute (NSI) as of 31.12.2020 on the territory of Sofia-region is built 1,508 km. road network, of which:

- ***Motorways*** 158 km, as relevant for the cross-border cooperation area, are:
  - **A2 - Hemus motorway**: Sofia -Veliko Tarnovo - Varna, partially covering the route from Sofia via Veliko Tarnovo and Ruse to Bucharest, which also belongs to the main TEN-T network.
  - **A3 - Struma motorway**: Sofia - Pernik - Blagoevgrad - "Kulata" BCP, covering part of the "Orient/East-Med" corridor
  - ***A6 - "Evropa" motorway*** - *border with the Republic of Serbia - Sofia*, from which is built only the part "Northern speed tangent" with a length of 16.5 km.
- ***Republican first-class roads,*** with a total length of the area of 301 km, of which:
  - ***Route I-1 (E 79)*** - border Romania - Vidin - Montana - Botevgrad - Sofia - Blagoevgrad - Kulata - border Greece. The road is part of the corridor of the main TEN-T network "*Orient/ East-Med*" and part of the ***Trans-European Transport Corridor No. 4***, the southern part of the route being defined by the Struma Motorway.
  - ***Road I-3 (E-83)*** - Byala - Pleven - Botevgrad/Sofia, one of the main roads for servicing Northern Bulgaria, connecting it with the Capital.
  - ***Road I-4 (E-772)*** - Sofia/Botevgrad - Sevlievo - Veliko Tarnovo -Shumen/Varna, forms part of the Sofia - V. Tarnovo - Ruse - Bucharest, included in the main TEN-T network on the territory of the country as a link between the capitals of Sofia and Bucharest.
  - ***Road I-6*** - border of Republic of North Macedonia - Gyueshevo - Kyustendil - Radomir - Sofia - Karlovo - Kazanlak - Burgas, provides connection between the capitals of Sofia and Skopje and on the Podbalkan road - to Burgas
  - ***Route I-8 (E-80)*** - border Serbia - Dragoman - Sofia - Plovdiv - Svilengrad - border Turkey forms part of the corridor of the main TEN-T network "*Orient/East-Med*", which in the south-east of the capital is served by Trakia motorway and Maritsa motorway, and the first-class road has duplicate functions
- ***Republican second-class roads,*** with a total length of the area of 350 km, of which:

- ***Route II-81*** - bypass Sofia - Petrohan - bypass Berkovitsa - Blagovo - bypass Montana - Lom, an important connection between the South-West and North-West regions and the most direct access to the port of Lom on the river Danube through the Petrohan Pass;
- ***Route II-82*** - Kostenets - Raduil - Borovets - Samokov - Pancharevo - bypass Sofia, connection of the capital with Borovets resort, serving the southern territory of Sofia region;
- ***Route*** II-62 Kyustendil - bypass Dupnitsa - bypass Klisura - Samokov provides access to Struma Motorway and the capital Sofia.

- ***The Republican third-class roads*** through Sofia region have a total length of 703 km.

According to data from the National Statistical Institute as of 31.12.2020 295 km of railway lines have been built on the territory of Sofia, including 105 km of double lines and 253 km of electrified lines. The main railway lines for servicing the railway area included in the TEN-T network on the territory of the country **(Figure 2.1.9-2)** are:

- ***railway line 1*** Kalotina-west (border with the Republic of Serbia) - Sofia - Plovdiv - Dimitrovgrad - Svilengrad (border with the Republic of Turkey). The line forms part of the transport corridor of the main TEN-T network - "*Orient/ East-Med*".
- ***railway line 2*** Sofia - Mezdra - Gorna Oryahovitsa - Kaspichan - Sindel - Varna. At the Sofia - G. Oryahovitsa line is part of the railway direction Sofia - G. Oryahovitsa - Ruse - Bucharest, included in the main TEN-T network on the territory of the country, and section G. Oryahovitsa-Varna is part of the extended TEN-T network.
- ***railway line 3*** Iliyantsi-Karlovo- Tulovo-Dabovo-Zimnitsa and Karnobat- Komunari - Sindel distribution-Varna ferry- Split, is included in the comprehensive TEN-T network on the territory of the country with the section Karnobat- Varna.
- ***railway line 5*** Sofia-Vladaya-Radomir-Dupnitsa-Kulata (border Republic of Greece). The line forms part of the transport corridor of the main TEN-T network - "*Orient/ East-Med*".
- ***railway line 6*** Voluyak-Razvena-Batanovci and Radomir-Gyueshevo (border with the Republic of North Macedonia) is included in the main TEN-T network on the territory of the country with the section Radomir-Gyueshevo.

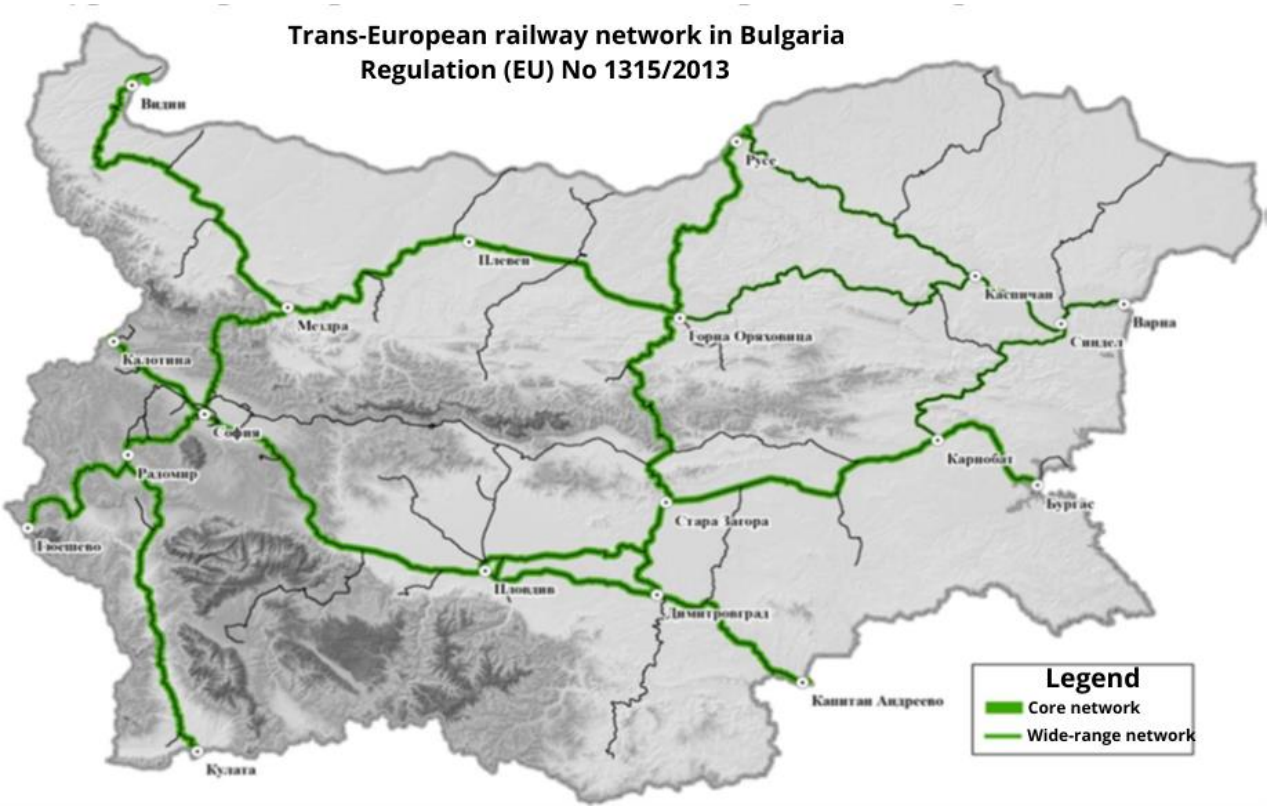


Figure 2.1.9-2 *Trans European railway network in the Republic of Bulgaria*

According to data from the National Statistical Institute as of 31.12.2020 on the territory of the region of Pernik there is a 573 km road network, of which:

- ***Motorways*** 32 km, as relevant for the CBC area, are:
  - ***A3 - Struma* motorway** Sofia - Pernik - Blagoevgrad - BCP "Kulata", covering part of the corridor "Orient/East-Med"
  - ***A6 - Evropa motorway*** - border with the Republic of Serbia - Sofia (Kalotina BCP), which is part of the road E-79 and ***Trans-European transport corridor No. 4 and No.8***.
- ***Republican first-class roads,*** with a total length of the area of 58 km, of which:
  - ***Route I-1 (E 79)*** - border Romania - Vidin - Montana - Botevgrad - Sofia - Blagoevgrad - Kulata - border Greece. The road is part of the corridor of the main TEN-T network "*Orient/ East-Med*" and part of the ***Trans-European Transport Corridor No. 4***, the southern part of the route being defined by the Struma Motorway.
  - ***Road I-6*** – border of Republic of North Macedonia - Gyueshevo - Kyustendil - Radomir - Sofia - Karlovo - Kazanlak - Burgas, provides connection between the capitals of Sofia and Skopje and on the Podbalkan road - to Burgas

- ***Route I-8 (E-80)*** - border Serbia - Dragoman - Sofia - Plovdiv - Svilengrad - border Turkey forms part of the corridor of the main TEN-T network "*Orient/East-Med*", which in the south-east of the capital is served by Trakia motorway and Maritsa motorway, and the first-class road has duplicate functions

- ***The Republican second-class road II-63*** passes through the territory of the region with a length of 66 km and the road deviates to the left at 81.4 km on ***Route I-6*** in the western part of the city of Pernik and reaches the border with the Republic of Serbia at the village of Strezimirovtsi and *Strezimirovtsi BCP*.
- ***The Republican third-class roads*** through the Pernik region have a total length of 417 km.

According to data from NSI as of 31.12.2020 on the territory of the region of Pernik there are 115 km of railway lines, including 8 km are double and 84 km are electrified. The main railway line for servicing the region with railway transport are main ***railway line 5*** - Sofia-Vladaya-Pernik-Radomir-Dupnitsa-Blagoevgrad-Kulata (border with Greece) - is part of the TEN-T network as a connection with Greece and main ***railway line 6*** - Sofia - Voluyak - Pernik - Gyueshevo (border with Republic of North Macedonia), which is underdeveloped for intermodal/combined transport services. The lines are part of the main TEN-T network- *Orient/East-Med* corridor.

According to data from the National Statistical Institute as of 31.12.2020 on the territory of Kyustendil region there is a 621 km road network, of which:

- ***Struma Motorway***, with a length at the region - 44 km.
- ***The Republican first-class road I-6***, which in the section from the Gyueshevo BCP to Pernik coincides with the European road E 871, starts from the border with Republic of North Macedonia, passes through the villages of the municipality of Kyustendil: Gyueshevo, Kamenichka Skakavitsa, Ranentsi, Garlyano, Vratsa, Zhilentsi, surrounds the northern city of Kyustendil and passes through the villages of Carvenyano and Yabalkovo. The length of the road on the territory of Kyustendil region is 85 km.
- ***The Republican second-class road*** II-62 passes through the territory of the region with a length of 54 km and the road deviates at km 25.7 of the Republican first-class road I-6 north-east of the city of Kyustendil, after the village of Piperkov Chiflik passes through the villages of Bagrentsi and Novi Chiflik.
- ***The Republican third-class roads*** through Kyustendil region have a total length of 438 km.

According to data from NSI as of 31.12.2020 on the territory of Kyustendil region there are 121 km of railway lines, 64 km of which are electrified. The main railway line for servicing the region is railway line 6 Voluyak-Razmenna-Batanovtsi and Radomir-Gyueshevo (border with the Republic of North Macedonia), which is underdeveloped for intermodal/combined transport services. The line is part of the main TEN-T network- *Orient/East-Med* corridor.

Road traffic is the most prevalent and most common mode of transportation of people and goods on the territory of the **Republic of Serbia**. In recent years, there has been a significant

increase in the daily traffic on the road network, which is the result of the increase in economic activities on the territory of the Republic of Serbia, the completion of the state road network, mainly highways, and the continuing increase in the use of the main roads by transit users. Extra-urban movements are mostly daily, while the total volume of movements is certainly dominated by daily movements in urban areas. The impact of public urban and suburban passenger transport on overall transport flows is therefore high.

The core TEN-T network does not cover the territory of the Republic of Serbia. The main transport corridor, which connects Bulgaria and *the Republic of Serbia, is**Trans-European Transport Corridor No. 10** with direction Salzburg-Ljubljana-Zagreb-Belgrade-Niš-Sofia*.

As of 2018, there are a total of 43,275 km of roads in the Republic of Serbia, and in the Serbian part of the cross-border area the total length of the road network is 10,853 km, which represents a share of 25% of the country's road infrastructure. Although the road network in the Republic of Serbia is quite well developed, its quality and technical condition are not satisfactory.

Table 2.1.9-1 *Road network density in the regions of the CBCP and TSIM area*

Region	Area (km^2)	Roads - total (km^2)	Density of the road network (km/km^2)	Synthetic indicator
Borski	3507	1469,740	0,4191	1,58
Zaječarski	**3624**	1404,636	0,3876	1,81
Nišavski	**2728**	1424,412	0,5221	1,29
Pirotski	**2761**	1115,897	0,4042	1,63
Toplički	**2231**	1216,538	0,5453	1,52
Jablanički	**2770**	1824,404	0,6586	1,39
Pchinski	**3520**	2823,186	0,8020	1,45

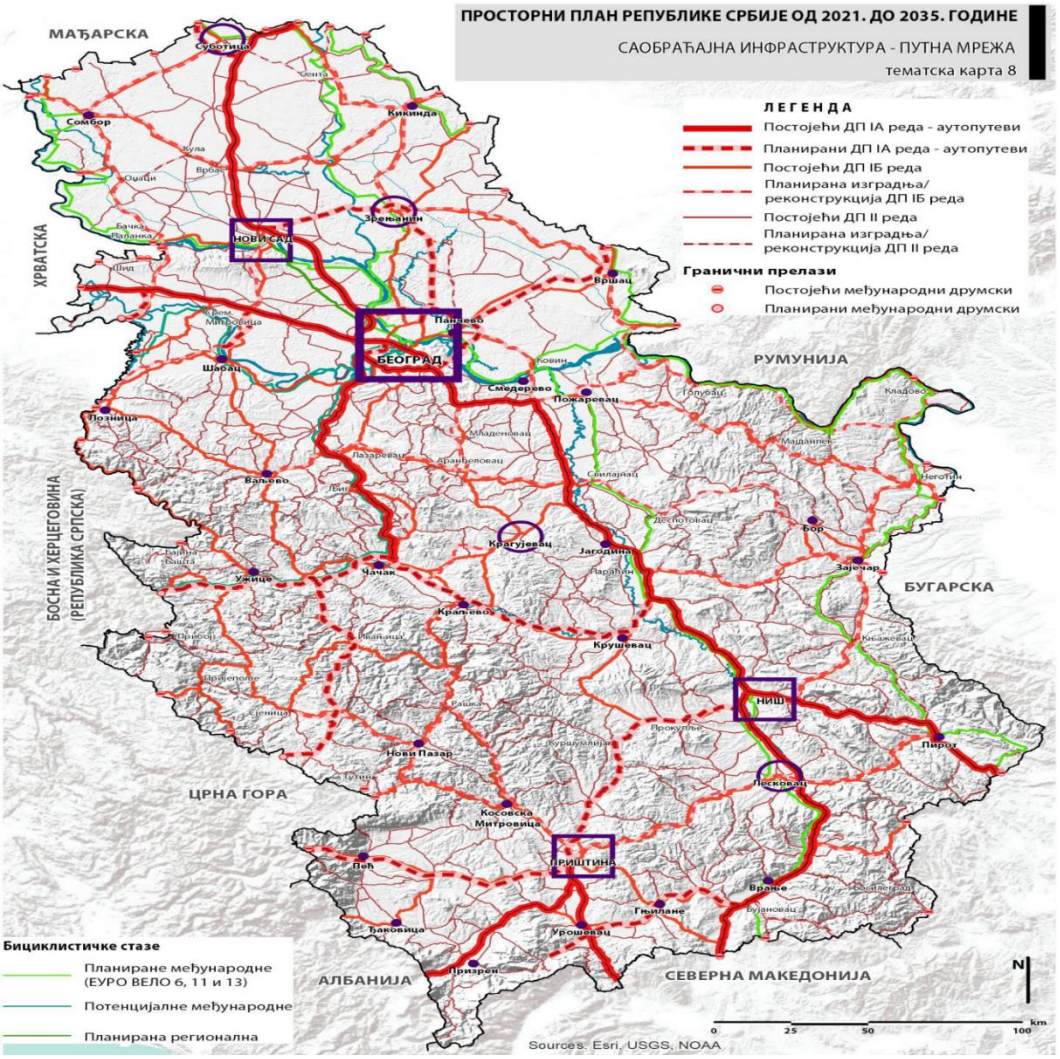


Figure *2.1.9-3 Road network in the Republic of Serbia*

According to the value of the synthetic indicator for the density of the road network, the region of Southern and Eastern Serbia is with 1.42 and is second among the regions in the Republic of Serbia.

Of importance for the cross-border area is the A4 motorway from Niš to the Bulgarian border. With additional significance for the region is the A1 motorway from Leskovac to the border with the Republic of North Macedonia.

Trans-European Transport Corridor No. 10 is the backbone of the railway infrastructure system in Serbia, with a share of more than 50% of travel.

The existing railway network consists of the following categories of railways: major railways of importance for international and national traffic; regional railways of importance for

regional and local traffic; local railways of importance for local traffic; manipulative lines of importance for economic operators; and museum-tourist railways.

The main international railway lines in the North-South direction are: ***E79*** *Belgrade - Vrbnica,* ***E85*** *Subotica - Belgrade - Niš - Presevo, Kraljevo - General Jankovic and E771 Subotica* - Bogojevo and West-East: ***E66*** *Belgrade-Varsac* ***and*** *E70 Sid-Belgrade-Niš-Dimitrovgrad.*

The most important railway routes in the Republic of Serbia are the main lines E70 and E85 running along ***the Trans-European Railway Corridor No. 10*** (Salzburg-Ljubljana-Zagreb*)* - *Belgrade-Niš - (Skopje-Veles-Thessaloniki)*, i.e. on its branches ***No. 10b*** (Budapest) - Novi Sad - Belgrade, and ***No. 10s***: Niš - (Sofia - Istanbul) - (Bitola - Lerina - Igoumenitsa).

The density of the railways in the Republic of Serbia is comparable to that in the EU. Only about 33% of the lines are electrified and 7% are double-tracked. The only railway connection between the Republic of Serbia and the Republic of Bulgaria (Sofia-Niš-Belgrade) is one-way, and is currently almost completely electrified, but there are several critical sections where speed must be seriously slowed down (parts of Niš-Preshevo and Niš-Dimitrovgrad lines designed for speeds of only 80-100 km/h). The main railway lines of the Republic of Serbia are designed for a maximum speed of 120 km/h.

The railway network of the border area may be qualified as “non-standard” and heavily depreciated. Most of the railway lines (including the accompanying infrastructure) there need to be completely redeveloped to meet modern standards. Currently, for the Serbian part of the cross-border cooperation zone, the modernization and rehabilitation of the Niš-Brestovac section, part of the international railway line to Thessaloniki (Trans-European Railway Corridor No.10) is being implemented.

According to the value of the synthetic indicator for rail network density, the region of Southern and Eastern Serbia is 0.14 and is close to the values in the other regions are equal to Belgrade region 0.12, Sumadija regions and Western Serbia 0.11, with the exception of the Vojvodina region leading by 0.23.

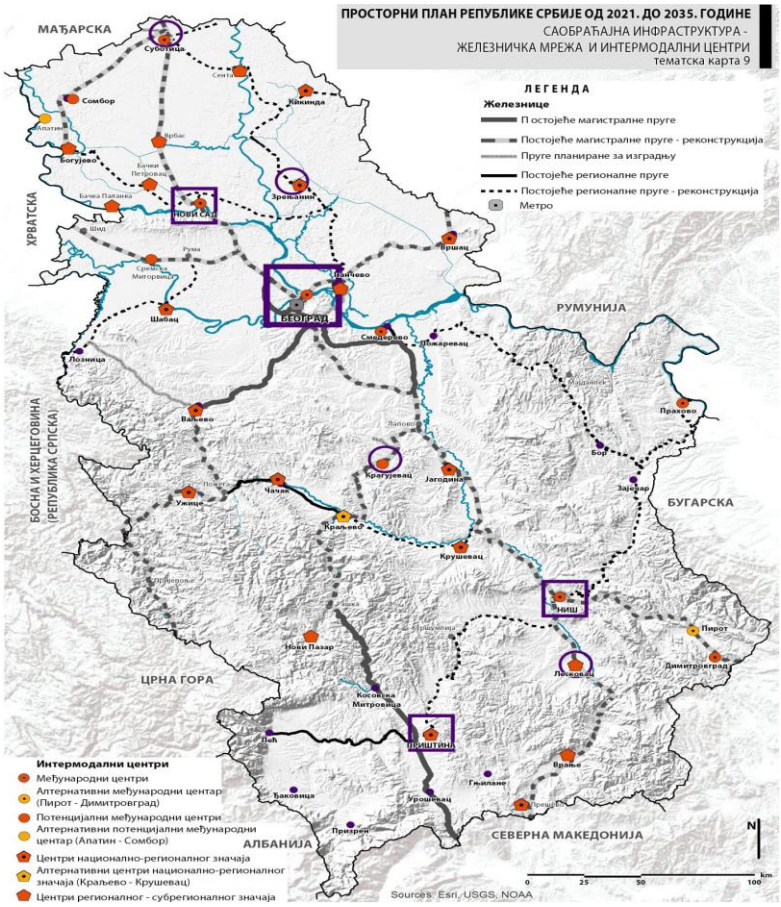


Figure 2.1.9-4 *Railway network and intermodal centres in the Republic of Serbia*

Table 2.1.9-2 *Railway network density in the regions of the CBCP and TSIM area*

Region	Area (km^2)	Railway network length (km)	Density of the road network (km/km^2)	Synthetic indicator
Borski	3.507	104,544	0,03	0,17
Zaječarski	3.624	102,072	0,03	0,16
Nišavski	2.728	151,527	0,05	0,15
Pirotski	2.761	78,141	0,03	0,16
Toplički	2.231	83,137	0,04	019
Jablanički	2.770	46,795	0,02	0,06
Pchinski	3.520	83,758	0,02	0,10

Eurovelo - European Bicycle Route Network

In addition to the TEN-T network, two of the European bicycle routes, namely EuroVelo 13 - the Iron Curtain Path and EuroVelo 6 - the Atlantic-Black Sea, are located in the cross-border

cooperation area. EuroVelo 13 provides an opportunity to visit 20 countries starting in Northern Finland, passing near the Baltic Sea, Germany, the Czech Republic, Slovakia-Bratislava, Romania and ending in Bulgaria in the small Black Sea city of Rezovo. Following this route for more than 9,950 km is a lively lesson in history, but it also gives a welcome reminder of the peace and reconciliation that followed the fall of the "curtain".

EuroVelo 6 makes it possible to visit 10 countries, starting in eastern France, passing through the Central European countries (Switzerland, Germany, Austria, Slovakia, Hungary, Croatia), Serbia, Romania, Bulgaria and ending in Constanta (Romania). Following this route, there are beautiful banks, rivers and castles.

The Eurovelo routes have a tourist purpose, which is why they do not connect large cities, but are directed to places with important natural or cultural heritage.
(Source: https://en.eurovelo.com/ev13 u https://en.eurovelo.com/ev6)

Figure 2.1.9-5 *EuroVelo routes*

BCP

There are currently 5 operational border crossing points between the Republic of Bulgaria and the Republic of Serbia:

- *Bregovo-Mokranje BCP - a road* border crossing of regional importance for Bulgaria. It is located 25 km from the city of Vidin. The site is located on secondary road II-12, which is included in international road E-79. The Bregovo BCP is built in close proximity to the city of Bregovo. The main transition through the BCP is related to the carrying out of commercial and tourist activities by citizens of Bulgaria and the Republic of Serbia.

- *The Kula-Vrashka Chuka BCP is* a Grade II road border crossing with regional significance for Bulgaria. It is located 47 km from the city of Vidin and has a transport connection to the main road E-79. The main passenger traffic through it is from Bulgarian and foreign citizens travelling to and from Serbia and the Western European countries for trade, tourism and others.
- *Kalotina-Gradina BCP* - located on the main road and railway connection between the two countries, about 2 km west of the village of Kalotina. The crossing point will be the end of the A6 - Evropa motorway. The road section Kalotina-Sofia is part of *Trans-European Transport Corridor No. 10*.
- *Strezimirovtsi BCP* - located in the middle of the village divided by the same name Strezimirovtsi. Access to the point is via Route II-63 Pernik - Breznik - Tran - Glavanovtsi - Slishovtsi - Strezimirovtsi BCP
- *The Oltomantsi-Ribartsi BCP* is located about 30 km north-west of Kyustendil and about 4 km from the nearest Bulgarian settlement of Dolno Uyno. It is located on the road Kyustendil- village of Dolno Wino - Altomantsi BCP - Ribartsi BCP - village of Mlekomintsi - village of Radichevtsi - village of Raichilovtsi - Bosilegrad. On the side of Serbia, the point is located 13 km east of the city of Bosilegrad. This BCP connects the regions of the city of Kyustendil and city of Bosilegrad and the shortest international transport link between Serbia and Greece via Bulgaria. Traffic is scarce.

Airports

There are two airports serving the border region - Sofia City International Airport and Niš International Airport. Although Sofia is not eligible, it is still the only airport on the Bulgarian side of the border region.

Sofia Airport is the largest international airport in the Republic of Bulgaria, which has implemented an ambitious investment programme in the last 10 years through the construction of a second terminal building, a new runway and a number of connected facilities.

Niš Airport is a small but developing international airport (the second largest in Serbia). It is intended for both the carriage of goods and passengers. The location of the airport is 0.5 km from the motorway connecting the Belgrade-Niš-Sofia and Belgrade-Niš-Scope-Thessaloniki corridors.

Inland waterways

Inland waterways provide opportunities to develop environmentally friendly and low-cost transport services, making them a viable alternative to road transport. With one of the most important European waterways - the Danube, the region receives a significant advantage. Important ports in the **Bulgarian part** of the cross-border zone are the following:

- The port of Vidin is the second river port in Bulgaria, included in the main TEN-T network on the territory of the country as part of the Rhine-Danube transport corridor (internal waterway on the Danube with the port of Vidin and the port of Ruse and intermodal terminal in Ruse). At the same time, this port is also part of the other corridor of the main TEN-T network, passing through the territory of the country, i.e. the corridor Orient/East-Med (railway and road route in the direction Vidin - Sofia - Kulata and Sofia - Plovdiv - Burgas/Svilengrad branch (Turkish border).
- Port of Vidin Centre;
- Port of Vidin South;
- Port of Vidin North;
- Port of Lom;
- Port of Oryahovo;

The port of Lom and the port of Oryahovo are part of the port area Vidin from the Rhine-Danube corridor, but are included as inland ports in the extensive TEN-T network. In addition to general and bulk cargo, the port of Oryahovo also handles passengers and the ferry terminal of Oryahovo handles ro-ro cargo.

The ports in the **Serbian cross-border region** are as follows:

- International passenger port of Kladovo - the Government of the Republic of Serbia, in January 2017 established the port area of the international passenger dock in Kladovo. The port infrastructure - the pontoon - is built with funds from the budget of the Republic of Serbia. In co-operation with the Romanian side, it is expected to establish a regular shipping line between Kladovo and Turnu Severin soon. The main problems are outdated facilities and the lack of investment to improve and develop port infrastructure.
- Port in Prahovo (Bor region) - The port is located 861 km on the right bank of the Danube River, three points between Serbia, Bulgaria and Romania. The port of Prahovo is of open type and has an operating shore with a length of 560 m. The industrial track with a length of 1,270 m is connected to the national railway network.
- International passenger port of Dolni Milanovac (Municipality of Maidanpek), established in September 2016

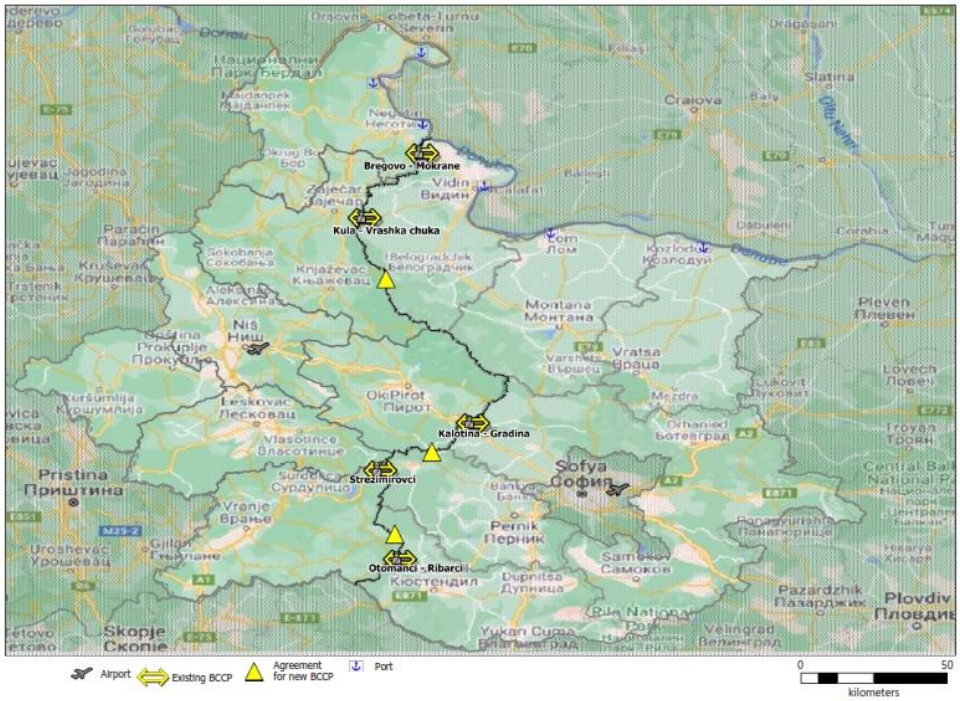


Figure 2.1.9-6 *BCP, airports and ports*

Information and Communication Technologies (ICT)

ICTs are gradually becoming widely available to the public, both in terms of accessibility and costs, and accessibility has been steeply increasing in recent years. As a potential alternative to developing regional transport infrastructure, ICTs can provide an important opportunity to better connect the border region with the outside world.

Table 2.1.9-3 *Share of households with Internet access in 2020*

Administrative units	**Share of households with Internet access (%)**
Republic of Bulgaria average	**78.9**
Republic of Serbia average	**80.8**
EU-27 average	**89.0**

Source: NSI, SORS and https://ec.europa.eu/eurostat/databrowser/view/tin00073/default/table?lang=en

Water Supply and Sewerage

The border region is in a much better position in terms of the availability of water resources and infrastructure than many other regions and localities in both countries. But outdated equipment,

mainly asbestos pipes, leads not only to health and hygiene problems, but also to inefficient work (water losses, frequent need for repairs, etc.).

According to data, 99.4% of the households are connected to the water supply network of the **Republic of Bulgaria** as of 2017 and 76% of the households are connected to the sewerage network and 63.4% are served by wastewater treatment plants.

Investments in the water supply and sewerage infrastructure under Operational Programme Environment 2014-2020 are currently in progress.

In the cross-border region of the **Republic of Serbia**, the water supply system is underdeveloped, with about 77% of the population having access to public drinking water supply. Regarding the sewerage system, only the main settlements (the larger municipalities) have a sewerage system. Most of the wastewater is discharged directly into rivers, causing damage and significant environmental problems. The municipalities are active in applying for and receiving funding for the construction and reconstruction of a sewerage and water supply network.

Renewable energy sources

Hydro, wind and solar energy are used in the country to produce alternative electricity depending on the specific natural conditions of each region.

Bulgaria already has significant additional competitive potential for renewable energy, in particular in the wind sector (up to 18 GW). Solar photovoltaic energy as a potential can provide just over 6 GW capacity, In addition, biomass (up to 1 GW) and hydrogen generation (1.6 GW) are also considered interesting investment opportunities.

Table 2.1.9-4 *Capacity built by Types and Regions in Bulgaria as of 2018*

Administrative units regions	HPP	Photovoltaic plants	Wind power plants	Biomass -fired power plants	Total number	Total Generated Power	Density MW/ 1000 km^2
Vidin	11.6	34.8	-	1.5	58	47.9	15.8
Montana	29.5	15.0	0.0	1.5	31	46.0	12.7
Vratsa	24.2	29.4	4.5	2.4	45	60.5	16.7
Sofia-region	61.3	2.3	0.0	4.9	49	68.5	9.7
Pernik	-	2.5	6.0	-	33	8.4	3.5
Kyustendil	38.5	6.3	-	-	38	44.7	14.5
R. of Bulgaria	**2 362.4**	**1,052.8**	**700.2**	**64.2**	**2 337**	**4,179.7**	**37.7**

Source: NCRR

Electricity generation in the Republic of Serbia relies on about 70% of coal, while the remaining 30% is generated in hydroelectric power plants. The country has significant additional competitive potential for wind power generation (up to 5.6 GW) as well as solar photovoltaic

potential (6.9 GW). There is also the potential for construction of large hydropower plants located mainly on the Ibar, Morava, Danube and Drina rivers.

Tourism

The attractiveness of tourism in the cross-border region is based on the rich cultural and natural heritage, diverse landscapes and relatively good connectivity and accessibility.

Based on the National Concept of Tourism Zoning, the Republic of Bulgaria is conceptually divided into nine tourist regions. The division of tourist regions helps to form regional tourism products.

Figure 2.1.9-7 *The National Concept of Tourism Zoning*

The regions of Vidin, Montana and Vratsa from the cross-border region fall into the following two tourist regions:

- Danube region - cultural-historical, river (cruise), adventure, wine, culinary and religious and ecotourism;
- Stara Planina Region - mountain, recreational, cultural-historical, festival, creative, adventurous, rural, religious, mountain-skiing and ecotourism;

The regions of Kyustendil and Pernik fall within the scope of the tourist region Sofia, and the region of Kyustendil also falls within the scope of the Rila-Pirin region. Sofia - region falls within the scope of three regions:

- Rose Valley region - balneology, SPA and wellness, cultural-historical, festival, adventure, mountain-skiing, recreation, wine and ecotourism;

- Rila-Pirin region - mountain (all types of skiing, mountain trekking, recreational), religious, adventure, balneo, SPA and wellness, cultural-historical, festival, wine and ecotourism;
- Sofia Region - business, cultural (all types), mountain trekking (all types), health (all types), religious, adventure and ecotourism.

The spatial distribution of the country's tourist resources is characterized by a high degree of overlap and territorial proximity of natural and cultural sites. This allows to combine various recreational activities, allows to overcome the seasonality and increase the usability of the tourist superstructure.

Tourist centres in the cross-border region include Belogradchik (cultural and eco tourism), Chiprovtsi (cultural tourism), Varshets and Berkovitsa (spa), Tran (ecotourism and cultural tourism), Zemen (cultural), Kyustendil (spa), Sapareva Banya (spa), Vitosha (skiing) and Panichishte (mountain resort with skiing) and Rila Monastery (cultural, religious) in Bulgaria.

For 2018 places for accommodation, bed base and tourist flow in the Bulgarian part of the cross-border zone are as follows:

Table 2.1.9-5 Places for *accommodation, bed base and tourist flow in the Bulgarian part of the cross-border area*

Region	Places for accommodation		Bed base		Tourists	
	Number	*Partition*	Number	*Partition*	Number	*Partition*
Vidin	*25*	*0,72%*	822	*0,24%*	55168	*0,71%*
Montana	*24*	*0,69%*	1214	*0,36%*	70557	*0,90%*
Vratsa	*24*	*0,69%*	857	*0,26%*	79790	*1,02%*
Sofia - region	*92*	*2,66%*	451	*0,13%*	806898	*10,35%*
Pernik	*10*	*0,29%*	451	*0,13%*	30948	*0,40%*
Kyustendil	*73*	*2,11%*	2964	*0,88%*	181480	*2,33%*
Bulgaria - cross-border zone	*248*	*7,16%*	**6759**	*2,00%*	**1224841**	*15,71%*
Bulgaria total	*3 458*	*100%*	*335 597*	*100%*	*7 799 680*	*100%*

According to *the Tourism Development Strategy of the Republic of Serbia*, 18[79] tourist destinations have been identified in the country. The destinations are roughly defined according to the current infrastructure available and the presence of an existing tourist inflow.

The seven areas of the cross-border zone of the Republic of Serbia fall within the following tourist regions:

[79] TOURISM DEVELOPMENT STRATEGY OF THE REPUBLIC OF SERBIA 2016 – 2025

- Lower Danube - Cultural Heritage, Natural Treasures, Danube, National Park Dzherdap. Key tourist products of this destination are river tours, ecotourism, ethnotourism, rural tourism, cultural-themed routes (cycling, gastronomy, etc.), special interesting events.
- Niš and Niška Banja - cultural heritage, natural resources, Niška Banja. Key tourist products of these destinations are health, wellness and spa tourism, cultural-themed routes, events, rural tourism.
- Vlasina, Vranja and Vranska Banja - cultural heritage, natural resources, Vlasina Lake, Vranska Banja, small cities. The main tourist products of these destinations are health, wellness and spa, ethnotourism, skiing, cultural-themed routes, events, rural tourism, special interests.
- Stara Planina - cultural heritage, natural resources, Stara Planina, small cities. The main tourist products of this destination are alpine tourism, rural tourism, events, ethnotourism, special interests.

The strategy identifies the following activities of particular importance for the development of tourism: marketing/promotion; improvement of tourist infrastructure (construction and renovation of cycle paths and other thematic cultural routes, tourist signalling, visitor centres, etc.); support for tourist agencies in the field of tourism; development of online reservation systems; construction and landscaping of attractions (e.g. theme parks, adrenaline activities, etc.); organization of conferences and events - strengthening the position of the Republic of Serbia as a MICE[80] tourist destination; development of international and regional cooperation and creation of regional tourism products; development of innovation and entrepreneurship in tourism, etc.

Tourist centres in the cross-border region include Gamzigrad (cultural tourism), Niš and Negotin (cultural tourism), Pirot (cultural tourism), Zvonacka Banja (spa, Pirot region), Vranska Banja (Pina region) and Niška Banja (spa, Nishava region), Stara Planina (mountain tourism) in Serbia.

For 2018 places for accommodation, bed base and tourist flow in the Serbian part of the cross-border zone are as follows:

Table 2.1.9-6 Places for *accommodation, bed base and tourist flow in the Serbian part of the cross-border area*

Region	**Places for accommodati**		**Bed base**		**Tourists**	
	Number	***Partition***	**Number**	***Partition***	**Number**	***Partition***
Borski	*14*	*1,37%*	*3028*	*2,64%*	*78946*	*2,30%*
Zaječarski	*21*	*2,06%*	*9770*	*8,51%*	*149269*	*4,35%*
Jablanički	*20*	*1,96%*	*1843*	*1,61%*	*30173*	*0,88%*

[80] Meetings, Incentives, Conferences, Exhibitions

Nišavski	*48*	*4,70%*	*3038*	*2,65%*	*130485*	*3,80%*
Pirotski	*10*	*0,98%*	*752*	*0,66%*	*25038*	*0,73%*
Pchinski	*30*	*2,94%*	*2209*	*1,92%*	*26207*	*0,76%*
Toplički	*4*	*0,39%*	*994*	*0,87%*	*31620*	*0,92%*
Serbia - cross-border zone	*147*	*14,40%*	*21634*	*18,86%*	*471738*	*13,74%*
Serbia total	*1012*	*100%*	*114771*	*100%*	*3430522*	*100%*

Summary of the status of tangible assets:

The reviewed situation of tangible assets gives a clear idea of the need for targeted improvement measures in the following main directions:

- Investing in the development and maintenance of existing transport communications and cultural and historical infrastructure and natural landmarks in order to enable the promotion of the region and offering of a competitive tourist product.
- Investing to develop joint actions in the field of cultural heritage exchange;
- Investment for the development and maintenance of infrastructure based on environmentally sound, alternative and green solutions and covering the needs of the region for a high standard of living and the promotion and implementation of the circular economy model.
- Investing for the development and improvement of information and communication connectivity and digitalization and creating prerequisites for achieving high competitiveness in the cross-border region.

The made analysis shows the existence of outstanding potential for the development of cross-border infrastructure and the establishment of zones with different functions, including the existence of potential for transition to a circular economy and resource management, through investments to increase the level of digitisation, transport communications, energy efficiency, cultural exchange, environment, tourism and recreation, sport, work and employment, etc., i.e. potential for the development of cross-border multifunctional zones in support of a more connected and competitive region.

2.1.10. Cultural and historical heritage, including architectural and archaeological heritage

Cultural heritage is an important tool for the joint development of the region and illustrates a major asset of the cooperation area. The culture in the region is rich, unique, as well as diverse and can easily be used as an engine for regional development, regeneration and prosperity.

Culture is one of the most important factors in cross-border cooperation framework, as it provides a clear overview of the common features and provides a common identity for the region.

This is a prerequisite for an attractive tourism product and can also be easily used as an engine for regional development and prosperity. Thracian, Neolithic, Roman, Byzantine and medieval cultures have accumulated assets in many objects and museum artefacts. Therefore, one of the most prominent features of culture is the regional diversity, which can be seen both in the movable and immovable cultural heritage, intangible cultural heritage, the creation of contemporary art and culture and the products of contemporary art industries.

The region's cultural heritage includes monuments and sites related to churches, old cities and old rural areas, archaeological sites, as well as monuments dedicated to commemorating historical events or personalities. Remains of ancient civilizations can still be found in many places on both sides of the border. The ancient architecture, where it is preserved, has many similar features. There are a large number and variety of important architectural, archaeological and ethnological monuments of cultural importance in the border region. All monuments constitute an ideal ground for the development of joint tourist routes, joint research, promotion and advertising, joint conservation actions, intercultural education, etc.

Tangible cultural heritage

UNESCO World Heritage Site

There are two World Heritage Sites or Natural Sites in the programme area - Gamzigrad-Romuliana, the Gallery Palace in the Republic of Serbia and the Rila Monastery in the Republic of Bulgaria.

- Rila Monastery (1983): property 11 ha, security zone 1,290 ha, outstanding universal value. Criteria (VI): The Rila Monastery is a symbol of the Bulgarian Revival from the XVIII-XIX century, influences an important role for the development of the culture and arts of all Christian peoples with its architecture, frescoes, masterpiece of the creative genius of the Bulgarian people, which preserves Slavic values in an attempt to restore uninterrupted historical continuity, symbolizes the awareness of Slavic cultural identity over the centuries.
- The Roman memorial complex from Gamzigrad - Romuliana, the Gallery Palace, in the eastern part of Serbia, was built by Emperor Gaius Valerius Galerius Maximian in the late III and early IV centuries. It's known as Felix Romuliana, named after the Emperor's mother. The place consists of fortifications, the palace in the north-western part of the complex, basilicas, temples, hot baths, memorial complex and tetrapilon. The group of buildings is also unique in intertwining ceremonial and memorial functions.

The indicative list of the UNESCO World Heritage Site includes 16 tangible immovable sites in the Republic of Bulgaria and 12 in the Republic of Serbia, among which a cultural and historical landmark is located in the cross-border zone - the Borders of the Roman Empire - the Danube Limes in Bulgaria and the Borders of the Roman Empire (in Serbia).

The section of Bulgarian territory is about 471 km long and runs along the Danube River through the regions of Vidin, Montana, Vratsa, Pleven, Veliko Tarnovo, Ruse and Silistra, including 33 sites, of which 9 are located in the cross-border zone as follows:

Vidin region:

- Vidin (Bononia) Roman city - The city is extremely rich in heritage from the Roman, Byzantine, medieval and late medieval age, represented by a complex of architectural monuments, including remains of the ancient fortress wall, Baba Vida fortress, cross barracks, synagogue, library and mosque of Pazvantoglu, etc. Archaeological research reveals new sections of the city's ancient and medieval fortification system.
- Roman city of Colonia Ulpia Traiana Ratsiaria, located 2 km west of today's village of Archar, Vidin region. The city emerged in the second half of the 1st century under Vespasian (69-79) and in honour of the successful completion of the Second Dacian War in 106 Emperor Trayan gave the city the title Colony. After the administrative reform of Diocletian, at the end of the III century became the capital of the province of Coastal Dacia. It existed until 586, when it was destroyed by the Avars.

Montana region:

- The ancient castle of Almus near the city of Lom is located within the city limits. A fortress wall from the 1st century was found, a canal, a soldier's shed of the military camp, the later remains are of a representative building from the II-III century.
- Ancient and late-antique fortress, and Roman road station "Cebrus"/"Camistrum" in locality Keler Bair, village of Dolni Tsibar. The fortress was built in the I century. Known for the battle of 28 BC between barbaric tribes and the one led by Marcus Licinius Crassus (Jr.), the grandson of triumvirus of the same name. In battle, the chief of the bastarni, Deldon, dies. In the II century the fortress was destroyed by barbarians and restored at Justinian. North of the village are located the Ibisha Reserve and the protected area "Isle of Tsibar", where rare birds nest. To the west of the village is the Tsibar swamp, which has an area of 185 ha.

Vratsa Region:

- Roman fortress Regianum/Bigrane;
- Ancient and early Byzantine city of Auguste near the village of Harlets, Kozluduy municipality is a national archaeological reserve “Auguste” on the coast of Ogosta in Kaleto locality. It was founded on the remains of a Thracian settlement from the end of the Bronze Age to the Roman Age. A moat and a fortress wall in the shape of an irregular pentagon and 12 fan-shaped and U-shaped towers are preserved;
- ancient fortress and prehistoric settlement, Roman quarry for limestone and Roman fortress Valeriana.

The Serbian limes starts at Nesin, near the border with Croatia, and ends at Rakovica (Dortikum) and is 588 km long, including a total of 60 sites, of which 24 are located in the CBC area, as follows: 17 sites in the municipality of Kladovo and 7 in the municipality of Negotin.

In addition to Serbia's UNESCO World Heritage Indicative List, another cultural site is located in the cross-border zone, namely *Negotinske Pivnice*. It is a rural complex (settlements consisting of wineries), which are located in the region of Negotinska border. *Negotinske Pivnice* with partially preserved vineyards are a testimony to the tradition of the local population of continuous cultivation of vineyards from Roman times to the present day.

Immovable cultural property (ICP)

The cross-border region is rich in real cultural values, which belong to a certain historical period such as prehistoric, ancient, medieval, Renaissance and new times, as well as with scientific and cultural value such as archaeological, historical, architectural and construction, artistic, urban.

From many places of cultural and historical interest related to history and national memory, we present those of national and regional importance:

Table 2.1.10-1 *Cultural and historical sites of national and regional importance*

The Republic of Serbia	
regions	***Main Landmarks***
Borski	Kladovo Fortress; Djerdap national park; Lepenski Vir; Rajko's Cave, Bukovo; Hestil (RTB Bor); Fetislam Fortress, Kladovo; Koroglaš Monastery, Negotin; Old church of the Holy Mother of God, Negotin; Pontes with Trajan's Bridge –Kladovo; Old downtown of Negotin; Hajduk Veljko's Powder Magazine – Negotin; Tabula Traiana – Kladovo; Rudna Glava – Majdanpek; Lepenski Vir – Majdanpek; Diana Fortress (Karataš) – Kladovo; Štubik Wine Cellars &Rajac and Rogljevo wine cellars complex - Negotin;
Zaječarski	Lapušnja Monastery - Boljevac; Holy Trinity Monastery- Knjaževac; Church of the Holy Mother of God –Knjaževac; Soko Grad Medieval Fortress – Sokobanja; Gamzigrad–Romuliana (The Palace of Galerius) - Zaječar
Nišavski	Niš Fortress, Skull Tower (Ćele kula), Niška Banja; Mediana - Brzi Brod - Niš / Medijana; Kurvingrad Medieval Fortress, Doljevac; St. Stevan's Monastery, Old District Offices Building – University Building, Niš / Crveni Krst; Old Church of the Holy Ascension, Gadžin Han; Pasteur Institute Building, Niš / Medijan,; Monastery of the Holy Mother of God, Niš / Niška Banja; Latin Church, Niš / Pantelej; St. Roman Monastery – Ražanj; Early Byzantine Tomb with Frescoes - Niš / Pantelej; Bubanj Memorial Park - Niš / Palilula; Čegar -Niš / Pantelej;

Pirotski	Church of St. Petka, the monastery of St. John the Theologist, Temska Monastery; Church of St. Parascheva, Poganovo Monastery; Grad – Pirot Medieval Fortress; Old house (Hristić family House) - Pirot
Toplički	Tower "South - Bogdanova", Church of Saint Nicolas (St. Nicholas' Monastery) – Kuršumlija; Church (Monastery) of the Holy Mother of God – Kuršumlija; Church of St. Mina – Kuršumlija; Marina kula (Mara's Tower) Medieval Fortress – Kuršumlija; Ajdanovac Monastery –Prokuplje; Latin Church (Jug-Bogdan Church); Church of St. Procopius; Hisar Fortress;
Jablanički	Roman necropolis in Mala Kopasnica; a late Roman-early Byzantine (6th century AD) town of Caričin Grad or Iustiniana Prima; the Jasunjski Monasteries; church of St. John the Baptist; Justiniana Prima – Lebane; Monastery of St. John; Monastery of the Holy Mother of God, Šop Đokić House, Rudare Monastery, Giga House, Čukljenik Monastery,
Pchinski	Church of the Holy Mother of God – Vražji kamen, Trgovište; Church of the Holy Virgin, Vladičin Han; Markovo Kale Medieval Fortress, Vranje; Turkish Hammam of Vranje; Municipal Authorities Building (Vranje Municipal Assembly); Pasha's House – Vranje; Borislav Stanković House – Vranje; Baba Zlatina Street Complex- Vranje; Prohor Pčinjski Monastery; emorial Rooms in Prohor Pčinjski
Republic of Bulgaria	
Region	***Main cultural and historical sites***
Vidin	Roman city of Ratsiaria and Roman necropolis , village of Archar, part of the serial site - "Borders of the Roman Empire - Danube Limes in Bulgaria"; Roman fortress "Kaleto" - Damiyska Ahala, Belogradchik; Roman and Late Antiquity fortress "Bononia" - part of the serial site - "Borders of the Roman Empire -Danube Limes in Bulgaria"; Baba Vida Fortress; Cross Barracks, Venetian warehouses, mosque and library of Pazvantoglu, Synagogue, churches; Roman fortress Kulata, Tower; Magura Cave with Bronze Age Rock Drawings; Roman Castel Florentiana, village of Florentin; Belogradchik rocks.
Vratsa	The ancient and medieval fortification from the X-XII century and the early Christian basilica from the VI century in Gradishte are located near the Vratsata Pass; Place of battle and monument of Hristo Botev and his company - memorial complex "Botev pat"; Monastery complex "St. Ivan Rilski Kassinets (Pusti); Roman fortress Valeriana, Dolni Vadin, part of the serial site - "Borders of the Roman Empire -Danube Limes in Bulgaria"; Roman fortress Regiana - part of the serial site - "Borders of the Roman Empire -Danube Limes in Bulgaria"; Archaeological complex "Kaleto" near Mezdra; Thracian settlement - Vikus Trulensium and ancient fortress, village of Kunino; Ancient and early Byzantine city of Auguste near the village of Harlets.
Montana	Ancient and medieval fortress Kaleto, Berkovitsa; Ancient fortress Cebrus, village of D. Tsibar; The ancient castle of Almus near the city of Lom - early and late Roman castel; early Byzantine fortified settlement and necropolis; Ancient and medieval fortress, Kaleto locality, over Montana city; Ancient fortress Pomodiana, Mal Tepe locality, village of Stanevo; Chiprovsky Monastery The ancient fortress of Castra ad Montanesium; Ancient and Late Antiquity fortress, and Roman road station "Cebrus" "Camistrum" in l. "Keler Bair", Dolni Tsibar village.

Sofia-region	Ancient fortress "Tsari Mali grad" , village of Belchin; Thracian fortress - Gradishte - Chertigrad, village of Brusen; Early Byzantine and medieval fortress "Bozhenishki Urvich" and rock cult complex; Late Byzantine fortress at the Trayanova Vrata Pass (Stenos), village of D. Vasilitsa; Late Antiquity Fortress "Shishmanovo Kale", village of Dospey; Palace of a Thracian ruler (Turzis), l. Smilovene, Koprivshtitsa; Late Antique Residence Scretiska /Early Byzantine Kratiskara and Rotunda Kostinbrod; Elenska Basilica, Pirdop; Late Antique and Medieval fortress on peak Borovets, Pravets
Pernik	Thracian sanctuary, Gradishte locality, Baykalsko village; Bilinski monastery and frescoes in the church of St. Archangel Michael; Medieval fortress, village of Blateshnitsa; Ancient complex including: "Late Antiquity Complex "Kula";" Temple-Well"; "Roman Bath"; Zemen Monastery; Medieval Fortresses, city of Zemen in l. Orlovo gnezdo and Kaleto; Prehistoric settlement, village of Kozhinci, Dupkata cave; Medieval fortress Krakra Pernishki; Cave rock monastery "St. Nicholay", village of Peshtera; Medieval Church "St. George", village of Studena; Monastery Church "St. Archangel Michael" at the Tran Monastery, city of Tran.
Kyustendil	Ancient and medieval city of Pautalia - Velbazhd. National Architectural and Archaeological Reserve; Roman Military Camp, Late Ancient and Early Byzantine city of Germanea, Sapareva Banya. ; Early Christian Basilica and Medieval Church "St. Spas"/"Ascension of the Lord", village of Cherven bryag, Karo locality; Rila monastery: The Hrelyova Tower, the church, the monastery buildings, the church "St. Luka"; the convent "Pchelino"; the pilgrimage route in its part from the city of Rila to the tomb of St. Ivan Rilski; Remains of a medieval fortress, village of Razhdavitsa; Kadin Bridge and inscription from 1470; Church "St. Ivan Rilski" XVI-XVII c. Village of Pastuh; Medieval church "St. Petka", 1598, village of Vukovo, municipality of Boboshevo

Intangible cultural heritage

The importance of intangible cultural heritage is not the cultural manifestation itself, but rather the wealth of knowledge and skills transmitted through it from one generation to the next. Includes: spoken traditions and languages, customs, rites, holidays, rituals, beliefs, music, songs, dances, culinary and oenological traditions, traditional crafts, traditional medicine, traditional games and sports, bearers of cultural value and important elements in the preservation of historical memory.

Intangible cultural heritage is the main source of identity and has strong links to history. It is the basis of international and national holidays and events, which are an important resource for the development of cultural and cognitive tourism.

Many cultural expressions such as music, dance, spoken word, rites, annual village and urban gatherings or traditional cultural skills are threatened with extinction. This process is driven by a continuously globalising international culture and advances in the technical and information sciences on the one hand, and by the vulnerable nature of this category of cultural heritage, its temporal transience and the fact that in many cases it exists only at the time of implementation or the skills to implement it are taught on the other.

The Republic of Bulgaria regularly registers various elements in the UNESCO Intangible Cultural Heritage of Humanity List and 5 of them have been approved by 2019. Of them 4 are specific for the cross-border area, namely:

1. ***Cultural practices related to 1 March***. The name of the holiday, celebrated throughout the country, means "Baba Marta" in Bulgarian and the wearing of martenitsas is a Bulgarian tradition, related to the reception of spring, which according to Bulgarian folklore starts in March.
2. ***Folklore holiday Surva in Pernik region*** is held every year on 13 and 14 January to celebrate the New Year on the old calendar. The core of the holiday is a popular masquerade ritual that takes place in villages throughout the region.
3. The tradition of carpeting in Chiprovtsi. The carpets are famous for their composition, ornamental motifs and colour. Carpet weaving goes hand in hand with beliefs, verbal formulas and ritual practices. Carpeting is deeply integrated into the social and cultural life of the population.
4. ***Bistrishki babi*** - archaic vernacular, dances and rituals from the Shopluka region. Traditional dances and vocal singing, which occur in the area of Shopluka, are still performed by a group of elderly women "Bistrishki Babi". This tradition includes ancient forms of horo and ritual practice of lazaruvane, ceremony of consecration of young women.

In addition, one of the two intangible cultural heritage included in the UNESCO Register of Good Practices is also characteristic of the cross-border zone - the Bulgarian Chitalishte centre (Community Cultural Centre): practical experience in preserving the vitality of intangible cultural heritage. Chitalishte centres are traditional public institutions in Bulgaria with 150 years of tradition, which perform educational functions, provide a place for local talent groups and enjoy the reputation of a healthy cultural institutions with a specific mission to preserve and develop traditional national values.

In the modern era, which have retained their social legitimacy and flexibility and due to their geographical coverage covering the whole territory of Bulgaria, the Chitalishte centres continue to satisfy the modern needs of the Bulgarian society as centres for cultural, information and social activities. For the regions is the cross-border region the number of functioning Chitalishte centers is as follows: Vidin - 77, Vratsa - 101, Montana - 101, Kyustendil 97, Pernik 81, Sofia region 150.

All three elements of **Serbian territory** included in the UNESCO Representative List for the Intangible Cultural Heritage of Humanity are located in the cross-border region, namely:

- ***The singing accompanied by Gusla*** is an ancient art of performing mostly heroic epics, practised for centuries as a form of historical memory and expression of cultural identity.
- ***Colo,*** traditional folk dance. It is performed by dancers who are connected to each other to form a chain, usually moving in a circular line. It is accompanied by music and includes all members of the local community involved in the gathering.
- ***Slava,*** feast of the patron saint of the family day. In Serbia, Orthodox Christian families celebrate an important holiday in honour of patron Slava, who is considered their patron and

bearer of wealth. The celebration consists of a ritual offering of a bloodless sacrifice and a celebration for relatives, neighbours and friends.

All the above mentioned intangible cultural heritage assets are evidence of the successful steps taken by the national cultural institutions to promote the cultural heritage and attract the interest of visitors and tourists in Serbia and Bulgaria. This is in line with the trend of greater mobility of the population in Europe, which allows more people to attend cultural events and traditional holidays.

Cultural Corridors

The Diagonal Road - a cultural corridor connecting South-east Europe with Asia - runs through the territory of the cross-border region. This cultural corridor is one of the most ancient arteries of trans-continental or even global importance. Starting from Central Europe to Slovenia, passing successively through Croatia, Bosnia and Herzegovina, Serbia, Republic of North Macedonia, Bulgaria and Turkey, proceeding to the Far East. Its numerous branches are on the one hand geographically determined (passing through the valleys of large rivers, the lowlands between the mountain ranges, the comfortable passages), aspiring to the Strait of Bosphorus.

The Western Trans-Balkan Road crosses South-east Europe in a north-south direction. This corridor unites the territories on both sides of the Balkan Mountains, passing through Romania, Bulgaria and Greece. The road connects Western and Central Europe with the Aegean Sea and the Mediterranean Sea, crossing the Danube Road, the Diagonal Road, the Sofia-Ohrid Road and the Via Egnatia. The Western Trans-Balkan Route is a kind of axis of distribution of ancient Greek culture in the north, a specific axis in time connecting habitats with distinctive cultural values from different historical periods.

The Roman road Via Traiana, built during the time of Emperor Traian in the I century AD. It crosses Stara Planina at the Beklemeto-Troyan Pass and connects Moesia with Thrace and the Aegean Sea. It occurs in the 2nd connection between the cities of Escus (village of Gigen) and Nove (Svishtov) to the north, through Montemno (Beklemeto-Troyan Pass) to Trimontium (Plovdiv) to the south.

Cultural institutions

Theatre performances, musicals, opera, philharmonic, authentic folklore singing and dance troupes and orchestras symbolise the rich cultural life of local communities and regions.

In the last few years, the professional cultural institutes have been developing well both in the Republic of Bulgaria and in the Republic of Serbia. Traditional cultural organizations such as libraries, museums, galleries, community centres and cultural centres, etc. have a long standing presence.

For the Republic of Serbia, there is no data available on cultural institutions at the region level, but at the level of statistical regions. Therefore, for the purpose of this analysis, summary data are provided for the statistical region of Eastern and Southern Serbia, which coincides with the territory of cross-border cooperation between Serbia and Bulgaria. On the Bulgarian side, a cumulative value is provided for all 6 eligible regions (Vidin, Vratsa, Montana, Sofia-region, Pernik and Montana).

Table 2.1.10-2 *Cultural institutions in the cross-border area 2018*

Cultural institutions	for the Republic of Serbia	for the Republic of Bulgaria
Theatres	1	8
Performances	*70*	*867*
Museums	2	25
Visits	*353103*	*673000*
Cinemas	1	6
Attendance	*310560*	*119110*
Libraries	10	4
Radio stations	3	9
Television stations	5	9

Source: NSI and SORS

Summary of the state of cultural heritage:

The potential for growth and development through the use of the cultural, historical and archaeological heritage of cross-border areas is extremely high. Much of it, with some of the most significant sites, is located in a non-urban environment, which implies opportunities for their development and conservation. And while in an urban environment the needs of the living city require measures to be taken for the regular or rescue exploration of these monuments, the heritage outside urban centres is in a difficult situation and measures need to be taken for restoration, monitoring and conservation.

Situated in a natural environment, some of the archaeological sites are crucial for the development of the cross-border area. Bringing the most important archaeological heritage sites to cultural tourism sites through their restoration and socialization would contribute to rationalizing the use of tourist resources, creating conditions for building networks of cultural heritage and tourist sites in the cross-border area.

2.1.11. State in terms of harmful physical factors

A. Noise

In the case of harmful physical factors, the most relevant for the cross-border region in the scope of the CBCP and the TSIM is the noise factor.

Road traffic is the main source of noise pollution in Europe and noise levels are expected to increase over the next decade, both in urban and rural areas, due to the development of urbanisation and the increased need for mobility.

Directive 2002/49/EC of 25.06.2002 on the assessment and management of environmental noise was adopted to limit the harmful effects of environmental noise.

Legislation to limit environmental noise has been adopted in both the Republic of Bulgaria and the Republic of Serbia.

Information on the state of the factor and the main sources of noise in the cross-border region covered by the CBCP and TSIM is provided below.

- ***Regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria)***

The main sources of noise on the territory of the six regions are the sources typical of the modern settlements - the transport flows of road and rail transport, as well as the local sources of noise (industrial, utility workshops, commercial sites, restaurants, etc.).

The state of the **transport infrastructure** is described in ***item 2.1.9 of the EAR***.

Local sources of noise

The districts of Vidin, Montana and Vratsa (NUTS III) are located in the North-Western Development Region (NUTS II), the statistical area of Northern and South-Eastern Bulgaria (NUTS I), and the regions of Sofia- Pernik, Kyustendil, in the South-Western Development Region (NUTS II), the statistical area of South-Western and South-Central Bulgaria (NUTS I).

The economic development of the six regions follows the general dynamics of the economic development of the Republic of Bulgaria. Like other Level 2 areas, industry is second in the sectoral economy.

In comparison with the gross added value of the North-western region, the region of Vidin has a share of 9.5% and the region of Montana has a share of 15.87% and the region of Vratsa has a share of 27.75%. As a highly negative moment, the internal regional disproportions in the South-Western region of Sofia-region should be taken into account - the region has a share of 24%, the region of Pernik with 3% and Kyustendil with 3%, with the largest share in the South-Western region of Sofia-city with 61%.

With the exception of the region of Vratsa and Sofia-region where the dominance of the industry sector is reported with 48.5% and 56%, respectively, for all other regions there is a sustained trend of dominance of the services sector, with for 2019 its share in the region of Vidin being 71% against 14.9% for the industry sector and 14.1% for the agricultural sector; in the region of Montana - 58.6% against 27.6% for the industry sector and 13.8% for the agricultural sector; in the region of Pernik - 63.7% against 31.2% for the industry sector and 5.1% for the agricultural sector, and in the region of Kyustendil 62% against 29% for the industry sector and 9% for the agricultural sector.

For the regions of the SWR, the main productions of the industry sector are: production of ferrous and non-ferrous metals, machine building, food industry, confection and textiles, manufacture of medicinal substances, mining and non-ferrous metals and coal mining, chemical, parts for the automotive industry, manufacture of software, production of electricity, construction, etc. For the North-western region, the main industries in the sector are power generation and distribution, mechanical engineering, food industry, confection and textiles,cast iron and cement production, etc.

4 complex permits have been issued for the region of Vidin: Landfill for non-hazardous waste - "Vidahim" AD; Regional landfill for non-hazardous waste (RLNW) for the municipalities of Vidin, Belogradchik, Boynitsa, Bregovo, Gramada, Dimovo, Kula, Makresh, Novo Selo, Ruzhintsi and Chuprene; "VIDAHIM" AD, city of VIDIN; Akma Trade Limited EOOD

8 complex permits have been issued for the region of Montana: "Berg Montana Fittingi" AD; "BULGARPLOD SOFIA"AD - Installation for intensive breeding of broilers; "Vi Vas Zinc" EOOD; RLNW for the municipalities of Montana, Krivodol, Boychinovtsi, Berkovitsa, Lom, Chiprovtsi, G. Damyanovo, Brusartsi, Medkovets, Varshets, Yakimovo and Vulchedrum; Monbat AD; FAUSTINA GROUP OOD, village of Dr. Yosifovo, region of Montana; Stroykeramika OOD - Montana; Emko OOD, city of Sofia, site city of Montana

8 complex permits have been issued for the region of Vratsa: RLNW of the municipalities of Vratsa and Mezdra; RLNW Oryahovo, Valchedram, Kozloduy, Hayledin, Mizia, Byala Slatina, Borovan, Knezha; Holsim (Bulgaria) AD, village of Beli Izvor; Eggs and Birds AD, Mizia, Kozloduy site; Stroykeramika AD, Mezdra - Mezdra workshop; Metizi AD, city of Roman; MAY-TU EOOD, city of Vratsa and "ASA-BUL" EOOD, city of Vratsa.

18 complex permits have been issued for the region of Sofia-region: site "Ceramic Plant" - city of Botevgrad; ALMAGEST AD, mountain village of Verinsko, municipality of Ihtiman; Shamot El Pe 2007 OOD; Meridian 29 EOOD, village of Osikovitsa, Pravets Municipality, Sofia region; SAM TRADING 2008 EOOD; TAMARA 2009 OOD, village of Opitsvet, Kostinbrod Municipality; Bulgartransgaz EAD - Ihtiman Compressor Station; El Bat AD; VMV-Metal EOOD - Ihtiman; OGNYANOVO K AD, PUKLINA ZNHV; AURUBIS BULGARIA AD; RLNW for the municipalities of Gorna Malina and Elin Pelin, village of Gorna Malina; RLNW for the municipalities of Kostinbrod, Svoge, Slivnitsa, Bozhurishte, Godech and Dragoman; Kostenets Paper Meal EAD; Dzhiev AD, city of Kostinbrod; RLNW for the municipalities of Samokov, Dolna Banya, Kostenets and Ihtiman; RLNW for the municipalities of Zlatitsa, Chavdar, Mirkovo, Pirdop, Chelopech, Anton and Koprivshtitsa; RLNW for the municipalities of Botevgrad, Pravets and Etropole

For the region of Pernik, 14 complex permits have been issued: STEEL INDUSTRY AD - city of Pernik; Landfill for hazardous and non-hazardous industrial waste (LIW) of "Stomana Industry" AD, city of Pernik; "Leyaro Kovashki Mashinostroitelen Complex" EOOD, city of Radomir, Industrial Zone; RLNW "Teva" for the municipalities - Pernik, Breznik, Zemen,

Kovachevtsi, Radomir and Tran; "AIFOROS Bulgaria" EAD; "Galko" AD, city of Radomir; "KERAMINZHENERING" AD branch KZ "DRAGOVISHTITSA"; "Kolkhida Metal" AD - city of Pernik; "TIB SALDARE" OOD; "Toplofikatsiya - Pernik" AD, TPP "Republica"; "Toplofikatsiya - Pernik" EAD, cinder dump "Kudin dol" is located south of TPP "Republic"; "Toplofikatsiya - Pernik" EAD, cinder dump "7th September"; "AK ELECTRIC" AD, city of Radomir;

4 complex permits have been issued for the region of Kyustendil: "TPP Bobov Dol" EAD, village of Kamenik; "TPP Bobov Dol" EAD, village of Golemo selo; "KERAMINZHENERING" AD - branch KZ "BAGRENTSI"; ET "Valentin Georgiev - Valdis" .

The industry develops mainly in the industrial areas, in the immediate vicinity of the entrance-exits of the settlements, around the main road routes.

In addition to the industrial sites, there are various local sources of noise (workshops, commercial sites, restaurants, etc.) on the territory of the settlements with a limited range of noise impacts.

Summary data on noise load in the regions Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil

The Environmental Noise Protection Act (ENPA) and its accompanying regulations provide full compliance of Bulgarian legislation with the requirements of Directive 2002/49/EC on environmental noise assessment and management.

The implementation of Directive 2002/49/EC by the Republic of Bulgaria is related to the preparation of the Strategic Noise Maps and Action Plans to:

1. agglomerations with more than 250,000 inhabitants;

2. the main roads - with traffic over 6,000,000 crossings per year;

3. the main railway lines - with more than 60,000 crossings per year;

4. the main airports with over 50,000 aircraft movements per year.

The six regions do not fall within the scope of the ENPA, for which the strategic noise maps (SNMs) must be prepared, as well as an action plan to them. In their territory main roads pass (*within the meaning of §1, item 10 of the Additional Regulations of the ENPA "Main Road" is a republican road through which more than 3 million motor vehicles pass annually."*), which are included in the Updated Strategic Noise Map of 1,122,606 km of road sections in the Republic of Bulgaria, through which more than 3 million motor vehicles pass annually and the Action Plan thereto, approved by Order No. РД-01-240/27.04.2020 of the Minister of Health.

In the territory of the regions, within the scope of CBCP and TSIM, main roads pass (*within the meaning of §1, item 10 of the Additional Regulations of the ENPA "Main Road" is a republican road through which more than 3 million motor vehicles pass annually."*), which are included in the Updated Strategic Noise Map of 1,122,606 km of road sections in the Republic of Bulgaria, through which more than 3 million motor vehicles pass annually and the Action Plan thereto, approved by Order No. РД-01-240/27.04.2020 of the Minister of Health.

In compliance with the requirements of the ENPA, as well as the measures approved in the Action Plan to the SNM of 2016, a *System for continuous and systematic monitoring of noise - concerning residential areas and/or territories with children's, healing, educational and public buildings near major road sections of the Republican road network has been built and put into* operation. The system is provided with public access and visualization of the measuring data for environmental noise for five terminals (http://api.webnoise.eu/), of which two are located in the area of cross-border cooperation - one terminal in the region of Pernik - city of Radomir, Route I-6 and one terminal on the territory of Sofia-region - Automated Census Point No. 4067, Route I-8 Kalotina-Sofia. There are no terminals of the continuous monitoring system located on the territory of the other regions within the scope of CBSP and TSIM.

The ENPA maintains a NOISE (Noise Observation and Information service for Europe) database, which includes data from noise maps developed by EU Member States. Analysis of the data shows that for agglomerations in Europe (incl. Bulgaria) the main source of excess noise is road transport. Compared to road transport, rail transport is more cost-effective in terms of noise impact, as it only occurs when passing individual train sets. Obsolete railway formations and routes do not allow high-speed traffic, which limits the efficient mass use of railway transport.

Regarding environmental noise from industrial sources, according to the EPA, RIEW performs preventive, ongoing and subsequent control on industrial installations and facilities, including for the categories of industrial activities under Appendix 4 to Art.117, para.1 of the EPA. The control and own measurements are carried out by accredited laboratories, observing the requirements of the *Methodology for determination of total sound power emitted into the environment by an industrial enterprise and determination of the level of noise at the site of impact*, approved by Order No. РД-613/08.08.2012 of the Minister of Environment and Water.

According to data from the Regional reports on the state of the environment in the last reporting year 2020, there was no change in the acoustic environment of the regions concerned compared to the transitional years. Existing industrial sites in the area are located mainly in separate industrial areas and are not sources of overburden noise for the settlements.

The main sources of noise in urban areas are the means of transport - cars, trucks and railways. In the Republic of Bulgaria, the *National Noise Monitoring System in the Urban Areas of the Ministry of Health operates for monitoring noise in* the settlements. Ordinance No.6 of 26.06.2006 on *environmental noise indicators, taking into account the degree of discomfort in different parts of the day, the limit values of environmental noise indicators, the methods for assessing the values of the noise indicators and the harmful effects of noise on the health of the population*, defines the main indicator for assessing the noise impact - equivalent level of noise Leq, dBA for the three periods of the day - day(07.00 AM - 7.00 PM), evening (7.00 PM - 11.00 PM) , night (11.00 PM - 07.00 AM).

The noise level limits for the different territories and development zones are regulated in the above-mentioned Ordinance No. 6 - they are presented in the following table:

Table 2.1.11-1 Limit values for equivalent sound levels in dB(A).

Spatial Zone	Equivalent noise level (dbA)			
	day	evening	night	24 hours
Housing areas and territories	55	50	45	50
Territories subject to intensive road traffic	60	55	50	60
Production-warehousing territories and zones	70	70	70	70

On the territory of the North-West region within the scope of the cross-border cooperation area, a measurement of the street noise in the region cities of the respective Regional Health Inspectorates (RHI) - Vidin, Vratsa and Montana is conducted annually. According to the summarized data from the annual reports of the Regional Health Inspectorate of the total number of points 50% of them are defined on streets with intensive traffic and high density of habitation, 20% of the points are close to local sources of noise and 30% of the points are in the inner neighbourhoods of the residential area with minimal noise impact. From the conducted measurements in the period 2010-2019 of the noise level, values above the limit values specified in Ordinance No. 6/2006 were registered in residential areas and territories subject to the impact of road traffic.

From the results of the noise measurement on territories subjected to the impact of road traffic at points in the city of Montana for 2019 it is evident that at all points the measured noise level does not comply with the limit value of 60 dB(A). The mean value of the measured noise load at the 6 points is 68.5 dB(A). The increase in noise is in the range of 6.4 dB(A) to 11.2 dB(A) above normal. It is evident from a comparison of the noise levels for 2010-2019 that the measured average equivalent noise level in the six points is above the permissible norm and there is a growing trend. The results of the noise measurement on areas subjected to the impact of railway traffic in the city of Montana (station No 7 - Railway Station) shows a measured noise level above the limit value of 65 dB(A). As a result of the monitoring in 2019 of noise on areas with industrial noise sources - production and storage areas, the measured noise level in two of the points is in the norm (70 dB) and in point No. 8 the norm is exceeded by 3.8 decibels. The average value of the measured noise load in the three points is 68.3 dB. The results of noise measurement in the three points of residential areas and territories of the city of Montana shows noise values ranging from 63.7 dB(A) to 67.8 dB(A), i.e. the measured noise levels are above the 55 dB(A) norm. Such a trend is also observed in the levels of measured noise in public and individual recreational areas with 23.4 dB(A) above the norm.

On the territory of the South-West region within the scope of the cross-border cooperation area, a measurement of the street noise in the region cities of the respective Regional Health Inspectorate - Sofia Region, Pernik, Kyustendil is conducted annually. RHI-Sofia Region conducts systematic monitoring for determination and control of noise load in the region in three municipalities - Botevgrad, Samokov and Svoge and includes a total of 35 points. The analysis of the data from the measured equivalent noise levels in 2020 shows that there is no improvement in the acoustic

environment at all points located on areas subject to enhanced noise protection, as well as at points located on areas subject to intensive road traffic. The main reasons for the formation of an urban environment with unfavourable acoustic mode are: increase in the number of motor vehicles; mistakes in urban planning (deployment of medical institutions in the cities of Botevgrad and Samokov near central streets with intense traffic); narrow streets and redevelopment; insufficient number of green belts; partial rehabilitation of the pavement of the roads, etc.

On the territory of RHI-Pernik, the total number of points is 24, located in the city of Pernik. The measurements made in 2019 show that the permissible noise levels were exceeded in 16 units by the checkpoints on the territory of the Regional Health Inspectorate - Pernik, which represents 66.7% of the total number of controlled areas. In the same year, only 8 points reported normal noise levels. Seven of them belong to the group - points on territories with industrial sources of noise - production and storage areas and one to the group - points on territories subject to the impact of rail and tramway transport.

Every year RHI-Kyustendil conducts a measurement of street noise on the territory of Kyustendil region in the settlements - city of Kyustendil and city of Dupnitsa. The same functions are performed by RHI-Blagoevgrad in the city of Blagoevgrad. According to the summarized data from the annual reports of the Regional Health Inspectorate of the total number of points 50% of them are defined on streets with intensive traffic and high density of habitation, 20% of the points are close to local sources of noise and 30% of the points are in the inner neighbourhoods of the residential area with minimal noise impact. From the conducted measurements in the period 2014-2018 of the noise level, values above the limit values specified in Ordinance No. 6/2006 were registered in residential areas and territories subject to the impact of road traffic.

According to the NSI, the noise load in the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil, reported in all noise recording points in the regions for the period 2010-2019, is given **in Tables** 2.1.11-2, 2.1.11-7 respectively:

Table 2.1.11.-2 *Distribution of monitored points according to the registered noise levels in Vidin Region 2010-2019*

Year	Monitored points (number)	Distribution of monitored points according to the registered noise levels in Vidin Region dB(A)				
		under 58	58-62	63-67	68-72	73-77
2010	**13**	1	1	11	-	-
2011	**15**	4	1	9	1	-
2012	**15**	5	2	7	1	-

2013	**15**	5	2	7	1	-
2014	**13**	4	5	4	-	-
2015	**15**	5	3	7	-	-
2016	**15**	5	2	8	-	-
2017	**15**	5	2	8	-	-
2018	**15**	5	2	7	1	-
2019	**15**	5	1	7	2	-

Table 2.1.11-3 *Distribution of monitored points according to the registered noise levels in Montana Region 2010-2019*

Year	**Monitored points (number)**	**Distribution of monitored points according to the registered noise levels in Montana Region dB(A)**				
		under 58	**58-62**	**63-67**	**68-72**	**73-77**
2010	**15**	-	3	12	-	-
2011	**15**	-	6	9	-	-
2012	**15**	1	5	9	-	-
2013	**15**	1	4	10	-	-
2014	**15**	-	-	-	-	-
2015	**15**	-	2	8	5	-
2016	**15**	-	-	10	5	-
2017	**15**	-	-	12	3	-
2018	**15**	-	2	10	3	-
2019	**15**	0	0	9	5	1

Table 2.1.11-4 *Distribution of monitored points according to the registered noise levels in Vratsa Region 2010-2019*

Year	**Monitored points (number)**	**Distribution of monitored points according to the registered noise levels in Vratsa Region dB(A)**				
		under 58	**58-62**	**63-67**	**68-72**	**73-77**
2010	**15**	4	3	4	3	1
2011	**15**	3	6	2	4	-
2012	**15**	7	3	2	3	-
2013	**15**	7	5	2	1	-

2014	**15**	6	4	4	1	-
2015	**15**	8	4	2	1	-
2016	**15**	3	4	7	1	-
2017	**15**	2	3	9	1	-
2018	**15**	4	2	8	1	-
2019	**15**	6	3	5	1	-

Table 2.1.11-5 *Distribution of monitored points according to the registered noise levels in Sofia-region 2010-2019*

Year	**Monitored points (number)**	**Distribution of monitored points according to the registered noise levels in Sofia-region dB(A)**				
		under 58	**58-62**	**63-67**	**68-72**	**73-77**
2010	**35**	10	13	11	1	-
2011	**35**	9	11	15	-	-
2012	**35**	10	16	9	-	-
2013	**35**	9	15	11	-	-
2014	**35**	2	18	14	1	-
2015	**35**	2	14	19	-	-
2016	**35**	2	16	17	-	-
2017	**35**	1	17	17	-	-
2018	**35**	1	16	18	-	-
2019	**35**	4	14	17	-	-

Table 2.1.11-6 *Distribution of monitored points according to the registered noise levels in Pernik Region 2010-2019*

Year	**Monitored points (number)**	**Distribution of monitored points according to the registered noise levels in Pernik Region dB(A)**				
		under 58	**58-62**	**63-67**	**68-72**	**73-77**
2010	**24**	1	2	8	4	9
2011	**24**	1	2	8	2	11
2012	**24**	1	1	7	6	9
2013	**24**	-	3	7	7	7
2014	**24**	-	1	10	8	5

2015	**24**	-	1	12	10	1
2016	**24**	-	3	11	10	-
2017	**24**	-	4	15	4	1
2018	**24**	-	7	11	6	-
2019	**24**	-	4	16	4	-

Table 2.1.11-7 *Distribution of monitored points according to the registered noise levels in Kyustendil Region 2010-2019*

Year	**Monitored points (number)**	**Distribution of monitored points according to the registered noise levels in Kyustendil Region dB(A)**				
		under 58	**58-62**	**63-67**	**68-72**	**73-77**
2010	**12**	**-**	**1**	**1**	**9**	**1**
2011	**36**	5	3	21	7	-
2012	**36**	5	3	15	13	-
2013	**36**	4	2	18	12	-
2014	**36**	5	3	20	8	-
2015	**36**	5	4	15	11	1
2016	**36**	6	4	21	5	-
2017	**36**	6	3	18	9	-
2018	**36**	6	4	18	8	
2019	**35**	6	6	21	2	-

- ***Regions: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pchinski (Republic of Serbia)***

The main sources of noise in the territory of the seven regions are road vehicles, railway traffic and industrial installations, as well as local sources of noise (industrial, utility workshops, retail outlets, restaurants, etc.).

The state of the **transport infrastructure** is described in ***item 2.1.9 of the EAR***.

Local sources of noise

Serbian statistics do not report gross domestic product (GDP) by region, but at regional level (NUTS II equivalent). According to the principle of job evaluation in 2018, the regions have the following shares in Serbian GDP: The Belgrade region leads the way (41.3%), followed by the Vojvodina region (25.9%) and then by Sumadija and western Serbia (18.6%). The region of southern and eastern Serbia, which is covered by the CBCP and TSIM, has the lowest share of 14.1%.

The sectoral analysis of GDP at the Serbian cross-border area shows that Nishava is a leader in all parts of the economy, followed by the Pcinja region (trade, construction, transport, food and furniture, state administration, administration, professional and scientific activities, real estate, education, health, social security, art and entertainment). The third region, which stands out in terms of GDP, is Jablanica. Unlike the Pcinja region, it has a higher GDP in financial transactions. In addition to these three areas, the data shows that GDP in the Bor region is higher than in the rest of the processing industry, i.e. electricity, gas, steam and air conditioning, as well as water supply and waste disposal.

Industry on both sides of the border is mainly represented by the extractive industry, which has been a leading sector in the past and still retains its most important part in regional industrial production. The most famous mining centres on the part of the Republic of Serbia are Bor with copper and Zaječar with coal and quartz mining, and on the part of the Republic of Bulgaria - Svoge and Pernik with coal mining. Other important industries are energy, metallurgy and mechanical engineering, chemical, textile, tobacco, etc. In Bulgaria and partly in Serbia, industrial production has fallen significantly during the transition to a market economy with restructuring and privatisation of large enterprises and has not yet recovered.

On the Serbian side, according to the statistics for the region of Southern and Eastern Serbia, 465,976 enterprises were registered at the end of 2018, of which 16.4% SMEs (57,072) and 12.5% large enterprises. Nishava and Jablanica have the highest number of micro, small and medium-sized enterprises, while the highest concentration of enterprises with more than 1,000 people is registered in Pirot, Pcinja, Zaječar and Bor.

Summary data on noise load *regions Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pcinski*

Directive 2002/49/EC on environmental noise assessment and management has been transposed into Serbian law by:

- *The Law on Protection against Environmental Noise* (OG of RS, No 36/2009 and 88/2010);
- *Ordinance on Noise Indicators, Limits, Methods for Assessment of Noise Indicators, Violations and Harmful Effects of Environmental Noise* (OG of the Republic of RS, No. 75/2010);
- *The Ordinance on the Methods of Creation and Content of Strategic Noise Maps and the Methods of Public Presentation* (OG of RS, No. 80/2010);

In order to support the implementation of Directive 2002/49/EC, the following have been developed:

- *Regulations on the methodology for the preparation of action plans* (OG of RS, No. 72/2010);
- *Regulations on noise measurement methods, the content and scope of the noise measurement report* (OG of the RS, No. 72/2010);
- *Regulations on the methods for determining acoustic zones* (OG of the RS, No. 72/2010);

- *Regulations on the conditions to be met by a professional organization for noise measurement, as well as documentation for representation to the request for permission for noise measurement* (OG of RS, no. 72/2010).

By amending the Environmental Noise Protection Act, work is currently underway to transpose *EU Directive 2015/996 establishing common noise assessment methods in accordance with Directive 2002/49/EC,* which replaces Appendix II to Directive 2002/49/EC and contains new common assessment methods (CNOSSOS-EU: 2015). The amendment of the law also provides for the designation of the bodies responsible for drawing up strategic noise maps and action plans to them, namely:

- Local government units for agglomerations,
- PE Railways of Serbia for rail traffic noise,
- PO Roads of Serbia for traffic noise, and
- Nikola Tesla airport for air traffic noise.

In order to develop the method for the preparation of strategic noise maps, the Ministry of Environmental Protection of the Republic of Serbia implemented a project "*Development of strategic noise maps of Niš agglomeration*" (Nišavski region) in the period 2018-2019, as a result of which strategic noise maps of Niš agglomeration were developed and published, as well as a guide for the development of strategic noise maps for the other agglomerations. The purpose of the guide is to provide guidance with practical information and advice to designated competent authorities for the development of strategic noise maps under Directive 2002/49/EC and EU Directive 2015/996.

Currently, in the Republic of Serbia, Niš is the only settlement with 24-hour continuous monitoring.

In implementation of the legislation adopted in 2019:

- Public Rail Infrastructure Management Joint stock company "Infrastructure of Serbian Railways" has developed strategic noise maps for:

- railway line in the direction of Batajnica - Centre Belgrade - Ovcha - 28.88 km;

- Railway number 101: Belgrade-Sid-State border (Tovarnik), section Nov Belgrade-Batajnica, total length 16.22 km;

- Railway number 106: Belgrade Centre-Pancevo main station- state border (Stamora Moravita), section Belgrade Centre-Ovcha, total length 12.54 km;

- Railway number 110: Belgrade Centre-Nov Belgrade, total length 3.00 km, i.e. the total required length of the railway lines.

- The public company "Roads of Serbia" has developed action plans for noise protection to the developed strategic noise maps for 843 km of the state road network.

With *Ordinance on Noise Indicators, Limits, Methods for Assessment of Noise Indicators, Violations and Harmful Effects of Environmental Noise* (OG of the Republic of Serbia, No. 75/2010)

are the limit values of the noise indicators, which refer to the total noise resulting from all noise sources in the observed place. The limit values for day (Lden) and evening are the same.

The general noise indicator (Lden) describes the noise disturbances over a 24-hour period (day-night) and the night noise indicator (Lnight) describes the noise disturbances at night from 10:00 PM to 6:00 AM.

The analysis of the data from the strategic noise maps prepared for sections of the main lines shows that they covered residents exposed to 55 dB and above for Lden and 45 dB and above for Lnight, provided that a corridor of 300 m width to the left and right of the main lines is taken into account. The largest population - 58,900 people, is exposed to the general noise indicator Lden, which is less than 55 dB, while below the values of the night noise indicator Lnight -less than 45 dB, 58,100 inhabitants are exposed.

B. Vibrations

Vibrations are divided into whole-body vibrations (general vibrations) and hand-arm vibrations (local vibrations). The limit values for whole-body vibrations are not yet well justified in terms of their harmful effects on the body.

Vibrations transmitted on a whole body or general vibrations are defined when the worker stands, sits or rests with a large surface of his body on the vibrating base, seat or surface. Vibrations on the whole body are mechanical vibrations which, when transmitted, lead to risks for the health of workers - drivers of excavators, bulldozers, scrapers, dumpers; drivers of trucks, buses, concrete mixers, wagons; drivers of locomotives; tractor drivers; drivers of self-propelled agricultural machines, electric trucks, etc.

Vibrations transmitted by the hand-arm system or local vibrations are defined when the worker is holding a vibrating tool and the perceived surface is his/her hand. Hand-arm vibrations are mechanical vibrations that, when the hand-arm system is transmitted, lead to risks to the health of workers with vibrating hand tools, with certain types of non-mechanized equipment, with the control elements of the machines and equipment, etc. Hand-held percussion, drilling and cutting tools are widely used in repair and construction (residential, road) and logging.

No evidence of identified environmental problems from general vibrations emitted by large technogenic sources of impact in the cross-border area within the scope of the CBCP and TSIM.

C. Ionizing radiation

No radiation parameters other than natural parameters characteristic of the area concerned were observed. There are no sites and other anthropogenic sources on the territory, which are proven pollutants, which contribute to a change in the radiation situation.

The radiation gamma background is within the limits of the typical natural gamma background for the region (according to the available data in the Regional State of the Environment Reports and the data from the radiation monitoring of the European Commission).

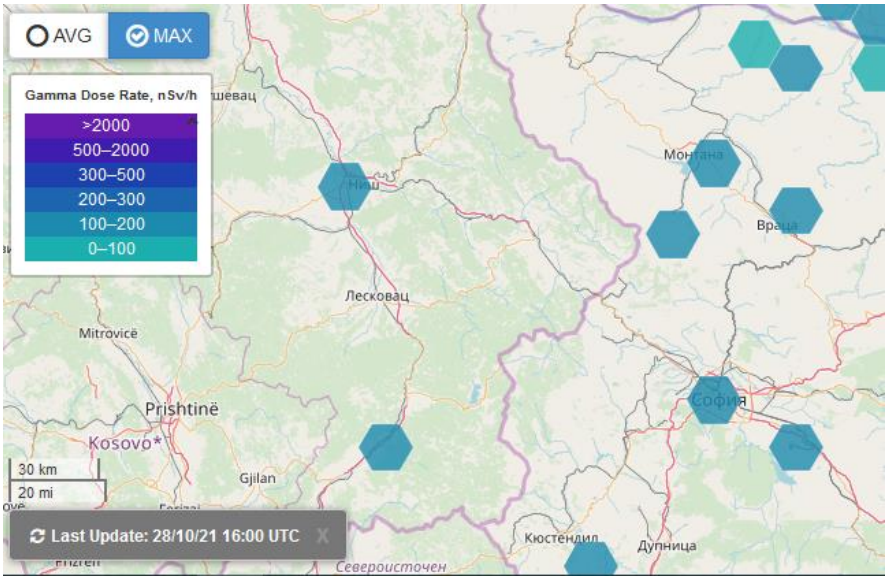


Figure 2.1.11-1 *Excerpt from the interactive radiation monitoring map, European Commission* [81]

D. Non-ionizing radiation

Non-ionizing radiation is one of the few studied environmental factors with adverse effects on humans and insufficiently clarified mechanisms of their biological effects. Non-ionizing radiation includes a number of factors: electrostatic field, constant magnetic field, radio frequency electromagnetic waves, laser radiation, etc.

In recent years, new technologies related to electromagnetic field (EMF) radiation from different frequency ranges have been entering more and more rapidly, both in the working environment and in populated areas. Almost every activity of modern man is related to the use of sources of non-ionizing radiation: electric current, household appliances, transport, medicine, cosmetics, communication technology.

Electromagnetic fields are a combination of invisible electric and magnetic fields with different forces. They are generated both by natural phenomena and by human activities mainly in the use of electricity.

The majority of man-made electromagnetic fields have a specific frequency ranging from high frequencies (mobile phones) through medium frequencies (computer screens) to extremely low frequencies (all high or low voltage electrical conductors).

For the territory of the Republic of Bulgaria, the emitters of energy of the EMF (radio and television transmitters and repeaters, radar and navigation stations, etc.) shall be located in such a way that the strength and power density of the EMF in the area of the populated areas does not exceed the limit levels, as required by Ordinance No. 9/1991 limit levels of electromagnetic fields

[81] *https://remap.jrc.ec.europa.eu/Simple.aspx*

in populated areas and determination of hygienic-protective zones around emitting sites, specified in **Table 2.1.11-8:**

Table 2.1.11-1 Limit values for the strength and density of EMF energy flow in a populated area

No.	Frequency range of the emitter	Limit value
1.	from 30 to 300 kHz	25 V/m
2.	from 0.3 to 3 MHz	15 V/m
3.	from 3 to 30 MHz	10 V/m
4.	from 30 to 300 MHz	3 V/m
5.	from 0.3 to 30 GHz	10 μW/cm2

For the territory of both countries, there is no systematic measurement data on the values of electromagnetic fields from these sources and their impact on the environment. Therefore, an appropriate assessment of the state of the EMF in the environment cannot be provided.

The sources of electromagnetic radiation may be classified as follows:

→ short-wave, medium-wave and long-wave radio transmitters;
→ private ultra-short-wave (UW) radios;
→ television transmitters and repeaters;
→ high voltage substations - open and closed;
→ power lines;
→ substations;
→ mobile communication base stations;
→ short-wave and VHF systems for mobile communications of transport, police, ambulance, etc.;
→ radar systems of the police, air transport, television and other satellite links;
→ personal communication systems (radio amateur transmitters).

The National Centre for Public Health and Analysis (NCPHA) in the Republic of Bulgaria performs targeted measurements of EMF values in “sensitive” areas with the presence of kindergartens, schools, hospitals, recreational and leisure facilities, as well as in densely populated areas with high density of radiating equipment, for the purpose of completing the information system. NCPHA also performs measurements with monitoring stations for 24-hour monitoring, as well as with spectral analysers to distinguish the contribution of different emitters in points around "sensitive" buildings and areas.

The results of the measurements carried out by the NCPHA in almost the whole country show that the EMF values do not exceed the limit levels in accordance with the requirements **of Ordinance No. 9 of 14.05.1991 on** *limit levels of electromagnetic fields in populated areas and determination of hygienic protection zones around radiating objects*, namely 10 μW/cm^2. Exceed of this value shall be detected at not more than 3% of the measured values.

The NCPHA information system is web-based and enables direct monitoring on Google map of the location of sources by address and geographical coordinates, the availability of measurement, and measurement data compared to the limit level. The specialized part of the information system is for the specialists and provides information about the technical characteristics of the antennas, the place and manner of installation, the availability of measurement, as well as protocols and data from the performed measurements on the site. The data in the electronic database are filled in by the RHI after verification by the specialists from the NCPHA, as well as by measurements and preliminary examinations under **Ordinance No. 9 of** 14.05.1991, carried out by the NCPHA.

The Regional Health Inspectorate, *in accordance with the Instruction for planning, organizing and reporting on the activities of the Regional Health Inspectorate* of the Ministry of Health from 2016, monitors the broadcasting objects, incl. systematic and targeted control of the values of the EMF, as the obligation to measure refers to 10% of the public places put into operation - base stations for mobile communication at random, as well as in areas of kindergartens, schools, hospitals.

For the Republic of Serbia, the limit values for exposure to non-ionizing radiations are determined by the *ПРАВИЛНИК О ГРАНИЦАМА ИЗЛАГАЊА НЕЈОНИЗУЈУЋИМ ЗРАЧЕЊИМА*[82], adopted on the basis of Art. 6, para. 6, item 1 of the Non-ionizing Radiation Protection Act. The reference limits/limits for exposure of the population to electric, magnetic and electromagnetic fields (0 Hz to 300 GHz), distributed according to field frequency, are the following:

Table 2.1.11-9 *Reference limits for exposure of the population to electric, magnetic and electromagnetic fields*

Frequency Range	Magnetic flux density (mT)	Electrical density (mA/m^2)	Specific level of energy absorbed - whole body (W/kg)	Specific level of energy absorbed per head and torso (W/kg)	Specific level of absorbed energy for limbs (W/kg)	Density (W/m^2)
0 Hz	40					
>0-1 Hz		8				
1-4 Hz		8/f				
4-1000 Hz		2				
1000 Hz-100 kHz		f/500				
100 kHz- 10 MHz		f/500	0,08	2	4	

[82] https://www.ekologija.gov.rs/sites/default/files/old-documents/Nejonizujucih/3._%D0%9F%D1%80%D0%B0%D0%B2%D0%B8%D0%BB%D0%BD%D0%B8%D1%86%D0%B8/pravilnik%202.pdf

10 MHz-10 GHz			0,08	2	4	
10-300 GHz						10

In 2019, 12,630 base stations were registered on the territory of the Republic of Serbia, of which 279 were declared as sources of non-ionising radiation of particular interest (IPI). In the same year, the Ministry of Environmental Protection issued 40 decisions on the use of IPI.

As of 31 December 2018 in the city of Belgrade there are 451 overhead lines, nine underground cables and 42 transformer and distribution stations, with the Environment Ministry issuing a total of seven IPI decisions for seven energy facilities.

IPI as well as sensitive areas are terms that are defined and described in accordance with the recommendations of the World Health Organization in the *Regulations on the sources of non-ionizing radiation of special interest, types of sources, manner and period of their occurrence* (Official Gazette of the RS, no. 104/09). An indicator has been introduced to identify a stationary and mobile source whose electromagnetic field is in the sensitivity zone (areas of residential areas where people can stay up to 24 hours a day) and reaches at least 10% of the size of the reference limit.

In the Republic of Bulgaria and the Republic of Serbia there is no legislation regulating the protection of the population from low-frequency electric and magnetic fields, as well as for those with frequency 50 Hz emitted by energy systems. Measured values at these frequencies should be compared with the European Recommendation 1999/419/EC on the protection of the population from electromagnetic fields.

With regard to ***magnetic fields in residential buildings with built-in substations***, the results of the measurements in the Republic of Bulgaria are as follows:

- Most unfavourable in terms of magnetic field effects are transformer stations built in first floors (ground floor type), in some cases also those of the built-in type. The discrepancies mainly relate to the noise and vibration in the rooms located directly adjacent to the transformer station, but higher magnetic field values are also detected in this type of equipment.
- Although magnetic field values are within the limits of hygiene standards for individuals with active or massive metal implants (**Recommendation 1999/519/EC**), they are relatively high in terms of the carcinogenic thresholds described in the literature (3 mG = 0.3 μT).

For the exposure status of the population from the ***other sources of*** EMR described above, there are insufficient data from measurements and assessments in both countries. The following can be summarized:

- Exposures to medical sources of EMF may be very serious and severely in excess of the limit values;

- The radiation from the cell phones is very high, but it's only for a short time. However, in many countries, research is being carried out into the absorption of electromagnetic energy from brain tissue and it is still unclear whether these phones have no harmful effect due to chronic, spurious effects directly on the brain;
- Household electrical appliances and electrical installations are also a major problem for the population, especially in case of incorrect installation.
- The risk of other emitters - police radios, emergency aid, transport, as well as security and anti-theft ones, which are much talked about in the world at present, and which create serious levels of electromagnetic exposure on persons in the vicinity of the emitters, can also be added here.

Summary of the state in terms of harmful physical factors:

Of the harmful physical factors, the most important for the region is noise - increased values are found mainly in cities, on the territory of both countries, mainly due to transport.

No excesses or problems were reported for the other harmful physical factors.

2.1.12. State and management of waste

- ***Regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria)***

Waste management in the Republic of Bulgaria, and in particular on the territory of the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil, is carried out on the basis of specific regulations (the main ones are the Waste Management Act and its regulations, waste management regulations at municipal level), the National Waste Management Plan 2021-2028 and the Municipal or Regional (for the municipalities part of the Regional Waste Management Association) waste management programs.

The situation with regard to waste management in the six areas is as follows (source *Regional reports on the state of the environment of RIEW-Montana, RIEW - Vratsa, RIEW- Sofia and RIEW-Blagoevgrad for 2020; National Waste Management Plan 2021-2028, Information System for Management and Monitoring of EU Funds in Bulgaria 2020*):

All municipalities within the scope of the two regions have developed **household waste management regulations** and implement **municipal or regional waste management programs**, and waste management programs for the period after 2020 are under development and adoption.

Municipal waste management programs are one of the most important tools for implementing waste legislation at the local level. They are developed and implemented in accordance with Art. 52 of the Waste Management Act. They are developed and adopted for a period that should coincide with the period of operation of the National Waste Management Plan and in accordance with the structure, objectives and projections of the plan. These programs are an integral part of municipal environmental programs under Art. 79 of the EPA.

The modern concept of waste management is aimed at resource efficiency aimed at preventing waste generation, promoting reuse and recovery through recycling, regeneration or other process of extraction of secondary raw materials, disposal and safe storage of waste, increasing the responsibility of producers.

According to *the National Waste Management Plan 2021-2028* In the composition of the formed household waste, biodegradable is 36%, biological is 25%, and recyclable fractions of paper and cardboard, plastic, glass and metals - 27.5%.

Management of household waste

Household waste management policy

The policy on household waste management in the areas under consideration is fully in line with the state policy on waste management and is aimed at environmentally and economically sustainable technologies, whereby everything that can be recovered and recycled to become energy, raw material for industry, fertilizer for plants, is separated from household waste, and minimal amounts of waste are disposed of in newly built regional landfills.

The total amount of household waste generated follows a trend towards a permanent decrease, with a decrease of about 36% over the period 2008-2018. The quantities of household waste deposited and direct household waste deposited are also significantly reduced.

In recent years, there has been a steady trend of growth in the share of recycled household waste from 19.4% in 2008 to 31.5% in 2018.

The share of household waste in the total amount of waste generated for the period 2008-2018 has decreased to 2-4%.

The largest amounts of waste are generated in the South-West region (more than 1/3 of the household waste in the country and with a constantly increasing share), which also includes some of the areas under consideration.

Landfilling, as a method of waste disposal, has the highest relative share in the treatment of household waste, although it has declined over the last 10 years.

Recycling and/or recovery activities are priority objectives in waste management. The main characterisation procedure introduced aims at diverting waste streams that can be recycled and/or recovered from landfills. Waste generators remain required to follow the priority order (hierarchy) of their management, by reorienting waste streams towards recycling and/or recovery, including for energy production.

Household waste treatment facilities

Control on compliance with the ban on waste disposal was carried out for old municipal landfills for non-hazardous waste, for which orders for cessation of operations were issued and for which no reclamation was carried out.

On the territory of the regions within the scope of CBCP and TSIM, the generated household waste is served by facilities of the following RWMS:

1. **RWMS Vidin** (includes all 11 municipalities of the region) - a regional landfill for non-hazardous waste has been built. At the regional landfill, municipal mixed household waste is disposed of through landfill without undergoing preliminary treatment (separation) and sorting of separately collected recyclable waste for subsequent recovery. It is advisable to take action for the study, design and construction of an installation for preliminary treatment (separation) of the mixed stream of household waste entering the regional landfill from the 11 municipalities of the Vidin region;
2. **RWMS Oryahovo** (municipalities of Oryahovo, Kozloduy, Mizia, Hayredin, Borovan, Byala Slatina and Knezha - Vratsa region) - in addition to the available regional landfill for household waste disposal through landfill, an installation for preliminary treatment of household waste is under construction with the aim of their recovery and 2 installations for composting separately collected green and biodegradable waste (Oryahovo municipality and Kozloduy municipality);
3. **RWMS Vratsa** (Vratsa and Mezdra municipalities of Vratsa region) - has built the regional landfill for non-hazardous waste, a facility for preliminary treatment of mixed household waste before disposal by separating the useful components. An installation for composting separately collected green waste of the municipalities of Vratsa and Mezdra is under construction;
4. **RWMS Montana** (includes the 11 municipalities of Montana region and Krivodol Municipality of Vratsa region) - a regional landfill for non-hazardous waste, a separating plant for the separation of recyclable components, has been built in 2020 several composting plants for separately collected green and biodegradable waste (for Montana Municipality; Berkovitsa Municipality, Chiprovtsi). A centre for separate collection of household waste, including for large-scale and hazardous waste, also operates on the territory of Montana Municipality;
5. **RWMS Dupnitsa** (serves the municipalities of Dupnitsa, Kyustendil, Bobov dol, Sapareva Banya, Nevestino and Treklyano from the region of Kyustendil) - on the territory of RWMS operates a regional landfill for non-hazardous waste, an installation for pre-treatment of waste is under construction, as well as a composting installation that will serve the municipalities of Dupnitsa, Bobov dol and Sapareva Banya. Municipalities of Kyustendil, Nevestino and Treklano in RWMS "RILA ECO", Dupnitsa waste management region implement a project for an installation for pre-treatment and a composting installation;
6. **RWMS Blagoevgrad** - in addition to the municipalities of Blagoevgrad region, the municipalities of Rila, Kocherinovo and Boboshevo of Kyustendil region participate in it;
7. **RWMS Pernik** (includes the 6 municipalities in the region) - has built the regional landfill for non-hazardous waste, a facility for preliminary treatment of mixed household waste before disposal by separating the useful components; a plant for composting separately collected green waste of the municipalities;

8. **RWMS Kostinbrod** (Kostinbrod, Svoge, Bozhurishte, Godech, Slivnitsa and Dragoman municipalities from Sofia-region) - on the territory of RWMS the generated waste is disposed of at a regional landfill, with 3 composting plants and an installation for preliminary treatment under construction;
9. **RWMS Botevgrad** (municipalities Botevgrad, Etropole and Pravets from Sofia-region) - on the territory of RWMS an installation for preliminary waste treatment as well as a composting installation are under construction, as currently all generated household waste is deposited at the regional landfill;
10. **RWMS Kostenets** (Kostenets, Samokov, Dolna Banya and Ihtiman municipalities of Sofia-region) - has built the regional landfill for non-hazardous waste, a facility for preliminary treatment of mixed household waste before disposal by separating the useful components; a plant for composting separately collected green waste of the municipalities; a system for separate collection of hazardous waste;
11. **RWMS Gorna Malina** (municipalities of Gorna Malina and Elin Pelin from Sofia-region) - on the territory of RWMS operates a regional landfill for non-hazardous waste, a project for the construction of an installation for preliminary waste treatment as well as a composting installation is in progress;
12. **RWMS Zlatitsa** (municipalities Zlatitsa, Anton, Mirkovo, Chavdar, Pirodop, Chelopech and Koprivshtitsa from Sofia-region) - on the territory of RWMS operates a regional landfill for non-hazardous waste, an installation for pre-treatment of waste is under construction, as well as a composting installation.

Collection of household waste

The population of the regions is fully covered by the waste collection system. In the settlements of Kyustendil region with a small population and/or difficult to reach geographical position (mountainous areas) it is difficult to carry out waste collection and disposal. For them, the collection and transport of the waste is carried out at the request of the respective mayor or mayor's deputy.

Systems for separate collection of packaging waste by municipalities have been introduced.

In order to achieve higher environmental performance, the competent authorities shall monitor the obligations of municipalities in the field of separate waste collection and progressively achieve the recycling and recovery targets for household waste.

Unregulated pollution with waste

The main difficulties facing the municipalities of the territories concerned are related to the cleaning of unregulated pollution, as a large percentage of construction waste does not enter landfills, but is disposed of unregulatedly by the inhabitants of the small settlements. Unregulated disposal of waste of any kind is carried out.

Widespread waste

Persons carrying out activities by placing on the market widely distributed waste shall fulfil their obligations through participation in collective systems, represented by recovery organizations or shall pay the due product fee to the Enterprise for management of environmental protection activities.

In commercial and other public sites, systems for handling widespread waste operate, mainly through placed containers for the collection of this type of waste, most often applicable to portable batteries and accumulators. Through municipal campaigns, the collection of widespread waste originating from the population is carried out periodically.

The collection of widespread packaging waste is carried out through systems for separate collection of packaging waste, organized by organizations for the recovery of packaging waste.

Status of separate waste collection

On the territory of Kyustendil region, the quantitative targets for separate collection, recycling and recovery of household waste, including at least paper and cardboard, metal, plastic and glass from households and other similar waste from other sources for the period from 01.01.2016 to 31.12.2020 have increased from 25 to 50%. The disposed biodegradable ones amount to 35% at the end of 2020. packaging waste, unusable batteries and accumulators, decommissioned electrical and electronic equipment, including fluorescent lamps and other lamps containing mercury are collected in special purpose containers or by campaigns.

The population by current address as of 15.12.2020 of Kocherinovo Municipality (Kyustendil region) counts 4,711 inhabitants and no separate collection system is currently in place in it (it falls into the category of municipalities with a population of <5,000 inhabitants).

In each of the municipalities in the region of Vratsa there are systems for separate collection of packaging waste, the percentage of the population covered is different for each depending on the separate points for the location of the coloured containers in the settlements.

The percentage of the population covered by the three-component system for separate waste collection for each municipality individually is between 40-45%. This is due to the fact that containers for separate collection of packaging waste in some of the above-mentioned municipalities are located only in municipal centres and in settlements with increased tourist interest.

On the territory of most of the outlets where the sale of electrical and electronic equipment takes place, there is a possibility to take back into the outlets electrical and electronic equipment that has become obsolete.

The collection of such waste from the population is primarily carried out through mobile points.

Waste oils and petroleum products, collected quantities of ferrous and non-ferrous metals waste, unusable batteries and accumulators, decommissioned electrical and electronic equipment, hazardous waste shall be handed over to persons for subsequent treatment on the basis of contracts concluded.

Construction waste

On the territories of the areas under consideration there are built and functioning landfills for construction waste, meeting the requirements of Ordinance No. 6/27.08.2013 on the conditions and requirements for construction and operation of landfills and other facilities and installations for recovery and disposal of waste in Vidin region In Sofia region - Kostinbrod municipality operates a landfill for inert waste.

On the territory of some of the other regions currently in force regional landfills are disposed of construction and demolition waste - earth, bricks, concrete, asphalt, tiles, wood, metals, paper, plastics, glass. In many municipalities, construction waste is stored in advance on sites designated by the municipality by decisions of the Municipal Councils.

The practice as a whole shows that separate collection is carried out by type of construction waste, both by companies and by the population.

The main focus in the management of this type of waste is assigning responsibility to the contracting authorities for construction works and the removal of construction works for the development of a plan for management of construction waste. It stipulates that the waste must be divided by type and delivered for recovery. The main objectives of their management are to minimize both their formation and their disposal.

In recent years, there have been positive trends for an increase in the relative share of recovered to disposed construction waste. The metallic waste generated by the construction works is recovered at 100%.

Production and hazardous waste

The main objectives of management are to prevent, reduce or limit harmful effects on the state of the environment and human health from these types of waste.

Some of the production waste (including textiles) is disposed of if it does not have characteristics (physical and chemical) allowing its recovery, is not of interest to the recycling industry and/or its recovery, as well as the lack of facilities and installations. An important problem is the unregulated incineration of industrial waste, in particular textile waste, paper and plastic packaging waste. Some generators of production waste continue to use waste as an alternative to established heating fuels.

Another important problem is that the capacity of landfills for non-hazardous waste is rapidly being exhausted due to the disposal of a significant part of the production waste.

On the territory of all regions, hazardous and production waste generated shall be collected separately on designated and marked sites or indoor warehouses, in appropriate containers.

- ***Regions: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski (Republic of Serbia)***

On the territory of the Republic of Serbia, the management of household waste in accordance with the Law on Waste Management (OG of the RS, No. 36/09, 88/10, 14/16 and 95/18 - other right), is under the jurisdiction of the local self-government. At the local level, waste management plans are adopted, setting waste management targets in the respective territory and each region to develop a regional waste management plan.

Management of household waste

The special measures in the Waste Management Act refer to the obligations that the local self-government unit, in accordance with the local plan, must implement, namely to organize: selection and separate collection of waste, including the frequency of collection of waste for recycling (paper, metal, plastic and glass); ensure the disposal of household waste in containers or otherwise; provide and equip collection centres for household waste that cannot be disposed of in household waste containers (bulky, biodegradable and other waste), including hazardous household waste.

Households and other producers of household waste carry out the selection of household waste for recycling.

Sanitary landfills shall be used for the disposal of non-hazardous waste. The seven regions of the cross-border cooperation area are served by two regional landfills "Muntina padina" in Pirot and "Zelikovac-Depot Two" in Leskovac, with recycling waste separation centres, composting factory/plant for mechano-biological treatment and transhipment stations. Vranja has the first sanitary depot found in these areas.

The waste management strategy foresees a network of 26 regional waste management centres with the necessary waste management infrastructure (extending waste collection coverage to 100% of the population).

Funding for the construction of regional waste management centres is provided by European funds and the budget of the Republic of Serbia, but funding models based on the model of public-private partnership are not excluded.

Recyclable waste that is separated in the Regional Waste Management Centres and other municipalities and cities is handed over for recycling, while the rest is disposed of in existing sanitary landfills, but also in existing non-compliant landfills, which are still operated until closure or construction of new landfills and regional centres according to the Waste Management Strategy.

According to data available from the Environmental Protection Agency in 2017, The Republic of Serbia recycles only 5% of household waste, and in 2018 this percentage is around 17%.

The region of southern and eastern Serbia has approximately 28% of all landfills in the country. Without available landfills are the municipalities of Kursumlia, Gitoraja, Gadzin Han and Cerna Trava.

Unregulated pollution with waste

The problem is the large number of unregulated landfills on the territory of the country. Only 60% of household waste is collected and the rest is disposed of illegally.

Widespread waste

It is planned to reduce the generation of packaging waste and to further promote recycling, especially in households, with the establishment of primary waste selection. There is a need for greater involvement of local utility companies in primary selection as well as their networking, including existing packaging waste management operators. Collection sites, a network of collection points and treatment facilities will be identified and users will be encouraged to dispose of waste batteries and accumulators at the designated locations.

Waste oils will be collected at waste collection centres and should not be mixed. Waste food oils should be collected for the production of biodiesel. Recycling of waste tyres takes precedence over incineration according to the waste hierarchy. A network of collection and treatment stations for tyre waste will be developed. The treatment of waste vehicles needs to be further developed, which includes mandatory disassembly and separation of hazardous materials and components for further treatment. A system for separate collection of waste from electrical and electronic products for recycling of usable parts, as well as a network of collection stations and treatment plants will be further developed.

Construction waste

According to the Spatial Plan of the Republic of Serbia for the period 2021-2035, recycling of construction and demolition waste will be established in order to reduce the use of natural resources. Construction waste disposal sites will be identified, compulsory recycling of construction waste will be introduced and quality standards adopted. The goal is to reach 70% of the recycling of construction waste by 2035. Waste containing asbestos is a special category and is collected separately, stored and disposed of in cassettes specially built for this purpose in sanitary landfills, which are authorised to receive and dispose of this type of waste.

Production and hazardous waste

Construction of hazardous waste treatment facility in Serbia is planned. The construction of a hazardous waste management system will include establishment of the collection and transportation of hazardous waste, construction of central regional warehouses with hazardous waste in five regions in Serbia (Belgrade, Srednebanacki region, Podunavle region, Machva region and Nishava region), construction of facilities for physico-chemical treatment of hazardous waste, construction of incinerators for the incineration of hazardous and medical waste, and of hazardous waste cages at regional sanitary landfills.

The construction of plants for physical and chemical treatment of liquid hazardous waste and sludge, combined with liquid and slurry storage facilities, special streams of industrial waste (such as solvents, acids, bases) are planned in Raska, Rasina, Bor and Zaječar.

The location of all installations will be determined by waste management plans and appropriate spatial and urban planning plans.

Summary of the state in terms of waste:

For the territory within the scope of the Republic of Bulgaria: the main treatment of mixed household waste is landfilling, with positive trends in reducing the amount of landfilled waste with the introduction of pre-treatment plants and composting of separately collected biodegradable waste. The main problems are the lack of installations and facilities for the recovery of construction waste and the unregulated disposal of household and construction waste.

For the territory within the scope of the Republic of Serbia: the main way of treating household waste is also landfilling. A problem is the low collection rate of household waste, as well as the use of old, non-compliant landfills. Actions are planned to develop an environmentally friendly waste management system.

2.1.13. Hazardous chemicals and risk of major accidents

- ***Regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria)***

On the territory of the six areas within the scope of the CBCP and TSIM are located 31 existing enterprises falling within the scope of Chapter Seven, Section One of the EPA *(according to the Public Register under Art. 11, para. 1, item 6 of the EPA[83])*, of which 10 with high and 10 with low risk of a major accident:

- **High risk potential:** Kozloduy NPP EAD, city of Kozloduy; Allel EOOD, city of Kyustendil; Aurubis Bulgaria AD, city of Pirdop; Bulgartransgaz EAD - Underground Gas Storage Chiren, village of Chiren; Explosion Factory at the Mining Complex of Elatsite-Med AD, city of Etropole; DA DRVVZ, TD, DR, city of Sofia, Anton Warehouse Base, village of Anton; EL BAT AD, city of Dolna Banya; Midzhur Plant, village of Gorni Lom; Kamibo OOD, city of Vratsa; Monbat AD, city of Montana; Vratsa Petroleum Base, city of Vratsa; Livadski Dol Warehouse Base, village of Nikovaevo; Mineral fertilizers warehouse, city of Lom; Propane-Butane Storage Base, city of Kostinbrod; Propane-Butane and Light Fuels Storage Base, city of Pernik; Technological pumping station, city of Ihtiman; Workshop for the production of industrial explosives for the future production needs of the Republika mine to Mini otkrit vagledobiv EAD - city of Pernik;

[83] *https://www.moew.government.bg/bg/prevantivna- dejnost/himichni-vestestva/sevezo/registur/*

- **Low risk potential:** Vagledobiv Bobov Dol - EOOD, city of Bobovdol; Dundee Precious Metals Chelopech EAD, village of Chelopech; Etna Cargo Investments 1 OOD, village of Krivina; Plant for production of technical gases on the territory of Steel Industry AD, city of Pernik; Oil Plant, village of Pokrayna; Enrichment Complex of Elatsite-Med, village of Mirkovo; Oil Terminal of OMV Bulgaria OOD, city of Vidin; Storage facility for highly flammable liquids, city of Kostinbrod; Warehouse for storage of explosives for civil purposes, village of Lilyache; Storage facility for pyrotechnic articles, city of Elin Pelin; Warehouses for trade and storage of explosives, weapons, ammunition and pyrotechnic articles, village of Dragovishtitsa; TPP Bobov Dol EAD, village of Golemo selo; Factory for sunflower oil - Extraction Workshop of Faustina Group EOOD, village of Dr. Yosifovo; Fintech OOD, city of Elin Pellin.

➢ ***Regions of Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski (Republic of Serbia)***

18 existing Seveso enterprises are located on the territory of the 7 areas covered by the CBCP and TSIM, of which 7 with high and 11 with low risk potential *(according to the Register of Seveso Enterprises in the Republic of Serbia[84])*:

- **High risk potential:** Propane-butane warehouse, Zaječarski; Explosives factory, Zaječarski; Sulphuric acid smelter and factory, Borski; Chemical industry enterprise, Borski; Petroleum derivatives and propane-butane warehouse, Nišavski; Propane-butane warehouse, Nišhavski; Propane-butane warehouse, Toplički;
- **Low risk potential:** Production of quartz sand, Zaječarski; Factory of industrial gases, Borski; Flotation factory, Borski; Mine, flotation and flotation drainage "Chukaru Peki", Borski; Oil derivatives warehouse, Borski; Oil derivatives warehouse, Nišavski; Heating plant "Krivi Vir", Nišavski; Factory for masonry and roof panels of plasticized sheet metal and polyurethane filling, Jablanički; Factory for production of memory foams, Pcinski; Glass wool factory, Pcinski; Flotation factory and mine for lead and zinc, Pcinski.

Summary of the situation with regard to hazardous chemicals and the risk of major accidents:

Existing establishments with low and high risk of a major accident are available in the cross-border area subject to the CBCP and TSIM.

When implementing activities and measures under the CBCP and TSIM related to the construction of sites and infrastructure, it is necessary to take into account the existing enterprises in the area carrying out activities of storage/production/use of hazardous chemicals and mixtures in quantities that pose a risk of major accidents.

[84] https://www.ekologija.gov.rs/sites/default/files/2021-11/registar_seveso_postrojena_na_teritoriji_republike_srbije_2.pdf

2.1.14. Health status of the population

A. Health and demographic characteristics of the population

The purpose of the specialised study referred to in this point is to investigate the health status of the population of the cross-border region with a view to assessing the presence or absence of determinative environmental risk factors.

The subject of the study are the population of the respective regions and the whole country through comparative analysis.

Monitoring units:

- logical observation unit - the inhabitants of the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik and Kyustendil on the territory of the Republic of Bulgaria and the regions of Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski on the territory of the Republic of Serbia;
- technical observation unit - environment, including the factors and parameters of the areas concerned

➢ ***Regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria)***

Demographics

The region of Vidin is part of the North-western region of the country and covers an area of 3,032.9 km², or 2.7% of the country's area, with a population density as of 2020 of 30.1 people/km^2. By population it is the least populated area in the Republic of Bulgaria. There are 11 municipalities with 141 settlements on its territory .

The region of Vratsa is located in the North-Western part of Bulgaria. It occupies an area of 3,619.7 km², or 3.3% of the country's territory, with a population density as of 2020 - 51.6 people/km^2. It includes 10 municipalities and 123 settlements.

The region of Montana is part of the North-western region of the country and has an area of 3,635.5 km² or 3.3% of the country's area, with a population density of 40.7 people/km^2 as of 2020. It includes 11 municipalities with 129 settlements.

The region of Sofia-region - located in the western part of the country and covers an area of 7,059 km² or 6.3% of the area of Bulgaria, with a population density as of 2020 - 35.1 people/km^2. There are 22 municipalities with a total of 178 settlements.

The region of Kyustendil is located in the South-Western region of the Republic of Bulgaria, with an area of 3,084 sq. km. or 2.7% of the country's territory, with a population density as of 2020 - 44.3 people/km^2. It includes 9 municipalities with 182 settlements.

The region of Pernik is located in the South-Western region of the Republic of Bulgaria, with an area of 2,390.5 km², or 2.2% of the total area of the country, with a population density as of 2020 - 52.4 people/km^2. It includes 6 municipalities with a total of 171 settlements.

Population size

Over the past three years, the tendency to reduce the population in the considered regions, characteristic of the country, has continued and the population for the country has decreased by 1.2% over the period (**Table 2.1.14-1)**.

Table 2.1.14-1 *Population data for a three-year period, NSI*

Statistical region	Year	Total, no.	Rel. share of men, %	Relative share of women, %	Relative share in cities, %	Relative share in villages, %
Republic of Bulgaria	2018	7 000 039	48,5	51,5	73,7	26,3
	2019	6 951 482	48,5	51,5	73,7	26,3
	2020	6 916 548	48,4	51,6	72,9	27,1
Vidin Region	2018	84865	48,72	51,28	64,81	35,19
	2019	82835	48,73	51,27	64,92	35,08
	2020	81212	48,62	51,38	64,57	35,43
Montana Region	2018	129637	48,85	51,15	64,34	35,66
	2019	127001	48,91	51,09	64,32	35,68
	2020	125395	48,78	51,22	63,65	36,35
Vratsa Region	2018	162549	49,15	50,85	58,87	41,13
	2019	159470	49,06	50,94	58,89	41,11
	2020	157637	48,97	51,03	58,77	41,23
Sofia Region	2018	229041	49,12	50,88	61,46	38,54
	2019	226671	49,08	50,92	61,57	38,43
	2020	238476	49,17	50,83	58,97	41,03
Pernik Region	2018	120880	48,66	51,34	79,3	20,7
	2019	119190	48,6	51,4	79,49	20,51
	2020	120426	48,62	51,38	77,88	22,12
Kyustendil Region	2018	119041	48,68	51,32	69,92	30,08
	2019	116915	48,69	51,31	70,04	29,96
	2020	116619	48,62	51,38	69,39	30,61

According to the data in the table, the population of the 6 regions makes up about 24.3% of the population of the country. Except for the regions of Pernik and Kyustendil, in the other regions the population is more evenly distributed between cities and villages. For all regions, as well as for the country, the higher number of women compared to men is maintained.

Age structure

The age structure of the population of the six regions is presented in the following table:

Table 2.1.14-2 *Age structure of the population, NSI*

Statistical region	Year	Total number	% of the general population		
			0-17	18-59	60+
Republic of Bulgaria	**2018**	7 000 039	15,24	60,01	24,74
	2019	6 951 482	15,34	59,79	24,87
	2020	6 916 548	15,38	59,84	24,77
Vidin Region	**2018**	84865	12,97	53,71	33,32
	2019	82835	12,97	53,73	33,30
	2020	81212	12,87	54,16	32,97
Vratsa Region	**2018**	162549	14,61	57,55	27,84
	2019	159470	14,74	57,32	27,94
	2020	157637	14,81	57,43	27,75
Montana Region	**2018**	129637	14,50	55,63	29,87
	2019	127001	14,54	55,61	29,85
	2020	125395	14,55	55,81	29,64
Region of Sofia-region	**2018**	229041	14,66	58,39	26,95
	2019	226671	14,82	58,27	26,92
	2020	238476	14,39	59,06	26,55
Pernik Region	**2018**	120880	13,12	57,85	29,03
	2019	119190	13,24	57,65	29,10
	2020	120426	13,28	57,92	28,80
Kyustendil Region	**2018**	119041	12,89	55,92	31,20
	2019	116915	13,01	55,73	31,26
	2020	116619	12,92	55,96	31,12

The working-age population in all regions is lower, although this is insignificant for some regions, compared to the national average rate. Although the last year saw a slight decline in the working-age population at the expense mostly of a slight increase in the working-age population, the high percentage of the third compared to the first age group is maintained, which determines the processes of demographic ageing of the population.

The ageing process is more pronounced in women than in men, due to the higher mortality among men and, as a result, the lower average life expectancy among men.

Birth rate

As can be seen from the following table, the birth rate generally decreases in all regions, as well as in the country, with the lowest for the villages of Pernik region and the cities of Vidin region. In the regions of Sofia-region, Pernik, Kyustendil - the birth rate is higher in the cities, while in the three regions of NWR - Vidin, Vratsa and Montana it is higher in the villages.

Table 2.1.14-3 *Birth Rate, ‰, NSI*

Statistical region	Year	Total	City	Village
Bulgaria	2018	8,9	9,1	8,3
	2019	8,8	8,9	8,5
	2020	8,5	8,6	8,2
Vidin Region	2018	6,8	7,3	6,0
	2019	6,5	6,5	6,7
	2020	5,8	5,5	6,2
Vratsa Region	2018	8,4	8,5	8,2
	2019	8,4	8,0	8,9
	2020	8,4	7,9	9,1
Montana Region	2018	7,7	8,0	7,1
	2019	7,3	7,0	7,9
	2020	7,3	7,2	7,5
Sofia Region	2018	8,6	9,6	7,2
	2019	9,0	9,7	8,0
	2020	8,9	9,4	8,2
Pernik Region	2018	7,7	8,4	4,8
	2019	7,3	7,9	4,8
	2020	6,7	7,4	4,1
Kyustendil Region	2018	6,9	7,9	4,7
	2019	7,4	8,1	5,8
	2020	6,8	7,3	5,6

Data on the number of live births in the last 3 years are presented in the following table :

Table 2.1.14-4 *Live births, NSI*

Statistical region	2018	2019	2020	Compared to the total number for
	Live births	Live births	Live births	

	total	**total**	**total**	**the country in 2020 - %**
Total for the country	62197	61538	59086	n/a
Vidin	586	548	473	0,80
Vratsa	1375	1348	1334	2,26
Kyustendil	831	873	793	1,34
Montana	1004	936	923	1,56
Pernik	933	872	803	1,36
Sofia Region	1988	2056	2079	3,52

The table shows that the biggest contributor is Sofia-region which is also the only area of the 6 in which the number of live births increased during the period. For the other regions, the indicator has a negative downward trend, with the most unfavourable values for Vidin region.

Death rate

The data for the 6 regions under consideration by death rate are as follows:

Table 2.1.14-4 *Death Rate, ‰, NSI*

Statistical region	**Year**	**Death rate**	**In cities**	**In villages**	**Infant death rate**
Bulgaria	2018	15,4	13,2	21,8	5,8
	2019	15,5	13,3	21,6	5,6
	2020	18,0	15,7	24,2	5,1
Vidin Region	2018	23,2	15,4	37,4	6,8
	2019	22,9	15,4	36,8	9,1
	2020	27,7	20,0	41,7	4,2
Vratsa Region	2018	19,8	14,8	26,8	7,3
	2019	19,8	15,1	26,4	4,5
	2020	22,3	17,3	29,5	3,7
Montana Region	2018	21,7	16,1	31,7	3,0
	2019	21,8	16,2	31,9	3,2
	2020	25,5	20,6	34,2	10,8
Sofia Region	2018	18,4	14,9	24,0	6,0
	2019	18,3	14,7	24,0	4,4
	2020	24,0	20,5	32,1	3,8
Pernik Region	2018	19,6	16,3	32,1	7,5
	2019	20,4	17,1	33,4	9,2
	2020	23,0	19,6	35,7	5,0
Kyustendil Region	2018	20,3	16,4	29,3	4,8
	2019	20,6	17,0	29,2	5,7
	2020	21,2	18,1	25,8	5,3

The overall death rate is the highest for the region of Vidin, which, given the previous data that present it as the region with the lowest population size, leads to a lasting trend for its reduction, especially in the villages. Overall, the trend for increased values for all regions for 2020 is evident, which is also associated with COVID-19 mortality.

The lowest death rate for Sofia-region for 2018 and 2019, but unlike other regions here is the highest growth rate for 2020 compared to the previous two years of the period under review. Raise in infant death rate marks Montana region for 2020 - 10.8 per thousand, which is more than twice the data for the country - 5.1 per thousand and dramatically increased compared to the previous two years for the region itself - 3.0-3.2 per thousand for 2018 and 2019.

The predominant causes of infant death rate are diseases from:

Class XVI - Certain conditions occurring during the perinatal period - they account for 45.5% of infant death rate cases for 2020;

Class XVII Congenital abnormalities (developmental vices), deformations and chromosomal aberrations - 18.9% of cases;

Class X - Diseases of the respiratory system - 13.6% of cases, more than 72% of them due to pneumonia;

Class IX Diseases of the circulatory organs - 6% of cases.

The regions of Pernik and Vidin have high infant death rates for 2019, but there has been a decline in 2020.

As the leading causes of mortality in the country for 2019 The World Health Organisation shall indicate the following :

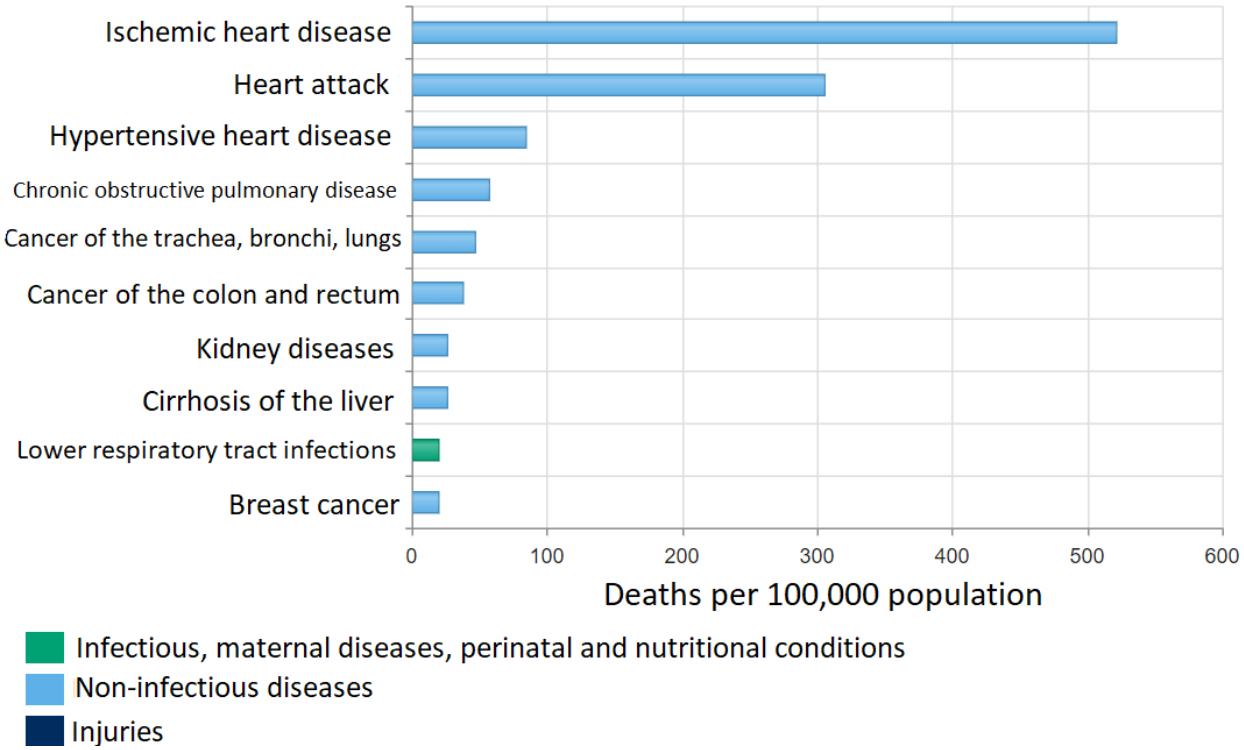


Figure 2.1.14-1 *Leading causes of mortality in Bulgaria for 2019, World Health Organization*[85]

[85] https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death

Table 2.1.14-5 *Mortality by cause - International Classification of Diseases (ICD) per 100,000 population (for the country, regions of Vidin, Vratsa and Montana) for 2020, NSI*

Causes of death, ICD-X revision	Republic of Bulgaria			Vidin Region			Vratsa Region			Montana Region		
	total	men	women	total	men	women	total	men	women	total	men	women
Total	**1,798.9**	**1,963.0**	**1,644.6**	**2766,3**	**2937,8**	**2603,6**	**2232,1**	**2452,6**	**2020,1**	**2548,4**	**2845,4**	**2264,8**
Class I Certain infectious and parasitic diseases (A00-B99)	6,1	7,1	6,1	8,5	7,5	9,5	10,1	12,9	7,4	7,1	8,1	6,2
Tuberculosis (A15-A19, B90)	1,1	1,8	1,1	1,2	2,5	-	2,5	5,1	-	-	-	-
Human immunodeficiency virus (HIV) disease (B20-B24)	0,3	0,4	0,3	-	-	-	-	-	-	0,8	-	1,5
Viral hepatitis (B15-B19), B94.2	0,5	0,7	0,5	-	-	-	1,9	3,9	-	0,8	1,6	-
Other infectious and parasitic diseases (A00-A09, A20-B09, B25-B89, B91-B94.1, B94.8-B99)	4,3	4,2	4,3	7,3	5,0	9,5	5,7	3,9	7,4	5,5	6,5	4,6
Class II Neoformations (C00-D48)	***267,2***	***316,6***	***267,2***	***307,2***	***380,7***	***237,6***	***364,5***	***432,3***	***299,4***	***265,5***	***324,4***	***209,1***
Malignant neoformations (C00-C97)	265,7	315,1	265,7	307,2	380,7	237,6	362,7	429,8	298,1	264,7	324,4	207,6
including:												
Malignant neoformations on lips, oral cavity and pharynx (C00-C14)	5,8	9,1	2,7	7,3	12,5	2,4	10,1	18,0	2,5	5,5	11,4	-
Malignant neoformations of esophagus (C15)	3,2	5,5	1,0	3,7	5,0	2,4	5,0	6,4	3,7	2,4	4,9	-
Malignant neoformations of stomach (C16)	15,6	19,5	11,9	8,5	12,5	4,8	18,9	19,3	18,6	12,7	8,1	17,0
Malignant neoformations of colon, rectum and anus (C18-C21)	38,7	46,7	31,1	37,8	47,6	28,5	61,2	72,1	50,7	42,0	55,2	29,4
Malignant neoformations of liver and intrahepatic bile ducts (C22)	10,0	12,6	7,5	9,8	7,5	11,9	12,6	16,7	8,7	4,8	4,9	4,6
Malignant neoformations of pancreas (C25)	18,0	20,5	15,6	23,2	25,0	21,4	27,1	30,9	23,5	19,0	26,0	12,4
Malignant neoformations of larynx (C32)	5,4	10,4	0,6	9,8	17,5	2,4	6,3	11,6	1,2	8,7	17,8	-
Malignant neoformations of trachea, bronchus and lung (C33-C34)	50,0	76,7	24,8	65,8	117,7	16,6	73,2	108,1	39,6	48,3	73,0	24,8
Malignant skin melanoma (C43)	2,5	2,9	2,0	4,9	2,5	7,1	1,3	2,6	-	3,2	3,2	3,1
Malignant neoformations of mammary gland (C50)	20,6	0,7	39,4	24,4	-	47,5	23,3	-	45,8	21,4	-	41,8
Malignant neoformations of cervix (C53)	5,2	-	10,2	6,1	-	11,9	8,2	-	16,1	6,3	-	12,4
Malignant neoformations of uterine body (W54-C55)	5,6	-	10,9	14,6	-	28,5	9,5	-	18,6	0,8	-	1,5

Malignant neoformations of ovary (C56)	6,6	-	12,8	2,4	-	4,8	5,7	-	11,1	4,8	-	9,3
Malignant neoformations of prostate (C61)	17,2	35,5	-	15,8	32,6	-	18,3	37,3	-	18,2	37,3	-
Malignant neoformations of kidney, except renal pelvis (C64)	5,6	8,3	3,1	6,1	12,5	-	2,5	3,9	1,2	6,3	8,1	4,6
Malignant neoformations of bladder (C67)	9,0	14,5	3,9	11,0	20,0	2,4	13,9	21,9	6,2	14,3	22,7	6,2
Malignant neoformations of brain and other parts of central nervous system (C70-C72)	9,7	10,5	9,0	7,3	10,0	4,8	8,2	7,7	8,7	5,5	4,9	6,2
Malignant neoformations of brain and other parts of thyroid gland (C73)	0,9	0,9	0,9	2,4	-	4,8	-	-	-	0,8	-	1,5
Hodgkin's disease and lymphomas (C81-C86)	4,5	4,7	4,4	8,5	10,0	7,1	6,9	5,1	8,7	7,1	8,1	6,2
Leukaemia (C91-C95)	6,2	7,5	5,0	11,0	15,0	7,1	5,7	6,4	4,9	7,9	13,0	3,1
Other malignant neoformations of lymphatic, blood producing and related tissues (C88, C90, C96)	2,4	2,5	2,4	1,2	2,5	-	2,5	2,6	2,5	1,6	1,6	1,5
Other malignant neoformations (C17, C23-C24, C26-C31, C37-C41, C44-C49, C51-C52, C57-C60, C62-C63, C65-C66, C68-C69, C74-C80, C97)	22,9	26,0	20,1	25,6	30,1	21,4	42,3	59,2	26,0	23,0	24,3	21,7
In-situ neoformations, benign neoformations and neoformations of unspecified or unknown nature (D00-D48)	1,5	1,5	1,4	-	-	-	1,9	2,6	1,2	0,8	-	1,5
Class III Diseases of the blood, blood-producing organs and individual disorders involving the immune mechanism (D50-D89)	2,1	2,2	2,0	2,4	2,5	2,4	1,9	2,6	1,2	0,8	1,6	-
Class IV Diseases of the endocrine system, eating disorders and metabolism disorders (E00-E89)	26,1	25,9	26,3	43,9	47,6	40,4	56,1	68,2	44,5	124,4	146,0	103,8
Diabetes mellitus (E10-E14)	25,5	25,4	25,6	42,7	47,6	38,0	54,9	66,9	43,3	124,4	146,0	103,8
Other endocrine, nutritional and metabolic disorders (E00-E07, E15-E89)	0,6	0,4	0,7	1,2	-	2,4	1,3	1,3	1,2	-	-	-
Class V Mental and Behavioural Disorders (F01-F99)	2,0	2,4	1,6	4,9	5,0	4,8	-	-	-	-	-	-
Dementia (F01, F03)	0,9	0,7	1,1	1,2	-	2,4	-	-	-	-	-	-
Alcohol abuse (including alcohol psychosis) (F10)	0,7	1,3	0,2	-	-	-	-	-	-	-	-	-
Drug dependence, toxicomania (F11-F16, F18-F19)	0,0	0,0	-	-	-	-	-	-	-	-	-	-

Other mental and behavioural disorders (F04-F09, F17, F20-F99)	0,4	0,4	0,4	3,7	5,0	2,4	-	-	-	-	-	-
Class VI, VII, VIII Nervous system and sensory organ diseases (G00-H95)	13,7	14,3	13,0	34,1	25,0	42,8	6,3	5,1	7,4	22,2	19,5	24,8
Parkinson's disease (G20)	3,5	3,8	3,3	18,3	12,5	23,8	0,6	1,3	-	7,9	11,4	4,6
Alzheimer's disease (G30)	1,2	1,0	1,5	3,7	-	7,1	1,3	-	2,5	0,8	1,6	-
Other diseases of the nervous system and sensory organs (G00-G12, G14, G21-G25, G31-H95)	8,9	9,6	8,3	12,2	12,5	11,9	4,4	3,9	4,9	13,5	6,5	20,1
Class IX Diseases of circulatory organs (I00-I99)	***1,090.1***	***1,101.8***	***1,079.1***	***1769,0***	***1700,6***	***1833,9***	***1325,1***	***1335,6***	***1315,0***	***1523,0***	***1571,9***	***1476,3***
Ischemic heart disease (I20-I25)	219.8	245.3	195.9	301,1	320,6	282,7	324,8	346,1	304,3	164,0	191,4	137,9
including:												
Acute myocardial infarction (I21-I22)	80.5	103.9	58.6	50,0	77,6	23,8	90,8	117,1	65,6	41,2	58,4	24,8
Other forms of ischemic heart disease (I20, I23-I25)	139.3	141.4	137.3	251,1	242,9	258,9	234,0	229,0	238,7	122,8	133,0	113,1
Other heart diseases (i30-I51)	372.9	377.2	368.9	384,0	368,2	399,1	462,9	474,8	451,5	606,2	606,7	605,7
Cerebrovascular diseases (I60-I69)	317.4	302.5	331.4	677,9	643,7	710,3	432,0	413,0	450,3	427,9	428,3	427,5
Other circulatory diseases (I00-I15, I26-I28, I70-I99)	179.9	176.8	182.8	406,0	368,2	441,9	105,3	101,7	108,9	324,9	345,5	305,2
Class X Respiratory Diseases (J00-J99)	***86.6***	***107.5***	***67.0***	***150,0***	***192,8***	***109,3***	***129,9***	***169,9***	***91,5***	***151,3***	***214,1***	***91,4***
Influenza (J09-J11)	0.7	1.0	0.5	1,2	2,5	-	-	-	-	0,8	-	1,5
Pneumonia (J12-J18)	42.9	52.2	34.1	63,4	75,1	52,3	39,1	39,9	38,3	14,3	17,8	10,8
Other chronic lower respiratory diseases (J40-J47)	21,6	28,5	15,1	69,5	90,2	49,9	71,3	101,7	42,1	34,9	55,2	15,5
including:												
Asthma (J45-J46)	0.4	0.4	0.4	3,7	2,5	4,8	-	-	-	-	-	-
Other chronic lower respiratory diseases (J40-J44, J47)	21,2	28,1	14,7	65,8	87,7	45,1	71,3	101,7	42,1	34,9	55,2	15,5
Other respiratory diseases (J00-J06, J20-J39, J60-J99)	21,4	25,7	17,2	15,8	25,0	7,1	19,6	28,3	11,1	101,4	141,1	63,5
Class XI Diseases of the digestive system (K00-K92)	59.9	82.1	39.0	84,1	112,7	57,0	82,6	110,7	55,7	67,4	84,4	51,1
Abdominal ulcer, duodenal ulcer, gastroenteric ulcer (K25-K28)	3,5	4,5	2,6	8,5	12,5	4,8	3,8	5,1	2,5	2,4	3,2	1,5
Cirrhosis, fibrosis and chronic hepatitis of the liver (K70, K73-K74)	26,4	43,3	10,6	34,1	50,1	19,0	37,2	60,5	14,8	25,4	42,2	9,3

Other diseases of the digestive system (K00-K22, K29-K66, K71-K72, K75-K92)	30.0	34.4	25.авг	41,5	50,1	33,3	41,6	45,0	38,3	39,6	38,9	40,3
Class XII Diseases of the skin and subcutaneous tissue (L00-L99)	0.8	1.0	0.6	-	-	-	-	-	-	4,0	4,9	3,1
Class XIII Diseases of the bone-muscle and connective tissue (M00-M99)	0.5	0.7	0.4	-	-	-	-	-	-	0,8	-	1,5
Rheumatoid arthritis and arthrosis (M05-M06, M15-M19)	0.1	0.1	0.1	-	-	-	-	-	-	0,8	-	1,5
Other bone and connective tissue damage (M00-M02, M08-M13, M20-M99)	0.4	0.6	0.3	-	-	-	-	-	-	-	-	-
Class XIV Diseases of the genitourinary system (N00-N99)	25,9	29,2	22,8	52,4	67,6	38,0	38,5	36,0	40,8	54,7	63,3	46,5
Kidney and ureter diseases (N00-N29)	25,6	28,6	22,7	51,2	67,6	35,6	38,5	36,0	40,8	54,7	63,3	46,5
Other diseases of the genitourinary system (N30-N99)	0,4	0,6	0,2	1,2	-	2,4	-	-	-	-	-	-
Class XV Pregnancy, childbirth and postpartum period (O00-O99)	0,1	-	0,1	-	-	-	-	-	-	-	-	-
Class XVI Certain conditions occurring during the perinatal period (P00-P96)	2,0	2,3	1,7	1,2	-	2,4	1,3	-	2,5	2,4	1,6	3,1
Class XVII Congenital abnormalities (developmental vices), deformations and chromosomal aberrations (Q00-Q99)	1,3	1,4	1,3	1,2	2,5	-	0,6	1,3	-	0,8	-	1,5
Class XVIII Symptoms, signs and abnormalities found in clinical and laboratory tests n.e.c. (R00-R99)	55.0	57.1	53.1	103,6	97,7	109,3	39,1	36,0	42,1	118,1	126,5	110,0
Sudden infant death (R95)	0.0	0.1	-	-	-	-	-	-	-	-	-	-
Not well specified and unspecified causes of death (R96-R99)	33.7	39.7	28.0	26,8	35,1	19,0	23,3	21,9	24,7	44,4	56,8	32,5
Other symptoms, signs and abnormalities found in clinical and laboratory tests n.e.c. (R00-R94)	21,3	17,3	25,1	76,8	62,6	90,3	15,8	14,2	17,3	73,7	69,8	77,5
Class XX External causes of morbidity and death rate (V01-Y98)	36,2	54,2	19,2	50,0	90,2	11,9	53,6	87,5	21,0	38,0	60,0	17,0
Accidents (V01-X59, Y85-Y86)	21,1	30,6	12,3	39,0	67,6	11,9	34,1	54,0	14,8	19,0	29,2	9,3
including:												
Transport accidents (V01-V99, Y85)	6,3	10,2	2,7	18,3	30,1	7,1	10,1	15,4	4,9	5,5	9,7	1,5
Falls (W00-W19)	6,5	7,6	5,4	6,1	10,0	2,4	8,8	15,4	2,5	3,2	3,2	3,1

Accidental drowning and sinking in water '(W65-W74)	1,2	2,0	0,4	-	-	-	-	-	-	0,8	1,6	-
Accidental poisoning and effects of poisonous substances (X40-X49)	1,4	2,3	0,6	1,2	2,5	-	1,3	1,3	1,2	1,6	1,6	1,5
Other accidents (W20-W64, W75-X39, X50-59, Y86)	5,8	8,5	3,2	13,4	25,0	2,4	13,9	21,9	6,2	7,9	13,0	3,1
Intentional self-harm (X60-X84, Y87.0)	8,5	13,8	3,4	6,1	12,5	-	13,9	24,4	3,7	10,3	16,2	4,6
Assault (X85-Y09, Y87.1)	0,7	1,0	0,5	1,2	2,5	-	2,5	3,9	1,2	2,4	4,9	-
Injury of undetermined intent (Y10-Y34, Y87.2)	5,3	8,0	2,7	3,7	7,5	-	3,2	5,1	1,2	6,3	9,7	3,1
Other external causes of trauma and poisoning (Y35-Y84, Y88-Y89)	0,5	0,7	0,3	-	-	-	-	-	-	-	-	-
Class XXII Special Purpose Codes (U00-U85)	123,4	157,3	91,5	153,6	205,4	104,5	122,4	154,4	91,5	168,0	219,0	119,3
of which: COVID-19 (U07.1-U07.2)	123,4	157,3	91,5	153,6	205,4	104,5	122,4	154,4	91,5	168,0	219,0	119,3

Table 2.1.14-5 *Death rate by cause under ICD per 100,000 population (for the regions of Kyustendil, Pernik and Sofia-Region), for 2020, NSI*

Cause of death, ICD-X revision,	**Kyustendil Region**			**Pernik Region**			**Sofia-region**		
"European Abbreviated List" 1	**total**	**men**	**women**	**total**	**men**	**women**	**total**	**men**	**women**
Total	**2403,9**	**2624,5**	**2194,9**	**2299,5**	**2596,1**	**2018,9**	**2118,0**	**2359,6**	**1884,7**
Class I Certain infectious and parasitic diseases (A00-B99)	6,0	7,0	5,0	4,2	6,9	1,6	0,9	1,8	-
Tuberculosis (A15-A19, B90)	3,4	3,5	3,3	2,5	5,2	-	-	-	-
Human immunodeficiency virus (HIV) disease (B20-B24)	-	-	-	-	-	-	-	-	-
Viral hepatitis (B15-B19), B94.2	0,9	-	1,7	-	-	-	-	-	-
Other infectious and parasitic diseases (A00-A09, A20-B09, B25-B89, B91-B94.1, B94.8-B99)	1,7	3,5	-	1,7	1,7	1,6	0,9	1,8	-
Class II Neoformations (C00-D48)	***320,3***	***389,0***	***255,2***	***346,4***	***386,3***	***308,6***	***263,6***	***315,1***	***213,8***
Malignant neoformations (C00-C97)	320,3	389,0	255,2	344,7	384,6	307,0	263,6	315,1	213,8
including:									
Malignant neoformations on lips, oral cavity and pharynx (C00-C14)	7,7	12,3	3,3	6,7	6,9	6,5	6,0	10,5	1,7

Malignant neoformations of esophagus (C15)	5,1	8,8	1,7	4,2	8,6	-	3,0	5,3	0,8
Malignant neoformations of stomach (C16)	18,8	24,6	13,3	20,9	22,3	19,5	17,6	18,4	16,9
Malignant neoformations of colon, rectum and anus (C18-C21)	41,1	45,8	36,7	55,1	63,5	47,1	41,3	54,3	28,7
Malignant neoformations of liver and intrahepatic bile ducts (C22)	9,4	5,3	13,3	15,9	15,5	16,2	6,0	5,3	6,8
Malignant neoformations of pancreas (C25)	23,1	35,2	11,7	21,7	22,3	21,1	16,8	18,4	15,2
Malignant neoformations of larynx (C32)	9,4	19,4	-	9,2	17,2	1,6	7,3	14,9	-
Malignant neoformations of trachea, bronchus and lung (C33-C34)	44,5	66,9	23,4	59,3	92,7	27,6	46,0	69,1	23,7
Malignant skin melanoma (C43)	5,1	8,8	1,7	5,8	8,6	3,2	3,4	2,6	4,2
Malignant neoformations of mammary gland (C50)	25,7	-	50,0	28,4	-	55,2	21,9	-	43,1
Malignant neoformations of cervix (C53)	6,9	-	13,3	7,5	-	14,6	1,7	-	3,4
Malignant neoformations of uterine body (W54-C55)	8,6	-	16,7	13,4	-	26,0	9,0	-	17,7
Malignant neoformations of ovary (C56)	6,9	-	13,3	5,8	-	11,4	4,7	-	9,3
Malignant neoformations of prostate (C61)	30,8	63,4	-	21,7	44,6	-	20,2	41,1	-
Malignant neoformations of kidney, except renal pelvis (C64)	3,4	1,8	5,0	9,2	15,5	3,2	4,3	7,9	0,8
Malignant neoformations of bladder (C67)	10,3	21,1	-	10,9	17,2	4,9	10,3	18,4	2,5
Malignant neoformations of brain and other parts of central nervous system (C70-C72)	15,4	21,1	10,0	13,4	10,3	16,2	13,8	13,1	14,4
Malignant neoformations of brain and other parts of thyroid gland (C73)	-	-	-	1,7	1,7	1,6	-	-	-
Hodgkin's disease and lymphomas (C81-C86)	2,6	1,8	3,3	5,0	6,9	3,2	7,3	9,6	5,1
Leukaemia (C91-C95)	6,0	5,3	6,7	6,7	8,6	4,9	5,2	7,0	3,4
Other malignant neoformations of lymphatic, blood producing and related tissues (C88, C90, C96)	2,6	5,3	-	0,8	1,7	-	0,4	-	0,8
Other malignant neoformations (C17, C23-C24, C26-C31, C37-C41, C44-C49, C51-C52, C57-C60, C62-C63, C65-C66, C68-C69, C74-C80, C97)	36,8	42,2	31,7	21,7	20,6	22,7	17,2	19,3	15,2
In-situ neoformations, benign neoformations and neoformations of unspecified or unknown nature (D00-D48)	-	-	-	1,7	1,7	1,6	-	-	-
Class III Diseases of the blood, blood-producing organs and individual disorders involving the immune mechanism (D50-D89)	8,6	12,3	5,0	0,8	-	1,6	3,0	5,3	0,8

Class IV Diseases of the endocrine system, eating disorders and metabolism disorders (E00-E89)	107,9	105,6	110,1	176,1	176,9	175,4	35,7	36,8	34,7
Diabetes mellitus (E10-E14)	106,2	105,6	106,7	176,1	176,9	175,4	34,8	35,0	34,7
Other endocrine, nutritional and metabolic disorders (E00-E07, E15-E89)	1,7	-	3,3	-	-	-	0,9	1,8	-
Class V Mental and Behavioural Disorders (F01-F99)	-	-	-	1,7	3,4	-	1,7	2,6	0,8
Dementia (F01, F03)	-	-	-	0,8	1,7	-	-	-	-
Alcohol abuse (including alcohol psychosis) (F10)	-	-	-	-	-	-	0,4	0,9	-
Drug dependence, toxicomania (F11-F16, F18-F19)	-	-	-	-	-	-	-	-	-
Other mental and behavioural disorders (F04-F09, F17, F20-F99)	-	-	-	0,8	1,7	-	1,3	1,8	0,8
Class VI, VII, VIII Nervous system and sensory organ diseases (G00-H95)	6,9	3,5	10,0	20,9	20,6	21,1	20,2	18,4	22,0
Parkinson's disease (G20)	1,7	1,8	1,7	2,5	1,7	3,2	3,4	3,5	3,4
Alzheimer's disease (G30)	-	-	-	3,3	-	6,5	1,3	1,8	0,8
Other diseases of the nervous system and sensory organs (G00-G12, G14, G21-G25, G31-H95)	5,1	1,8	8,3	15,0	18,9	11,4	15,5	13,1	17,7
Class IX Diseases of circulatory organs (I00-I99)	***1265,8***	***1263,9***	***1267,6***	***1368,9***	***1459,5***	***1283,2***	***1418,0***	***1484,4***	***1354,0***
Ischemic heart disease (I20-I25)	162,7	172,5	153,4	240,4	319,4	165,7	301,4	320,3	283,1
including:									
Acute myocardial infarction (I21-I22)	36,8	44,0	30,0	161,1	228,4	97,5	60,6	73,5	48,2
Other forms of ischemic heart disease (I20, I23-I25)	125,9	128,5	123,4	79,3	91,0	68,2	240,8	246,8	235,0
Other heart diseases (i30-I51)	402,5	417,2	388,6	293,0	327,9	259,9	533,6	576,8	491,9
Cerebrovascular diseases (I60-I69)	300,6	322,1	280,2	542,5	513,4	570,1	206,4	203,1	209,6
Other circulatory diseases (I00-I15, I26-I28, I70-I99)	399,9	352,0	445,3	293,0	298,8	287,5	376,7	384,2	369,3
Class X Respiratory Diseases (J00-J99)	***129,3***	***172,5***	***88,4***	***69,3***	***91,0***	***48,7***	***115,7***	***144,4***	***87,9***
Influenza (J09-J11)	-	-	-	0,8	-	1,6	0,4	0,9	-
Pneumonia (J12-J18)	97,6	132,0	65,0	33,4	41,2	26,0	43,0	56,0	30,4
Chronic lower respiratory tract diseases (J40-J47)	8,6	12,3	5,0	29,2	44,6	14,6	46,4	62,1	31,3
including:									
Asthma (J45-J46)	-	-	-	-	-	-	-	-	-
Other chronic lower respiratory diseases (J40-J44, J47)	8,6	12,3	5,0	29,2	44,6	14,6	46,4	62,1	31,3

Other respiratory diseases (J00-J06, J20-J39, J60-J99)	23,1	28,2	18,3	5,8	5,2	6,5	25,8	25,4	26,2
Class XI Diseases of the digestive system (K00-K92)	62,5	91,5	35,0	76,8	111,6	43,9	54,6	79,6	30,4
Abdominal ulcer, duodenal ulcer, gastroenteric ulcer (K25-K28)	-	-	-	5,0	5,2	4,9	1,7	2,6	0,8
Cirrhosis, fibrosis and chronic hepatitis of the liver (K70, K73-K74)	39,4	61,6	18,3	51,7	84,1	21,1	28,4	49,9	7,6
Other diseases of the digestive system (K00-K22, K29-K66, K71-K72, K75-K92)	23,1	29,9	16,7	20,0	22,3	17,9	24,5	27,1	22,0
Class XII Diseases of the skin and subcutaneous tissue (L00-L99)	-	-	-	-	-	-	0,4	0,9	-
Class XIII Diseases of the bone-muscle and connective tissue (M00-M99)	0,9	1,8	-	0,8	-	1,6	0,9	1,8	-
Rheumatoid arthritis and arthrosis (M05-M06, M15-M19)	-	-	-	-	-	-	-	-	-
Other bone and connective tissue damage (M00-M02, M08-M13, M20-M99)	0,9	1,8	-	0,8	-	1,6	0,9	1,8	-
Class XIV Diseases of the genitourinary system (N00-N99)	32,5	35,2	30,0	41,7	56,7	27,6	24,9	28,9	21,1
Kidney and ureter diseases (N00-N29)	32,5	35,2	30,0	41,7	56,7	27,6	24,5	28,9	20,3
Other diseases of the genitourinary system (N30-N99)	-	-	-	-	-	-	0,4	-	0,8
Class XV Pregnancy, childbirth and postpartum period (O00-O99)	-	-	-	-	-	-	-	-	-
Class XVI Certain conditions occurring during the perinatal period (P00-P96)	-	-	-	1,7	1,7	1,6	1,7	1,8	1,7
Class XVII Congenital abnormalities (developmental vices), deformations and chromosomal aberrations (Q00-Q99)	0,9	-	1,7	2,5	3,4	1,6	1,3	0,9	1,7
Class XVIII Symptoms, signs and abnormalities found in clinical and laboratory tests n.e.c. (R00-R99)	***281,8***	***285,2***	***278,5***	***31,7***	***42,9***	***21,1***	***23,2***	***27,1***	***19,4***
Sudden infant death (R95)	-	-	-	-	-	-	-	-	-
Not well specified and unspecified causes of death (R96-R99)	210,7	246,4	176,8	27,5	37,8	17,9	12,0	16,6	7,6
Other symptoms, signs and abnormalities found in clinical and laboratory tests n.e.c. (R00-R94)	71,1	38,7	101,7	4,2	5,2	3,2	11,2	10,5	11,8
Class XX External causes of morbidity and death rate (V01-Y98)	39,4	61,6	18,3	35,9	56,7	16,2	35,7	62,1	10,1
Accidents (V01-X59, Y85-Y86)	21,4	29,9	13,3	25,0	36,1	14,6	16,3	27,1	5,9
including:									
Transport accidents (V01-V99, Y85)	7,7	12,3	3,3	4,2	6,9	1,6	9,9	16,6	3,4
Falls (W00-W19)	8,6	14,1	3,3	5,8	5,2	6,5	2,1	3,5	0,8

Accidental drowning and sinking in water '(W65-W74)	1,7	1,8	1,7	-	-	-	1,3	2,6	-
Accidental poisoning and effects of poisonous substances (X40-X49)	-	-	-	7,5	10,3	4,9	0,4	0,9	-
Other accidents (W20-W64, W75-X39, X50-59, Y86)	3,4	1,8	5,0	7,5	13,7	1,6	2,6	3,5	1,7
Intentional self-harm (X60-X84, Y87.0)	4,3	8,8	-	8,3	15,5	1,6	6,9	13,1	0,8
Assault (X85-Y09, Y87.1)	-	-	-	-	-	-	1,3	2,6	-
Injury of undetermined intent (Y10-Y34, Y87.2)	12,8	21,1	5,0	2,5	5,2	-	11,2	19,3	3,4
Other external causes of trauma and poisoning (Y35-Y84, Y88-Y89)	0,9	1,8	-	-	-	-	-	-	-
Class XXII Special Purpose Codes (U00-U85)	141,3	195,4	90,1	120,2	178,6	65,0	116,5	147,9	86,2
of which: COVID-19 (U07.1-U07.2)	141,3	195,4	90,1	120,2	178,6	65,0	116,5	147,9	86,2

From the data presented in the above two tables, the following analytical summaries can be made:

- deaths per 1000 people are significantly above the national average and in the six regions, with the worst off being Vidin, followed by Montana and Kyustendil;
- and for the six regions, as well as for the country, the leading cause of death (in the last few years) has been circulatory diseases (Class IX), followed by neoformations (Class II) and respiratory diseases (Class X), as:
    - respiratory diseases for 2020 were shifted as a number of COVID-19 deaths and ranked fourth in number of deaths;
    - for Kyustendil in third place as a cause of mortality are Class XVIII diseases Symptoms, signs and deviations from the norm found in clinical and laboratory tests not elsewhere classified, which are significantly above the national average.

Natural growth

Low birth rates, intensified migration processes and gradually rising overall death rates determine the negative natural growth of the population

According to NSI data for the last three years, the data for the areas under consideration are as follows:

Table 2.1.14-7 Natural *Growth, (‰), NSI*

Statistical region	**2018**			**2019**			**2020**		
	total	**city**	**village**	**total**	**city**	**village**	**total**	**city**	**village**
Total for the country	**-6,5**	**-4,1**	**-13,5**	**-6,7**	**-4,4**	**-13,1**	**-9,5**	**-7,1**	**-16,0**
Vidin Region	-16,4	-8,1	-31,4	-16,4	-8,9	-30,1	-21,9	-14,5	-35,5
Vratsa Region	-11,4	-6,3	-18,6	-11,4	-7,1	-17,5	-13,9	-9,4	-20,4
Montana Region	-14,0	-8,1	-24,6	-14,5	-9,2	-24,0	-18,2	-13,4	-26,7
Kyustendil Region	-13,4	-8,5	-24,6	-13,2	-8,9	-23,4	-17,2	-13,2	-26,5
Pernik Region	-11,9	-7,9	-27,3	-13,1	-9,2	-28,6	-16,3	-12,2	-31,6
Sofia-region	-9,8	-5,3	-16,8	-9,3	-5,0	-16,0	-12,3	-8,7	-17,6

The data on the course of natural growth show a tendency to increase the negative value over the years, with all areas in the range of CBCP and TSIM having values less favourable than the national average. The most unfavourable values are in the regions of Vidin and Montana, where the values are more than twice the national average. In all regions the growth rate in the villages is much lower/with higher and unfavourable negative values, which is explained by the worse living conditions, remoteness of some areas and difficult access to health services, including lower health culture of the population, as well as the predominantly elderly population in these areas.

Prevalence and morbidity. Hospitalized morbidity.

The classes of diseases according to the International Classification of Diseases most closely related to **environmental factors** are:

Class II: Neoformations;

Class IV: Diseases of the endocrine glands, nutrition, metabolism and immunity disorders;

Class IX: Diseases of the organs of the circulation;

Class X: Diseases of the respiratory system;

Class XI: Diseases of the digestive system;

Class XII: Diseases of the skin and subcutaneous tissue;

Class XIV: Diseases of the genitourinary system;

Class XVII: Congenital anomalies.

The data presented reflect the primary turnover of the population for medical care to pre-hospital (polyclinical) institutions in the city. Overall morbidity (primarily recorded cases) and some classes of ICD disease have been observed, which according to literature may have been influenced **by environmental risk factors.**

The data presented reflect the primary turnover of the population for medical care to pre-hospital (polyclinical) institutions. Overall morbidity (primarily recorded cases) and some classes of ICD disease have been observed, which according to literature may have been influenced **by environmental risk factors.**

According to aggregated data for the regions presented in the *National Health Map of the Republic of Bulgaria for 2018*[86] the data for the leading registered diseases in the regions show the following:

Table 2.1.14-8 *Registered morbidity - leading disease classes by disease group and age, %*

Statistical region	Age group	Leading classes for registered morbidity, %			
Vidin Region	0-17	X-43,97%	I-9,02%	XX-8,36%	XIX-5,51%
	Over 18	IX-14,74%	XIII-12,47%	X-12,33%	XIV-6,91%
	total	X-20,33%	IX-11,12%	XIII-9,58%	XIX-6,13%
Vratsa Region	0-17	XXI-35,40%	X-26,54%	I-15,38%	XI-3,92%
	Over 18	XXI-20,49%	IX-18,84%	X-9,75%	XIV-6,93%
	total	XXI-23,99%	IX-14,46%	X-13,69%	XIV-5,87%
Montana Region	0-17	X-35,80%	XIX-10,77%	XI-10,05%	I-6,97%
	Over 18	XIX-12,38%	IX-10,72%	XIV-10,21%	X-10,05%
	total	X-15,16%	XIX-12,06%	XIV-9,46%	IX-8,68%
Sofia Region	0-17	X-74,86%	VII-4,49%	I-3,39%	XII-2,72
	Over 18	IX-17,89%	XIV-17,86%	XIII-9,54%	X-9,07%
	total	X-28,03%	XIV-13,19%	IX-12,84%	VII-7,57%
Pernik Region	0-17	X-41,77%	I-11,20%	VII-7,49%	XII-6,85%

[86] *https://www.mh.government.bg/media/filer_public/2018/06/06/priturkakmbr45-nzk_2018.pdf*

	Over 18	X-16,70%	IX-14,10%	XIII-10,55%	XIV-9,63%
	total	X-21,70%	IX-11,39%	XIII-8,91%	VII-8,73%
Kyustendil Region	0-17	X-49,82%	I-15,31%	VII-6,50%	XII-5,17%
	Over 18	IX-33,81%	X-9,86%	IV-7,68%	XIV-6,84%
	total	IX-29,70%	X-14,77%	IV-6,84%	VII-6,62%

From the data presented, it can be seen that in most areas, respiratory and circulatory diseases are at the first place.

The exception is the region of Vratsa, where the leading diseases are class XXI - Factors, howling on the health status of the population and contact with the health services.

With regard to hospitalised morbidity, the country is dominated by diseases of the organs of the circulation, respiratory system, digestive system, neoformations, diseases of the genitourinary system, trauma, poisoning and some other consequences of external causes, diseases of bone and connective tissue, pregnancy, childbirth and postnatal period. The data for the areas covered by the CBCP and TSIM for 2018 are presented in the following table:

Table 2.1.14-9 *Hospitalized morbidity - leading disease classes by disease group and age, %*

Statistical region	**Leading classes for hospitalized morbidity, %**			
Vidin Region	X-14,44%	IX-12,94%	II-10,34%	XIV-7,07%
Vratsa Region	X-22,73%	IX-13,57%	XI-8,09%	XXI-7,85%
Montana Region	XXI-18,95%	IX-18,92%	X-10,68%	VI-7,60%
Sofia Region	XXI-14,51%	IX-13,05%	II-12,33%	XI-8,62%
Pernik Region	IX-19,32%	X-16,09%	XI-10,31%	XIII-7,73%
Kyustendil Region	XXI-29,76%	IX-13,10%	X-10,53%	XIV-7,87%

The table shows that for individual regions the same three classes of diseases predominate as for the registered morbidity - XXI - Factors affecting the health status of the population and contact with health services, X - Diseases of the respiratory system and IX - Diseases of the circulatory organs.

- ***Regions: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski (Republic of Serbia)***

The seven areas covered by the TSIM and TCN relate to the Southern and Eastern Serbia region of the Republic of Serbia statistical publication *Regions, cities and municipalities, 2017* [87]):

Borski region has an area of 3,507 sq. km, includes 4 municipalities with a total of 90 settlements (6 cities and 84 villages). The population density for 2020 is 31.4 people/sq. km.

[87] *https://web.archive.org/web/20171122153807/http://webrzs.stat.gov.rs/WebSite/repository/documents/00/02/64/17/20-Regioni,_gradovi_i_op%C5%A1tine.pdf*

Zaječarski region has an area of 3,624 sq. km, includes 4 municipalities with a total of 173 settlements (5 cities and 168 villages). The population density for 2020 is 29.1 people/sq. km.

Nišavski region has an area of 2,728 sq. km, includes 7 municipalities with 282, of which 8 cities. The population density for 2020 is 131.8 people/sq. km.

Pirotski region has an area of 2,761 sq. km. It includes 4 municipalities with 214 settlements - 4 cities and 210 villages. The population density for 2020 is 30.1 people/sq. km.

Pchinska region has an area of 3,520 sq. km. It includes 7 municipalities and 363 settlements - 6 cities and 357 villages. The population density for 2020 is 55.7 people/sq. km.

Toplichka region has an area of 2,231 sq. km, includes 4 municipalities and 267 settlements, of which 6 cities. The population density for 2020 is 37.1 people/sq. km.

Jablanički region has an area of 2,770 sq. km, includes 6 municipalities with 336 settlements - 7 cities and 329 villages. The population density for 2020 is 71.3 people/sq. km.

Population size

Over the past three years, the tendency to reduce the population in the considered regions has continued (**Table 2.1.14-10)**.

Table 2.1.14-10 *Population data for a three-year period, EUROSTAT*

Statistical region	Year	Total, no.	Rel. share of men, %	Relative share of women, %
The Republic of Serbia	2018	7001444	48,7	51,3
	2019	6963764	48,7	51,3
	2020	6926705	48,7	51,3
Region Borski	2018	113914	48,9	51,1
	2019	112085	48,9	51,1
	2020	110219	48,9	51,1
Region Zaječarski	2018	108753	49,0	51,0
	2019	106917	49,1	50,9
	2020	105280	49,1	50,9
Region Nišavski	2018	363217	49,1	50,9
	2019	361446	49,1	50,9
	2020	359545	49,1	50,9
Region Pirotski	2018	85410	50,7	49,3

Statistical region	Year	Total, no.	Rel. share of men, %	Relative share of women, %
	2019	84244	50,7	49,3
	2020	83153	50,7	49,3
Region Pčinjski	2018	198102	50,6	49,4
	2019	196971	50,6	49,4
	2020	195894	50,6	49,4
Region Toplički	2018	84762	50,5	49,5
	2019	83743	50,6	49,4
	2020	82658	50,7	49,3
Region Jablanički	2018	202105	50,0	50,0
	2019	199946	50,0	50,0
	2020	197532	50,0	50,0

The data show that the population of the seven regions represents 16.4% of the country's population. The population decreases annually for both the country and the regions, and unlike the regions in the Republic of Bulgaria, in 4 of the Serbian regions the ratio between men and women is the same or in favour of men. In the three years, the population declined by 1.07%.

Age structure

Data on the age structure of the population for the period 2018-2020 are presented in the following table:

Table 2.1.14-11 *Data on the age structure of the population over a three-year period, EUROSTAT*

Statistical region	Year	% of the general population		
		0-15	**15-64**	**65+**
The Republic of Serbia	**2018**	14,4	65,7	19,9
	2019	14,3	65,3	20,4
	2020	14,3	64,8	20,9
Region Borski	**2018**	12,2	63,8	24,0
	2019	12,1	63,3	24,6
	2020	12,0	62,9	25,1
Region Zaječarski	**2018**	11,4	60,9	27,7

	2019	11,2	60,5	28,3
	2020	11,2	60,1	28,7
Region Nišavski	**2018**	13,5	64,9	21,6
	2019	13,5	64,4	22,1
	2020	13,5	63,9	22,6
Region Pirotski	**2018**	11,8	64,0	24,2
	2019	11,8	63,0	25,2
	2020	11,7	62,3	26,0
Region Pčinjski	**2018**	16,0	68,9	15,1
	2019	15,5	69,0	15,5
	2020	15,2	68,9	15,9
Region Toplički	**2018**	14,0	63,7	22,3
	2019	13,9	63,3	22,8
	2020	13,8	63,0	23,2
Region Jablanički	**2018**	13,8	65,5	20,7
	2019	13,7	65,2	21,1
	2020	13,5	64,9	21,6

In both the country and the regions within the scope of the CBCP and the TSIM there is a deterioration of the age structure - a decrease of the population from the first two age groups at the expense of an increase in the population in overworking age. The most unfavourable indicators are for the regions Zaječarski and Pirotski.

Birth rate, death rate, natural growth

Data on birth rate, general and infant death rate and natural growth are presented in the following table:

Table 2.1.14-12 *Birth rate, Death rate, Infant death rate and Natural Growth Rate, ‰, Statistical Office of the Republic of Serbia (SORS)*

Statistical region	Year	Birth rate	Death rate	Infant death rate	Natural growth
The Republic of Serbia	2018	9.2	14.6	4.9	-5.4
	2019	9.3	14.6	4.8	-5.3
	2020	8.9	16.9	5.0	-8.0
Region Borski	2018	6.9	18.6	7.7	-11.7
	2019	6.8	19.1	5.3	-12.3

	2020	6.0	21.7	9.2	-15.7
Region Zaječarski	2018	5.6	20.3	11.7	-14.8
	2019	6.3	20.6	4.5	-14.3
	2020	5.6	22.5	15.4	-16.9
Region Nišavski	2018	9.2	15.1	3.9	-5.9
	2019	9.1	15.0	7.3	-5.9
	2020	8.7	18.3	8.7	-9.6
Region Pirotski	2018	7.2	18.2	18.0	-11.0
	2019	7.5	17.8	6.3	-10.3
	2020	7.1	20.1	8.6	-13.0
Region Pčinjski	2018	9.8	12.0	11.4	-2.3
	2019	10.4	12.0	5.9	-1.6
	2020	9.4	15.1	7.6	-5.7
Region Toplički	2018	9.1	17.2	6.5	-8.0
	2019	9.3	17.4	3.9	-8.1
	2020	8.9	20.3	9.6	-11.4
Region Jablanički	2018	8.6	16.0	7.0	-7.5
	2019	8.0	16.4	6.9	-8.4
	2020	8.1	18.5	5.0	-10.4

The birth rate for both the country and the regions has varied over the years, decreasing over the three-year period considered. In all regions, except for Pčinjski and Toplički, the coefficient is lower than the national average - it is the lowest for Borski and Zaječarski regions.

The trend for death rate is significantly less favourable - the overall death rate is increasing both for the country and for the regions, with the exception of Pčinja region, all other regions have values higher than the national average. The highest death rate is in the two regions with the lowest birth rates - Zaječarski and Borski.

In terms of infant death rate, both in the country and in most regions, this indicator shows an unfavourable trend for increase. The exception are the regions of Pirotski, Pčinjski and Jablanički, where infant death rate is decreasing. In all regions, infant death rate is higher than the national average for the last year, except only for the Jablanički region, where the indicator is equal to the national average.

Natural growth continues, as in previous years, to be negative, and for the three-year period the downward trend is maintained. Only in the region of Pčinjski the natural growth is higher than the national average. The most unfavourable values are for the regions of Zaječarski and Borski, where it is about twice below the national average.

As the leading causes of death rate in the Republic of Serbia for 2019 The World Health Organisation shall indicate the following:

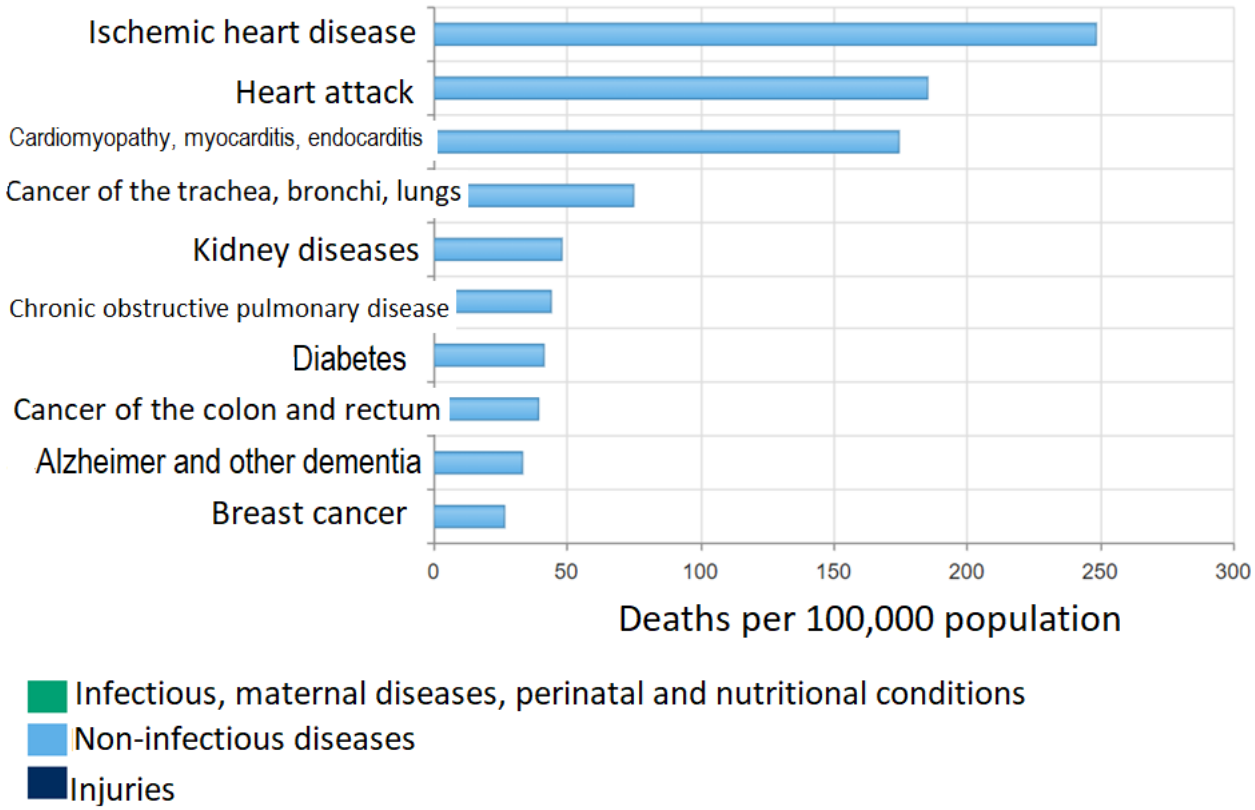


Figure 2.1.14-2 *Leading causes of death rate in the Republic of Serbia for 2019, World Health Organisation*[88]

[88] https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death

Table 2.1.14-13 *Deaths by cause of death in 2020, number, SORS*

Causes of death, ICD-X revision	The Republic of Serbia	Region Borski	Region Zaječarski	Region Nišavski	Region Pirotski	Region Pčinjski	Region Toplički	Region Jablanički
Total	**116850**	**2374**	**2349**	**6535**	**1662**	**2948**	**1663**	**3626**
Class I Certain infectious and parasitic diseases (A00-B99)	822	22	11	34	19	48	9	9
Class II Neoformations (C00-D48)	***21392***	***326***	***371***	***1205***	***260***	***395***	***194***	***580***
Class III Diseases of the blood, blood-producing organs and individual disorders involving the immune mechanism (D50-D89)	301	7	17	24	12	10	3	16
Class IV Diseases of the endocrine system, eating disorders and metabolism disorders (E00-E89)	3535	77	127	243	59	62	58	123
Class V Mental and Behavioural Disorders (F01-F99)	1579	25	52	138	10	18	9	62
Class VI Nervous system and sensory organ diseases (G00-G99)	2910	38	63	178	65	36	18	103
Class VII Diseases of the eye and its appendages (H00-H59)	0	0	0	0	0	0	0	0
Class VIII Diseases of the ear and mastoid (H60-H95)	1	0	0	0	0	0	0	0
Class IX Diseases of circulatory organs (I00-I99)	***55305***	***1255***	***1138***	***2510***	***795***	***1588***	***887***	***1645***
Class X Respiratory Diseases (J00-J99)	***6715***	***116***	***126***	***253***	***113***	***205***	***86***	***146***
Class XI Diseases of the digestive system (K00-K92)	2918	52	72	201	57	65	40	69
Class XII Diseases of the skin and subcutaneous tissue (L00-L99)	148	4	3	9	1	2	2	4
Class XIII Diseases of the bone-muscle and connective tissue (M00-M99)	180	4	6	15	2	1	0	0
Class XIV Diseases of the genitourinary system (N00-N99)	2229	67	69	128	28	50	36	80
Class XV Pregnancy, childbirth and postpartum period (O00-O99)	6	1	0	2	0	1	0	0
Class XVI Certain conditions occurring during the perinatal period (P00-P96)	205	5	8	21	4	9	4	5

Causes of death, ICD-X revision	**The Republic of Serbia**	**Region Borski**	**Region Zaječarski**	**Region Nišavski**	**Region Pirotski**	**Region Pčinjski**	**Region Toplički**	**Region Jablanički**
Class XVII Congenital abnormalities (developmental vices), deformations and chromosomal aberrations (Q00-Q99)	105	2	0	9	2	4	3	1
Class XVIII Symptoms, signs and abnormalities found in clinical and laboratory tests n.e.c. (R00-R99)	5483	77	66	524	92	191	136	379
Class XIX Trauma, poisoning and certain other external effects (S00-T98)	2660	61	49	195	27	56	43	97
Class XXII Special Purpose Codes (U00-U85)	***10356***	***235***	***171***	***846***	***116***	***207***	***135***	***307***

From the data presented in the above table, the following analytical summaries can be made: for the seven regions, as well as for the country, the leading cause of death (as in the past few years) are circulatory organ diseases (Class IX), followed by neoformations (Class II) and respiratory system diseases (Class X), with 2020 respiratory diseases shifted as the number of deaths from COVID-19 (Class XXII) and ranked fourth in number of deaths.

Prevalence

The most common contributors to population mortality are chronic non-communicable diseases. Heart disease, blood vessel disease and malignancy account for more than two-thirds of all causes of mortality in recent years in the Republic of Serbia. More than half of all deaths (**51.7%**) are due to death from diseases of the circulatory system, one in five deaths **(21.3%)** is due to malignant tumours, from obstructive pulmonary diseases - **2.6%**, and from complications of diabetes **- 3.1%**.

The leading causes of death due to illness in the Republic of Serbia compared to those in the EU at the age of 64 prove several times higher, namely: ischaemic heart disease - from **25.6%** in the Republic of Serbia to **15.8%** in the EU, cerebrovascular disease - from **17.3%** in the Republic of Serbia to **7.2%** on average in the EU, malignant neoformations - twice as high as in the EU.

B. Analysis of environmental risk factors affecting the health of the population in the cross-border region

Environmental risk factors for human health are identified and tracked at national level in the following documents for both countries:

- *The annual reports of the Minister of Health on the state of health of citizens and implementation of the National Health Strategy of the Republic of Bulgaria* - the last such report was approved in April 2020 [89]and refers to 2019) and
- SORS and EUROSTAT statistics, *Health impact of ambient air pollution in Serbia, World Health Organisation, 2019* for the Republic of Serbia.

According to those documents, part of the health risk factors, in addition to socio-economic and lifestyle-related factors, is the group of environmental and work-related factors. Among the environmental factors at risk for health are ***ambient air quality, drinking water quality and quantity, bathing water, soil, waste, noise, genetically modified organisms in food, non-ionizing radiation and ionizing radiation***.

Deteriorated ambient air quality (ambient air pollution) is a serious threat to human health and the quality of life of the population. According to the analysis of the current situation, the main pollutant in the considered area of the CBCP and TSIM are **fine particulate matter**.

Systemic exposure to elevated levels of atmospheric pollutants directly or indirectly provokes a range of undesirable effects, from minor functional disturbances to the occurrence of serious diseases of individual organs and systems (especially respiratory). The most sensitive population groups - children, the elderly and people with chronic diseases - are also exposed to potentially harmful effects of atmospheric pollutants. The health risk of air pollution by dust depends both on the size of the particles and the chemical composition of the suspended particulate

[89] *https://ncpha.government.bg./uploads/reports-analyzes/HealthOfTheNation_AnualReport_2020.pdf*

matter, on the other chemical compounds adsorbed on their surface and on the area of the respiratory system in which they are deposited, especially in the case of possible negative cumulative effects resulting from various industrial and construction activities. An age factor in the degree of respiratory morbidity is reported - it is significantly more common in children from 0-18 years and decreases in adults from the group over 18 years.

Regarding **drinking water** for the territory of the areas covered by the CBCP and TSIM for the Republic of Bulgaria, no significant problems have been identified, and for the Republic of Serbia there is also no evidence of such risks. Problems have been identified related to drought and water scarcity, irrational use of water, unregulated landfills, characteristic mainly of the Republic of Serbia - due to the low level of waste collection, which create a risk of pollution of the water of drinking water sources located nearby.

There is no information on pollution and health risks from established **bathing areas**.

The state of the **soils** in the cross-border area indicates the local (point) nature of the pollution. No cases of adverse effects arising from significant soil pollutions have been reported, but there is a risk to human health from the unauthorised disposal of waste - in agricultural land harvested for human consumption.

With regard to **waste**, no pollutions have been identified that have the potential to have an impact on human health, but the main method of household waste disposal in general in both countries is landfilling, and non-compliant landfills, including non-regulated landfills, are still a problem. The risks are higher for the territory of the regions in the Republic of Serbia, given that the collection of household waste is still low there as well. Both countries undertake activities and implement policies aimed at limiting waste generation, reducing the amount of waste to landfill, environmentally friendly treatment of specific waste streams and respecting the waste management hierarchy.

Increased **noise** levels are observed in settlements in the regions of the cross-border area of both countries - a risk factor leading to adverse effects on the population and human health - hearing impairment, discomfort, etc.

There are no problems and violations of norms regarding **ionizing and non-ionizing radiation**, as well as **genetically modified organisms in food**.

In recent years, the risks associated with climate change have been associated with primary and secondary effects. The primary effects directly affect human health, for example through heat and cold waves and flooding. Secondary effects indirectly affect human health through other climate-affected factors such as pollen, carrier diseases, fires, contaminated food, water and air, and damaged crops. The primary and secondary effects of climate change on health can be differentiated into the following groups: heat-related morbidity and death rate; extreme weather-related morbidity and death rate; cardiovascular diseases, including stroke, asthma, respiratory allergies and respiratory tract diseases; food and nutritional diseases; water-related diseases;

mental health and stress-related disorders, neurological diseases and disorders. The key future vulnerabilities are as follows:

o Impact of temperature and humidity on health - these include the expected increase in: the number of deaths from cardiovascular diseases and strokes in major cities during the summer due to heat waves and the effects of the urban heat island; diseases from vectors; campylobacterial infections; respiratory diseases due to the effects of dust and PM in warmer air; and allergic diseases due to earlier flowering and increased concentration of pollen, spores and other urgent health effects related to weather conditions. These include the expected increase in: death rate due to extreme weather events and fires, which is higher in vulnerable groups; water and food morbidity due to damaged infrastructure; and post-traumatic disorder.

o Change in precipitation-related health effects - this includes the expected increase in: occurrence of cryptosporidiosis and campylobacteriosis due to a combination of more frequent precipitation and higher average annual temperatures; and infections caused by non-cholera vibrio (enteritis not isolating vibrio-cholera) due to more abundant precipitation and higher levels of humidity.

Summary of population and human health state:

For the entire cross-border area, both countries have population densities below the national average, negative natural growth, high mortality, unfavourable age structure and demographic ageing.

In both countries, cause mortality is the leading cause of circulatory diseases, followed by new formations and respiratory diseases.

The analysis of human health risk factors for the cross-border region focuses primarily on air pollution, increased noise levels, unauthorised disposal of waste and drinking water problems, in terms of scarcity and drought. For the entire cross-border region, climate change risks are becoming increasingly important for the population.

2.2. Possible development of the environment without the implementation of CBCP and TSIM

Based on the analysis of the data from the environmental characteristic in the previous **item 2.1 of the Environmental Assessment Report**, the following table assesses the development of environmental aspects without the application of CBCP and TSIM by environmental components and factors, incl. human health. The impact of the “zero alternative”, i.e. the refusal to implement the CBCP and TSIM, has also been assessed.

Table 2.2-1 *Possible development of the environment without the implementation of CBCP and TSIM*

Environmental components and factors	***Development without application of CBCP and TSIM***
Climate and climate change Adaptation.	Existing and new sources of greenhouse gases will increase their emissions, but their levels will be negligible for both countries and globally. Over the last three decades, emissions of the main greenhouse gases have tended to decrease. This trend is expected to continue without the implementation of the CBCP and TSIM, slowing down the green and digital transition, which contribute to limiting greenhouse gas emissions. The refusal to implement the CBCP is associated with lost benefits in terms of adaptation - the strategic project to prepare the population for action in the event of disasters will not be implemented,
Ambient air	Without the implementation of CBCP and TSIM, investments related to the greening of the business and sustainable growth of SMEs will be delayed/not implemented in this scope, and the current levels of emissions from the respective industries will be maintained accordingly. The economic development of the cross-border region is slowing down, the benefits for financing and additional investments will be missed, as well as the utilisation of EU funds, respectively - improving working conditions, improving the quality of life, healthy lifestyle, respectively ensuring a pleasant environment, preserving the rich nature on the basis of sustainable development of the environment.
Water	In case of non-implementation of CBCP and TSIM, the development of waters will be unfavourable as: - there will be no positive impact of territorial cohesion, green solutions and an integrated border region; - there will be no mutual cooperation which may lead to adverse effects on surface water. - the control over the envisaged tourism initiatives will be lowered.
Subsoil	No trend change expected
Soils and land use	No development is expected, but existing soil and land use problems may be exacerbated.
Vegetation and animal world	No development expected
Protected areas and territories	No development expected
Landscape	Trends will remain the same as at the moment.
Tangible assets	In case of non-implementation of CBCP and TSIM, the development of tangible assests will be unfavourable as:

Environmental components and factors	***Development without application of CBCP and TSIM***
	→ there will be no positive impact of achieving smart digital and electronic transformation of the local economy to achieve a sustainable competitive region. → the identified opportunities for development of a regional tourism product and hence stimulation of the local economy, balanced development and achieving competitiveness of the business environment will not be possible.
Cultural and historical heritage	No development is expected, and the benefits of restoring, preserving, promoting, including increasing and diversifying the sources of income for the territories covered by the CBCP and TSIM will be lost.
Harmful physical factors	The non-implementation of the CBCP and TSIM will continue the trend of higher noise emissions from road transport. The possibility of financing and implementing activities related to the achievement of the priorities and objectives set by the two documents will not be used. No change in the tendency is expected in relation to the other harmful physical factors.
Waste	The non-implementation of CBCP and TSIM has a less favourable impact than their implementation, as opportunities for financing activities and measures related to greening of enterprises, green transition, digitalization, which are directly related to limiting the generated quantities and types of waste.
Hazardous chemicals and risk of major accidents	No change is expected in the management status of hazardous chemicals and the risk of major accidents and the impact of existing enterprises with low or high risk potential.
Population health status and health risk	Without the implementation of the CBCP and the TSIM, the benefits associated with the funding activities to improve the well-being, security/response to extreme natural events and the quality of life in the cross-border region.

3. Environmental characteristics for areas likely to be significantly affected by the implementation of the CBCP and TSIM

CBCP and TSIM will be implemented within the defined geographical scope:

- *Republic of Bulgaria: 6 NUTS III districts: Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil*
- *The Republic of Serbia – 7 NUTS III districts: Borski, Zaječarski, Nišavski, Pirotski, Topličkі, Jablanički, Pčinjski*

Accordingly, and within this territorial scope, environmental, population and human health impacts will be realised. Some of the activities and measures that are without investment character - soft measures (marketing studies, investments in improving the quality of services, improving the

quality of services of general interest, branding, digitization) have no potential for environmental impact.

Activities and measures of an investment nature - hard measures - are of low detail - without a specific location, parameters, scope and accompanying activities, therefore, taking into account the precautionary principle, the whole territory covered by the CBCP and the TSIM is considered to be affected.

The analysis of the possible significant impact of territories on the implementation of the CBCP and TSIM is made by components and environmental factors, taking into account the current guidelines of the European Commission, *The Technical Guidelines of the European Commission for the integration of the principle of "no significant harm" under the Recovery and Sustainability Mechanism Regulation*, with impacts also analysed against the six environmental objectives covered by the Taxonomy Regulation and

With regard to the likely significant impact of components and environmental factors, it is expected that:

Climate, Climate Change, Ambient Air

No significant impact is expected on both ambient air and climate as a result of the implementation activities of the CBCP and TSIM and the related priorities, specific objectives, activities and measures, nor is it expected to generate significant new emissions of harmful substances. On the contrary, the activities/measures envisaged as eligible in the two specific objectives 1.1 and 2.1 are related to both the improvement of the AAQ of the cross-border region and the strategic project under Priority 3 contributes to the adaptation to climate change.

Waters, WPA and Flood Risk

There are no territories likely to be significantly affected by the implementation of the CBCP and TSIM in both countries. The following are areas which may be slightly affected.

Danube Region

In the Danube Region there are the following sources of pressure, which are assessed as significant at the RBM level: - Point sources - discharge of untreated/insufficiently treated domestic and industrial wastewater; - Diffuse sources - mainly pressure from agricultural activities; - Hydromorphological pressure - change in the physical characteristics of water bodies. Activities subject to the CBCP and the TSIM may have a certain contribution from point sources of household and industrial waste water.

West Aegean Region

The analysis shows that the following significant problems may be the certain share for deterioration of the surface water bodies in the WAR during the implementation of the CBCP and TSIM:

- Water pollution from the discharge of untreated household waste water from sites subject to CBCP and TSIM - from sewerage networks and not complying with the requirements of Directive 91/271/EEC waste water treatment plants of settlements;

- Discharge of industrial wastewater from sites within the scope of CBCP and TSIM. Chemical pollution of surface water bodies has a direct impact on their environmental status/potential
- Agriculture and livestock farming are not subject to CBCP and TSIM, but the industry causes pollution of 5.5% of the surface water bodies within the territorial scope of the BDA.
- Water abstraction and modification of surface water flow in the tourist activities provided for in the CBCP. Excessive use of water from rivers and dams can affect surface water flow when accumulated with the effect of constructed derivation HPP;
- Adverse effects of activities not complying with the requirements in the WPA, especially when no SSZ has been set for drinking water;
- Adverse impact on the constructed site under CBCP and TSIM, failing to comply with the requirements in the scope of the defined APSFRs.

For *the Republic of Serbia*, adverse effects may arise as a result of:

- Construction of industrial sites under CBCP and TSIM in case of vulnerability to surface water;
- The presence of a relatively high level of polluted rivers in the absence of treatment in rural areas;
- Construction of sites of CBCP and TSIM in areas with insufficient drinking water and outdated water supply systems;
- Areas with a relatively high risk of flooding;
- Areas at risk of overuse of tourist resources;
- Adverse effects on SSZ for DDWS, including, where not specified;
- Pollution of cross-border surface water bodies Timok River and Dragoveshtica River from mining activities in R. Serbia;
- Pollution of river Nishava with domestic wastewater from settlements (sensitive areas);
- Impact of the CBCP and TSIM on the WPAs in Protected territories.

Subsoil

The activities and measures are not related to risks to the subsoil, including no potential for creating conditions for erosion processes and other negative geological phenomena. Risk of adverse impact may arise in case of non-compliance of the planned for construction sites and infrastructure with the seismic activity of the area, as well as with the geological features - susceptibility/conditions for landslides, erosion, stability of the geological base.

Soils and land use

There are no territories likely to be significantly affected by the implementation of the CBCP and TSIM in both countries.

With the development of tourism activities envisaged in the TSIM, there is a possible impact on forest soils, expressed in re-densification, increase of surface water flow and erosion.

More significant adverse impact on the land and soil is possible with the construction of sites and/or infrastructure under CBCP and TSIM is expected, in case of non-compliance with the requirements of the legislation related to soil protection and the environment.

Biodiversity

Most of the measures and activities of the CBCP and TSIM relate to a neutral to positive impact on biodiversity, with most of the measures and activities having no investment character. There are no foreseen events related to the establishment of new industrial zones or the construction and operation of new large industrial facilities, but focus on existing SMEs. Part of the objectives of the CBCP and the TSIM are aimed directly at sustainable development, greening and green transition, which will have an indirect positive impact.

Similarly, no significant impact on ***protected areas*** and ***protected territories*** is expected.

Landscape

The envisaged measures and activities under CBCP and TSIM are not expected to significantly affect areas with valuable/natural landscapes. The impact on the landscape as a whole ranges from neutral to indirect positive, similar to the impact on biodiversity.

Tangible assets

The drafts of the CBCP and TSIM envisage the implementation of targeted measures to improve existing and create new, modern and complying with all environmental requirements and standards communications and infrastructure, including but not limited to:

- Investments in the purchase of specialized equipment and technologies, digitalization and surveillance systems; virtual business centres, e-commerce solutions, spatial expansion technologies (Specific Objective 1.1 CBCP);
- Investments in public training infrastructure and specialized equipment to achieve a green, low-carbon transition to a zero-carbon economy, green and blue investments, circular economy, climate change mitigation and adaptation (Specific objective 3.1 CBCP);
- Investments in tangible assets related to the rationalization of the use of tourist resources, including the provision of fast, fair and ecological access and conditions for the construction of networks of cultural heritage and tourist sites in the cross-border area, including eco-trails and bike lanes (TSIM)

In the light of the foregoing, no significant negative impact of territories by tangible assets is expected, but only a positive one.

Cultural and historical heritage

Businesses and measures have no potential for significant impact or adverse effects. Measures related to the preservation of cultural heritage, refinement of eco-paths and cycling routes are envisaged in order to enrich the tourist offer and realization, as the available cultural, historical and archaeological wealth of the region offers exceptional opportunities for the development of cultural tourism. The measures related to specific objective 2 of the TSIM are directly aimed at exploiting the potential of cultural and historical heritage for the development of tourist products, and a positive impact is expected - maintenance of these sites.

Harmful physical factors

In the case of harmful physical factors, the relevant for the cross-border region in the scope of the CBCP and the TSIM is the noise from road traffic factor. Transport links and connectivity between the Republic of Bulgaria: 6 NUTS III districts: Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil and Republic of Serbia - 7 NUTS III districts: Borski, Zaječarski, Nišavski, Pirotski, Toplički, Jablanički, Pčinjski are presented in item 2.1.11.

The change in the noise load in the area concerned may be influenced by the change in the transport and communication network, the emergence of new local noise sources, etc., provided for in the CBCP and the TSIM, depending on the specific parameters of any such projects.

Consideration of the development needs and potential as a result of the achievement of the objectives and priorities of the CBCP and TSIM is relevant for the identification of the noise-factor affected areas, and in relation to the potential possible impacts of the noise-factor, the following can be identified: **Priority 1: Competitive border region,** *Policy Objective 1*: *"Smarter Europe", Specific objective 1.1: "Strengthening the sustainable growth and competitiveness of SMEs and creating jobs in SMEs, including through productive investment"* ; **Specific Objective 2: Enhancing regional competitiveness, incl. in the field of tourism,** *Measure 2.1. Developing and providing framework support for local business growth, expanding and better presenting a greener and smarter competitive global market*, etc.

On the other hand, the focus of the strategy is *to implement a horizontal policy in the field of green transition, which requires each supported project to contain a component related to the protection of environmental components and the search and implementation of green solutions.* The activities envisaged as eligible, incl. for the construction of new and reconstruction of existing eco-trails and bicycle routes in the region (under Specific Objective 2, measure 2.2 of TSIM) will have a positive effect on limiting the noise load and impact on the environment and the population of the region covered by the CBCP and TSIM.

The priorities and measures provided for by the CBCP and the TSIM are not related to activities implying additional vibration, ionising and non-ionising radiation effects.

Waste

No significant impact of waste activities on territories is expected, nor is significant waste generation expected in the implementation of eligible activities and measures, on the contrary - most activities and measures contribute to limiting the generated waste.

Hazardous chemicals and risk of major accidents

The provisions of the CBCP and TSIM are not related to a significant impact resulting from the storage and use of hazardous chemicals, and the eligible activities and measures do not have the potential to increase the risk of a major accident occurring in existing enterprises with low and high risk potential in the cross-border area.

Population and human health

Regarding **human health**, the implementation of the CBCP and TSIM provisions is not linked to new, significant sources of emissions and environmental damage that would lead to new or increased adverse effects of identified existing risk factors in the cross-border area. On the contrary, the implementation of the activities and measures is expected to have a positive impact related to the improvement of the quality of life (improve the quality of services of general interest), the development of non-hazardous for health activities - subject to income for the population (tourism), limiting the harmful impact of local production (technological investments, green transition and digitalisation). It is of utmost importance that the location of new sites - in case of financing of such under the CBCP and TSIM, to comply with the closest **zones and sites, which are subject to health protection**, as well as to ensure compliance with the regulatory requirements regarding water protection, in particular the prohibitions and restrictions in the **sanitary protection zones** of the water sources for drinking and domestic water supply and mineral waters used for medical, preventive, drinking and hygienic needs. A detailed assessment of the expected impacts is presented in **item 6 of the EAR**, and measures to limit the potential adverse effects are recommended in **item 7 of the EAR**.

Taking into account the above**, the assessment against the six environmental objectives of the principle of no significant harm of** the activities and measures of the CBCP and TSIM allows the following conclusions to be drawn:

1) ***Climate Change Mitigation:*** The majority of the measures have a positive or no impact on the reduction of greenhouse gas emissions, and none of the measures and activities result in significant greenhouse gas emissions - no significant damage to climate change mitigation is expected;
2) ***Climate Change Adaptation:*** None of the measures or activities under the CBCP and the TSIM lead to a detrimental impact of the current and projected future climate on the population, nature or assets - no significant damage to climate change mitigation is expected. Part of the measures and activities are contributing to adaptation and ensuring resilience to climate change - strategic project under Priority 3 of CBCP;
3) ***Sustainable use and conservation of water and marine resources:*** Measures and activities will have an indirect positive effect on water, and no measures and activities are foreseen to lead to deterioration of water quality or quantity, subject to water protection regulations.

4) ***Transition to a circular economy, preventing waste generation and their recycling:*** Part of the activities and measures are contributing to the transition to a circular economy (under Priority 1 of the CBCP). The other measures and activities of the CBCP and TSIM shall not entail a significant increase in the generation, incineration or disposal of waste, shall not lead to significant inefficiencies in the direct or indirect use of natural resources and shall not have the potential to cause long-term damage to the environment in relation to the circular economy.

5) ***Pollution prevention and control****:* Part of the measures and activities have a clear environmental focus, and they will contribute to limiting existing environmental problems. The provisions of the CBCP and TSIM are mainly related to improvements and development of existing sites, which will lead to their renewal, modernisation, and also related to limiting the environmental impact.

Specific objective 1.1 of the CBCP focuses on the sustainable growth of SMEs, Specific objective 2.1 on integrated social, economic and environmental development, and Specific objective 3.1 on promoting adaptation to climate change, risk prevention and disaster resilience (related to the prevention and mitigation of pollution as a result of disaster situations and phenomena).

When financing new sites and technical infrastructure the availability of areas and sites subject to health protection and other sensitive areas - sanitary protection areas around water sources, protected areas and territories, cultural heritage sites, possibly cumulative impact with existing facilities and infrastructure in the area concerned should be taken into account. These impacts and their prevention or minimization will be subject to the legally required procedures for environmental impact assessment, environmental assessment, complex permit, permits under the Water Act, etc., which will ensure the implementation only of projects that do not lead to a significant increase in pollutant emissions to air, water or land.

6) ***Protection and restoration of biodiversity and ecosystems:*** The principle nature of the activities to be carried out under the CBCP and TSIM shall be such that it does not imply negative impacts (or at least significant ones) on biodiversity. Most of the measures and activities of the CBCP and TSIM relate to a neutral to positive impact on biodiversity, with most of the measures and activities having no investment character. There are no foreseen events related to the establishment of new industrial zones or the construction and operation of new large industrial facilities, but focus on existing SMEs. Part of the objectives of the CBCP and the TSIM are aimed directly at sustainable development, greening and green transition, which will have an indirect positive impact. Subject to the national laws and administrative acts of the two countries, which aim to protect their biodiversity, the potential negative impacts of the activities and measures of an investment nature will be kept to an acceptable level. Measures and activities under the

CBCP and TSIM are not expected to lead to a deterioration of the state and sustainability of ecosystems or the conservation status of habitats and species, and consequently no significant damage is expected.

4. Existing environmental problems identified at different levels related to the CBCP and TSIM, including those related to areas of particular ecological importance, such as protected areas under the Biodiversity Act

An analysis of the existing environmental problems in the country, identified at different levels, related to the CBCP and TSIM, including the relationship between the environmental problems and the provisions of the plan, respectively - conclusions whether the CBCP and TSIM will lead to improvement of the environmental situation or to deterioration and deepening of existing environmental problems and/or the emergence of new ones is made in the following table:

Table 4-1 *Existing environmental problems and their relation to the drafts of the CBCP and TSIM.*

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
Climate Change and Adaptation to a Changing Climate	Greenhouse gas emissions (CO_2, CH_4, N_2O, O_3 and halogenated hydrocarbons) are emitted in all processes of converting fossil fuels into energy - solid fuels used in domestic heating or liquid fuels used in internal combustion engines of road transport. The existing problems consist of the effects of a changing climate: - drought associated with water scarcity; - flood risk; - extreme weather events - severe storms; - risk of landslides and collapses; - more frequent forest fires, etc. In terms of adaptation to a changing climate, the unsustainability of most of the existing infrastructure built years ago is a problem.	No change in climate change trends is expected without the application of CBCP and TSIM.	Measures and activities related to the generation of significant amounts of greenhouse gas emissions are not foreseen. On the contrary, some measures and actions contribute to reducing these emissions - digitalization, technological investment, green transition. It is not expected that activities or measures under the CBCP and TSIM will adversely affect the sustainability of existing tangible assets, including sites and infrastructure to the effects of a changing climate.
Ambient air	There are areas that are critical in terms of air pollution due to domestic heating in populated areas (sulphur and nitrogen oxides, dust). In 2019, PM_{10} air pollution continues to be a major issue for national ambient air quality for both countries. Additional contributions to PM air pollution are also made by adverse weather conditions such as prolonged low wind speed weather and prolonged droughts.	No development expected.	No deepening of existing or new problems are expected in relation to AAQ, nor are significant new emissions of harmful substances expected in the implementation of the eligible activities and measures. On the contrary, some measures and actions are indirectly contributing to the improvement of AAQ - digitalization, technological investments, green transition.

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
Surface water, Groundwater, Water Protection Areas, Flood Risk	Insufficiently defined SSZ Absence of UWWTP Incomplete drinking water supply Losses in the water supply network Losses in obsolete sewerage network WWTP - insufficient treatment Discharge of WW without authorisation Pollution with fertilisers and pesticides Disposal of waste in water bodies and the WPAs Other - erosion	No development expected. It is possible to deepen the problems with surface water, WPAs and the risk of flooding.	The implementation of the CBCP and TSIM is not expected to lead to a deepening of existing problems or the emergence of new ones. Through the eligible activities and measures provided for in the programme and the strategy, a positive impact is expected in terms of surface water, health and flood risk.
Subsoil	No subsoil concerns were raised. Risk factor is the risk of earthquakes.	No development or change is expected	CBCP and TSIM are not expected to cause problems.
Soils and land use	In both countries (the Republic of Bulgaria and the Republic of Serbia) there is a long-term trend for violation of land from the forest fund and/or use of agricultural land for non-agricultural purposes with the construction of new: industrial areas/parks, infrastructure, motorways, roads, rehabilitation of old ones, etc., leading to permanent losses of fertility (organic matter), production and ecosystem functions of the soil; Existence of active erosion events; Pollution of the soil in the urban environment and its adjacent areas with waste of organic and inorganic origin;	No development expected/Problems may deepen.	The implementation of the CBCP and TSIM is not expected to lead to a deepening of existing problems or the emergence of new ones. The eligible activities and measures provided for in the programme and strategy are expected to have a positive impact on land and soil. It is mandatory when designing new sites and alternatives for them to be researched for: the categorisation of land with a view to using low-productivity land; the quality performance of soil with a view to protecting soil resources.
Vegetation	Some of the most significant factors affecting forest habitats are logging (regulated and unregulated including);	No development expected	There is a risk of deepening environmental problems in tourism development not in line with

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
	Others are hydrological events and facilities (e.g. dredging, as well as water use), construction of buildings, facilities and linear infrastructure, tourist flow, pollution (incl. of water, air and soil, as well as with SHW. Drought is the most significant factor for vegetation as a consequence of climate change.		biodiversity in areas - as the measure under TSIM does not foresee significant new sites and infrastructure, it is assumed to improve/limit the adverse impact of current tourism activities.
Animal world	With regard to fauna, environmental problems are linked to direct and indirect impacts on populations. Indirect impacts occur mainly when changing the characteristics of habitats of animal species, changing basic environmental parameters, such as noise, water pollution, urbanization, intensification of agricultural practices, construction of transport and energy infrastructure, etc. - most often disturbance and fragmentation are observed. Direct impacts are directed at individuals and as a consequence their direct death rate or expulsion from the natural habitat is most often observed.	No development expected	Similar to that described for Vegetation.
Protected areas and protected territories	The main component of PA and PT, subject to conservation in them, are plant habitats and plant and animal species. In this sense, the environmental problems are the same as those described above. EIA procedures and, in particular, the CA for PA, are the tool by which these problems are assessed and the corresponding impacts are reduced or eliminated.	No development expected	Similar to that described for Vegetation
Landscape	The landscape problems are the result of the problems observed in the other environmental	The problems, including those related to the CBCP and TSIM - the unregulated landfills, the	The implementation of CBCP and TSIM contributes to limiting the problems.

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
	components - the most significant for the region are related to: - presence of unregulated landfills; - air pollution, noise load, water conservation problems that reduce the quality of the urban landscape as a living environment; - low innovation of SMEs, which has an indirect negative impact on the surrounding landscape; - effects of climate change that pose risks to natural landscapes.	pollution in the settlements are expected to deepen.	No deepening of existing or development of new problems with the implementation of the projections of the two documents is expected. There is a risk of environmental problems only for the measure of TSIM for the development of tourism in case of non-compliance of tourism products and activities with the capacity of the environment of the region.
Tangible assets	Insufficient infrastructure to service and cover the needs for economic and social development of the region. The need for funding to develop and realise the identified potential of the cross-border region.	No development is expected/Problems may be aggravated from the point of view of not maintaining the existing tangible assets due to lack of funding	The implementation of the CBCP and TSIM is not expected to exacerbate existing problems or create new ones, but rather the opposite. The eligible activities and measures provided for in the Programme and the Strategy are expected to have a positive impact on the development of FTAs - improvement of transport, communal, cultural, and tourism infrastructure, digitalisation and introduction of e-services to provide local needs, strengthening territorial cohesion and achieving competitiveness.
Cultural and historical heritage	Lack of financial resources for the protection and maintenance of cultural heritage sites Underdeveloped and maintained infrastructure for access to cultural and historical sites and natural landmarks Insufficient joint actions in the field of cultural heritage exchange;	Deepening of the problem and risk of deterioration of cultural values	No deepening of the problem is expected, nor new problems arise, but on the contrary, the development of cultural tourism will provide funds for the preservation and maintenance of

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
			cultural and historical sites in the cross-border area.
Harmful physical factors	Registered noise levels above the limits in residential areas and territories subject to the effects of road traffic.	The non-implementation of the CBCP and TSIM will continue the trend of higher noise emissions from road transport. The possibility of financing and implementing activities related to the achievement of the priorities and objectives set by the two documents will not be used. No development is expected in relation to the rest harmful physical factors.	The implementation of the CBCP and TSIM is not expected to lead to a deepening of existing problems or the emergence of new ones. The priorities and measures provided for by the CBCP and the TSIM are not related to activities implying significant noise levels, nor additional vibration, ionising and non-ionising radiation effects.
Waste	The majority of household waste is treated by disposal (the lowest level in the waste management hierarchy); Unregulated disposal of waste, creating risks of soil, water pollution and therefore a risk to human health.	No development expected/Problems may deepen	The implementation of the CBCP and TSIM is not expected to lead to a deepening of existing problems or the emergence of new ones. The activities and measures under the CBCP and the TSIM are not related to the generation of significant quantities of waste, including hazardous waste.
Hazardous chemicals and risk of major accidents	Potential for an environmental problem in relation to the risk from major accidents is the lack of compliance with the emergency/safety distances around enterprises with risk potential and allowing the deployment of legally unacceptable objects and facilities in them. The problem is overcome by the implementation of the procedures set out in the regulations.	No development expected.	The application of CBCP and TSIM does not provide for the storage, use and activities with hazardous chemicals and mixtures. It is mandatory that when designing new sites and alternatives to them, a study be carried out on the presence in the vicinity of establishments with a risk

Component/Environmental Factor	***Existing environmental problems with regard to CBCP and TSIM***	***Development of the problem without application of CBCP and TSIM***	***Development of the problem/Emergence of new environmental problems with the implementation of CBCP and TSIM***
			potential, to take into account the safe distance to such establishments, in order to prevent the risk of new environmental problems in this sense.
Population and human health	Based on the analysis of the risk factors made in item 2.1.14.B the problems related to the risk factors for human health of the environment are mainly related to: - degraded ambient air quality in some areas of the cross-border area; - shortage of drinking water; - unregulated landfills; - exceeds of noise standards in some settlements.	No change in development is expected.	No new environmental problems, significant for the health of the population, are expected to arise, as a result of the planned activities, limiting the identified existing problems, evident from what is described by components and factors in the middle of the previous rows of the table.

5. Environmental protection objectives at national and international level relevant to the CBCP and TSIM and the way in which these objectives and all environmental considerations are taken into account in the preparation of the programme and the strategy

5.1. Integration of environmental protection objectives into the projects of the CBCP and TSIM

The integration of environmental protection objectives in the CBCP and TSIM is enshrined in the Financial Support Regulations for the period 2021-2027, including in the specific objectives and thematic concentration of Interreg, identified respectively in Articles 14 and 15 of the Interreg Regulation. According to the mentioned Regulations at least 60% of the ERDF contribution and, where applicable, the amount allocated under the Union's external financing instruments to each Interreg programme under strands A, B and D shall be allocated to **policy objective 2** *("A greener, low-carbon and sustainable Europe with a transition economy to zero net carbon by promoting a clean and fair energy transition, green and blue investments, a circular economy, climate change mitigation and adaptation, risk prevention and management, and sustainable urban mobility")* and a maximum of two other policy objectives as defined in Article 5 (1) of Regulation (EU) 2021/1060;

In this regard***, CBCP and TSIM integrate environmental protection objectives at European and national level***.

5.2. Environmental objectives at international and national level relevant to the CBCP and TSIM and in a manner consistent with them

The following tables analyse the relevance of environmental protection objectives at international and national level included in some of the strategies, plans and programmes described in **item 1.4** of the EAR:

Table 5.2-1 Relativity *and degree of compliance with environmental protection objectives at international level*

Strategic document and objectives on environmental protection at international (including European) level	Analysis of the degree of compliance in the drafts of CBCP and TSIM 2021-2027
UN 2030 Agenda for Sustainable Development "Transforming the World" The objectives with regard to environmental protection are: Objective 3: Good health and well-being Objective 6: Clean water and sanitation Objective 7: Economically available and clean energy Objective 11: Sustainable cities and communities Objective 12: Responsible consumption and production Objective 13: Climate action Objective 14: Underwater life Objective 15: Life on the ground	Objectives 11, 12 and 13 are directly reflected in the drafts of CBCP and TSIM. Priority 1, and in particular specific objective 1.1 of the CBCP, will contribute to the sustainable growth of SMEs and to objectives 11 and 12 of the UN Sustainable Development Programme, respectively. Priority 3 and the strategic project to prepare the population for action in the event of disasters will contribute directly to the achievement of Objective 13, as well as indirectly to Objectives 3, 4, 11, 14 and 15. Contribution to the objectives are also the measures under TSIM, which will contribute to a green transition, sustainable development of tourism, protection of cultural heritage.
Proposal for a Decision of the European Parliament and of the Council on a General European Union Environment Action Programme by 2030 (Eighth EU Environment Action Programme by 2030) (COM(2020)652) <u>Thematic priority objectives:</u> (a) irreversible and gradual reduction of greenhouse gas emissions and increase of removals of natural or other removers into the Union in order to achieve the 2030 greenhouse gas emission reduction and climate neutrality target for 2050 set out in Regulation (EU) .../...90; (b) Continuous progress in enhancing adaptation capacity, strengthening resilience and reducing vulnerability to climate change; (c) progress towards a model of growth with a recovery that takes to the planet back more than it takes, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy; (d) zero pollution ambition for a non-toxic environment, including air, water and soil, as well as protecting the health and well-being of citizens from environmental risks and impacts; (e) protecting, conserving and restoring biodiversity and increasing natural capital, in particular as regards air, water, soil and forests, fresh water, wetlands and marine ecosystems; (f) promoting environmental sustainability and reducing the main pressures on the environment and climate related to production and consumption, in particular in the areas	Contribution to objective (a) are activities and measures for digitalisation and green transition, technological investments that are related to the reduction of greenhouse gas emissions. A direct contribution to objective (b) is the strategic project under Priority 3 of the CBCP to prepare the population for action in the event of disasters. Contributions to objectives (c) and (d) are the activities under Priority 1 of the CBCP related to enhancing productive capacity (which is related to resource efficiency), the technological renewal of SMEs, which will limit the harmful environmental impact resulting from the use of old technologies; the deployment of digital technologies under measure 1.1 of the TSIM, digital and green transition under measure 2.1. The CBCP and TSIM shall contribute to Objective and (e), through Specific Objective 1.1 for the sustainable growth of SMEs (linked to limited/reduced environmental impact, including biodiversity), Specific Objective 2.1 to promote environmental development as part of social and economic development; Specific Objective 3.1 - linked as a result to the protection of biodiversity in areas with disaster actions taken. There will also be a positive effect of measure 2.2 of the TSIM to rationalise the use of tourist resources - through environmental access activities, which will limit the congestion and adverse effects of traditional forms of access by motor vehicles and regulate tourist traffic and pressure.

90 *COM(2020) 80 final.*

of energy, industrial development, buildings and infrastructure, mobility and the food system.	The strategic project under Priority 3 of the CBCP, as well as the activities under Priority 1 for technological investments in SMEs, which will promote the transition to greener production, Measure 2.1 through green transition and digitalization, as well as the activities under Measure 2.2 of the TSIM related to environmental access to tourist destinations, have a direct contribution to the objective (f).
Communication from the European Commission "Clean Planet for All. A European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy" (COM (2018)773) ***Strategic building blocks:*** 1. Maximising the benefits of energy efficiency, including from zero-emission buildings 2. Maximising RES implementation and maximising the use of electricity to fully decarbonise Europe's energy supply 3. Achieving clean, safe and connected mobility 4. A competitive EU industry and a circular economy as a key factor in reducing greenhouse gas emissions 5. Development of adequate smart grid infrastructure and interconnections 6. Full realization of the benefits of the bioeconomy and creation of essential carbon removers 7. Removal of residual emissions by capture and storage of CO_2	The TSIM integrates building block 3 for clean, safe and connected mobility, through Measure 2.2, which provides for the development of eco-access - construction of new and refurbishment of existing eco-paths and cycling routes. The activities under Priority 1 of the CBCP and measure 2.2 of the TSIM are related to technological investments, green transition and digitalization, which will contribute to the reduction of greenhouse gas emissions. The other building blocks are not reflected in the CBCP and TSIM.
Communication from the European Commission: "Building a climate resilient Europe - the new EU climate change adaptation strategy" (COM(2021)82) *Guidelines:* 1. Building a climate resilient Union: 1.1. Smarter adaptation: improving knowledge and managing uncertainties - expanding knowledge boundaries on adaptation; more and better data on climate-related risk and losses; making Climate-ADAPT an authoritative European platform on adaptation. 1.2. More systematic adaptation: supporting policy development at all levels and in all sectors - improving adaptation strategies and plans; promoting local, individual and fair sustainability; integrating climate resilience into national fiscal frameworks; promoting environmentally friendly adaptation solutions; 1.3. Faster adaptation: ubiquitous acceleration of adaptation - accelerating the deployment of adaptation solutions; reducing climate risk; addressing climate protection gaps; ensuring availability and sustainability of fresh water. 2. Strengthening International Climate Resilience Actions: 2.1. Increasing support for international climate resilience and preparedness 2.2. Increasing international funding for climate resilience 2.3. Strengthening global commitment and exchanges on adaptation	Priority 3, with specific objective 3.1 of the CBCP and the planned strategic project to prepare the population for action in the event of disasters, is directly contributing to the achievement of both main directions of the strategy.

Communication from the European Commission "A path to a healthy planet for all. An EU Action Plan: Towards zero air, water and soil pollution" (COM(2021)400) ***Leading initiatives:*** Leading initiative 1: Reducing health inequalities through zero pollution Leading initiative 2: Supporting Zero Pollution Actions in Urban Areas Leading initiative 3: Promoting zero pollution in different regions Leading initiative 4: Facilitating the choice of zero pollution Leading initiative 5: Joint application of zero pollution Leading initiative 6: Presentation of Zero Pollution Solutions for Buildings Leading initiative 7: Living labs for eco-friendly digital solutions and smart zero pollution Leading initiative 8: Minimising the European pollution footprint in other regions of the world Leading initiative 9: Consolidation of EU Zero Pollution Knowledge Centres	The CBCP and the TSIM take into account the Communication of the European Commission, as the main purpose of the documents is to reduce inequalities, including regarding the health status of the population in the cross-border region, which will be achieved through the implementation of activities and measures, as they will lead to improvement of the quality of the environment of the settlements, improvement of the characteristics and parameters of SMEs, reduction of pollution and improvement of the quality of life in general.
Communication from the European Commission on a European Green Pact (COM (2019)640) The document sets out 10 key points in the European Commission's plan: **1. "Climate-neutral" Europe** - A target of zero net greenhouse gas emissions by 2050, to be supported by a new "Climate Law" **2. Circular economy** - a new circular economy action plan is foreseen as part of the wider EU industrial strategy - aiming at a sustainable product policy with "prescriptions on how to produce goods", using fewer materials and ensuring that they can be reused and recycled; **3. Renovation of buildings**; **4. Zero pollution** - whether in air, soil or water - the goal is to achieve a "pollutant-free environment" by 2050; **5. Ecosystems and biodiversity** - a new biodiversity strategy up to 2030 with new measures addressing the main drivers of biodiversity loss, measures to tackle soil and water pollution, and a new forest strategy - has an indirect relationship; **6. "Farm to fork" strategy** - targets green and healthier agriculture objectives and includes plans to significantly reduce the use of chemical pesticides, fertilisers and antibiotics; **7. Transport** - Carbon targets for cars; promotion of electric vehicles and sustainable alternative fuels. **8. Finance** - Fair Transition Mechanism by providing assistance to the areas most dependent on fossil fuels; **9. Research and development and innovation** - funding research for climate-friendly technologies and research projects with environmental objectives - irrelevant; **10. Foreign relations**.	CBCP and TSIM have a positive overall contribution to the points of the Green Pact, as the priorities, specific objectives, activities and measures are aimed at sustainable economic growth, taking into account environmental requirements, digitalisation and green transition, environmentally friendly development of tourism, including environmentally friendly access to tourist destinations.

Communication from the European Commission: New action plan on the circular economy - Towards a cleaner and more competitive Europe (COM/2020/98) **Directions for key actions:** **1. Sustainable products policy framework -** designing sustainable products and establishing sustainability principles (durability of products, re-usability, modernisation and repair, increased energy and resource efficiency, increased recycled content of products, secondary production and high-quality recycling, reduction of CO_2 emissions, limitation of disposable products, digitisation of product information, etc.), providing more opportunities for consumers and public purchasers, circularity in production processes; **2. Key product value chains -** guidelines for electronics and ICT, vehicle batteries, packaging, plastics, textiles, construction and buildings, food, water and nutrients; **3. Less waste, more value -** a more effective policy to prevent waste and support its circular nature, increase the circular and non-toxic environment, create a functioning EU market for secondary raw materials, take measures in relation to the export of waste; **4. Circularity for the benefit of people, regions and cities -** creating jobs in relation to the circular economy, acquiring skills, cohesion; **5. Cross-sectoral actions -** enhancing the synergies between circularity and reducing greenhouse gas emissions, integrating circular economy objectives; research and innovation.	Contributions to the transition to sustainable products and a circular economy will be provided by activities under Priority 1 of the CBCP related to investments in technology, as well as investments aimed at managing product quality, enhancing product capacity.
EU biodiversity strategy by 2030 ***Initiatives:*** 1. Protecting and restoring nature in EU - a harmonised network of protected areas - protection of at least 30% of the land territory and 30% of the sea basins in the EU; - introduction of measures for strict protection of at least one third of the protected areas - 10% of the land territory and 10% of the sea basins of the EU; - Strict protection of natural centuries-old forests; - establishment of ecological corridors to prevent genetic isolation, allowing migration and the improvement of ecosystems; - effective management of protected areas - definition of clear conservation objectives and measures and appropriate monitoring. 2. EU Nature Recovery Plan - The EU will propose quantitative targets for nature recovery, classification of protected species and habitats, revision of legislation on the use of pesticides, EU initiatives on pollinators, action plans, new/revision of strategies for soils and forests, development of forest information system, sustainability criteria, etc. 3. Creating the conditions for a transformative economy - EU guidelines and initiatives for cooperation will be developed, sustainable corporate governance, sustainable financing,	The attitude towards biodiversity protection as a whole has all the predictions of the CBCP and TSIM, as they will improve the state of the environment as a whole. As CBCP and TSIM do not provide for measures and activities with the potential for significant adverse impacts on biodiversity, they do not conflict with the objectives of the strategy.

classifications of activities contributing to the conservation and restoration of biodiversity, knowledge centre, promotion of cooperation. 4. EU efforts to implement the ambitious World Programme on Biological Diversity - international treaties and agreements, measures to minimise the marketing of products related to deforestation or forest degradation on the EU market, etc.	
EU strategy for the Danube region **Pillar:** Environmental protection in the Danube region: ***- restoration and maintenance of water quality*** - this is a central theme for the region, which includes both water quality and quantity. Challenges include reducing pollution by biological, food and other hazardous substances, as well as eliminating or adapting to waterway drainage. ***- management of environmental risks*** - in the Danube region there are a number of natural and industrial risks which, in addition to climate change challenges, mean that risk potential analysis, preparedness and rapid response mechanisms are key to the strategy. ***- Preservation of biodiversity, environment and air and soil quality*** - The Danube Region is an interconnected and interdependent ecosystem that allows us to use invaluable products and services in the field of environmental protection (food, fiber, drinking water, regulating the amount of water in a certain territory and soil protection). The territory of the region comprises a significant share of the largest wild nature areas in Europe and includes ecological links which are vital for the ecological health of the whole continent.	Direct contribution to the placed in Pillar: Environmental protection in the Danube Region will have a strategic project under Priority 3, which is entirely aimed at managing environmental risks related to climate change. The project will also contribute indirectly to the other two main objectives of the Pillar by preventing adverse impacts on water, biodiversity and soil.
Danube River International Basin Management Plan - Update 2015 The plan focuses on four important issues: - *Pollution with organic substances; - Pollution with nutrients; - Pollution with hazardous substances; - Hydromorphological changes;*	CBCP and TSIM do not provide for activities with the potential for water pollution or for inducing hydromorphological changes.
First Danube Basin Flood Risk Management Plan The objectives of the flood risk management plan for the river basin of the Danube are: - Avoiding new risks; - Reducing existing risks; - Strengthening resilience; - Raising awareness; - Principle of solidarity	A direct contribution has the strategic project under Priority 3 of the CBCP to prepare the population for action in the event of disasters. The other projections of the CBCP and TSIM do not lead to new risks or to a deepening of existing flood risks.

***Table 5.2-2** Relativity and degree of compliance with environmental protection objectives at national level - Republic of Bulgaria*

Strategic document and objectives for environmental protection at national level, developed for the territory of the Republic of Bulgaria	**Analysis of the degree of compliance in the drafts of CBCP and TSIM 2021-2027**
National Development Programme BULGARIA 2030 The environmental objectives are set out in the National Priorities: 4. A circular and low-carbon economy 5. Clean air and biodiversity 6. Sustainable agriculture	CBCP and TSIM integrate environmental objectives related to sustainable growth of SMEs, environmental development, promoting adaptation to climate change, with which the implementation of the programme will contribute to objectives 4 and 5 of the National Programme.
Strategy for transition to a circular economy 2021-2027 (draft) ***Strategic objectives:*** Strategic objective 1: A green and competitive economy – Specific objective 1.1: Higher productivity of resources - Specific objective 1.2: New Business Models - Specific objective 1.3: Coherence in the economy - Specific objective 1.4: Bulgaria contributes to the supply of critical raw materials Strategic objective 2: Less waste, more resources - Specific objective 2.1: Less waste - Specific objective 2.2: More options for sustainable use - Specific objective 2.3: More recycled waste, better quality raw materials - Specific objective 2.4: No landfilled waste Strategic objective 3: Economy in favour of consumers - Specific objective 3.1: Better informed consumers - Specific objective 3.2: Sustainable behavioural patterns - Specific objective 3.3: Social green economy	Priority 1 of the CBCP includes activities for technological investments and ones for product quality management, increasing productive capacity, and TSIM envisages green transition and digitalization measures, greening the market - they will contribute to strategic objectives 1 and 2. Measure 1.1 of the TSIM to expand access and improve the quality of services of general interest, including through digital solutions, will contribute to specific objective 3.3.
National air pollution control programme 2020-2030 The programme has been developed and adopted in order to meet the commitments of the Republic of Bulgaria to achieve the national ceilings for the total annual emissions of certain air pollutants for 2020 and 2030, in particular for pollutants - sulphur dioxide (SO_2), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), ammonia (NH_3) and fine particulate matter ($PM_{2.5}$), compared to the emissions for the base year 2005 in accordance with Directive (EU) 2016/2284. **National Programme for Ambient Air Quality Improvement 2018-2024** The programme proposes a package of measures to be implemented by the end of 2024 in order to comply with the requirements of the directive on cleaner air for Europe as regards PM10 levels.	Contribution to limiting atmospheric pollution in settlements is also expected from the activities under Priority 1 of the CBCP and the measures under the TSIM for technological investments, digitalization, green transition, ecological access to tourist destinations.

The measures are targeted at reducing emissions from the two main sectors that are sources of PM10 emissions, namely domestic heating and transport. Measures to reduce emissions from the combustion of solid fuels for domestic heating are aimed at replacing old and inefficient heating appliances with new ones that meet modern performance requirements (eco-design) and replacing solid fuels with other more environmentally friendly heating devices.	
The National Strategy and Action Plan for Adaptation to Climate Change of the Republic of Bulgaria *The general strategic objectives* are: Inclusion and integration of CCA;. Inclusion and integration of ACC. This includes improving adaptation policies and integrating adaptation considerations into existing national and sectoral plans and programmes. Institutional capacity building for CCA: Institutional capacity building for ACC. This includes building expertise, training, knowledge base, monitoring and research to ensure and support adaptation actions. Raising awareness on CCA. Raising awareness about ACC. This includes raising public education and awareness on ACC issues and the need for adaptation actions to be implemented in Bulgaria in order to achieve public support and participation in adaptation policies and actions. *The strategic objectives for the sectors* are: **Agriculture Sector** • Sustainable management of agricultural practices for adaptation to climate change • Encouragement of adaptation and information capacity in the agricultural sector • Promoting research and innovation to adapt to climate change • Strengthening the policy and legal framework for adaptation of the agricultural sector **Biodiversity and Ecosystems Sector** • Improving ecosystem management • Improving knowledge management and communication with stakeholders on ecosystem adaptation • Creating space for biodiversity and ecosystems • Strengthening resilience to climate change by reducing non-climate change pressures • Sustainable use of regulatory and cultural ecosystem services for adaptation **Energy Sector** • Institutional capacity building, knowledge and use of adaptation data • Incorporation of climate change considerations into energy sector policies, plans and financial mechanisms	Contributing to all three common strategic objectives is Priority 3 of the CBCP, which envisages the implementation of a strategic project to prepare the population for action in the event of disasters. Potential for integration in specific project proposals are the objectives for the sectors Biodiversity and Tourism, which should be taken into account at the stage of preparation of the project proposals by the potential candidates.

• Incorporation of climate change resilience in design and engineering • Increasing the sustainability of energy supply **Forests Sector** • Improving the knowledge base and raising awareness of climate change adaptation • Improvement and protection of forest resources • Improving the potential for sustainable use of forest resources **Human Health Sector** • Improving management for adaptation • Establishing a knowledge base and awareness on adaptation • Adapting the external environment to reduce the impact of climate change on health **Tourism Sector** • Inclusion of climate change adaptation in the policy development process and the legal framework for the tourism sector • Raising awareness and knowledge base for climate change adaptation in the tourism sector • Building adaptive capacity in the tourism sector • Developing specific adaptive actions for the tourism sector **Transport Sector** • Institutional capacity building and knowledge base in the transport sector • Incorporating climate change adaptation issues into key planning and decision-making processes **Urban environment sector** • Strengthening the policy and legal framework for including climate change adaptation • Adaptation capacity building • Development of financial, social and risk management policies to adapt to climate change • Improving knowledge management, research, education and communication with stakeholders on adaptation **Water Sector** • Improving management for adaptation • Strengthening the knowledge base and awareness on adaptation • Improving adaptive management of water system infrastructure	
Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030 The Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030 defines the main objectives and measures for the implementation of national energy and climate policies implementing European legislation, principles and priorities for energy development in order to achieve binding EU climate and energy targets for 2030 as follows: - Reducing greenhouse gas (GHG) emissions by at least 40% compared to 1990; - Increasing energy efficiency (EE) to at least 32.5%;	CBCP and TSIM contribute to the binding EU objectives, as measures and activities are mostly linked to a transition to greener solutions for SMEs, leading to a reduction in carbon intensity.

- Increasing the share of energy from renewable sources (RS) to at least 32% of the EU's gross final energy consumption; - Ensuring at least a 15% level of interconnection between Member States. In this regard, the main objectives of the Integrated Plan of the Republic of Bulgaria are defined as follows: - stimulating low-carbon development of the economy; - development of competitive and secure energy; - reducing dependence on fuel and energy imports; - ensuring affordable energy for all consumers.	
National Programme for the Protection, Sustainable Use and Restoration of Soil Functions 2018-2027 The general strategic objective of the country related to the protection, sustainable use and restoration of soil functions is: Sustainable land use, ensuring a high level of soil conservation, high productivity, ecosystem maintenance and societal well-being. Strategic objectives: 1: Improvement of administrative capacity, legal instruments for the implementation of environmental legislation and information security for sustainable soil management. 2: Prevention of degradation processes, restoration and preservation of soil functions. 3: Sustainable soil management as a natural resource and environmentally friendly land use. 4: Engagement of the public in the processes of management, sustainable use and protection of soils.	CBCP and TSIM do not include activities and measures with a direct focus on soil protection, but in general the effect will be positive indirectly, as the majority of the indicative activities and measures envisaged contribute directly or indirectly to improving the state of the soil and land use as well as the environment in general. ***In the implementation of construction works related to the construction and subsequent operation of sites, including those for technological renovation, measures in accordance with the National Program and the legislation for soil protection should be envisaged and implemented in all cases.***
National Strategy for Forestry Sector Development 2013-2020 There are 3 objectives and 4 priorities: Objective 1: Ensuring sustainable development of the forestry sector by striking the optimal balance between the ecological function of forests and their ability to provide material benefits and services in the long term Objective 2: Strengthening the role of forests in ensuring the country's economic growth and more equitable territorial socio-economic development Objective 3: Increasing the contribution of the forestry sector to the green economy Priority 1: Maintaining vibrant, productive and multifunctional forest ecosystems to mitigate climate change Priority 2: Conservation, restoration and maintenance of biological and landscape diversity in forest areas Priority 3: Improving the viability and competitiveness of the forestry sector Priority 4: Exploiting the potential of the forestry sector to develop the green economy	The projections of the CBCP and the TSIM are not directly related to forest areas. Similarly to what is described above, most activities have an indirect positive effect on the environment and on forest areas, respectively. ***Given that there are such areas in the cross-border area, including those covered by environmental protection legislation, the implementation of measures and activities should comply with forest management legislation and existing forest strategies, plans and programmes.***
National waste management plan 2021-2028 Three main objectives have been formulated, to which the relevant programmes have also been developed.	CBCP and TSIM do not envisage activities aimed directly at waste management, but indirect positive effects will be achieved by the technological investments under Priority 1 of the TSIM, the

Objective 1: Reducing the harmful impact of waste by preventing its generation and encouraging its reuse - National Waste Prevention Program with - Subprogramme for food waste. Objective 2: Increasing the amount of recycled and recovered waste - Programme for reaching the targets for preparation for reuse and recycling of household waste; - Programme for achieving the targets for recycling and recovery of construction and demolition waste; - Programme for reaching the targets for recycling and recovery of mass waste. Objective 3: Reducing the quantities and risk of landfilled household waste - Program for reducing the quantities and risk of landfilled household waste.	measures of TSIM for digitalization, green transition, which will contribute to reducing the generation of waste from the relevant sectors. The activities and measures under the CBCP and the TSIM are not related to the generation of significant quantities of waste, including hazardous waste.
National Strategy for Management and Development of the Water Sector in the Republic of Bulgaria and its Action Plan in the short (2013-2015), medium (2016-2021) and long term (2022-2037) perspectives Objective 1: Guaranteed provision of water to the population and businesses in the face of climate change leading to drought Objective 2: Preservation and improvement of surface and groundwater status Objective 3: Improving efficiency in integrated water management as an economic resource Objective 4. Reducing the risk of flood damage	CBCP and TSIM include measures and activities directly contributing to the first three objectives of the National Strategy, but activities such as technological renewal, product quality management, The CBCP through the strategic project under Priority 3 has a direct contribution to Objective 4 of the National Strategy.
National Plan for Conservation of the Most Significant Wetlands in Bulgaria 2013-2022 Main objective of the plan: To provide a basis for the planning and implementation of activities for the conservation and sustainable management of the most significant wetlands in Bulgaria. - Priority 1 - Reasonable use of wetlands in the country with a view to long-term protection of their ecosystem services and associated benefits for society. Maintaining the ecosystem functions of wetlands through the sustainable use of their resources contributes to the quality of life of local communities, their livelihoods, and is also an important approach to climate change mitigation and adaptation. - Priority 2 - Preservation of good ecological status of the wetlands described in this Plan as significant for the conservation of biodiversity and preventing the net loss of wetland areas in the country, including through supportive measures; - Priority 3 - Limit adverse factors of anthropogenic nature that affect wetlands as ecosystems. The different statutory protection statuses (under the PTA and the BDA) and associated management regimes and measures remain the main means for the protection of wetlands. - Priority 4 - Restoration of wetlands whose condition is impaired due to various anthropogenic effects but have a high potential for restoration and/or represent an important habitat for rare and endangered species. The main role here is the restoration and maintenance of the water regime, which is often associated with the design and construction of hydrotechnical facilities.	The territorial scope of the CBCP and TSIM includes two Ramsar sites - Karst Complex Dragomansko Blato (as part of the complex is a protected area "Aldomirovsko Blato"), located in Pernik Region and Ibisha Island (part of the territory of the island is a maintained Ibisha Reserve), located in Vratsa region, as well as two potential Ramsar sites - Choklyovo Blato (a protected area), part of which is located on the territory of the village of Bunovo, Kyustendil municipality, and the Seven Rila Lakes (within Rila National Park), located also in Kyustendil region. When planning activities and measures in the area of those areas, the priorities of the plan and the established regimes and restrictions for the concerned area territory should be respected.

- Priority 5 - Raising public awareness and supporting the conservation, maintenance and restoration of wetlands. Promoting the social, economic and environmental benefits of wetlands can be achieved through various forms of environmental education, as well as by demonstrating mechanisms for sustainable use of natural resources. Support for sustainable forms of wetland use is very important for increasing public support, especially from local communities.	
Plan for river basin management in West Aegean region (2016-2021) **AND** **Plan for river basin management in Danube region (2016-2021)** The RBMP defines the framework of integrated water management at the basin level and includes a programme of measures to achieve environmental protection objectives (Section 7 of the RBMP). The RBMP enshrines the principle of protection of surface and groundwater from depletion, pollution and damage in order to maintain the necessary quantity and quality of water and a healthy environment, preservation of ecosystems, preservation of the landscape and prevention of economic damage.	the provisions of the CBCP and TSIM have been analysed and assessed against the RBMP 2016-2021 in the sections of the EAR for the water component - no activities and measures have been identified that contradict the plan. The level of detail of the provisions of the CBCP and the TSIM does not allow the definition of specific measures by the RBMP relevant to the programme and strategy, and any project proposal of an investment nature should be preceded by an assessment/opinion of the competent authority on the eligibility to the RBMP in force at the time of preparation and proceeding with the proposal.
Flood risk management plan for West Aegean Region for basin management 2016-2021, including Draft of the Updated Preliminary Flood Risk Assessment (PFRA) for West Aegean Region for basin management, 2021 **AND** **Flood risk management plan for Danube Region for basin management 2016-2021, including Draft of the Updated Preliminary Flood Risk Assessment (PFRA) for Danube Region for basin management, 2021** The aim of the FRMP is to create conditions for reducing the adverse effects on human health, the environment, cultural heritage and the business of flooding in river basin management areas, in particular in designated areas with a potential significant flood risk (APSFR).	The provisions of the CBCP and TSIM have been analysed and assessed against the FRMP 2016-2021 and the draft updated FRMP 2021 in the sections of the EAR for the water component - no activities and measures have been identified that conflict with the documents. The level of detail of the provisions of CBCP and TSIM does not allow for the identification of specific measures by the FRMP relevant to the programme and strategy, and any project proposal of an investment nature should be preceded by a location analysis regarding the location in relation to areas with a significant potential flood risk under the PFRA project in force at the time of preparation of the project and by an assessment/opinion of the competent authority on the eligibility of the FRMP in force at the time of preparation and proceeding with the proposal.
National Priority Action Framework for Natura 2000 for the period 2021-2027 (Draft) The National Priority Action Framework for Natura 2000 provides for the following measures: E.1. Horizontal measures and administrative expenditure related to Natura 2000 E.1.1. Establishment of sites and management planning E.1.2. Site management and communication with stakeholders E.1.3. Monitoring and reporting E.1.4. Remaining knowledge gaps and research needs	When implementing measures and activities on the territory of protected areas, the possibility of implementing measures of the framework should be taken into account or no contradiction with the identified measures should be allowed.

E.1.5. Communication and awareness-raising, education and visitor access measures in relation to Natura 2000 E.1.6. References (for horizontal measures and administrative expenditure related to Natura 2000) E.2 Site-related conservation and recovery measures within and outside Natura 2000 E.2.1. Marine and coastal waters E.2.2. Steppe areas and areas with shrub vegetation E.2.3. Bogs, muddies, swamps and other wetlands E.2.4. Grassland E.2.5. Other agri-environmental systems (including arable land) E.2.6. Forests and wooded areas E.2.7. Rocky habitats, dunes and sparsely vegetated areas E.2.8. Freshwater habitats (rivers and lakes) E.2.9. Others (caves, etc.) E.2.10. References to site-related conservation and recovery measures within and outside Natura 2000 E.3. Additional measures for specific species not associated with specific ecosystems or habitats E.3.1. Measures and programmes for specific species not specified elsewhere E.3.2. Prevention, mitigation or compensation of damage caused by protected species E.3.3. References to additional measures for specific species not related to specific ecosystems or habitats	
National Biodiversity Conservation Strategy The strategy has the following main priorities: - Strengthening the scientific basis for biodiversity conservation; - Support of legislative initiatives; - Expansion and strengthening of the network of protected areas; - Environmental education and complementary training; - Development and implementation of ecotourism policy; - Promoting the protection of the Black Sea basin; - Promoting nature conservation in the Balkans.	CBCP and TSIM do not foresee activities and measures according to the priorities of the strategy, and an indirect positive effect is expected as a result of the expected improvement in the state of the environment, including the implementation of measures for sustainable economic activities, sustainable tourism, green transition. ***The implementation of the CBCP and the TSIM, including the approval and implementation of the project proposals, should be consistent and not contradictory to the strategy. Particular attention in this regard should be paid to the project proposals related to construction and activities outside urbanised areas.***
Biodiversity Strategy in the Republic of Bulgaria (Draft, October, 2021) ***National targets:*** 1. Achieving full implementation of the Birds Directive and the Habitats Directive. 2. Ensuring the conservation, preservation and development of the network of protected areas and biosphere parks 3. Conservation and improvement of the populations of endangered species on the territory of the country, protection of globally endangered species. 4. Conservation of biodiversity in the Black Sea and coastal marine ecosystems.	CBCP and TSIM do not foresee activities and measures according to the priorities of the strategy, and an indirect positive effect is expected as a result of the expected improvement in the state of the environment, including the implementation of measures for sustainable economic activities, sustainable tourism, green transition. ***The implementation of the CBCP and the TSIM, including the approval and implementation of the project proposals, should be***

5. Conservation and restoration of ecosystems and the ecosystem services and benefits they provide 6. Sustainable improvement of information provision in the biodiversity sector 7. Introduction of procedures for access to genetic resources and control of their use on the territory of the country. 8. Increasing the contribution of agriculture to the conservation and improvement of biodiversity, reducing the use of pesticides and increasing the share of agricultural land managed according to the principles of organic farming, achieving sustainable use of fisheries resources. 9. Maximum limitation of introduction and naturalization of alien species in nature and control of widespread invasive alien species. 10. Preserving and increasing the function of forests in preserving biodiversity and reducing climate change trends by increasing their area, quality and sustainability. 11. Conservation, restoration and expansion of green infrastructure in urban and suburban areas. 12. Conducting regular public campaigns to inform the public and work at local level.	***consistent and not contradictory to the strategy. Particular attention in this regard should be paid to the project proposals related to construction and activities outside urbanised areas.***

Table 5.2-3 *Relativity and degree of compliance with environmental protection objectives at national level - Republic of Serbia*

Strategic document and objectives for environmental protection at national level developed for the territory of the Republic of Serbia	Analysis of the degree of compliance in the drafts of CBCP and TSIM 2021-2027
Strategy for Waste Management for the period 2010-2019 The long-term goals for the period until 2019 are: ▪ Introduction of separate collection and treatment of hazardous waste from households and industry; ▪ Establishment of 12 regional waste management centres - regional landfills, facilities for separating recyclable waste and transfer stations in each region; ▪ Provision of facilities for the incineration of organic industrial and medical waste; ▪ Strengthening the professional and institutional capacity for hazardous waste management;	CBCP and TSIM do not envisage measures and activities under the objectives of the Strategy, but indirect positive effects will be achieved by the technological investments under Priority 1 of the TSIM, the measures of TSIM for digitalization, green transition, which will contribute to reducing the generation of waste from the relevant sectors.

▪ Achieving a coefficient of reuse and recycling of packaging waste (glass, paper, cardboard, metal and plastic) up to 25% of their amount; ▪ Establishment of a system for the management of construction and asbestos-containing waste.	The activities and measures under the CBCP and the TSIM are not related to the generation of significant quantities of waste, including hazardous waste.
National Security Strategy of the Republic of Serbia, 2019 The national security strategy of the Republic of Serbia includes a policy on *the protection of the environment and resources of the Republic of Serbia.* The protection of the environment and resources of the Republic of Serbia shall be achieved by achieving the following objectives: ▪ monitoring, evaluating, planning and mitigating the effects of climate change; ▪ protection from floods and fires; ▪ environmental quality standard improvement; ▪ effective management of hazardous waste; ▪ improving resource management capabilities and capacities.	Direct relevance and contribution to the first two objectives is the strategic project under Priority 3 of the CBCP to prepare the population for action in the event of disasters. Indirect contribution to improving the quality of the environment and improving the management of resources will generally be made by activities under Priority 1 of the CBCP (as a result of technological investment, innovation, product quality), as well as measures under the TSIM related to the deployment of digital solutions, green transition, digitalization, environmental access. CBCP and TSIM do not provide for measures and activities that conflict with the objectives of the strategy.
Strategy for water management on the territory of the Republic of Serbia by 2034 **The main strategic objective -** achieving integrated water management, a harmonised water regime throughout Serbia and to ensure such water management achieves maximum economic and social effects in a fair manner, with an understanding of the need to protect against pollution and improve natural ecosystems and in compliance with international agreements. Each individual area of the water sector has its own specific strategic objectives, which must be in line with the main ones, and many activities and measures of different nature are needed to achieve them. ▪ **Use of Water** **Strategic objective:** Ensuring that adequate quantities of water of appropriate quality are available to different categories of consumers, primarily for the supply of water to the population, without endangering the environment. ▪ **Protection of water against pollution** **Strategic objective:** Achieving and maintaining good condition and good ecological potential of surface and groundwater bodies in order to protect human health, protect aquatic and coastal ecosystems and meet the needs of water users. ▪ **Regulation of watercourses and protection from the harmful effects of water** **Strategic objective:** Reducing the risk of harmful effects of water ▪ **Regional and multifunctional hydraulic systems** **Strategic objective:** Improvement of the water regime, i.e. elimination of temporary and spatial discrepancy between available water resources and water needs, protection of water from pollution and protection against water, development of regional and multifunctional hydrosystems ▪ **The legal and institutional framework**	CBCP and TSIM are relevant to the first area - water use, as a contribution to reducing water costs will benefit from investments under Priority 1 related to technology, innovation, product quality. With regard to the second area and its strategic objective, the CBCP and TSIM do not provide for activities and measures that have the potential for water pollution. The third area and the strategic objective identified for reducing the risk of harmful effects of water - through the strategic project under Priority 3 of the CBCP to prepare the population for action in the event of disasters - is directly relevant. The last three areas and their objectives are not relevant to the CBCP and TSIM provisions.

Strategic objective: Completing the legal reform of the water sector in line with the needs of adapting to social conditions and EU requirements and an effective organisation of the water sector ▪ **Economic policy** **Strategic objective:** Establishment of a system for sustainable, long-term financing of the water sector on a self-financing basis, including stable sources of funding, continuous inflows of funds and mechanisms for their collection	
National Action Plan to mitigate the effects of desertification and land degradation (draft) **Strategic objective 1: Improving the living conditions of endangered populations** • Operational objective: Improving cooperation, awareness-raising and education – Activity 1.1. Introduction of the land conservation component and its functions in formal education – Activity 1.2. Introduction of a new curriculum in the framework of specialised studies on land and space design for successful agricultural production and prevention of land degradation. – Activity 1.3. Organization of workshops, courses, land-related workshops (on degradation, conservation and condition) and observance of international dates within the framework of environmental protection. • Operational objective: Policy framework – Activity 1.4. Establishment of a coordinating body - National Council on Desertification and Land Degradation. • Operational objective: Science, Technology and Knowledge – Activity 1.5. Connecting institutions and improving cooperation in the field of land research for sustainable land use. – Activity 1.6. Improving the monitoring, early warning and drought risk assessment system. **Strategic objective 2: Improving the condition of endangered ecosystems** • Operational objective: Policy framework – Activity 2.1 Rehabilitation and renovation of devastated and polluted sites. – Activity 2.2. Protecting high-productive land from urbanisation and unscrupulous use – Activity 2.3. Drawing up a map of Serbia's erosion • Operational objective: Science, Technology and Knowledge – Activity 2.4. Establishment of state land monitoring and monitoring of land indicators on the territory of the Republic of Serbia – Activity 2.5. Establishment of a common database for land threatened with various forms of degradation and pollution – Activity 2.6. Applying good practices for the management and use of land resources.	The national plan is not directly reflected in the CBCP and TSIM, but ***the investment project proposals to be approved for funding should align the operational objectives to Strategic Objective 2 in order to avoid contradictions between the projects and the strategy.***

Strategic objective 3: Generating global benefits through the effective implementation of the United Nations Convention to Combat Desertification • Operational objective: Science, Technology and Knowledge − Activity 3.1. Regional Network of Research Institutions • Operational objective: Capacity building − Activity 3.2. Establishment of an institutional and professional framework for the implementation of the Convention **Strategic objective 4: Mobilising resources to support the implementation of the Convention by building effective partnerships between national and transnational actors.** • Operational objective: Policy framework − Activity 4.1. Alignment of existing land and environmental regulations with relevant EU and UN legislation.	
Nature Conservation Programme of the Republic of Serbia for the period from 2021 to 2023 This Programme revises the Draft Strategy for Nature Conservation of the Republic of Serbia for the period from 2019 to 2025. The programme shall consider the results achieved by presenting them in a concise manner according to each of the objectives of the stated strategy and presenting an Action Plan with specific indicators. General objective: Improving the nature conservation and biodiversity conservation system *Specific objective 1.1: Reduced negative impact on biodiversity* *Specific objective 1.2: Improved management system for protected areas, ecological network and species.* *Specific objective 1.3: Improved public policy for nature conservation and biodiversity conservation and public participation in decision-making.*	CBCP and TSIM do not foresee activities and measures according to the priorities of the Programme, and an indirect positive effect is expected as a result of the expected improvement in the state of the environment, including the implementation of measures for sustainable economic activities, sustainable tourism, green transition. ***The implementation of the CBCP and the TSIM, including the approval and implementation of the project proposals, should be consistent and not contradictory to the strategy. Particular attention in this regard should be paid to the project proposals related to construction and activities outside urbanised areas.***
National Environmental Protection Programme 2010-2019 The general policy objectives are grouped into the following areas: 1. Adoption of strategic and planning documents in the field of environmental protection and sustainable use of natural resources, defined by the Environmental Act and other special laws; 2. Integration of environmental policy with economic and other sectors. Participate in the preparation and implementation of sectoral strategies in environmental areas. Integration of environmental protection and energy efficiency principles in spatial development and urban planning; 3. Strengthening institutional capacity to establish and implement sectoral environmental policies and policy in general and establishing an emergency response system. 4. Improvement of the environmental quality control system through accreditation by authorized laboratories, application of norms and regulations, mandatory quality control of monitoring of environmental factors and analytical methods, own monitoring of pollutants, development	CBCP and TSIM are relevant to the objectives of area 6 - through investments under Priority 1 of CBCP in technologies, increasing productive capacity related to the reduction of pollution as a result of the use of older/non-environmental technologies at the time.

of a cadastre of pollutants, development of greenhouse gas inventory, construction of a single information system; 5. Improvement of the legal system in the field of environmental protection through the adoption of sectoral laws and regulations, improvement of monitoring of the implementation of the legislation and capacity building of the judiciary; 6. Development of an effective financing system for environmental protection and economic incentives. It is necessary to ensure full implementation of the "polluter pays" principle. An effective system of economic instruments should be put in place to promote the reduction of pollution. Effective financial mechanisms should be put in place to promote environmental investments and secure sources of funding for the Fund. These may include mechanisms for converting debt into environmental investment, full reimbursement of the costs of environmental services, investment programmes in privatised companies, etc. Increasing the level of environmental investment to cover the costs of operation, maintenance and modernisation/expansion of existing infrastructure in the field of environmental protection and pollution reduction technologies. Competition and private sector involvement in the provision of services should be promoted, especially in the waste and water management sectors; 7. Improvement of formal and non-formal education in environmental protection and energy efficiency, which should be based on the National Strategy for Environmental Education. Awareness-raising through better information and communication to the public and the development of mechanisms for their participation in environmental decision-making in accordance with the Aarhus Convention.	
Roadmap for a Circular Economy in Serbia (2020) The Roadmap aims to promote production by implementing circular business models, to motivate industry to create new jobs and to improve business by finding innovative sustainable solutions for markets. The purpose of this document is to encourage society to make systematic changes in thinking, culture and attitude to resources, as well as to encourage decision-makers to make political commitments to change public policies and dialogue in the context of the circular economy. The Roadmap aims at: • Providing information on the importance of the transition to a circular economy, i.e. the new business model and conditions for competitiveness, the possibility of faster development of Serbia and solving the problem of the management of secondary raw materials, including waste, the need for resource and energy independence and environmental security. • Identification of sectors where there is already a basis for implementing circular instruments in the economy, without underestimating less developed sectors and traditional industries, which will require more investment to move towards new production. • Identify key drivers of change that can contribute to a faster transition to a circular economy through synchronised and collaborative activities.	Priority 1 of the CBCP includes activities for technological investments and those for product quality management, enhancing productive capacity, and the TSIM provides for green transition and digitalization measures, market greening - they will contribute to the transition to a circular economy.

In summary of analyses carried out above:

- The envisaged activities under the CBCP and measures under the TSIM do not conflict with environmental protection objectives;
- CBCP and TSIM integrate the relevant environmental objectives at national and international level and will contribute to their achievement. These include the integration of measures and activities in the CBCP and TSIM, **contributing directly or indirectly to the achievement of the objectives of the strategic documents at national and European level** for climate change mitigation, adaptation to the changing climate, protection and sustainable use of water, transition to a circular economy, pollution containment and control, protection and restoration of biodiversity and ecosystems (***environmental objectives within the scope of the principle of no significant damage***).

6. Possible significant environmental and human health impacts, including cross-border environmental impacts in other countries

This item of the EA report assesses the expected impacts of the implementation of the CBCP and TSIM on the environment and human health at the two levels that the programme and strategy identify (strategic level and level "measures/activities"), taking into account the nature of the interaction and synergy between the different impacts, namely: secondary, cumulative (considered in a separate point 6.3), concurrent, short-term, medium-term, long-term, permanent and temporary, positive and negative effects.

Strategic level:

- For CBCP, this shall include an assessment of the impact of the *Priorities and Specific Objectives*;
- For TSIM, this includes an assessment of the impact of the *Vision, the Strategic Objective and the Specific Objectives.*

"Measures/activities" level:

- For the CBCP, this shall include an assessment of the impact of the *activities/investments/strategic project supported;*
- For TSIM, this shall include an assessment of the impact of the *measures*.

The impact assessment also integrates the assessment under the *Technical Guidelines of the European Commission for the integration of the principle of "no significant harm" under the Regulation on the Recovery and Sustainability Mechanism*.

6.1. Assessment of probable impacts at Strategic level

6.1.1. For CBCP

Component Environmental Factor	***Priority 1: Competitive border region***	***Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments***	***Priority 2: Integrated development of border region***	***Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism, and security in areas other than urban areas***
	Impact			
Climate, Climate Change, Adaptation to Changing Climate	There is no direct relevance to these elements, with indirect positive impacts expected from improved competitiveness, involving the use of new, environmentally friendly technologies linked to the generation of no less emissions into the atmosphere and resilience to the effects of climate change.		The integrated development of the border region is related to the exchange of information and experience, carrying out joint activities in compliance with a complex of aspects (integration of activities), part of which is the protection of the environment and human health. Positive impacts are expected from the implementation of the priority for environmental and human health components and factors associated with the implementation of	Indirect positive impact resulting from integrated economic and environmental development, similar to the impact of Priority 2
Ambient air quality	Similarly to the impact in terms of climate change.			Similarly to the impact in terms of climate change.
Surface waters Groundwater WPA Flood Risk	The priority and the specific objective are not expected to have an impact in the lawful use and management of water and polluted water, protection of the WPAs and compliance with the requirements for flood prevention in the process of economic activities.			The specific objective is indirect, positive permanent, long-term impacts in terms of water protection, water protection areas; improving the treatment of polluted wastewater; there is no potential to increase the risk of floods.
Subsoil	No impact expected			No impact expected
Soils Land use	The development of competitiveness has an indirect positive impact as a result of the improvement of production technologies linked to the limitation of emissions and pollution. New production may have a negative impact on the land and soil subject to new construction of enterprises and infrastructure as a result of cessation of the			Positive, indirect, long-term, permanent impacts in soil management and land use as a result of the integration of environmental considerations into economic development.

Component Environmental Factor	***Priority 1: Competitive border region***	***Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments***	***Priority 2: Integrated development of border region***	***Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism, and security in areas other than urban areas***
	Impact			
	production functions of the soil and its anthropogenisation. The degree of impact depends on the parameters of the specific project. In the event of the development of new activities, the requirements for soil protection and the use of low-quality land in the development of production should be observed.		interlinked and complementary (integrated) measures, based on close coordination of different public policies, tailored to local specificities, responding to local development needs and potentials and bringing common benefits to partners and regions.	
Vegetation **Animal world** **Protected areas Protected territories**	Enhancing competitiveness is linked to technological renewal, limiting the harm associated with old, non-innovative technologies, replacing traditional with e-services, which will have an indirect positive impact on biodiversity and protected areas and territories. Possible negative impact - direct (in the case of new project proposals outside the boundaries of settlements) and indirect (from new production activities within the boundaries of settlements), weak and largely reversible in the effective application of environmentally friendly technologies and measures to protect biodiversity.			At this stage, activities under the specific objective of this priority do not imply significant negative impacts on biodiversity in the territorial scope of the programme, and in order to effectively promote integrated social, economic and environmental development through appropriate and environmentally friendly practices, positive effects in less developed and sparsely populated areas can even be expected. For example, in some sites this could help to reduce or stop certain harmful local practices towards nature (illegal logging, poaching, over-exploitation of herbs, mushrooms, etc.). With appropriate and correct mapping of the activities to promote environmental development according to the legal basis

Component Environmental Factor	***Priority 1: Competitive border region***	***Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments***	***Priority 2: Integrated development of border region***	***Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism, and security in areas other than urban areas***
	Impact			
				regarding the protection of biodiversity in both countries, as well as international and strategic documents in this regard, a tangible positive impact on the component under consideration could even be expected in the long term.
Landscape	Similarly to the impact on biodiversity.			Positive, indirect, long-term, permanent impact on the landscape as a result of the integration of environmental considerations into economic development, which will also result in the integration of considerations of preservation and improvement of the quality of the surrounding landscape.
Tangible assets	The priority and specific objective are expected to have a direct, positive, permanent, long-term impact in terms of investment in tangible assets contributing to a sustainable (and by default green) economy in the region.			The specific objective has a direct, positive, permanent, long-term impact. The integrated development of the cross-border region in every aspect envisages objectives related to the rationalization of the use of tourist resources, communications and digitalization, which implies targeted and long-term actions to maintain and develop the material

Component Environmental Factor	***Priority 1: Competitive border region***	***Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments***	***Priority 2: Integrated development of border region***	***Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism, and security in areas other than urban areas***
	Impact			
				assets available in the region in order to cover local needs and realize local potential.
Cultural and historical heritage	No impact on the component is expected.			Positive impact for the protection and maintenance of cultural heritage sites, given their integration in the development of the region.
Harmful physical factors	Positive impacts from sustainable development actions where the reduction of noise sources and levels is expected.			Positive impacts resulting from the integration of environmental considerations into development, where the limitation of sources and levels of noise is expected.
Waste	Positive impacts related to limiting the generation of waste as a result of the use of new/less waste or non-waste technologies and improved product quality,			Positive impacts resulting from the integration of environmental considerations into development, where the limitation of waste generation is expected.
Hazardous chemicals and risk of major accidents	Indirect positive impacts associated with the use of modern, innovative technologies limiting the risks of industrial accidents, including hazardous substances.			Environmental development is also linked to the mitigation of accident risks, including hazardous chemicals.
Population Human health Risk of accidents	Enhancing competitiveness involves the use of modern, innovative technologies limiting environmental and hence population risks, including the risk of accidents for workers. Increased competitiveness is linked to improving the well-being of the population, limiting inequalities leading to increased quality of life.			Integrated social, economic and environmental development is related to improving social services for the population, well-being, quality of the environment,

Component Environmental Factor	***Priority 1: Competitive border region***	***Specific objective 1.1: Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments***	***Priority 2: Integrated development of border region***	***Specific objective 2.1 Fostering the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism, and security in areas other than urban areas***
	Impact			
	Risks to human health exist when expanding existing and building new production, in the event that areas and sites subject to health protection are located in the vicinity, sanitary protection zones around drinking water sources, bathing areas, agricultural areas with crops grown for human consumption. For such projects, funding should be allowed only after assessment of the possible impact and risks for the population and human health, and their location should be consistent with spatial planning solutions and projections for the development of settlements, in order to prevent their implementation to lead to negative impact on residential areas, recreational and sports areas, recreational and resort areas and sites subject to health protection.			increasing security. This will have positive effects on the health of the population.
Summary of impacts:	*An indirect positive impact is mainly expected, linked to the improved state of SMEs compared to their current state, including the release of less harmful substances in the environment and the improvement of the quality of life of the population.* *Significant negative impacts are not expected in compliance with environmental and human health regulations.*			*Fully positive, permanent impacts are expected given the integration of environmental considerations into development.*

Component/Environmental Factor	***Priority 3: A more resilient border region***	***Specific objective 3.1 Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account eco-system based approaches***
	Impact	
Climate, Climate Change, Adaptation to a changing climate	The region's resilience makes a direct positive contribution to adaptation to a changing climate and to increasing the resilience of the region to adverse phenomena as a consequence of climate change. Negative impacts and greenhouse gas emissions are not expected.	Direct positive impacts on increasing the region's adaptation capabilities to climate change, risk prevention and disaster resilience, for which greater frequency and scale is expected as a result of climate change.
Ambient air quality	Indirect positive impacts related to limiting possible damage from natural disasters, and in particular fires related to emissions of a significant amount of harmful substances into the air in a short time are expected.	
Surface waters Groundwater WPA Flood Risk	The priority is not directly related to the amount and quality of surface water, the condition of the WPA and the reduction of the risk of flooding, but the territorial cohesion favours the long-term and permanent development and the exchange of information, experience and good practices in the processes of water and WPA management	The specific objective has direct, positive, permanent, long-term impact on surface water, WPAs and flood risk management.
Subsoil	Indirect positive impacts related to limiting possible disaster damage to the subsoil (activation of negative geological processes as a result of flooding and the like).	
Soils Land use	The priority and specific objective relate to direct and indirect positive impacts on soils and land use associated with limiting damage in the event of natural disasters - floods and associated risks of collapses, landslides and fires leading to soil destruction and therefore the current use of large areas of land.	
Vegetation Animal world Protected areas Protected territories	The priority and specific objective are not related to negative impacts on the biodiversity components within the territorial scope of the programme. Increasing the region's resilience to disasters and promoting adaptation to climate change will indirectly contribute to limiting the impact and damage of disasters on biodiversity, including protected areas and territories. Negative impacts on the component are not expected.	
Landscape	The priority and specific objective relate to direct and indirect positive impacts - preventing or limiting damage to landscapes in the disaster area and increasing the resilience of the area.	
Tangible assets	The priority is expected to have a direct, positive, permanent, long-term impact in terms of the envisaged investments in specialized equipment aimed at providing digital solutions for prevention, adaptation, sustainability in the region.	The specific objective is expected to have a direct, positive, permanent, long-term impact given the investment in specialized equipment aimed at providing digital solutions for prevention, adaptation, sustainability.

Component/Environmental Factor	***Priority 3: A more resilient border region***	***Specific objective 3.1 Promoting climate change adaptation and disaster risk prevention, and resilience, taking into account eco-system based approaches***
	Impact	
Cultural and historical heritage	The priority and specific objective have a direct and indirect positive impact on cultural heritage sites, as the risk prevention and increased disaster resilience of the region will also limit the risk of destruction/damage to cultural values from such phenomena.	
Harmful physical factors	Increasing the region's resilience to and prevention of disasters is not linked to the impact of harmful physical factors.	
Waste	As part of the damage resulting from disaster situations, significant amounts of waste are also generated in most cases, depending on the nature and destructive power of the particular disaster. The priority and the specific objective will have an indirect positive impact related to the prevention/limitation of waste generated as a result of the improved sustainability and adaptive capacity of the region.	
Hazardous chemicals and risk of major accidents	Disasters pose a serious threat to enterprises with high and low risk potential and are also one of the main risk factors that can lead to a major accident in such enterprises. In this respect, limiting the risks and damage from disasters has a positive effect on limiting the risk of a major accident occurring in enterprises with a risk potential.	
Population **Human health** **Risk of accidents**	Direct and indirect positive impacts related to: - protection of people's lives and health in times of disaster thanks to increased resilience; - limiting the risk to people's lives and health through the prevention of disaster situations.	
Summary of impacts:	*The priority and specific objective shall have direct and indirect positive impacts on environmental components and factors associated with the prevention of disasters and associated adverse impacts on the environment and human health and with limiting the scale of damage to the environment and human health in the event of disasters.*	

6.1.2. For TSIM

Component/Environmental Factor	***Vision:*** ***Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion***	***Strategic objective: To enhance growth in all its aspects***	***Specific objective 1: To expand and improve service provision***	**Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism** *(at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)*
	Impact			
Climate, Climate Change, Adaptation to a changing climate	Developments based on science and innovation, resource efficiency and green economic growth are associated with positive direct and indirect impacts related to limiting greenhouse gas emissions and increasing resilience to the effects of climate change.	Indirect positive impacts, as an important aspect that integrates into development are environmental requirements.	The specific objective has an indirect positive impact - as a result of improved services through more digital solutions, it implies obtaining the service without the need to visit a specific location (limiting the use of a vehicle to reach the place of receipt/use of the service).	There is no direct relevance to these elements, with an indirect positive impact expected from improved competitiveness involving the use of new, environmentally friendly solutions.
Ambient air quality	Development based on science and innovation, resource efficiency and green economic growth contribute to reducing emissions of harmful substances into ambient air. Negative impacts are not expected from the vision thus formulated.	The impact on the climate is similar.	The impact on the climate is similar.	The impact on the climate is similar.
Surface waters Groundwater Water Protection Areas	The vision has an indirect, positive, permanent, long-term impact on surface water, WPAs and flood risk reduction.	The Strategic Objective has an indirect, positive, permanent, long-term	No impact expected.	The specific objective has an indirect, positive, permanent, lasting impact on surface water, the WPAs and flood risk reduction,

Component/Environmental Factor	***Vision:* *Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion***	***Strategic objective: To enhance growth in all its aspects***	***Specific objective 1: To expand and improve service provision***	**Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism** *(at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)*
	Impact			
Flood Risk		impact on surface water, WPAs and flood risk reduction.		provided that the competition and development of tourism is in compliance with the legal requirements for water protection.
Subsoil	No impact expected			
Soils **Land use**	A long-term positive impact on soils and land use is expected, given that the vision is also aimed specifically at sustainable use and conservation of resources - land, forests, water, natural and cultural heritage.	The strategic objective has an indirect, positive, permanent, lasting impact on soil condition and land use, as development in all respects by default should also include the rational use of land and soil protection.	No impact expected.	No negative impact on soils is expected in the sustainable development of tourism activities.
Vegetation **Animal world** **Protected areas** **Protected territories**	The vision integrates the objectives of conservation of sustainable use of resources, including biodiversity and natural heritage - positive impacts are expected for these components.	Similarly to the impact of the previous environmental components, as a growth aspect the environmental aspects are taken into account, therefore the	The expansion and improvement of services by default applies to urbanised, populated areas. Therefore, negative impacts on biodiversity and protected areas and	Enhancing competitiveness in a sustainable way and developing sustainable tourism are not associated with significant negative impacts on the conservation-relevant components of biodiversity within the scope of the programme.

Component/Environmental Factor	***Vision:* *Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion***	***Strategic objective: To enhance growth in all its aspects***	***Specific objective 1: To expand and improve service provision***	**Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism** *(at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)*
	Impact			
		understanding is of development in line with biodiversity, protected areas and territories in the cross-border region.	territories are not expected.	
Landscape	A positive impact on landscape elements is expected as a result of balanced development, conserving and rationalising resources.	Similarly to the impacts for the previous components.	No negative impact on the landscape is expected.	Similarly to the impact on biodiversity.
Tangible assets	The vision has a direct, positive, permanent, long-term impact - investments in tangible assets that will contribute to improving resource efficiency, resource conservation, green economic growth.	Similar to the impact of "Vision"	The specific objective is expected to have a positive impact - investing in assets related to the provision of the relevant services.	Positive, long-term impact associated with investments in assets to increase competitiveness and sustainable tourism.
Cultural and historical heritage	The vision has a direct, positive, permanent, long-term impact related to the conservation and sustainable use of cultural heritage sites.	The strategic objective is expected to have a direct, positive, permanent, long-term impact similar to the environmental impacts analysed above.	The specific objective has no impact on cultural and historical heritage.	The specific objective is expected to have a direct, positive, permanent, long-term developmental impact, including the preservation of cultural heritage sites.

Component/Environmental Factor	***Vision:* *Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion***	***Strategic objective: To enhance growth in all its aspects***	***Specific objective 1: To expand and improve service provision***	**Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism** *(at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)*
	Impact			
Harmful physical factors	Positive impacts from sustainable development actions where the reduction of noise sources and levels is expected.			No effects are expected in relation to harmful physical factors.
Waste	The conservation and sustainable use of resources - resource efficiency is related to contributing to the transition to a circular economy and limiting the quantities and types of waste generated from the respective economic activities.			Increased competitiveness is linked to the implementation of environmentally friendly solutions, including the reduction of waste generated and the transition to a circular economy. The development of sustainable tourism is not linked to the generation of significant quantities and types of waste.
Hazardous chemicals and risk of major accidents	No impact expected			
Population **Human health** **Risk of accidents**	The vision is related to direct and indirect benefits for the population of the region related to the improvement of the quality of the environment, the quality of life and the well-being of the population as a result of the balanced integrated development.	Growth in all its aspects has a positive effect on the population of the region in terms of employment, well-being, quality of life.	The expansion and improvement of the services provided has a positive impact on the population - related to increasing access to services and improving the quality of life.	An indirect positive impact of the increased competitiveness of the region is expected - this is related to improving the well-being and quality of life of the population. Sustainable tourism and the development of cultural heritage sites provide an environment and a place for recreation of the population. Negative impacts are not expected.

Component/Environmental Factor	***Vision:*** ***Opened to neighbouring borders and integrated in the European space and axes of urbanization, of culture, science and innovations. The well preserved and sustainably used resources (land, forests, water, natural and cultural heritage) – a guarantee for the regions prosperity and identity. A balanced integrated development achieved through persistent investment in economic, social, transport, engineering, cultural and tourist infrastructure thus ensuring green economic growth, adaptivity to changes and cohesion***	***Strategic objective: To enhance growth in all its aspects***	***Specific objective 1: To expand and improve service provision***	**Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism** *(at least 40% of the priority budget to be allocated to projects focusing on sustainable tourism and culture)*
	Impact			
Summary of impacts:	*The vision has direct and indirect positive impacts for the protection of the environment and human health, including cultural and natural heritage, resource efficiency, green economic growth. Negative consequences for components and environmental factors, including the population, are not expected.*	*The strategic objective has a positive impact, as growth in all its aspects also implies taking environmental aspects into account for development.*	*The specific objective has an indirect positive impact for some components and environmental factors and no impact for the rest.*	*Improving competitiveness is generally linked to a positive impact on the environment and human health, given that high competitiveness is linked to better quality and environmental performance of the services provided. The development of sustainable tourism and culture have a positive impact.*

6.2. Assessment of probable impacts at "activities/measures" level

6.2.1. For CBCP

A. Activities/investments supported under Priority 1:

Component **Environmental Factor**	***Technological and/or organizational investments aimed at reducing the cost of production/service delivery and any other investment leading to increased enterprise competitiveness including but not limited to purchase of specialized equipment and technologies (inlc. related upskilling), monitoring systems; purchase of IT equipment, training and know-how transfer, virtual business centres, e-commerce solutions, possibilities for electronic payments, etc; Actions aimed at increasing productive capacity***	***Investments aimed at quality management for improving product/service quality, including but not limited to improvements in the design of product/service features, improvements in customer after-sales service, improvements in product guarantee, total quality management systems, and any other aspect that defines overall product/service quality level;***
	Impact	
Climate, **Climate Change,** **Adaptation to a changing climate**	Indirect, long-term positive impacts related to the reduction of greenhouse gas emissions due to increased competitiveness of enterprises, new equipment and technologies, IT, transition to e-services (which are CO_2 neutral) are expected. Technological renewal is also associated with increasing the resilience of enterprises' assets to adverse impacts linked to a changing climate.	Improving the quality of products, their characteristics and service are some of the activities aimed at transition to a circular economy, also associated with fewer emissions of harmful substances, including greenhouse gases into the atmosphere.
Ambient air quality	Indirect, long-term positive impacts related to the reduction of harmful substances emissions due to increased competitiveness of enterprises, new equipment and technologies, IT, transition to e-services (which are CO_2 neutral) are expected.	
Surface waters **Groundwater** **Water Protection Areas** **Flood Risk**	Improved equipment and technologies are more environmentally friendly and in particular water and water protection areas. As there are no specific parameters at this level of detail and specific projects identified, the potential risk of negative impacts cannot be assessed. Investment projects are subject to the regulated preventive procedures under the environmental legislation of the two countries, which will ensure the absence of significant impacts on water and water protection areas.	Similar to the previous activity.
Subsoil	No impact expected	
Soils **Land use**	Similarly to the impact on water, activities are expected to have an indirect positive, long-term impact on soils and land use as a result of improved technologies and equipment for the production of less pollutants in the environment and on soils, respectively. For the assessment of the risk of negative impacts, taking measures for soil protection in the vicinity of specific enterprises and prevention of pollution, the regulated preventive procedures under the environmental legislation of the two countries shall be applied	Similar to the previous activity.
Vegetation	The principle nature of the activities is such that it does not imply negative impacts (or at least significant ones) on the components of biodiversity and landscape within the territorial scope of the programme, as no events related to the establishment of new industrial	
Animal world		

Component **Environmental Factor**	***Technological and/or organizational investments aimed at reducing the cost of production/service delivery and any other investment leading to increased enterprise competitiveness including but not limited to purchase of specialized equipment and technologies (inlc. related upskilling), monitoring systems; purchase of IT equipment, training and know-how transfer, virtual business centres, e-commerce solutions, possibilities for electronic payments, etc; Actions aimed at increasing productive capacity***	***Investments aimed at quality management for improving product/service quality, including but not limited to improvements in the design of product/service features, improvements in customer after-sales service, improvements in product guarantee, total quality management systems, and any other aspect that defines overall product/service quality level;***
	Impact	
Protected areas **Protected territories**	zones or the construction and operation of new large industrial facilities are currently foreseen and included, but focus on the renovation of existing SMEs.	
Landscape		
Tangible assets	Indirect, positive, permanent, long-term impact is expected in terms of planned investments related to digitalization, purchase of specialized equipment and technologies, monitoring systems; purchase of IT equipment, training and transfer of know-how, virtual business centres, e-commerce solutions, e-payment opportunities	Indirect, positive, permanent, long-term impacts are expected from the perspective of the envisaged investments related to digitalisation and technologies in order to achieve competitiveness.
Cultural and historical heritage	No impact expected.	
Harmful physical factors	Positive impact as a result of equipment and technology upgrades, e-services, where the reduction of noise sources and levels is expected.	The activities are not related to generation of noise or the impact of other harmful physical factors.
Waste	Positive impacts related to limiting waste generation as a result of improved technologies and equipment.	A direct positive contribution to limiting waste generation and the transition to a circular economy as a result of improved quality and extended product life.
Hazardous chemicals and risk of major accidents	Indirect positive impacts associated with the use of modern, innovative technologies limiting the risks of industrial accidents, including hazardous substances.	No impact expected.
Population **Human health** **Risk of accidents**	The renewal of technologies and equipment is associated with limiting the risks of accidents, as well as reducing the levels of environmental damage, which has a positive, permanent effect. Risks to human health exist when expanding existing and building new production, in the event that areas and sites subject to health protection are located in the vicinity, sanitary protection zones around drinking water sources, bathing areas, agricultural	Improved product/service quality is associated with limiting the risks for users - the impact is positive.

Component Environmental Factor	***Technological and/or organizational investments aimed at reducing the cost of production/service delivery and any other investment leading to increased enterprise competitiveness including but not limited to purchase of specialized equipment and technologies (inlc. related upskilling), monitoring systems; purchase of IT equipment, training and know-how transfer, virtual business centres, e-commerce solutions, possibilities for electronic payments, etc; Actions aimed at increasing productive capacity***	***Investments aimed at quality management for improving product/service quality, including but not limited to improvements in the design of product/service features, improvements in customer after-sales service, improvements in product guarantee, total quality management systems, and any other aspect that defines overall product/service quality level;***
	Impact	
	areas with crops grown for human consumption. For such projects, funding should be allowed only after assessment of the possible impact and risks for the population and human health, and their location should be consistent with spatial planning solutions and projections for the development of settlements, in order to prevent their implementation to lead to negative impact on residential areas, recreational and sports areas, recreational and resort areas and sites subject to health protection.	
Summary of impacts:	*An indirect positive impact is mainly expected, linked to the improved state of SMEs compared to their current state, including the release of less harmful substances in the environment and the improvement of the quality of life of the population.* *Significant negative impacts are not expected in compliance with environmental and human health regulations.*	*Improving the quality of products and services has a positive impact (directly on waste and tangible assets and indirectly on other components) for most components and environmental factors and no impact for others. Negative impacts are not expected*

Actions aimed at accessing new markets or market segments including but not limited to marketing studies, distance-spanning technologies, organisational cooperation and joint business schemes with other enterprises, company exhibition halls at company's establishment, etc.	***Marketing and promotion actions, participation in international fairs, exhibitions and other promotional events, consultation and information services, including e-marketing, communication with clients, etc***
Impact	
Activities shall not be of an investment nature and shall not have a negative impact on the environment and human health.	

B. Activities/investments supported under Priority 3:

Strategic project „Preparation of the population for actions in case of disasters and improvement of the capacity of the professional teams for response in case of emergency situations within Bulgarian-Serbian cross-border region“.	
Component/Environmental Factor	**Impact**
Climate, **Climate Change,** **Adaptation to a changing climate**	Direct positive impacts on increasing the region's adaptation capabilities to climate change, risk prevention and disaster resilience, for which greater frequency and scale is expected as a result of climate change.
Ambient air quality	Indirect positive impacts related to limiting damage from natural disasters, and in particular fires related to emissions of a significant amount of harmful substances into the air in a short time are expected.
Surface water Groundwater **Water Protection Areas** **Flood Risk**	The project is expected to have a direct positive, permanent, long-lasting impact on surface water and WPAs and especially to reduce the risk of flooding
Subsoil	Indirect positive impacts related to limiting possible disaster damage to the subsoil (activation of negative geological processes as a result of flooding and the like).
Soils **Land use**	Direct and indirect positive impacts on soils and land use associated with limiting damage in the event of natural disasters - floods and associated risks of collapses, landslides and fires leading to soil destruction and therefore the current use of large areas of land.
Vegetation	The project is not related to negative impacts on the biodiversity components within the territorial scope of the programme. Increasing the region's resilience to disasters and promoting adaptation to climate change will indirectly contribute to limiting the impact and damage of disasters on biodiversity, including protected areas and territories. Negative impacts on the component are not expected.
Animal world	
Protected areas Protected territories	
Landscape	The project is related to direct and indirect positive impacts - preventing or limiting damage to landscapes in the disaster area and increasing the resilience of the area.
Tangible assets	Expects direct, positive, permanent, long-term impact in terms of the envisaged investments in assets for prevention, adaptation, sustainability in the region.
Cultural and historical heritage	The project has a direct and indirect positive impact on cultural heritage sites, as the risk prevention and increased disaster resilience of the region will also limit the risk of destruction/damage to cultural values from such phenomena.
Harmful physical factors	Increasing the region's resilience to and prevention of disasters is not linked to the impact of harmful physical factors.
Waste	As part of the damage resulting from disaster situations, significant amounts of waste are also generated in most cases, depending on the nature and destructive power of the particular disaster. The priority and the specific objective will have an indirect positive impact related to the

	prevention/limitation of waste generated as a result of the improved sustainability and adaptive capacity of the region.
Hazardous chemicals and risk of major accidents	Disasters pose a serious threat to enterprises with high and low risk potential and are also one of the main risk factors that can lead to a major accident in such enterprises. In this respect, limiting the risks and damage from disasters has a positive effect on limiting the risk of a major accident occurring in enterprises with a risk potential.
Population Human health **Risk of accidents**	Direct and indirect positive impacts related to: - protection of people's lives and health in times of disaster thanks to increased resilience; - limiting the risk to people's lives and health through the prevention of disaster situations.
Summary of impacts: *The strategic project has direct and indirect positive impacts on environmental components and factors associated with the prevention of disasters and associated adverse impacts on the environment and human health and with limiting the scale of damage to the environment and human health in the event of disasters.*	

6.2.2. For TSIM

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
Climate, Climate Change, Adaptation to a changing climate	Similarly to the impact of Specific Objective 1 of TSIM.	The measure is not related to greenhouse gas generation. No impact expected.	Environmental access (eco-pathways and cycling routes) will favour the reduction of greenhouse gas emissions from motor vehicles. The vulnerability of the specific location to the effects of climate change should be taken into account in order to ensure the sustainability of infrastructure and sites.	Similarly to Measure 2.1
Ambient air quality	Similarly to the impact of Specific Objective 1 of TSIM.	The measure is not related to emissions of harmful substances into ambient air.	Environmental access (eco-paths and cycling routes) will favour the reduction of exhaust emissions from internal combustion engines of motor vehicles.	Similarly to Measure 2.1
Surface waters Groundwater Water Protection Areas Flood Risk	The measure is not related to impact on water, water protection areas and flood risk.		Significant impacts on water, protected areas and waters are not expected, and in terms of flood risk, in compliance with regulations and water management plans and flood risk.	The measure is related to activities that have no impact on water, water protection zones or have a bearing on the risk of flooding.
Subsoil	No impact expected			
Soils Land use	The measure is not related to impacts on soils and land use.		Indirect impacts on soils, expressed in changes in: physical properties	The measure is not related to impacts on soils and land use.

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
			(structure, bulk density), reduction of organic matter, air, water and heat regime. The impact is expected due to the need for new/redevelopment of existing eco paths and bicycle routes to and within tourist sites, as well as the expected increased human flow along the paths; Depending on the characteristics of the crossing territory, erosion events are also possible; soil pollution with waste of organic and inorganic origin.	
Vegetation **Animal world** **Protected areas** **Protected territories**	The activities under the measure of this specific activity focus on improving the proximity, accessibility and quality of public services, which are generally carried out within the urbanized settlements. Therefore, significant negative impacts on	Support for the green and digital transition of SMEs under Measure 2.1 relates to increasing the efficiency of production processes by implementing the circular economy model and technological solutions to reduce emissions (and even eliminate some) and waste, which could logically have some	The activities under Measure 2.2 focus on the restoration and preservation of cultural heritage monuments, improvements in their exhibitions and their digitalisation, the design and construction of new and reconstruction of existing eco-trails and cycling routes, and the practice shows that in many cases such events are combined with the promotion of local biodiversity and its benefits, which also promotes its conservation. In this respect, the	The activities under Measure 2.3 are aimed at promoting already existing tourist products and sites of the cross-border area, therefore negative impacts on biodiversity can be expected mainly in their adjacent areas from the increase of anthropogenic pressure as a result of some increase in tourist flow. Provided that this is carried out in a sustainable manner in accordance with the conservation legislation, regulations and administrative acts

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
	biodiversity and protected natural sites of conservation value do not imply.	(indirect) positive effects on the biodiversity components of the area.	close interrelationships between natural and cultural values and the need for their integrated management are increasingly recognised at European level, especially in the context of the Natura 2000 network, including through the development of cultural and sustainable recreational tourism. In this context, the European Commission is promoting the linkage of natural heritage to cultural heritage under Natura 2000.	of the two countries, including information campaigns to promote biodiversity in the area and to raise awareness of its value and benefits for ecosystems and the lives of the local population, the potential negative impacts will be acceptable, especially within the territorial scope of TSIM within some of the more popular and attractive tourist destinations and their directly adjacent territories, in the long term. Overall, the negative impacts of the last/current measure are largely offset by the potential positive impacts of the previous two.
Landscape	No impact expected		No negative impact on the landscape is expected - on the basis of the impact on the other components, a more favourable impact than currently observed is expected.	No impact expected.
Tangible assets	This measure is expected to have a direct, positive, permanent, long-term	This measure is expected to have an indirect, positive, permanent, long-term impact.	This measure is expected to have a direct, positive, permanent, long-term impact. Streamlining the use of tourist resources, including	This measure is expected to have a direct, positive, permanent, long-term impact. Improving regional practices for marketing and branding

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
	impact in terms of the opportunities it offers to expand accessible communication technologies, digital solutions and digitisation in the cross-border region.	Aiming at exploiting the existing potential for business support, the respective will contribute to the development and support of the assets related to the regional tourism product.	providing conditions for building networks of cultural heritage and tourist sites in the cross-border area, implies targeted and long-term actions to maintain and develop the material assets available in the region, including communications and mobility, as a basis for the realization of the tourist product.	of tourist sites, products and destinations implies targeted and long-term actions to maintain and develop the material assets available in the region, including communications, as a basis for the realization of the tourist product.
Cultural and historical heritage	This measure is not expected to have an impact on the component.	This measure is expected to have a direct, positive, permanent, long-term impact. The measure aims at fully exploiting the existing potential for business support and networking of relevant institutions on both sides of the border by building on and linking their support practices, which will fully contribute to the preservation, popularisation and implementation of joint efforts to maintain	This measure is expected to have a direct, positive, permanent, long-term impact. The measure aims entirely at creating conditions and opportunities both for the preservation of cultural heritage and its promotion and use as a regional tourist product through modern means.	This measure is expected to have a direct, positive, permanent, long-term impact. Improving regional practices for marketing and branding of tourist sites, products and destinations implies targeted and long-term actions for maintenance, monitoring, protection and socialization of cultural and historical heritage, including archaeological sites.

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
		cultural and historical heritage in the cross-border region.		
Harmful physical factors	No effects are expected in relation to harmful physical factors.		Environmental access - development of bicycle routes and eco-paths implies limiting traffic, respectively reducing noise levels from transport traffic related to tourist destinations. No impact is expected in relation to other harmful physical factors.	The measure is not related to an increase in noise or the impact of other harmful physical factors.
Waste	Digital solutions are associated with a reduction in the generated waste from the traditional provision of services.	A greener market is also associated with the generation of less waste from related activities.	The measure is not related to the generation of significant quantities of waste, nor to the generation of hazardous waste.	The measure is not related to the generation of waste in significant quantities, nor to the generation of hazardous waste.
Hazardous chemicals and risk of major accidents	No impact expected.			
Population **Human health** **Risk of accidents**	The measure has a positive impact on local populations, given the improvement of proximity, accessibility and	The growth of the business, the greener market are related to the improvement of the quality of life and the well-being of the population.	An indirect positive impact of the increased competitiveness of the region is expected - this is related to improving the well-being and quality of life of the population. Sustainable tourism and the development of cultural heritage	Similarly to the impact of Measure 2.1.

Component/Environmental Factor	***M 1.1.*** Expand accessibility and improve quality of services of general interest in support of social and economic growth	***M 2.1*** Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market	***M 2.2*** Streamline the utilization of the CBC region's tourist resources, incl. ensuring faster, equitable and environmentally friendly access to and conditions for networking of cultural heritage and tourist sites in the CBC region	***M 2.3.*** Improving CBC tourism marketing and branding practices
	Impact			
	quality of public services, including for vulnerable persons.		sites provide an environment and a place for recreation of the population. Negative impacts are not expected.	
Summary of impacts:	*The measure has an indirect positive impact for some components and environmental factors and no impact for the rest.*	*The measure has no negative impact on components and environmental factors. For some of the components and factors an indirect positive impact is expected - biodiversity, tangible assets, cultural and historical heritage, waste, settlement.*	*Overall, the measure has no or negligible positive impacts.* *The risk/extent of the potential negative impacts described above will be assessed at the stage - preparation of a project proposal, within the framework of the required preventive procedures under the environmental legislation of the two countries.*	*The measure is not associated with direct negative effects on environment. The positive impact will be on tangible assets and cultural heritage.* *Negative impacts are possible for biodiversity, with excessive increases in tourist flows, and this can be regulated in a sustainable way. An additional positive effect will be achieved in the implementation of information campaigns to promote biodiversity in the region and raise awareness about its value and benefits for ecosystems and the lives of the local population within the projects.*

6.3. Cumulative impact

The provisions of the CBCP and TSIM **at strategic level** are related to positive cumulative impacts and contribution to the implementation of objectives, priorities, guidelines and measures under the relevant strategies, plans and programmes considered in item 1.4 of the EAR. No negative cumulative impact at the strategic impact level is expected.

Most of the envisaged **activities and measures** under the CBCP and TSIM have a positive impact on the environment and human health, as not a small part of them are "soft" measures without investment nature and do not imply a negative cumulative effect with other activities in the cross-border region.

A risk of **negative cumulative impact** is possible in the implementation of the activities under the measures related to *the development of tourism* under the **specific objective 2 of** TSIM, as a result of an increase in tourist flows in the region of tourist destinations, which in most cases are in/near areas with valuable biodiversity, valuable landscapes and other sensitive areas, e.g. WPAs. Cumulative adverse effects may affect ambient air quality, water, soil, landscape, biodiversity and protected areas and territories, noise levels, and therefore contribute to discomfort for site visitors. In order to prevent such undesirable effects, the development of tourism and destinations should take into account the capacity of the environment, its value and the presence of sensitive areas and elements, including recommended information campaigns for visitors to be part of the project proposals.

According to the analysis performed, **no significant cumulative environmental impact is expected from the implementation of the CBCP and TSIM.**

6.4. Cross-border impact of the CBCP and TSIM

With regard to the **likely cross-border impact** resulting from the application of the CBCP and the TSIM:

- CBCP and TSIM are of a cross-border nature and scope, both aiming at an impact within the scope of the designated cross-border region. In this regard, **by establishing a single EAR for the entire territory covered by the programme, the impact of the provisions of the two documents in the cross-border region has by default been assessed, with consultations taking place in both countries**;
- Regarding the cross-border impact within the meaning of the *Strategic Environmental Assessment Protocol to the Convention on Environmental Impact Assessment in a Cross-border Context* - taking into account the provisions of the draft programme and draft strategy, there is no basis for assuming a cross-border impact on the nearest neighbouring countries - The Republic of North Macedonia and the Republic of Romania.

In the case of **cross-border water bodies** within the scope of the CBCP and TSIM, no significant impacts on surface water and the WPAs are expected, as well as floods, including cross-border impacts on them in other countries from the implementation of the CBCP and TSIM.

For the territorial scope of the CBCP, a total of five cross-border surface water bodies have been identified in DBR and WABR: river Danube River Timok River, Nishawa River, Erma River and Dragovistitsa River.

The WPAs contacting the Bulgarian border are:

- WPAs for DDWS: - at Makresh, Chuprene, Chiprovtsi and p. Kom.
- Nitrate-vulnerable areas - rivers west of Ogosta (Bregovo);
- Sensitive zones - all water bodies in the DRBM, including the cross-border ones with the Republic of Serbia;
- Areas for the conservation of economically significant aquatic species: Danube, the spring parts of Ogosta, the Nishava and Erma rivers;
- WPAs related to the conservation of water-dependent species and habitats and WPAs related to the conservation of wild birds: Western Stara Planina, parts of the Nishava and Erma rivers;
- WPAs related to the conservation of water dependent species territories and habitats: the spring parts of the river Chuprenska and river Chiprovska;
- The APSFR concerning cross-border GB is river Danube - FRMP of DRBM.

The programme and the strategy, as well as their priorities and objectives are aimed at developing the cross-border area, which will improve the state of surface water, WPAs, and reduce the risk of flooding in the majority of cases.

According to the RBMP of DRBM, Bulgaria is making efforts to establish closer bilateral coordination with the Republic of Serbia in the field of water management. In 2013, 2014 and 2015, bilateral contacts were continued with a view to establishing bilateral cooperation within the scope of the WFD and the FD.

6.5. Summary of expected impact

For **ambient air and climate change,** a direct and indirect positive impact is expected as a result of the provisions at both levels of detail. The provisions of the CBCP and TSIM do not have the potential for significant negative impacts, but only for local, generally reversible impacts. Direct and indirect positive impacts are expected in relation to **climate change adaptation**. There are no provisions, including activities and measures related to the generation of significant greenhouse gas emissions or those leading to conflict or reduction of the effectiveness of adaptation measures.

With regard to **water, including the WPA and the risk of flooding**, the impacts at the strategic level are mainly related to

- absence of negative effects, both directly and indirectly;

- positive impacts in the vast majority of cases;
- long-term and, in a large number of cases, permanent effects.

Potentially possible cases of negative effects are expected to be very rare.

At the "activities/measures" level, impacts on water are related to

- absence of direct negative effects, in very rare cases the presence of indirect effects;
- there is mainly a direct and indirect positive impact;
- long-term and, in a large number of cases, permanent impact;
- in the vast majority of cases there is no impact whatsoever.

The impact on **land and soil** at strategic level is positive and non-negative, both directly and indirectly. The impact at the "activities/measures" level is mainly a direct and indirect positive impact, in very rare cases indirect or direct impacts (absorption of new land - measure 2.2 of TSIM) are possible and in some cases no impact is present.

As can be seen from the above analysis, for **biodiversity and protected areas and territories** covered by the CBCP and TSIM, more potential benefits than negatives can be expected at this stage under certain conditions. Negative impacts may be minimised by appropriate measures and by carrying out the required EIA, EA and CA procedures.

The impact on both levels of detail on the **landscape** is predominantly positive, linked to the enhancement of its attractiveness and qualities. Possible negative effects are analogous to those for biodiversity.

For **tangible assets**, a positive cumulative impact is expected to improve the state of existing FTAs and/or the construction of new environmentally friendly ones at both levels of impact, as investments in assets related to the improvement of the state of the environment of the cross-border region are envisaged. Negative impacts on tangible assets are not expected.

With regard to **cultural and historical heritage**, the objectives and measures related to developing these sites and tourist potential with most of the other predictions at both levels of detail not implying a negative impact, subject to the existing legislation on the protection of cultural heritage in both countries.

In terms of **harmful physical factors**, the expected impact in terms of noise in general is defined as indirect positive, long-term and permanent for the region concerned. The provisions of the CBCP and TSIM have no potential for significant negative impact, including the creation of a risk to human health, taking into account the location of areas and objects with normalized noise regime. For other harmful physical factors, no impact is expected.

As regards **waste**, a generally direct indirect positive impact is expected as a result of the activities and measures leading to the reduction of waste generation. Negative impacts are not expected from other CBCP and TSIM provisions.

With regard to **hazardous chemicals** and the risk of major accidents, no negative impact is expected in compliance with the applicable legislation in the territory of both countries.

The impact on the **health and hygiene aspects** of the environment as a whole is positive. The placing of new production sites should take into account the territorial-structural decisions and forecasts for the development of the settlements, the proximity to areas and sites subject to health protection, including water protection zones, in order to prevent harmful effects on human health.

7. Measures designed to prevent, reduce and compensate as fully as possible the adverse effects of the implementation of the CBCP and TSIM on the environment and human health

Analyses and assessment of the likely impact on the implementation of the CBCP and TSIM shall require the identification of measures that will ensure that adverse effects on the environment and human health are prevented, mitigated and compensated to the fullest extent possible. The measures are motivated by the expected results of their implementation:

7.1. Measures to be reflected in the final versions of the CBCP and/or TSIM

The results of the assessment of the environmental and human health impacts of the CBCP and TSIM show no need for measures for the final versions of the documents.

7.2. Implementation measures for the application of CBCP and/or TSIM

General measures:

1. Plans, programmes, projects and investment proposals arising from the CBCP and TSIM, falling within the scope of Directive 2014/52/EU or Directive 2001/42/EC or outside them and falling within the scope of Art. 6 of Directive 92/43/EEC, shall be subject to an assessment of their compatibility with the object and objectives of conservation of protected areas and may only be approved after a decision/opinion on EIA/EA/CA for approval/coordination, and in compliance with the recommendations in the evaluations carried out, as well as with the conditions, requirements and measures set out in the decision/opinion.

Expected result: Prevention of significant adverse effects on the environment and human health, the object and objectives of protection of protected areas.

2. Investment proposals arising from measures and activities under the CBCP and the TSIM to comply with the current territorial development plans in the respective territory, as well as national, regional and local strategic, planning and regulatory documents, other available planned projects with similar and/or overlapping activities, in order to achieve the necessary synchronization in the implementation of the project procedures by the engaged institutional bodies.

Expected result: Prevent contradictions, according to the current regulations and the adopted strategic and planning documents. Non-admission of project proposals not in line with

existing proposals leading to administrative difficulties and/or request for double funding for overlapping activities.

Climate Change Adaptation

3. Compliance of the relevant activities and measures from the current strategic documents for adaptation to climate change and provision of measures to ensure sustainability of the projects related to the construction and development of sites, facilities and infrastructure.
Expected result: Ensuring climate resilience of projects.

Waters, water protection areas and flood risk

4. For the projects should be provided measures for preventing the deterioration of the state of surface water and the WPAs, in accordance with the requirements of Art. 116 of the Waters Act of the Republic of Bulgaria as well as the Waters Act of the Republic of Serbia.

5. Investment proposals, plans and programmes to be implemented in accordance with the current RBMPs, FRMPs and water conservation and management legislation.
Clarification on the main applicable provisions of the legislation for water protection

- *Compliance with the requirements of Art. 134 of the WA of the Republic of Serbia: The following shall be prohibited in the coastal flood strips and the land belonging to the reservoirs:*
  1. *storage of pesticides, disposal and treatment of waste;*
  2. *construction of livestock farms;*
  3. *construction of commercial and residential buildings;*
  4. *washing and servicing of vehicles and equipment;*
  5. *planting of permanent crops with shallow root system;*
  6. *disposal of waste.*
- *Compliance with the requirements of Art. 143 of the WA which, in order to protect from the harmful effects of water, prohibits:*
  1. *the violation of the natural state of the beds, the banks of the rivers and the coastal flood strips;*
  2. *the reduction of the conductivity of river beds, including through barrages and thresholds, without the relevant permit;*
  3. *the use of river beds as landfills for waste, earth and rock masses;*
  4. *construction works over the covered river sections;*
  5. *the storage of materials that would significantly increase the destructive power of water in case of floods.*
- *Compliance with the requirements of Art. 146. (1) of WA: It is forbidden to install residential and villa buildings and farm buildings in the floodplain terraces of rivers and the easement of hydrotechnical facilities and dam walls.*
- *Compliance with the requirements of Art. 125. (1) of WA. Only wastewater that can be treated in the existing process scheme of the treatment plant and does not endanger the life and health of the operating personnel should be included in the sewerage networks and the WWTP. The removal shall take into account:*

- *the discharge permit; the quantity and quality of the waste water;*
- *existing sewage network and treatment plant; sludge treatment technology for recovery or disposal.*

- *Compliance with the requirements of Art. 132 of the WA, persons, from whose economic activities are generated waste waters, shall be obliged to construct the necessary treatment facilities in accordance with the requirements for discharge into the water site, when on the respective territory there is no sewerage system.*
- *In case of water abstraction and/or use of a water body, to comply with the requirements of Art. 44 and 46 of the WA - availability of the relevant permit.*
- *For activities falling under the APSFR in the scope of flooding, measures to protect against the harmful effects of waters complying with the NCM and the FRMP measures of the Republic of Serbia shall be planned.*
- *When implementing activities under the CBCP and TSIM to comply with the applicable measures from the PoM and to be coordinated with the objectives of the RBMP 2016-2021/2022-2027 and the FRMP 2016-2021/2022-2027.*
- *Prevention of emergency pollution of surface water and areas for protection of the waters, in accordance with the requirements of Art. 131 of the WA: In the event of emergencies creating prerequisites for water pollution, the owner or the person operating the site - a source of pollution, including tailings ponds, slurries and embankments, shall take the necessary measures to limit or eliminate the effects of the pollution according to an emergency plan prepared in advance and shall immediately inform the basin directorates and the bodies of the Ministry of Interior, as well as with WA of the Republic of Serbia..*
- *Preservation of sanitary protection zones for drinking water, according to the restrictions and prohibitions in the SSZ.*

Expected result: Prevent the deterioration of surface water status and WPA, as well as increase the risk of flooding.

6. Sustainable use of water, including introduction of water use cycles in industrial plants, local treatment of industrial wastewater.

Expected result: Preservation of the chemical and ecological status/potential of surface water.

7. Taking measures and technological decisions to prevent the accidental contamination of surface water.

Expected result: Preservation of the chemical and ecological status/potential of surface and underground waters.

Soils

8. The *design* of the new sites should include the necessary activities and measures for conservation of soil resources and reclamation in order to prevent the occurrence of erosion processes and maximum restoration of disturbed lands.

Expected result: Prevent impact on lands and soils in the implementation of design solutions.

9. In carrying out the construction activities, it is necessary to take measures for the protection of the soil resources (preliminary seizure of the humus soil and its utilization for reclamation purposes).

Expected result: Conservation of soil resources.

Vegetation, animal world, protected areas and protected territories, landscape

10. Tourism development projects under measure 1.4 of TSIM to be implemented in accordance with the standards for recreational load and absorption capacity of the environment, and in compliance with the status of the territory.

11. As part of the project proposals for tourism development under specific objective 2 of TSIM to be required to ensure the implementation of information campaigns to promote biodiversity in the region and raise awareness about its value and benefits for ecosystems and the lives of the local population,

12. The popularisation of tourism products and sites under measure 2.3 of the TSIM should take into account the regimes of protected areas and protected territories in the area. Within their scope, compliance with the relevant prohibitions and recommendations reflected in the issued order for the respective territory should be enforced and respected.

Expected result of the measures for vegetation, animal world, protected areas and protected territories, landscape: Prevention of significant loads on the territory, including destruction of valuable landscapes, elements of biodiversity, habitats of species.

Cultural and historical heritage

13. Investment proposals, plans and programs to be implemented after a positive opinion of the competent authorities for the protection of cultural heritage, in accordance with the regimes for the protection of sites and the applicable regulations. In the presence of construction activities in areas with registered cultural properties, the respective to be carried out under the control of competent persons (determined or eligible under the relevant national legislation).

Expected result: Prevent negative impact and/or damage to immovable cultural properties.

Hazardous chemicals and risk of major accidents

14. In the event that the construction of new or changes to an existing plant and/or facility with low or high risk potential is envisaged, as well as in the planning of new works, including the construction of transport roads, residential areas, public works in the vicinity of existing

plants and/or facilities with low or high risk potential, where deployment or new works may be a source of or increase the dangers or consequences of a major accident occurring in those plants/facilities, it is necessary to:

a. Ensure safe distances of the enterprise and/or facility to residential areas, public places and areas, recreational areas and, where possible, large transport roads.
b. Maintain safe distances of establishments and/or facilities with low or high risk potential or other appropriate measures to areas of particular conservation sensitivity or interest and cultural and historical heritage sites in the vicinity of establishments, where appropriate, in order to protect them.
c. Taking additional technical measures to mitigate risks to human health and the environment in the case of existing establishments and/or facilities with low and high risk potential

Expected result: Preventing risks associated with major accidents involving hazardous chemicals.

Population, human health, health and hygiene aspects of the environment

15. When planning and implementing investment proposals, their location should be consistent with the current spatial planning decisions and provisions for the development of settlements, and should not allow the implementation to lead to negative impact on residential areas, recreational and sports areas, recreational and resort zones and other sites subject to health protection.

Expected result: Prevention of risks and protection of population and human health.

8. Reasons for choosing the considered alternatives

The drafts of the CBCP and TSIM provided by the Contracting Authority do not contain alternatives.

The analysis of the "zero alternative" made in item 2.2 of the EAR shows that it has a less favourable impact than the alternative for the implementation of the programme and its territorial strategy.

The alternative for the implementation of CBCP and TSIM is in general with a complex positive impact on the environment, including on the population and human health, as the eligible activities and measures are predominantly environmentally oriented, including contributing to the achievement of environmental objectives at national and international level. However, some of the envisaged activities are related to a possible negative impact, which is why at the stage of realization and implementation of the CBCP and TSIM, the measures recommended in item 7 of the EAR must be implemented, as well as to ensure compliance with all laws and regulations in

force in the two countries, related to the protection of the environment, including the population and human health.

On the basis of the analysis presented, the alternative for the implementation of the CBCP and TSIM is preferred to the zero alternative.

9. Methods for carrying out the environmental assessment, used regulations and documents and difficulties in gathering the necessary information

The main **methodological documents** used are the following guidelines and methodologies:

- Guidance on the implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment - European Commission [91]– DG Environment;
- Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment[92], 2013 – European Commission;
- The Use of Spatial Data for the Preparation of Environmental Reports in Europe, JRC technical support[93], 2010;
- Resource Manual to Support Application of the Protocol on Strategic Environmental Assessment, 2011 – UNECE[94];
- Good Practice Recommendations on Public Participation in Strategic Environmental Assessment[95], 16 February 2016 – UNECE;
- Cross border orientation paper for IPA CBC cooperation programmes with the participation of regions of Bulgaria, Republic of North Macedonia and Turkey[96], Ref. Ares(2019)6239329 - 09/10/2019;
- Strategic environmental assessment in Interreg NEXT programmes - Guidance note and review of approaches[97], July 2020, TESIM;
- Letter Ref. Ares(2020)32846 - 06/01/2020 of EC with provisions and clarifications for environmental assessments applicable to the plans and programmes co-financed by the EU in the period 2021-2027;

[91] *https://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf*
[92] *https://ec.europa.eu/environment/eia/pdf/SEA%20Guidance.pdf*
[93] *https://publications.jrc.ec.europa.eu/repository/handle/JRC58006*
[94] *https://unece.org/DAM/env/documents/2011/eia/ece.mp.eia.17.e.pdf*
[95] *https://unece.org/sites/default/files/2020-12/1514364_E_Espoo_web.pdf*
[96] *http://www.ipacbc-bgrs.eu/2020/cross-border-orientation-paper-ipa-cbc-cooperation-programmes-participation-regions-republic*
[97] *https://tesim-enicbc.eu/download/guidance-on-strategic-environmental-assessment-in-interreg-next-programmes/*

- Presentation on *Application of the SEA Directive to the EU 2021-2027 cofinanced programmes*, 40th meeting of the Expert Group on ESIF(EGESIF), Brussels, 11-12 February 2020, Directorate-General for the Environment;
- *Technical Guidelines for Climate Resilience of Infrastructure Projects 2021-2027, Notice from the European Commission, C(2021)543.*

The preparation of the EAR was carried out according to the following **methodological approach**:

1) Introduction of the collective experts to the drafts of the CBCP and TSIM and their provisions, the other documentation provided by the Contracting Authority, the opinions on the assignment for determining the scope and content of the EAR;
2) Identification and analysis of other plans, strategies and programmes related to the projects of the CBCP and TSIM;
3) Collection, analysis and processing of literature sources and data on the existing state of the environment by components and factors, its relationship with the current level of development of the cross-border area within the scope of the CBCP and TSIM;
4) Analysis of the development of the environment in the event of non-application of CBCP and TSIM (assessment of the impact of the so-called "zero alternative");
5) Analysis of the likely significant impact on territories with CBCP and TSIM;
6) Collection, processing and analysis of information on existing environmental problems at national level and their relation to the CBCP and TSIM, including possible development of these problems with and without the implementation of the CBCP and TSIM;
7) Analysis of the extent to which the projects of the CBCP and TSIM comply with the relevant environmental protection objectives and measures included/identified in documents - plans, strategies and programmes at national and international level;
8) Analysis and assessment of the environmental impacts of the CBCP and TSIM: As CBCP and TSIM are strategic documents, the assessment of likely significant environmental and human health impacts has been carried out at two levels of detail ("strategic" and "measures/activities");
9) Propose measures to prevent, reduce and mitigate impacts, as well as measures to monitor and control the impact of the programme on its implementation;
10) Reasoned choice of the most appropriate alternative in terms of environmental and human health impacts;
11) Preparation of a reasoned conclusion for the implementation of the CBCP and TSIM, taking into account the opinions received as a result of the consultations.

The impacts in item 6 of the EAR have also been assessed in the integration of *The Technical Guidelines of the European Commission for the integration of the principle of "no*

significant harm" under the Recovery and Sustainability Mechanism Regulation, with impacts also analysed against the six environmental objectives covered by the Taxonomy Regulation.

Basic **legal acts** which will be consistent in the preparation of the EAR are:
International documents:

- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, Protocol on Pollutant Release and Transfer Registers to the Aarhus Convention;
- United Nations Framework Convention on Climate Change, Kyoto Protocol;
- Convention on Environmental Impact Assessment in a Transboundary Context;
- Strategic Environmental Assessment Protocol to the EIA Convention in a Transboundary context;
- Multilateral Agreement among the countries of South-East Europe for implementation of the Convention on EIA in a Transboundary Context
- Convention on Long-range Transboundary Air Pollution, Protocols;
- Nagoya protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the Convention on biological diversity;
- Convention on the Transboundary Effects of Industrial Accidents, Protocol on Civil Liability and Compensation for Damage to Transboundary Water Sites Resulting from Transboundary Effects of Industrial Accidents;
- Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Protocol on Water and Health, Protocol on Civil Liability and Compensation for Damage to Transboundary Water Sites Resulting from Transboundary Effects of Industrial Accidents;
- Convention for the Protection of the Black Sea against Pollution, Protocol for the Protection of Biodiversity and Landscape Diversity in the Black Sea;
- The Convention on Biodiversity and the related Cartagena Protocol on Biosafety, the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation to the Cartagena Protocol on Biosafety, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation;
- Convention on the Conservation of European Wildlife and Natural Habitats;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- Convention on the conservation of migratory species of wild animals;
- Ramsar Convention on Wetlands;
- Agreement for the Conservation of Migratory Waterbirds from Africa and Eurasia;

- Agreement on the Conservation of Cetaceans of the Black and Mediterranean Seas and the Neighbouring Aquatory of the Atlantic Ocean;
- Agreement on the Conservation of Populations of European Bats;
- Convention Concerning the Protection of the World Cultural and Natural Heritage;
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa;

EU Legislation:

- Regulation (EU) 2021/1060 of the European Parliament and of the Council of 24 June 2021 laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, the Just Transition Fund and the European Maritime, Fisheries and Aquaculture Fund and financial rules for those and for the Asylum, Migration and Integration Fund, the Internal Security Fund and the Instrument for Financial Support for Border Management and Visa Policy ***(General Regulation)***;
- Regulation (EU) 2021/1059 of the European Parliament and of the Council of 24 June 2021 on specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments (**Interreg Regulation**);
- Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment;
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment;
- Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC;
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe;
- Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air;
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control);

- Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management;
- Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air;
- Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air;
- Directive 2002/3/EC of the European Parliament and of the Council of 12 February 2002 relating to ozone in ambient air;
- Water Framework Directive;
- Directive on the assessment and management of flood risks;
- Marine strategy framework directive;
- Commission Delegated Directive (EU) 2021/1226 of 21 December 2020 amending, for the purposes of adapting to scientific and technical progress, Annex II to Directive 2002/49/EC of the European Parliament and of the Council as regards common noise assessment methods;
- Commission Directive (EU) 2020/367 of 4 March 2020 amending Annex III to Directive 2002/49/EC of the European Parliament and of the Council as regards the establishment of assessment methods for harmful effects of environmental noise;
- Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council;
- Corrigendum to Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council;
- Directive 2002/49/EC on environmental noise assessment and management;
- Directive 2000/14/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC;
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
- Directive (EU) 2018/850 of the European Parliament and of the Council amending Directive 1999/31/EC on the landfill of waste;
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora;

- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;
- Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC.

For the Republic of Bulgaria:

- Environmental Protection Act;
- Prevention and Remediation of Environmental Damage Act;
- Biodiversity Act;
- Waste Management Act;
- Ambient air purity act;
- Climate Change Mitigation Act;
- Waters Act;
- Plant Protection Act;
- Medicinal plants act;
- Soils act;
- Environmental Noise Protection Act;
- Protected Areas Act;
- Protection of agricultural lands act and its implementing regulations;
- Cultural Heritage Act;
- Disaster Protection Act;
- Spatial Planning Act;
- Forestry Act;
- Health and Safety at Work Act;
- Health Act;
- Prevention and Remediation of Environmental Damage Act;
- Ordinance on the terms and conditions for environmental assessment of plans and programs;
- Regulation on the terms and conditions for compatibility assessment of plans, programmes, projects and investment proposals to the subject matter and purpose of the conservation of protected areas;
- Decision No 196 of the Council of Ministers of 11 April 2019 approving the Analysis of the Socio-Economic Development of Bulgaria 2007-2017 setting out the national priorities for the period 2021-2027, the list of policy objectives to be supported during the programming period 2021-2027 and the list of programmes and leading departments for their development;

- Decree No 142 of the Council of Ministers of 2019 for the development of the strategic and program documents of the Republic of Bulgaria for the management of the funds of the EU for the programming period 2021-2027;
- Other regulations regulating components and factors of the environment and human health.

B. For the Republic of Bulgaria (https://www.ekologija.gov.rs/dokumenta)

- Strategic Environmental Assessment Act;
- Environmental impact assessment Act;
  - → Regulations for the content of the research on Environmental impact assessment;
  - → Ordinance on the content of the request for the need for an impact assessment and the content of the request for the definition of the scope and content of the impact assessment study;
  - → Rules of procedure of the Technical Commission for the assessment of the environmental impact assessment study;
  - → Rules for the procedure of public view, presentation and public discussion of the environmental impact assessment study;
- Environmental Protection Act and Draft Law on Amendment and Supplement to the Environmental Protection Act;
- Law on Amendment and Supplement to the Integrated Prevention and Control of Environmental Pollution Act;
- Waste Management Act and Draft Law on Amendment and Supplement to the Waste Management Act and the regulations, ordinances and rules, including:
  - → Regulations on the content of the project for environmental protection and rehabilitation during and after the use of natural resources, procedure and conditions;
  - → Regulations on the content of renovation and reclamation projects;
- Law on Packaging and Packaging Waste and Draft Law on Amendment and Supplement to the Law on Packaging and Packaging Waste
- Law for the ratification of the Basel convention on the control of transboundary movements of hazardous wastes and their disposal;
- Law for the ratification of the Convention on the Transboundary Effects of Industrial Accidents and the Regulations;
- Regulatory documents - decrees, ordinances and rules to the Integrated Permits section;

- Biocidal Act and Regulations;
- Chemicals Act and Regulations;
- Laws ratifying the Stockholm and Rotterdam Conventions;
- Law on Meteorological and Hydrological Activities;
- Waters Act and regulations, including:
  - → Regulation on priority limit values and hazardous priority substances which pollute surface water and time limits for their achievement;
  - → Regulation on the limit values for pollutants in surface and groundwater bodies and sediment and the time limits for reaching them;
  - → The Ordinance on the Determination of Surface and Groundwater Bodies;
  - → The Ordinance on the ecological and chemical status parameters of surface water resources and the parameters of the chemical and quantitative status of groundwater resources;
  - → Ordinance on the determination of surface and groundwater bodies in order to preserve or achieve good ecological, chemical and quantitative status of groundwater resources;
- Land protection Act and Regulations;
- Nature Conservation Act:
- National Parks Act:
- Environmental Noise Protection Act and Regulations;
- Air protection Act and Regulations;
- Law for the prohibition of the development, production, storage and use of chemical weapons and their destruction;
- Kyoto Protocol Act;
- Law for the ratification of the Convention on Long-range Transboundary Air Pollution;
- Law on the ratification of the Montreal Protocol on Substances that Deplete the Ozone Layer;
- Law on the ratification of the Heavy Metals Protocol;
- Law on Protection against Non-ionizing Radiation and Regulations;
- Law on the Protection and Sustainable Use of Fish Stocks;
- Ordinance on monitoring conditions and air quality requirements in Republic of Serbia - Uredbao uslovima za monitoring i zahtevima kvaliteta vazduha (Official Gazette RS No 11/10 and 75/10);
- Other regulations regulating components and factors of the environment and human health.

The following have also been used as **sources of information**:

- Drafts of CBCP and TSIM;
- Territorial analysis of the BULGARIA – SERBIA cross border area 2021-2027;
- Other documentation provided by the MA and the NA.
- Official statistics, reports and bulletins with information about the Republic of Bulgaria and the Republic of Serbia, including data from Eurostat and the European Environment Agency;
- National and regional reports on the state and protection of the environment of the Republic of Bulgaria and the Republic of Serbia, incl.:
    - Annual Report on the Air Quality Situation in the Republic of Serbia for 2019 /Извештај о стању животне средине у Републици Србији за 2019 годину Министарство заштите животне средине. Агенција за защиту животне средине/;
    - National Report on the Environmental Situation in the Republic of Bulgaria for 2019, EEA, http://eea.government.bg/bg/soer;
    - Regional reports on the state of the environment in 2020 of RIEW Blagoevgrad, Vratsa, Montana and Sofia;
- Strategies, plans and programs of the Republic of Bulgaria and the Republic of Serbia related to the CBCP and TSIM - listed and analysed in item 1.4 of the EAR;
- Strategies, plans and programmes at national (of the Republic of Bulgaria and the Republic of Serbia) and international (European) level setting environmental protection objectives - listed in item 1.4 of the EAR and analysed in item 5 of the EAR;
- Literary sources of information on components and environmental factors in the Republic of Bulgaria and the Republic of Serbia (climatic factors, geology, hydrology, landscape, vegetation, animal world, etc.), including:
    - Environmental Assessment Report of the Bulgaria-Serbia CBC IPA Programme 2014-2020;
    - BANSIC: Employment and use of the territory in 2020, MAFF "Agrostatistics" Department, Results and analyses, No. 381;
    - Sustainable Land Management PROJECT, http://unccd-slm.org/;
    - Commission strategy for Bulgaria. Sustainable use of land in Bulgaria, 2007-2013. Draft MAF and DLG, Kingdom of the Netherlands;
    - Soil-geographical zoning of Bulgaria, 1974. IS "Pushkarov";
    - Artinova, N. 2014. Characteristics and grouping by content and composition of humus in the soils of Bulgaria by mathematical and statistical methods. The soil organic matter and soil fertility in Bulgaria;

- Second report of the Republic of Serbia on the United Nations Framework Convention on Climate Change (2017);
- Strategic framework for communication in the field of environmental protection;
- План управљања водама на територије Републике Србије од 2021 до 2027 године. Министарство пољопривреде, шумарства и водопривреде Републичка дирекција за воде.
- Опци план за отбрану од поплава. 2019 годину.
- Оперативни план за одбрану од поплава за 2020 годину;
- Стратешка процена утицаја просторног плана Републике Србије од 2021 до 2035 године на животну средину – Нацрт – Министарство грађевинарства, саобраћаја и инфраструктуре;
- Прелиминарна процена ризика од поплава за територију Србије 2019. Министарство пољопривреде, шумарства и водопривреде. Републичка дирекција за воду;
- Извештај о стању животне средине у Републици Србији за 2019 годину Министарство заштите животне средине. Агенција за защиту животне средине.
- Прелиминарна процена ризика од поплава за територију Србије 2019. Министарство пољопривреде, шумарства и водопривреде. Републичка дирекција за воду.
- Процена ризика од катастрофа у Републици Србији *(http://prezentacije.mup.gov.rs/svs/HTML/licence/Procena%20rizika%20od%20katastrofa%20u%20RS.pdf*Conception to set up a new groundwater network in Serbia, Z. Stevanovic, V. Vakanjac, S.P. Milanovic, Geoloski anali Balkanskog poluostrva, 2015;
- Mineral depozits and mining destricts of Serbia, J. Monthel, J. M. Leistel, F. Cottard, Geoinstitut, 2002;
- Recent Landform Evolution The Carpatho-Balkan-Dinaric Region (Chapter 13), 2012;

As difficulties in gathering the necessary information can be indicated:

- During the preparation of the environmental assessment documentation, a number of strategic documents are in the process of preparation and approval, which will be valid for the period 2021-2027 and have not yet been finalized - this makes it impossible to comply with the final documents, taking into account the available projects.

10. Measures in relation to monitoring during the implementation of the CBCP and TSIM

In implementation of Art. 10 of the SEA Directive, in accordance with the results and conclusions of the projections for the impact of the CBCP and TSIM on the environment and human health, measures and indicators are identified, on the basis of which the monitoring and control of predicted possible significant as well as possible unforeseen negative impacts will be carried out.

When identifying the measures and indicators, the identified indicators of progress and result in the project of the CBCP are taken into account, in order to avoid duplication.

Table No 10-1 *Measures for monitoring and control of the impacts on environmental and human health in the application of CBCP and TSIM*

No.	Measure for monitoring and control	Indicators	Period/Body responsible for carrying out
1.	For measures and activities of an investment nature, take into account the relevant climate change adaptation objectives, guidelines and measures to ensure their sustainability	Sustainability measures foreseen in the project proposals	Upon approval of the project proposals/ Managing authority, National authority
		Extreme Disruption of Objects, Facilities or Infrastructure - Climate Change Outcome	After putting into operation/ Beneficiaries
2.	Prevention of deterioration of the status of water bodies in the implementation of project proposals of an investment nature in the vicinity of such sites or related to the use/impact of water bodies	Surface and/or groundwater monitoring data, if prescribed by the competent authorities for the specific project proposal	During construction and operation in accordance with the frequency defined in the own monitoring plan/ Beneficiaries
3.	Eligibility of the project proposals with investment character to the current RBMPs and FRMPs .	Existence of an opinion from the competent authorities	Prior to the start of the project implementation/ Beneficiaries
4.	Prevention of contamination of water bodies in emergency situations	Envisaged preventative measures	During the preparation of the project proposal/ Beneficiaries
		Number of emergency situations - actions taken	From time to time/ Beneficiaries
5.	Compliance with adopted management regimes for protected areas, including limiting the likelihood of negative impacts on	Approved investment projects on the territory of protected areas occupied (decares);	Periodically/Beneficiaries

	protected areas and conservation priorities therein	Method of adjustment of the control modes.	
6.	Prevention of disturbance/damage/destruction of valuable plant species as well as animal species and their habitats	EIA/EA/CA procedures conducted (where applicable) Implementation of measures from EIA/EA/CA final deeds (when foreseen for biodiversity)	Periodically/Beneficiaries
7.	Prevention of damage/disruption/destruction of cultural property - archaeological sites in the construction of sites and infrastructure	Existence of a coherent opinion by a competent authority	Prior to commencement of construction activities/Beneficiary
		Existence of a competent, authorised person at the time of construction	During Construction/Beneficiary

11. Conclusion of the environmental assessment

Based on the analyses, forecasts and assessments made, the impact of the implementation of the CBCP and TSIM in the carrying out of the recommended measures in item 7 of the EA Report is:

In general, ***with regard to ambient air and climate change***, a positive impact is expected as a result of specific eligible activities and measures under the CBCP and the TSIM. The provisions of the CBCP and TSIM do not have the potential for a significant negative impact, but only for a temporary local, reversible impact. Activities and measures that would lead to a significant increase in greenhouse gas emissions are not foreseen.

Some of the envisaged activities (for technological investments, digitalization and green transition) have a positive contribution to ***climate change mitigation and adaptation to the changing climate***. The strategic project under Priority 3 of the CBCP has positive impact for improving adaptive capabilities and increasing the resilience of the area in case of disasters.

No activities or measures are foreseen that would pose a risk to the population, nature or assets based on the forecasts of the changing climate and its consequences.

With regard **to water, including water protection areas and flood risk**, overall positive impacts are expected at regional, national and cross-border level as the majority of the indicative actions and measures envisaged contribute directly or indirectly to improving the status of water, water protection areas and flood risk and the environment as a whole. The activities and measures included in the CBCP and TSIM have no potential to impair the good status and good

environmental potential of water bodies. Implementation of the provisions of the applicable water protection legislation will ensure that there are no significant negative impacts on activities with a possible impact on water bodies.

Impact on the ***subsoil*** is not expected.

An overall positive impact is expected at regional, national and cross-border level, as the majority of the indicative actions and measures envisaged contribute directly or indirectly to improving ***soil*** status and the environment as a whole. Compliance with the measures of item 7 of the EAR will limit the expected adverse effects.

As can be seen from the above analysis, for **biodiversity and protected areas and territories** covered by the CBCP and TSIM, more potential benefits than negatives can be expected at this stage under certain conditions. Negative impacts may be minimized by appropriate measures - recommended in item 7 of the EAR, and by carrying out the required EIA, EA and CA procedures.

The impact on both levels of detail on the **landscape** is predominantly positive, linked to the enhancement of its attractiveness and qualities. Possible negative effects are analogous to those for biodiversity.

The impact on ***cultural heritage*** is positive for measures related to the cultural heritage sites and neutral for other forecasts.

With regard to the ***noise*** factor, the expected impact is defined as indirect positive, long-term and permanent for the region concerned. The provisions of the CBCP and TSIM have no potential for significant negative impact, including the creation of a risk to human health**.** With regard to ***other harmful physical factors***, no impact is expected.

With regard to ***waste***, the main indirect positive impact is expected as a result of the activities of technological renewal and quality assurance and extended product life, green transition, digitalisation, digital and electronic technologies. The activities and measures under the CBCP and the TSIM are not related to the generation of significant quantities of waste, including hazardous waste.

With regard to ***hazardous chemicals and the risk of major accidents***, the CBCP and TSIM provisions do not include new establishments, nor do they have the potential to increase the risk of major accidents in existing establishments with low and high risk potential.

The impact on the ***population, human health and health and hygiene aspects*** of the environment is complex positive, linked to the beneficial impact of socio-economic factors in the region and environmental risk factors related to health impact.

CBCP and TSIM shall comply with the principle of non-damage.

In view of the above, the implementation of CBCP and TSIM is preferred in terms of environmental and human health impacts to the "zero alternative".

12. Report on the results of the consultations carried out in the process of preparing the CBCP and TSIM and carrying out the environmental assessment

The opinions received as a result of the consultations on the Task for determining the scope and content of the EAR and their manner of compliance with the reasons for this are presented in ***Table 12-1***:

Table No. 12-1 *Opinions received as a result of the consultations on the EAR Scope and Content Assignment and how to reflect them*

Opinion received from: (municipality, department, organization, etc.)	**Content of the opinion**	**Method of reflection with the reasons for this**
Republic of Bulgaria		
Council of Ministers, Central Coordination Unit - received by e-mail on 16.08.2021.	In connection with the ongoing consultations on the scope and content of the report on the environmental assessment of the draft Cross-Border Cooperation Programme between the Republic of Bulgaria and the Republic of Serbia for the period 2021-2027 (CBCP) and the draft of the Territorial Strategy for Integrated Measures (TSIM), we would like to inform you that on behalf of the Central Coordination Unit Directorate of the Administration of the Council of Ministers we have no comments on the proposed assignment.	The opinion contains no comments or suggestions.
Regional Development Council of the North-West Region - Vidin region Administration - *received by e-mail on 23.08.2021.*	Having read the Assignment for the scope and content of the environmental assessment report of the drafts of the CBCP and TSIM under the CBC INTERREG-IPA Programme between the Republic of Bulgaria and the Republic of Serbia, I inform you that I have no comments, suggestions for changes, as well as comments on the assignment you have submitted for the scope of the environmental assessment report. I believe that all the necessary areas are correctly covered in the proposed document. --- I am aware of the presented Assignment for the scope and content of the Report on the Environmental Assessment of the Projects of the CBCP between the Republic of Bulgaria and the Republic of Serbia 2021-2027 , co-financed under IPA and the Territorial Strategy for Integrated Measures (TSIM) and have no comments and suggestions.	The opinions contains no comments or suggestions.
Montana Region Administration	No opinion has been received	-

Vratsa Region Administration - Ref. No. 0400-2-(52)/18.08.2021	Your letter with Ref. No. 0400-2- (49)/10.08.21 was received to the e-mail of the Regional Administration - Vratsa, concerning the holding of consultations on the Assignment for the scope and content of an environmental assessment report (EAR) of the drafts of Cross-border cooperation programme 2021 - 2027. (CBCP), co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM). Having taken note of the full text of the EAR Scope and Content Assignment of the draft Cross-Border Cooperation Programme 2021-2027, I have the following opinion: The assignment for the scope and content of the EAR of the draft Cross-Border Cooperation Programme between the Republic of Bulgaria and the Republic of Serbia 2021-2027 (CBCP), co-financed under the Instrument for Pre-Accession Assistance and the Territorial Strategy for Integrated Measures (TSIM), has been prepared in accordance with the requirements of Art. 86, para. 3 of the Environmental Protection Act. In order to implement the general objective of the CBCP - strengthening the territorial cohesion of the cross-border region Bulgaria Serbia, policy objectives and related priorities and specific objectives are identified, aimed at realizing investments with different economic orientation, promoting integrated social, economic and environmental development, preserving cultural heritage, promoting adaptation to climate change, risk prevention and disaster resilience. The EAR will examine, analyse and assess the current state of the environment in the cross-border region in relation to each component and environmental factor, including population and human health, for the territory covered by the 2021-2027 CBCP. By identifying environmental problems at different levels related to the CBCP and TSIM, measures will be proposed to prevent, reduce and fully compensate for the adverse effects of the implementation of the CBCP and TCIM on the environment and human health. The EAR provides for an analysis of the relationship and relevance of the drafts of the CBCP and TSIM 2021 - 2027 with other plans, programs and strategies at European and international level. Analysis of the relevance of the drafts will be made with strategic documents at national, regional and local level, falling within the territorial scope of the programme and strategy in the Republic of Bulgaria and the Republic of Serbia.	

	I would like to draw attention, when preparing item 1.4 Connection of the CBCP and TSIM with other relevant plans, programmes and strategies of the EAR, to be taken into account the **adopted** in January 2021 National waste management plan 2021-2028	The information is reflected in item 1.4 of the EAR.
Regional Development Council of South-Western Region - Sofia-region Administration	No opinion has been received	-
Pernik Region Administration	No opinion has been received	-
Kyustendil Region Administration	No opinion has been received	-
Academic council - the Council of Rectors in the Republic of Bulgaria - received by e-mail on 20.098.2021.	With this opinion we express the opinion that the prepared Assignment for the scope and content of the environmental assessment report CBCP and TSIM between the Republic of Bulgaria and the Republic of Serbia 2021-2027 meets the requirements of the Ordinance on the terms and conditions for environmental assessment of plans and programs, prom. SG, issue 57 of 02.07.2004, amended and supplemented, promulgated SG, issue 70 of 07.08.2020 and Art. 36, para. 3 of the Environment Ordinance, taking into account the reasoned assessment of the lack of probability of negative impact of the project on biodiversity and habitats by NEN. To the text of the Assignment we have some remarks about inaccuracies in the expression and content, for which we also provide a proposal for corrections: Page 21 B. Climate change Climate change is the result of global processes on a large scale in both the Northern and Southern hemispheres. They mainly affect the air temperature and	

	precipitation regime, as well as the change of seasons. There is a general tendency to increase global air temperature, increase evaporation and change in the distribution and amount of precipitation, especially during winter and increase extreme events such as floods, high temperatures and associated fires and others. Page 26 2.1.5. Soil state Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil (Republic of Bulgaria) The soil cover in the regions of Vidin, Montana, Vratsa, falling within the Carpathian-Danube soil area is mainly represented by Chernozems, Luvisols, Fluvisols and Planosols. Shallow, carbonate soils (Rendzic Leptosols) are also spread on spots. In the higher pre-mountain and plain-hilly parts of the commented regions, other Leptosols, such as rancers and lithosomes, are found in addition to Rendzinas. In the high mountainous parts of Stara Planina there are predominantly Dystric and Eutric Cambisols. Large soil diversity due to diverse landforms, heterogeneous soil-forming rocks and climate differentiation predetermines significant diversity in terms of both soil quality and conservation and restoration measures. The regions of Pernik, Sofia-region and Kyustendil fall into the following soil provinces: Sofia-Kraishtenska, Vitoshko-Srednogorska, Osogovo-Belasishka. The predominant soil types in the plain and lower parts of the mountain slopes are the Cambisols, as well as the Chromic Luvisols and the Lithic and Rendzic Leptosols. In the low sparsely drained parts of the Sofia and Kyustendil fields, Vertisols are distributed. The foothills of the mountains up to 600-800 m above sea level, covered with dry oak forests and shrubs, are occupied by Dystric and Eutric Cambisols. At a height of 800-1,500 m are spread Dystric and Eutric Camlisols under beech and mixed forests, and over 1,700 m - Cambic Umbrisols and Mollic Umbrisols. Rendzic Leptosols are also distributed in this belt. Within the scope of the area under consideration, a three-level system for soil monitoring shall be applied. On the first level, large-scale monitoring is carried out, on the second level, the networks of acidification and salination are observed, on the third level, local soil pollutions are observed. Page 31 2.2. Possible development of the environment without the implementation of CBCP and TSIM	The proposed correction is consistent with item 2.1.1 of the EAR. The soils information is consistent with item 2.1.5 of the EAR.

	Based on the characteristic of the environmental components in item 2.1 of the EAR, in item 2.2. an analysis will be made of any modification of the environmental components, including with regard to human health, without the application of the CBCP and TSIM (thus the impact of the "zero alternative", i.e. refusal to implement the CBCP and TSIM will be assessed). 3. Environmental characteristics for areas likely to be significantly affected by the implementation of the CBCP and TSIM Based on the characteristics of the environmental components at the moment (which will be made in item 2 of the EAR), as well as on the provisions of the CBCP and TSIM, this section of the EAR will address those territories that will be most significantly affected by the programme and strategy. Sensitive areas such as protected areas of the Natura 2000 ecological network, settlements and other sites subject to health protection, sanitary protection areas around water sources, areas at risk of flooding, etc. will be examined in detail.	Consistent with item 2.2 of the EAR. Consistent with item 3 of the EAR.
KT Podkrepa	No opinion has been received	-
CITU	No opinion has been received	-
Bulgarian Chamber of Commerce	Bulgarian Chamber of Commerce has no comments to the document	The opinion contains no comments or suggestions.
BCCI Vratsa	No opinion has been received	-
Bulgarian Construction Chamber - received by e-mail on 19.08.2021	No opinion has been received	
National Association of Municipalities in the Republic of Bulgaria	No opinion has been received	-
Association of Business Clusters in Bulgaria	No opinion has been received	-
National Council for integration of people with disabilities	No opinion has been received	-

Road Infrastructure Agency	No opinion has been received	-
Ministry of Environment and Water Ref. No.04-00-1849/20.09.2021	I. Regarding the assignment of scope and content of the environmental assessment: The assignment was prepared in compliance with the provision of Art. 86, para. 3 of *the Environmental Protection Act* (EPA) and Art. 17, para. 1 of the *Ordinance on the Terms and Conditions for Performing Environmental Assessment of Plans and Programs* (EA Ordinance) regarding the requirements to the scope and content of the EA Report. For the information presented in the assignment, we have the following comments and recommendations: 1. item 1.3 *Alternatives for CBCP and* TSIM to be added to the Content of the Assignment for determining the scope and content of the EA Report on *the draft Cross-border Cooperation Programme 2021-2027, co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures* (on page 2); 2. In item 6. *Possible significant impacts on the environment and human health, including cross-border environmental impacts in other countries, of the Assignment in* carrying out the analysis of the likely significant environmental impacts (by components and factors) and human health to assess the impacts on tangible assets, cultural and historical heritage, including architectural and archaeological heritage, according to the requirements of Art. 86, para. 3, item 6 of the EPA. The same, respectively, need to be addressed in the EA report of the CBCP and the TSIM; 3. In item 1.4 *Connection of the CBCP and TSIM with other relevant plans, programmes and strategies*, letter A to include *Danube River International Basin Management Plan 2016-2021*. and *Flood Risk Management Plan in the international basin of the Danube 2016-2021*, and item 1.4 (B) to include Plan for river basin management in West Aegean region *(2016-2021);* 4. In item 2.1.3 A, the Timok River is omitted. We propose the following revision: *"The territory of the regions of Vidin, Montana, Vratsa, Sofia-region, and part of Pernik falls within the scope of the Danube region for water management and in the catchments of the rivers Iskar, Ogosta, rivers west of Ogosta, as well as the river Nishava, the river Erma and the river Timok, which originated on the territory of the Republic of Serbia and are cross-border rivers - tributaries of the Danube.";* 5. In item 2.1.3 A, we propose that *the paragraph "The Iskar River and the Struma River are among the most aquatic river basins in the country, with the largest annual volume of water flows."* **be replaced by *"The Iskar River and the Struma River***	Under item 1.1 - reflected in the EAR. Under item 1.2 - implemented in item 6 of the EAR. Under item I.3. implemented in item 1.4 of the EAR. Under items I.4,5,6 and 7 - in accordance with item 2.1.3 of the EAR.

	are among the most significant river basins in the country, with a large annual flow."; 6. The last paragraph of item 2.1.3 A should be amended as follows: *" The main sources of water pollution in Serbia are untreated industrial and domestic wastewater, agricultural wastewater, infiltrate, as well as pollution related to the mining and energy industries.";* 7. The first paragraph of item 2.1.3 B. **Groundwater to be edited as follows:** *"The factors that determine the conditions for the formation, dynamics, regime and quality of groundwater are physico-geographical: relief, climate, hydrology and hydrography, geological: geological construction, lithological composition of rocks and tectonic structures, and anthropogenic: related to the pressure of human activity - industry, agriculture, water use.";* 8. The last sentence in *item 3. "Environmental charanteristics for territories, which are likely to be significantly affected by the realization of CBCP and TSIM"*, we propose the following wording: *"... Sensitive areas such as protected areas of the ecological network "Natura 2000", settlements and other sites subject to health protection, sanitary protection areas around water sources, cross-border watercourses, areas at risk of flooding, etc. will be examined in detail.";* 9. On page 18, item 1.4.B. *"Plans, Programmes and Strategies on the Territory of the Republic of Bulgaria"* - to add a new bullet "National Biodiversity Conservation Strategy", to delete the bullet *"National Plan for Conservation of the Most Significant Wetlands in Bulgaria 2013-2020*", as it is duplicated by the correctly spelled *"National Plan for Conservation of the Most Significant Wetlands in Bulgaria 2013-2022"*. 10. On page 27, item 2.1.6. *"Biodiversity status",* in the box in brackets after the words "'including" add the word *"protected";* 11. On page 36, under A. *For the Republic of Bulgaria*, add *"Law on medicinal plants"*. 12. In Section III 1.4 Connection of the CBCP and TSIM with other relevant plans, programmes and strategies, letter "A", the following strategic documents should be considered: ➢ Proposal for a Decision of the European Parliament and of the Council on a General Union Environment Action Programme by 2030 (The EU's Eighth Environment Action Programme by 2030) (COM(2020) 652);	Under i. I.8 Executed in item 3 of the EAR. Under item I.9. implemented in item 1.4 of the EAR

	➢ Communication from the European Commission: "Building a climate resilient Europe - the new EU climate change adaptation strategy" (COM(2021)82); ➢ Communication from the European Commission "Updating the new industrial strategy for 2020: building a stronger Single Market for Europe's recovery" (COM(2021) 350); ➢ Communication from the European Commission: "A path to a healthy planet for all". An EU Action Plan: "Towards zero air, water and soil pollution" (COM(2021)400) instead of the one quoted in the assignment: *"Roadmap for an action plan aiming at zero pollution of water, air and soil".* We note that by Decision of the Council of Ministers No 459 of 17.06.2021 the *National Waste Management Plan 2021-2028* was already adopted, cited in Section III, 1.4. Connection of the CBCP and TSIM with other relevant plans, programmes and strategies, 6 B. **II. In relation to the EA report for the CBCP 2021-2027 and the TSIM:** 1. In the EA Report it is necessary to include a list of sources of information, as required by Art. 17, para. 1, item 2 of the EA Ordinance; 2. In the EA Report, it is necessary to include a list of the experts and the manager who prepared the EA report, in which everyone should certify with the signature the sections of the report developed by them, in compliance with the provision of Art. 17, para. 1, item 3 of the EA Ordinance; 3. With the EA Report it is necessary to submit declarations under Art. 16, para. 1 of the EA Ordinance; 4. Item 7 "Measures to prevent, reduce and fully compensate for the adverse consequences of the implementation of the CBCP and TSIM on the environment and human health" of the EA report the contracting authority should provide for measures in the implementation of activities during the design, construction and operation of the sites and infrastructure on the territory of the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil, which reflect the provisions of Article 104 of the EPA, for example:	Under item I.10 In accordance with item 2.1.6 of the EAR. Under i. I.11 Executed in item 9 of the EAR. Under i. I.12 Executed in item 1.4 of the EAR.

	In the event that the construction of new or changes to an existing plant and/or facility with low or high risk potential is envisaged, as well as in the planning of new works, including the construction of transport roads, residential areas, public works in the vicinity of existing plants and/or facilities with low or high risk potential, where deployment or new works may be a source of or increase the dangers or consequences of a major accident occurring in those plants/facilities, it is necessary to: Ensure safe distances of the enterprise and/or facility to residential areas, public places and areas, recreational areas and, where possible, large transport roads. Maintain safe distances of establishments and/or facilities with low or high risk potential or other appropriate measures to the region of particular conservation sensitivity or interest and cultural and historical heritage sites in the vicinity of establishments, where appropriate, in order to protect them. Taking additional technical measures to mitigate risks to human health and the environment in the case of existing establishments and/or facilities with low and high risk potential In addition, given the clarification made in item 2.1.13 *"Hazardous chemicals and risk of major accidents"* of the assignment that the EA report will include information about enterprises/facilities with high and low risk potential on the territory of the regions of Vidin, Montana, Vratsa, Sofia-region, Pernik, and Kyustendil, we inform you that up-to-date information about these enterprises can be found in the register under Art. 111, para. 1, item 6 of the EPA. It is published on the MEW website at: https://www.moew.govemment.bg/bg/prevantivna-dejnost/himichni- vestestva/sevezo/reeistur/ The register has search filters, for example by region, municipality, city, company name, etc. **III. Under the consultation scheme:** With regard to the EA Public Consultation Scheme, the authorities and third parties concerned have the following comments: 1. In the table on page 9, against the stage *Approval of the CBCP and TSIM by the Council of Ministers from the column Programming activities, in the column Stages and activities under the environmental assessment procedure*, the following should be entered: *"Notification of the Minister of Environment and Water as a result of the approval/acceptance of the CBCP 2021 - 2027 and* the TSIM, in view of the provision of Art. 29, para. 3 of the Ordinance on EA.	Under item II.1 the list is presented to item 9 of the EAR. Under item II.2 List is presented in Appendix No. 1 of the EAR. Under item II.3 Declarations are presented in Appendix No. 1 of the EAR. Under item II.4. Such a measure is included in item 7.2 of the EAR.

	2. To create a new **Stage** as in the column *Programming activities* to include the following *"Preparation, provision and public access to a Report on monitoring and control in the implementation of CBCP 2021-2027 and TSIM, including the measures to prevent, reduce or eliminate as completely as possible the alleged adverse consequences of the implementation of the plan or program on the environment and human health"*, in accordance with the requirements of Art. 30, para. 1 and 4 of the Ordinance on EA; **IV. Regarding the eligibility of TSIM in relation to the existing River Basin Management Plans and Flood Risk Management Plans (FRMPs) of the Danube region and West Aegean Region for Basin Management:** In implementation of the provisions of Art. 155, para. 1, item 23 of the *Waters Act* (WW), with ref. No. ПУ-01-414(3)/09.07.2021. of the Danube Region Basin Directorate (DRBD) (a copy of which we provide to you for consideration) is expressed an opinion on the received with ref. No. 04-00-1849/28.06.2021 of MEW additional information to the notification with ref. No. 04-00-1849/11.05.2021 of MEW, according to which the draft of the CBCP, including TSIM between the Republic of Bulgaria and the Republic of Serbia, which will be implemented within Priority 2 *"Integrated development of the cross-border region":* • is admissible in relation to the environmental protection objectives and measures for achieving good water status set out in the RBMP 2016-2021; • is eligible in relation to FRMP 2016-2021; • does not conflict with the *measures in the Flood Risk Reduction Programme;* • will not have a significant impact on the waters and water protection zones, provided that the planned measures in the existing RBMPs and FRMPs of the Danube Region are complied with, as well as the legal requirements referred to in item 2 of the opinion. By letter Ref. No. П-01-156 (3)/26.07.2021 of the West Aegean Region Basin Directorate (WARBD) (a copy of which we provide to you for consideration) was expressed an opinion on the received with ref. No. 04-00-1849/28.06.2021 of MEW additional information to the notification with ref. No. 04-00-1849/11.05.2021 of MEW, according to which: • the implementation of the activities of the project of the CBCP, and the implementation of the TSIM should not have a negative impact in terms of the water component;	The information was used in the development of item 2.1.13 of the EAR. The consultation scheme is supplemented in accordance with the remarks under item III of the opinion. The information under item IV, including the submitted opinions of the WARBD and DRBD, is taken into account in the development

	• CBCP and TSIM to it is admissible with the RBMP of the BDA (2016-2021) and the FRMP of the BDA (2016-2021), provided that: - comply with the measures set out in the RBMP of the BDA (2016-2021), described in item 4 of the opinion and the measures set out in the FRMP of the BDA (2016-2021), considered in item 5 of the opinion; - comply with the legal requirements described in i. 6 of the opinion; - there are no prerequisites for violating the set environmental objectives for groundwater bodies and surface water bodies and water protection areas. **V. Instructions for the follow-up to be taken for the EA procedure:** The next actions that you need to take under the EA procedure for CBCP 2021-2027 and TSIM include the preparation of an EA Report, and its development is entrusted to a team of experts with a manager, meeting the requirements of Art. 16, para. 1 and 3 of the EA Ordinance. Consultations should be held on the EA report, including its annexes, the draft programme and the strategy within the meaning of Art. 20 of the EA Ordinance, and for this purpose you should carry out: 1. Preparation and publication of a notice for consultations containing the information under Art. 20, para. 1, item 1 of the EA Ordinance. 2. Ensuring access to the EA report, tre programme and the strategy, acceptance of the opinions expressed in time under Art. 20, para.1, item 2 of the EA Ordinance. 3. Consultation with the public, interested authorities and third parties in ways pursuant to Art. 20, para. 2 of the EA Ordinance; 4. Provision of the EA report with all appendices thereto, in paper and electronic form at the MEW, including the programme and the strategy for consultation on the basis of Art. 20, para. 3 of the EA Ordinance. The documentation should be attached to the communication for consultations, given the requirements of Art. 20, para. 4 of the Ordinance on EA. 5. Sending the communication for consultations to all the departments and organizations referred to in the consultation scheme, as well as to make it public on your website and/or in another generally available way, in accordance with the provision of Art. 20, para. 4 of the EA Ordinance.	of parts "waters" of the EAR. The guidelines under item IV shall be followed when

		carrying out the environmental assessment procedure.
Ministry of Interior - *received by e-mail on 23.08.2021.*	In accordance with the position expressed by the embassy in Belgrade and within my competences, I have no comments on the assignment.	The opinion contains no comments or suggestions.
Ministry of Interior	No opinion has been received	-
Ministry of Economy - Directorate-General for European Funds for Competitiveness	No opinion has been received	-
Ministry of Education and Science - Directorate "Project Management and Implementation"	No opinion has been received	-
Executive Agency "Science and education for smart growth"	No opinion has been received	-
Ministry of Culture	No opinion has been received	-
Ministry of Tourism - representative of the Coordinator of Priority Area 3 of the European Strategy for the Danube Region	No opinion has been received	-
Audit of European Union Funds Executive Agency (Ministry of finance)	No opinion has been received	-
Commission for Protection against Discrimination	No opinion has been received	-
The Association of Business Clusters	No opinion has been received	-

National Association of Employers of People with Disabilities	No opinion has been received	-
Centre for Psychological Research - Sofia	No opinion has been received	-
National Association of Municipalities in the Republic of Bulgaria;	No opinion has been received	-
Regional Development Council of North-Western Region - Montana Region Administration	No opinion has been received	-
Regional Development Council of South-Western Region - Pernik Region Administration	No opinion has been received	-
Kyustendil Region Administration;	No opinion has been received	-
Road Infrastructure Agency	No opinion has been received	-
BCCI-Vratsa	No opinion has been received	-
Bulgarian Industrial Capital Association;	No opinion has been received	-
Union for Business Initiative;	No opinion has been received	-
Bulgarian Construction Chamber	No opinion has been received	-
Bulgarian Youth Forum	No opinion has been received	-
Free Youth centre	No opinion has been received	-
Agency for Regional Development and Business Centre 2000 - Montana	No opinion has been received	-

Ministry of Health Ref. No.04-15-140/09.08.2021	In connection with your letter received at the Ministry of Health with attached draft Assignment for determining the scope and content of an environmental assessment report (EA) of the aforementioned drafts of the CBCP and TSIM, we inform you the following: The submitted assignment provides for the environmental assessment report to comply with the regulatory requirements regarding the content, structure and scope of this type of reports. The task foresees that the EA report will examine the existing state of the environment and the existing environmental problems in each of the territories covered by the CBCP and TSIM. According to the assignment, the report will analyse and assess the expected impact on both individual environmental factors and components as well as on population and human health as a result of the implementation of the programmes. In carrying out this assessment, attention should be paid to the following: 1. When considering the status of the waters, data on the quality of drinking water should also be presented and analysed. Specify the need for the projects proposed in the CBCP and TSIM to also comply with the water protection requirements, in particular the prohibitions and restrictions in the sanitary protection zones of water sources for drinking and domestic water supply and mineral waters used for medical, preventive, drinking and hygiene purposes. 2. When considering the state of the environmental factors (noise, vibration, degradation of the ambient air, degradation of drinking water, ionising and non-ionising radiation), assess possible adverse effects, including cumulative ones, and provide for all necessary measures to prevent the occurrence of a health risk. 3. When presenting the health and demographic status of the population should be within the territorial scope of the Republic of Bulgaria and the Republic of Serbia to analyse the situation of the specific region and to compare it with the average data for the country as a whole. To analyse the possible impacts on human health of existing environmental and life problems specific to the region concerned.	On item 1. It is implemented in item 2.1.13 of the EAR. On item 2. It is implemented in the relevant subsections to item 2.1 of the EAR, as well as in the assessment of the impacts in item 6. Item 7.2 provides for measures to prevent the occurrence of a health risk. Under item 3 - the requirement is fulfilled.

	4. To analyse the possible negative or positive impact on human health resulting from the implementation of each of the objectives and priorities set out in the CBCP and the TSIM. 5. To analyse and assess which individual specific projects, if any, identified in the CBCP and TSIM, have the potential to have a significant negative impact, as well as the type and extent of the impact on individual environmental and life factors, during the construction and/or subsequent operation of the relevant sites. 6. To propose adequate measures to prevent and reduce as completely as possible the negative impacts on human health resulting from the implementation of the programme, including specific projects identified in the strategies of the Republic of Bulgaria and the Republic of Serbia (especially those concerning the development of infrastructure projects related to transport, business development and industrial zones), explicitly indicating the requirement that their location be consistent with spatial planning solutions and projections for the development of settlements, in order to prevent the implementation of the measures under the programme to lead to negative impact on residential areas, recreational and sports areas, recreational and resort areas and sites subject to health protection.	Under item 4 - the requirement is fulfilled in item 6 of the EAR. Under item 5, one specific project is identified in the CBCP - the strategic project under Priority 3, and its activities are not specified as location and scope. It is assessed according to the detail in which it is presented in item 6 of the EAR. On item 6. Such measures are proposed as per item 7.2.
RIEW Sofia Ref.No. 8102/31.08.2021	In connection with carrying out consultations under Art. 19a, item 3 of the Ordinance on the conditions and procedure for environmental assessment of plans and programs under presented with ref .No. 15326/09.08.2021 in the Regional Inspectorate of Environment and Water - Sofia, Assignment for scope and content of report for environmental assessment of projects of CBCP, co-financed under the instrument for pre-accession assistance between the Republic of Bulgaria and the Republic of Serbia and TSIM, I express the following:	The opinion contains no comments or recommendations.

	The assignment was prepared in compliance with the requirements for the content and scope of the EA Report, in accordance with the provisions of Art. 86, para. 3 of the Environmental Protection Act. For the information presented in the assignment, RIEW Sofia has no comments and recommendations:	
RIEW Montana Ref. No. 2625/19.08.2021	In connection with the assignment for scope and content of the EAR of the CBCP 2021-2027, co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the TSIM, presented in RIEW - Montana (ref. No. 4389 of 09.08.2021), I express the following opinion: The assignment with the proposed structure of the EAR is in accordance with the requirements of Art. 86, para. 3 of the Environmental Protection Act (EPA) in Art.17, para.1 of the Ordinance on the terms and conditions for carrying out an environmental assessment of plans and programmes (the Ordinance on EA). In the preparation of the report, to the information on the state of vegetation and the animal world, protected areas and protected territories, priority also in the context of these sections to be considered in the other elements of the National Ecological Network, in accordance with Art. 3, para.2 of the Biodiversity Act, namely: CORINE places, Ramsar places, important places for plants and ornithological important places. This letter is provided to you only electronically, by electronic exchange of documents.	The recommendation is consistent with in the EAR.
RIEW Vratsa Ref. No. OBOC-EO-216(1)/12.08.2021	In view of the ongoing environmental assessment of the draft Cross-Border Cooperation Programme 2021-2027 (CBCP), co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM), and in connection with your consultations on the above assignment for determining the scope and content of the assessment in accordance with the requirements referred to in Art. 19a of the Ordinance on the terms and conditions for conducting an ecological assessment of plans and programmes (EA Ordinance) in relation to the submitted documentation, and in accordance with the competences of RIEW-Vratsa, we provide you with the following opinion: In view of the fact that the terms of reference for the scope and content of the environmental assessment report on the draft Cross-Border Cooperation Programme 2021-2027 CBCP), co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM), is envisaged to comply with the requirements set out	The opinion contains no comments or recommendations.

	in Art. 86, para. 3 of the Environmental Protection Act (EPA) and Art.17 of the EA Ordinance. I have no notes or recommendations on them.	
RIEW Blagoevgrad Ref. No. 2689(1)/23.08.2021.	We would like to inform you that RIEW - Blagoevgrad has no recommendations and proposals for amending and supplementing the submitted for consideration Assignment for scope and content of the report for environmental assessment of the projects of the Cross-Border Cooperation Programme 2021-2027. (CBCP), co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM).	The opinion contains no comments or recommendations.
Basin Directorate for Water Management of the Danube Region Ref. No. ПУ-01-622(1)/17.08.2021	The Danube Region Basin Directorate (DRBD) has received your letter with ref. No. 99-00-2-222 (9)/09.08.2021, our ref. No. ПУ-01-622- (1)/17.08.2021, with a request for an opinion on the Assignment for determining the scope and content of the EAR of the drafts of the above programme and strategy. After reviewing the prepared assignment, I express the following opinion on the scope and content of the EAR of "CBCP 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia" and TSIM". The programming period of the projects under consideration of the draft CBCP and TSIM coincides with the implementation period of the updating/preparation of the second and third River Basin Management Plans (RBMPs for the period 2016-2021 and 2022-2027), as well as the implementation, updating and preparation of the first and second Flood Risk Management Plans (FRMPs for the period 2016-2021 and 2021-2027). The CBCP identifies objectives and related priorities, specific objectives and priorities/investments, including investments in existing enterprises, modernisation of infrastructure, creation of new enterprises and development of new products. A program on the territory of the Republic of Bulgaria has a geographical scope: Regions Vidin, Montana, Vratsa, Sofia-region, Pernik, Kyustendil. The TSIM will address measures (identified eligible programme support activities) according to specific territorial needs. In the EAR, an analysis will be made of the compliance and consistency of the provisions of the CBCP and TSIM 2021-2027 with the relevant plans, programmes and strategies, including the RBMP and the FRMP in the Danube Region for the period 2016-2021, including the Draft Updated Preliminary Flood Risk Assessment (PFRA),	In the parts of the EAR for the water component, the requirement of the DRBD in respect of the RBMP, the

	March - 2021. In this regard, the scope and content should be consistent with these planning documents, namely in terms of: 1. Current state of the environment - " Waters" component The assignment is planned to review and analyse the existing water status, water protection areas, flood risk. The territory of the regions of Vidin, Montana, Vratsa, Sofia-region, and part of Pernik falls within the scope of the Danube Region for Water Management and the catchment areas of the rivers Iskar, Ogosta, rivers west of Ogosta, as well as the river Nishava and river Erma, that originated in the territory of the R. of Serbia and are cross-border rivers. All of them collect and discharge their flow into the river Danube. The EAR will present information on the state of surface and groundwater within the territory of the cross-border region subject to the CBCP and the TSIM, the state of water protection areas, the presence of areas with a significant potential flood risk. For the analyses of the waters on the territory of the regions of Vidin, Montana, Vratsa, Sofia-region and part of Pernik will be used RBMP and FRMP of the Danube Region for the period 2016-2021, as well as PFRA to FRMP for the period 2022-2027. When preparing the EAR, an opinion of DRBD will be taken into account with ref. No. ПУ-01-414-(1)/02.06.2021 In this regard, I would like to inform you that DRBD has also issued another opinion ПУ-01-414/09.07.3021, which should also be taken into account. Regarding groundwater, it should be specified which of the listed physico-chemical parameters described as the most significant cause of the poor condition of bodies of water in the area are relevant for groundwater: "Exceeds in indicators BOD5, conductivity, nitrite nitrogen, nitrate nitrogen, total phosphorus, etc.". I recommend in the EAR to the waters component when considering the water protection zones to include in accordance with Art. 119a, para.1 of the Waters Act, in the sanitary and hygienic zones (SPZ) according to Art. 119, para. 4, item 2 of the Waters Act. In connection with the flood risk analysis, I would like to inform you that PFRA is the first stage in the process of implementing Directive 2007/60/EC (European Floods Directive), resp. The Waters Act. According to the requirements of the Directive, a review and, if necessary, an update of the PFRA shall be carried out every six years. The draft of the PFRA 2021-2027 was published for six months of public consultation on March 2021. After processing the proposals, comments and additional information received during the consultations, a final version of the PFRA has been	FRMP and the updated PFRA is fulfilled, as well as the instructions under items 1, 2, 3, 4, 5 and 6 of the opinion.

	prepared. As a result of the revision and updating of the PFRA in the Danube Region, 35 areas with a potential significant flood risk (APSFR), including the Danube River, have been identified, distributed in nine main rivers. The APSFRs were approved by the Minister of Environment and Water by Order RD-804/10.08.2021. 2. Environmental characteristics for areas likely to be significantly affected by the implementation of the CBCP and TSIM Based on the characteristics of the current environmental aspects as well as the provisions of the CBCP and TSIM, this section of the EAR plans to address those territories that will be most significantly affected by the programme and strategy. Sensitive areas such as protected areas of the Natura 2000 ecological network, settlements and other sites subject to health protection, sanitary protection areas around water sources, areas at risk of flooding, etc. will be examined in detail. 3. Existing environmental problems identified at different levels related to the CBCP and TSIM, including those related to areas of particular ecological importance, such as protected areas under the Biodiversity Act. It is envisaged to describe the existing environmental problems in the country, identified at different levels, related to the CBCP and TSIM. An analysis will be made of the relationship between the environmental problems of the provisions of the programme and the strategy, respectively whether the CBCP and/or TSIM leads to an improvement in the environmental situation or to a deterioration and deepening of existing environmental problems and/or the emergence of new ones. As information on existing environmental problems in relation to the water component, the assessment of the pressure and impact, may be included, respectively identified problems in the basin management areas, according to RBMP 2016-2021. 4. Environmental protection objectives at national and international level relevant to the CBCP and TSIM and the way in which these objectives and all environmental considerations are taken into account in the preparation of the programme and the strategy An analysis of the strategies, plans and programmes that set environmental objectives at national (for the Republic of Bulgaria in the Republic of Serbia) and international (European) level that are relevant to the CBCP and TSIM is planned, and based on the analysis, no conclusions are drawn as to the manner and extent to which these objectives and environmental considerations are taken into account in the programme.	

	To the national objectives related to the CBCP and TSIM should be considered the environmental objectives and the objectives for reducing the risk of flooding planned in the RBMP and FRMP respectively, including, where necessary, justification of exceptions from the achievement of the environmental objectives for preserving/achieving good water status (Art. l56c - Art. l56e of the WA). 5. Possible significant impacts on the environment and human health, including cross-border environmental impacts in other countries The impact is planned to be assessed by performing an analysis by components and environmental factors of likely significant environmental and human health impacts, including secondary, cumulative, concurrent, short-term, medium-term, long-term, permanent and temporary, positive and negative effects of the implementation of the CBCP and TSIM When considering the impacts on the waters component, as a result of the implementation of the measures in and activities/investments to be financed and implemented within the framework of the CBCP and the TSIM, the following should be considered: - consider and assess the potential impacts on surface and groundwater and water protection areas, including cumulative effects; - whereas the implementation of the project and intentions that provide for the use and/or abstraction of surface and groundwater resulting from the application of the CBCP and TSIM will be agreed for eligibility to the environmental objectives and planned measures for achieving good water status in the RBMP, as well as to the objectives of the management of the risk of flooding and the measures foreseen in the FRMP for the relevant period of operation. The planned infrastructure projects for implementation, within the scope of CBCP and TSIM, may give rise to potential additional pressure on surface water bodies and groundwater bodies, as well as on water protection areas, in cases where their implementation requires water abstraction and/or use of surface water bodies or their location is in the vicinity of water bodies and water protection areas.	

	6. Measures designed to prevent, reduce and compensate as fully as possible the adverse effects of the implementation of the CBCP and TSIM on the environment and human health. On the basis of the results of the analyses and assessments carried out in the EAR on the perceived environmental and human health impact resulting from the implementation of the CBCP and the TSIM, measures will be proposed to prevent, reduce and compensate as fully as possible the adverse effects of the implementation of the programme and strategy on the environment and human health. In the EAR I recommend to take into account the applicable planned measures in the RBMP 2016- 2021 and FRMP 2016-2021 in Danube Region. When implementing the planned infrastructure projects within the scope of the CBCP and TSIM, the following requirements, prohibitions and restrictions in the WA are required: - Activities related to water abstraction and use of a water body are subject to an authorisation regime under Art. 44 and Art. 46 of the Waters Act, except in the cases described in Art. 58 of the Waters Act. Permits for water abstraction and water use shall be issued in compliance with the requirements of Chapter Four "Permitting Regime" and Chapter Eight "Protection of Water and Water Sites" of the Waters Act and its implementing regulations. All activities must comply with Ordinance No.3 of 16.10.2000 on the terms and conditions for exploration, design, establishment and exploitation of sanitary protection zones around water sources and facilities intended for drinking and domestic water supply and around mineral water sources used for therapeutic, prophylactic, drinking and hygiene purposes. - For the protection of groundwater from pollution, the provisions of Art. 46, para. 2 and Art. 118a, para. 1, items 2, 3, and 4 of the Waters Act shall apply: "item 2 - disposal, including disposal of priority substances which may lead to indirect disposal of pollutants in groundwater: Item 3 - other activities on the surface and in the groundwater body, which may lead to indirect disposal of priority substances in the groundwater; item 4 - the use of materials containing priority substances, construction of structures, engineering and construction facilities and others, in which groundwater contact is or is possible. "	

	- To prevent pollution and accidents in relation to surface and groundwater, it is necessary to comply with the requirements of Art. 131 of the WA: "In the event of emergencies creating water pollution problems, the owner or the person operating the site - a source of pollution, including embankments, is obliged to take the necessary measures to limit or eliminate the consequences of pollution in accordance with a preliminary emergency plan and immediately notify the basin directorates and the Ministry of Interior. - In order to protect the coastal flood strips and the lands belonging to the reservoirs, to comply with the provisions of Art.134 of the WA, it is not allowed to: waste disposal and treatment; construction of residential buildings; washing and servicing of means of transport and equipment; According to Art. 143 of the WA it is prohibited - to protect from the harmful effects of water, prohibits: the storage of materials that would significantly increase the destructive power of water in case of floods; According to §1, para. 1 of the Additional Provisions to the WA: ✓ "land belonging to reservoirs" means land that is flooded at the highest water level of the reservoir , designated for the overflow of water with dimensional security; ✓ "a body of water" is a permanent or temporary concentration of water with appropriate boundaries, volume and water regime in the subsoil and in and in natural or artificial forms of the landscape together with the land belonging to it; ✓ "rivers' coastal flood strips" means the land to be flooded: a) within the limits of the corrections of the rivers in the settlements and between the river and the dykes - in the presence of dykes: in the case of a multiannual average maximum quantity of water of 5 per cent security or repeatability once every 20 years, for river stretches with unconstructed corrections or protection facilities.	
Basin Directorate "West Aegean Region" Ref. No. РД-11-497(3)/12.08.2021	In implementation of the provision of Art. 19a of the Ordinance on the terms and conditions for carrying out an environmental assessment of plans and programmes (Ordinance on EA), the West Aegean Basin Directorate expresses the following opinion on the submitted draft assignment for determining the scope and content of the environmental assessment report (EAR) of the above-described programme and territorial strategy: 1. In connection with the letter with ref. No. 04-00-1849/27.05.2021 of MEW, the WARBD has reviewed and evaluated the draft Program for cross-border cooperation	The opinion is taken into account in the development of the parts under the water component of the EAR, the requirements of items 1 to 10 of the opinion are fulfilled, including the conditions for eligibility

	(CBCP) 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia, in accordance with the provisions of Art.12, para.5 and para. 6 of the Ordinance on the terms and conditions for assessment of the compatibility of plans, programmes, projects and investment intentions with the object and objectives of the protection of protected zones (Environment Ordinance), having issued an opinion under Art. 155, para. 1, item 23 of the WA, with ref. No. П-01 - 156(1)/09.06.2021 that the programme is eligible under the RBMP of the WAR (2016-2021) and the FRMP of the BDA (2016-2021) in compliance with the provisions of the Waters Act and the conditions, prohibitions and measures described in the above-mentioned opinion. 2. Regarding the submitted draft assignment for determining the scope of the content of the environmental assessment report (EAR) of the CBCP and TSIM, in item 1.4. Connection of the CBCP and the TSIM with other relevant plans, programmes and strategies, it is necessary to add the River Basin Management Plan (RBMP) of the BDA (2016-2021). In the EA Report it should also be noted that the programming period of the project under consideration for the CBCP and TSIM coincides with the period of updating, preparation and implementation of the third River Basin Management Plans (RBMP 2022-2027) and the second Flood Risk Management Plans (FRMP) for the period 2022-2027. The finalized preliminary flood risk assessment (PFRA) for the West Aegean Region for Basin Management , with updated APSFRs, prepared on the basis of Art. 146a, para.1 of the Waters Act, should also be considered in the EAR of the CBCP and TCIM. 3. In item 2.1.3 Water state, water protection areas, flood risk, in item A Surface water, it is specified that during the review of the current state of the environment, the reflection of the state and characteristics of surface and groundwater was carried out on water bodies, according to the information contained in the RBMP of the WAR (2016-2021) and based on up-to-date information on the state of water available on the website of the Basin Directorate. In item B Groundwater are described the main sources of diffuse groundwater pollution. It is specified that information on the state of surface and groundwater will be presented in the EAR. In this regard, the main features of the surface water bodies within the territorial scope of the WAR are described and presented in tabular in Appendix 1. 2. 4. of Section 1 of the RBMP of the BDA (2016-2021). Table No 1.3.2.a. of Section 1 of the RBMP contains information on	from the previous opinion of the WARBD, described in the opinion of the MoEW above.

	groundwater bodies in the WAR for BM. The status of water bodies is discussed in Section 4 of the RBMP of the WAR (2016-2021). The EAR should take into account the forthcoming update of the characteristics of the surface and groundwater bodies in the WAR, which will be prepared in preparation for the update of the RBMP of the WAR for the period 2022-2027. Update on the Work Programme and the timetable for the update of the RBMP of the West Aegean Region for basin management and measures for consultation with stakeholders and the public is available on the web site of the WARBD at: https://wabd.bg/content/%d0%bf%d1%83%d1%80%d0%bl/%d0%bf%dl%83%d1%80%d0bl- 2022-2027/. In item C. Water protection areas are listed the regulated water protection areas, in accordance with the provisions of Article 6 of the Water Framework Directive. Information on the designated water protection areas in the West Aegean region under Art. 119a of the Waters Act, addressed in Section 3 of the RBMP of the WAR (2016-2021), should be included in the EAR. It is specified in item D. Flood risk that areas with significant potential flood risk are included in the cross-border area subject to the CBCP and TSIM. For the analyses of the waters on the territory of the regions of Pernik and Kyustendil will be used RBMP and FRMP of the West Aegean Region for the period 2016-2021, as well as the updated preliminary flood risk assessment to the draft FRMP for the period 2022-2027. 4. Regarding item 2.1.13 Hazardous chemicals and risk of major accidents, it is clarified that the EAR will present information about the existing in the area enterprises carrying out activities for storage/production/use of hazardous chemicals and mixtures in quantities that pose a risk of major accidents. In this regard, in Section 2 of the RBMP of the WAR (2016-2021), Table No 2.2.1.c. sites classified as high or low risk EPA establishments/facilities in the West Aegean region are presented. 5. In item 3. Environmental characteristics for projects likely to be significantly affected by the implementation of CBCP and TSIM, it is specified that special attention will be paid to sensitive areas that will be most affected by the programme, such as Natura 2000 sites, sanitary protection areas, areas at risk of flooding, etc. In this regard, it should be borne in mind that in accordance with Art. 116, para. 2, item 3 of the Waters Act, all waters and water bodies are protected from depletion, pollution	

	and damage in order to maintain the necessary quantity and quality of water and a healthy environment, to preserve ecochemistry, to preserve the landscape and to prevent economical damage, and to achieve these objectives, to define areas for protection of water. The EAR should include information on the areas for water protection described in item 3 of this opinion, regulated in Art. 119a of the WA, as well as on the updated APSFRs of the West Aegean Region for BM. 6. In item 4 Existing environmental problems, identified in different ways, related to CBCP and TSIM, including those related to regions of particular ecological importance, such as protected areas under the Biodiversity Act, when reviewing the existing environmental problems under the Water component, to take into account the significant pressures resulting from human activity on the state of surface and groundwater, considered in Section 2 of the RBMP of the WAR (2016-2021). An updated review of the impact of human activity on the state of surface and groundwater will be carried out in the process of updating the RBMP of the WAR for the period 2022-2027. 7. In item 5 Objectives of environmental protection at national and international level, relevant to the CBCP and the TSIM and in a way that these objectives and all environmental considerations are taken into account in the preparation of the programme and strategy that will analyse strategies, plans and programmes setting environmental objectives, to consider the environmental objectives for surface water bodies and groundwater bodies and water protection areas set out in Section 5 of the RBMP of the WAR (2016- 2021) - Update of the list of environmental protection objectives. 8. In item 6 Possible significant impacts on the environment and human health, including cross-border environmental impacts in other countries, it is necessary to assess the extent of the impact of the activities envisaged in the CBCP and TSIM on the state of water bodies, as well as on water protection zones under Art. 119a of the Waters Act. 9. In item 7.Measures provided for the prevention, reduction and the fullest possible compensation of the adverse consequences of the implementation of the CBCP and TSIM on the environment and human health and in item 10 Measures related to the monitoring during the implementation of the CBCP and TSIM, for the Waters component shall be assigned appropriate measures in the event of likely adverse consequences of the implementation of the Projects and the measures of the programme and strategy.	

	10. Regarding the reviewed Cross-Border Cooperation Programme (CBCP) 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM) plans, programme, investment intentions and projects and/or their amendments related to water abstraction and/or water use, it should be noted in the EA report that they need to be assessed for eligibility to the RBMP of the WAR and FRMP of the WAR and can only be approved after carrying out the applicable procedures under Chapter Six of the Environmental Protection Act - environmental assessment for plans and programmes and for carrying out environmental impact assessment, according to the requirements of Art. 155, para 1, item 23 of the Waters Act, for investment proposals. Based on the above, the West Aegean Region Basin Directorate gives a positive opinion on the assignment for scope and content of The report on the Environmental Assessment (EAR) of the Cross-Border Cooperation Programme (CBCP) 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia and the Territorial Strategy for Integrated Measures (TSIM), taking into account the comments and proposals made in this regard, as well as the conditions in the opinions on admissibility with ref. No. П-01-156(1)/09.06.2021 of the WARBD.	
Kostinbrod Municipality - received by e-mail on *23.08.2021*	I got acquainted with the Assignment for the scope and content of the environmental assessment report CBCP and TSIM between the Republic of Bulgaria and the Republic of Serbia for the period 2021-2027, I have no comments and suggestions regarding the supplementation of the scope and content of the environmental assessment report.	The opinion contains no comments or suggestions.
The Republic of Serbia		
Ministry of European Integration, Department of Programmes for Cross-border and Transnational Cooperation and Cooperation with Local and Regional Authorities and Organisations for More Efficient Use of Funds;	No opinion has been received	-
Ministry of European Integration, Planning, Programming, Monitoring and	No opinion has been received	-

Reporting of EU Funds and Development Assistance		
Chamber of Commerce and Industry of Serbia	No opinion has been received	-
Region of Zaječar	No opinion has been received	-
Region of Nishava	No opinion has been received	-
Region of Pirot	No opinion has been received	-
Region of Pirot	No opinion has been received	-
Region of Bor	No opinion has been received	-
Region of Toplica	No opinion has been received	-
Region of Pcinja	No opinion has been received	-
Permanent Conference of Cities and Municipalities	No opinion has been received	-
Serbian Association of Employers	No opinion has been received	-
Ministry of Human and Minority Rights and Social Dialogue	No opinion has been received	-
Ministry of Public Administration and local self-government	No opinion has been received	-
Ministry of Culture and Information	No opinion has been received	-
Ministry of Trade, Tourism and Telecommunications	No opinion has been received	-
Ministry of Labour, Employment, Veterans and Social Affairs	No opinion has been received	-
Ministry of education, science and technological development	No opinion has been received	-
Ministry of Economy	No opinion has been received	-
Ministry of Interior	No opinion has been received	-
Ministry of Youth and Sports	No opinion has been received	-

Ministry of Construction, Transport and Infrastructure	No opinion has been received	-
Ministry of Foreign Affairs *received by e-mail on 21.09.2021*	From my competence, as observers of the Joint Working Group for Programming INTERREG-IPA Cross-Border Cooperation Program Bulgaria - Serbia 2021-2027, in front of the RS MFA, I can notice only one small mistake related to the mention of Romania in the "Scoping report for determination of the scope and content of the Environmental Assessment Report RS - RB ". Namely, on pages 31, line 10 (immediately before item 7), "Romania" should be stated instead of "Republic of Romania", because that is the real name of the said country.	The comment has been taken into account in the EAR.
Ministry of Environmental Protection	No opinion has been received	-
Agency for Development of Serbia	No opinion has been received	-
Regional Development Agency Eastern Serbia	No opinion has been received	-
Regional Development Agency South	No opinion has been received	-
Development Centre of Jablanica region	No opinion has been received	-
Development Centre of Pcinja region	No opinion has been received	-
Statistical Office of the Republic of Serbia	No opinion has been received	-
Regional Development Agency South	No opinion has been received	-
Regional Development Agency Eastern Serbia	No opinion has been received	-
Institute for the Protection of Cultural Monuments of the City of Niš	No opinion has been received	-
Region of Bor	No opinion has been received	-
Region of Zaječar	No opinion has been received	-
Regional Chamber of Commerce - Niš	No opinion has been received	-

Regional Chamber of Commerce - Zaječar	No opinion has been received	-
Regional Chamber of Commerce - Leskovac	No opinion has been received	-
Pirot Tourist Organisation	No opinion has been received	-
Tourist area Lepenski Vir	No opinion has been received	-
Civil Association-Environmental Society Bujanovac	No opinion has been received	-
"Lazar" Association	No opinion has been received	-
Department of Environmental Protection of the City Administration of the City of Leskovac *received by e-mail on 21.09.2021*	Regarding the e-mail you sent, and in connection with giving an opinion on the draft Report on the coverage of strategic environmental assessment, and within the INTERREG IPA cross-border cooperation program between the Republic of Bulgaria and the Republic of Serbia for the programming period 2021-2027, we inform you the following: - The Report in question was prepared in accordance with the requirements of Art. 19a of the Rulebook on conditions and provisions for conducting environmental impact assessment of plans and programs. The report on the scope and content is in accordance with the instructions from the letter of the Ministry of Environment and Water with ref. no. 04-00-1849 / 23.07.2021. Of the Republic of Bulgaria. - Report on the scope and content of the Report on Environmental Impact Assessment delivers the Ministry of Regional Development and Public Works, in its capacity as the Managing Authority of the program, submits to the National Body for the Cross-Border Cooperation Program and the Territorial Strategy for Integrated Measures - the Ministry of European Integration of the Republic of Serbia for consultations on the program and strategy in the partner country; - Laws related to the environment in the Republic of Serbia are passed by the Government of the RS through its competent Ministries, in this case the Ministry of Environmental Protection, which performs state administration, prescribed by Article 6 of the Law on Ministries ("Official Gazette of RS" No. 128/2020); - In this particular case, the Sector for Strategic Planning, Projects, International Cooperation and European Integration was established to perform tasks within the scope of the Ministry of the Environment, which performs tasks, among others, related to programming and coordination of projects financed from grants and development aid. ,	The information provided in the opinion, respectively the applicable legislation of the Republic of Serbia, is consistent with the EAR.

	EU funds, as well as bilateral and multilateral sources of earmarked funds in the field of environmental protection, participation in the drafting of laws, regulations and other general acts in the field of environmental protection and participation in international cooperation and European integration within the sector. units, ie the Department for Strategic Planning and Implementation of Planning Documents, have been formed in the sector. - The Law on Strategic Environmental Assessment ("Official Gazette of RS", No. 135/2004 and 88/2010) in the Chapter Exchange of Information on Transboundary Impact in Article 23 defines the competence of the Ministry on transboundary impact of plans and programs on the environment. the middle. According to this RS law, the Ministry of Environmental Protection can address the competent local governments (entrusted affairs), to give opinions and suggestions on the impact on the environment, all in the decision-making process and giving consent to the Strategic Impact Assessment Report. - The Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/2004 and 36/2009), Chapter 7 "Notice on Possible Transboundary Impacts" and Article 32 define the competencies of the Ministry of Environmental Protection. - Based on all of the above, we believe that in this particular case our Opinion and suggestions on the subject of the Report on the scope of strategic assessment environmental impact, and within the INTERREG IPA cross-border cooperation program between the Republic of Bulgaria and the Republic of Serbia for the programming period 2021-2027, provides the Ministry of Environmental Protection, which should be involved in each segment of consent and decision-making. - We should also mention the "Law on Ratification of the Protocol on Strategic Environmental Assessment with the Convention on Environmental Impact Assessment in a Transboundary Context" ("Official Gazette of RS - International Agreements", No. 1/2010). , which defines the Protocol on Strategic Environmental Assessment of the Convention on Environmental Impact Assessment in a Transboundary Context.	
EUROPEAN MOVEMENT IN SERBIA *received by e-mail on 21.09.2021*	Based on the submitted "Report on the scope and content of the Environmental Impact Assessment Report on the draft Cross-border Cooperation Program 2021-2027, co-financed under the Instrument for Pre-Accession Assistance between the Republic of Bulgaria and the Republic of Serbia" and your request, we have prepared the following proposals, comments and recommendations. Cross-border cooperation plans and programs for integrated measures by increasing the ability to respond to a large number of different natural disasters are one of the most	

	important preventive actions in the field of environmental protection and human health. Such an example is the project "Be a hero!" Which is implemented by the European Movement in Serbia - Leskovac in partnership with the Association "Future" Montana (Republic of Bulgaria) and is a contribution to building a mechanism for mutual assistance in case of emergencies in the border area. . This project lasts eighteen months, and started in June this year and is co-financed from European Union funds through INTERREG - IPA Cross-border Cooperation Program Bulgaria - Serbia. The idea of the project and planned activities is to improve cross-border cooperation between Bulgaria and Serbia in the development of youth volunteerism in the field of natural disasters (earthquakes, floods and fires), by creating a cross-border network of organizations, experts and young volunteers. The first experiences in the realization of the project and communication with the Bulgarian partner determined us to submit these suggestions to you. According to the content of the "Environmental Impact Assessment Report ...", we estimate that the document presents well the current state of the environment, environmental protection goals at the national and international level, significant impacts on the environment and human health, including transboundary impact, as and envisaged measures to prevent and reduce adverse effects. The main shortcoming, very important, concerns the used normative bases and documents and refers to the area of risk prevention and increasing resilience to a large number of different natural disasters. The method of conducting environmental impact assessment according to the used normative basis and documents relevant to the Republic of Serbia does not take into account "Disaster risk assessment in the Republic of Serbia" (Ministry of Internal Affairs of the Republic of Serbia, 2018): http://prezentacije.mup.gov.rs/svs/HTML/licence/Procena%20rizika%20od%20katastrofa%20u%20RS.pdf. That the area of water protection and with it the lack of drinking water is becoming a significant issue of cross-border cooperation is also shown by the recent environmental dispute, which has acquired an interstate character. This is stated in the letter of the Bulgarian representative in the European Parliament, addressed to our Prime Minister and line ministers on the threat to transboundary water resources of Serbia and Bulgaria, regarding the pollution of the Dragovištica River and its tributaries Karamanička and Brankovska rivers in the Republic of Serbia. in the Republic of Bulgaria (Ministry of Environment / Environmental Protection Agency, 2019). This circumstance initiated a meeting to be held in our Ministry of Environmental Protection in Belgrade soon, which	The referred document is consistent with in the EAR.

	was attended by the Ambassador of the Republic of Bulgaria to Serbia and the Deputy Minister of the Ministry of Environment and Water of the Republic of Bulgaria and his associates. Both sides agreed to develop and start the implementation of a joint transboundary surface water monitoring program. Taking into account the above facts and the part in the "Report on the scope and content of the Environmental Impact Assessment Report on the draft Cross-border Cooperation Program 2021-2027" which refers to "Priority 3: A more resilient border region" for Specific Objective 3.1: "Promotion adaptation to climate change, risk prevention and disaster resistance (p. 12), the proposal is to include in the "development of a comprehensive program of border community preparedness for an adequate response to natural disasters" and the danger - lack of drinking water. The presented proposal is fully in line with the need to raise regional capacities to respond in cross-border cooperation to the dangers of climate change disasters where water resources are most exposed, which must be mitigated by increasing the resilience of the border population - those most affected.	The implementation of Specific Objective 3.1 of the CBCP will take the form of a strategic project *""Preparing the population for action in case of disasters and improving the capacity of specialized emergency response teams in the Bulgarian-Serbian cross-border region".* As the project cannot address all possible emergencies, it focuses on two major natural disasters which the territorial analysis of the programme identifies as most common in the programme area - fires and floods. The lack of drinking water is a matter for the central governments of the two countries, and it should also be taken into account that the CBCP does not have the resources to address this problem.
Public utility enterprise Mediana *received by e-mail on 21.09.2021*	First, we are forwarding you suggestions and comments on the Report on the scope and content of the report on the environmental impact of the draft Cross-Border Cooperation Program 2021-2027 co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and Serbia, and the Territorial Strategy for Integrated	

	Cross-Border Cooperation Program 2021 –2027. between the Republic of Bulgaria and the Republic of Serbia. We use the opportunity to comment on the documents for which the environmental impact assessment report is being prepared. 1.Namely, in Priority 1: Competitive border region, when it comes to the types of activities / investments that should be supported in order to develop the competitiveness of SMEs and create new jobs positions, we believe that investments aimed at transition to a circular economy should be added such as resources and the negative impact on the environment. 2.In Priority 3, More Resilient Border Region, Specific Objective 3.1: "Promotion of climate change adaptation, risk prevention and disaster resilience, only the part dealing with natural disasters is addressed, while the issue of climate change adaptation is completely eliminated, and we suggest that equally included in the Program. Also, we believe that the list of potential users is very narrow, because it does not include all participants - both in terms of reducing the risk of disasters, and adaptation to climate change. As a public utility company that deals with numerous utility activities, if it is directly involved in disaster response at the earliest stage, we suggest that you expand the list to companies that deal with water supply, waste, public hygiene and related activities.	1.The programme does not impose thematic limitations for interventions supported under Priority 1. The transition to a circular economy is a field that the CBC area can benefit substantively. Therefore, the recommendation is already reflected. 2.The limited programme resources and the need to concentrate these resources to identified fields for intervention as per the Territorial analysis and the results of the regional consultations, impose certain limitations to the scope of the selected specific objective. During regional and follow-up inter-institutional consultations, it was agreed the implementation of the strategic objective to be shaped by a strategic project whose aim would be to

	3.Regarding the Territorial Strategy for Integrated Measures, more precisely in the part covered by Specific Objective 1: Expand and improve service delivery, we believe that a measure of support to companies who providing public services should be added, because in the existing service delivery system there is often no economic justification and that there is also resistance to the provision of the service by the service user. Namely, our experience in the field of waste collection shows that service users from more remote settlements believe that they do not need the service, and especially that they should not pay for the service, so we should take into account the education of service users in terms of accepting and paying for the service.	develop disaster preparadness programmes and strenghten the instituional capacity for a cooperative and adequate response in cases of natural disasters. The topic of climate change is addressed accross entire Integrated territorial strategy (ITS), becuase it is a component of the ITS' horizontal policy, which states that each supported intervention needs to include component that contribute to the protection of the environment and biodiversity or provides green and digital solutions. This decision is seen as a strategy's instrument to promote the new cohesion policy. 3. The ITS has two major priorities 1) To expand and improve service provision and 2) To enhance regional competitiveness, incl. in the area of tourism, based on which project ideas will be financed respecting the bottom-up approach as a guiding principle for implementation. ITS

		framework already allows for interventions as requested by the Public Utility Enterprise Medijana, Nis within programme priority 2 Integrated development of border region. Therefore we consider that the comments is already reflected. It is up to the initiative of the project promoters at the stage of implementation of the strategy to propose a project of integrated and cross-border nature at the stage of application for funding.
	4.In section 1.4. The relationship of PPS and TSIM with other relevant plans, programs and strategies, in the part that talks about the plans and programs of the Republic of Serbia, the National waste management strategy for the period 2020-2025 is stated. According to our information, this document was announced in the draft, but it has not been adopted yet. We suggest that the status of the document should be checked, especially because the process of making an impact assessment itself evaluates the compliance and consistency of the draft Cross-Border Cooperation Program 2021-2027. and territorial strategies for integrated measures with relevant programs and strategies. This document also appears in the part that deals with waste management, where the activities and goals of the National Waste Management Strategy for the period 2020-2025 are stated. Also, in the part of waste management, the situation with waste disposal is not defined precisely enough, and on page 27 it is stated "The main method for final waste disposal in the Republic of Serbia is landfilling as the only way for organized waste management." According to our experience, almost half of the districts included in the border area, use unsanitary landfills, and we deeply believe that the documents that provide guidelines for future activities in the border region should specifically consider the development of measures to improve waste management in the border region. Having in mind that the	4. Item 1.4 of the EAR includes the relevant strategies, plans and programmes, including projects of such. In item 2.1.12 of the EAR an analysis of waste management in both countries is made, based on the available official sources of information for both countries. With regard to the proposal: The Integrated Territorial Strategy (ITS) provides two

	Republic of Bulgaria also faces a great challenge in terms of implementing the package of measures for the introduction of the EU circular economy package in the field of waste management, we strongly suggest that the Program and Territorial strategy for Integrated Measures of the Cross-Border Cooperation Program 2021-2027. between the Republic of Bulgaria and the Republic of Serbia strongly focus on waste management as one of the development priorities.	opportunities for addressing waste management challenges – one from a SME perspective (under Specific objective 2: To enhance regional competitiveness, incl. in the area of tourism, M 2.1 Development and provision of framework support to local businesses to grow, expand and perform better in a greener and smarter competitive global market), and another one – from public service perspective (under Specific objective 1: To expand and improve service provision). Therefore, the recommendation is already reflected in the ITS.
Society of Young Researchers Bor *received by e-mail on 21.09.2021*	Proposed amendments to the REPORT ON THE SCOPE AND CONTENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT of the draft Cross-Border Cooperation Program 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia, and the Territorial Strategy for Integrated Measures Within the public consultations on the REPORT ON THE SCOPE AND CONTENT of the REPORT ON ENVIRONMENTAL IMPACT ASSESSMENT of the draft Cross-border Cooperation Program 2021-2027, co-financed under the Instrument for Pre-Accession Assistance, between the Republic of Bulgaria and the Republic of Serbia, and the Territorial Strategy for Integrated Youth Bor has the following suggestions: 1. On page 9 in Specific Objective 1.1: "Improving the sustainable growth and competitiveness of SMEs and creating new jobs in SMEs, including productive	1.The listed type of activities/investments under any of the specific

	investments" add to the Types of activities / investments to be supported: Development and implementation of circular economy programs	objectives of the programme are non-exhaustive. At this stage, the programme does not impose thematic limitations for interventions supported under Priority 1. The circular economy is already addressed by the following text under SO 1.1: This includes management and workforce skills, technology, networks, internationalisation, resource efficiency". A key decisive factor for funding circular economy initiatives are the individual needs of potential project promoters and their own initiative during open calls for application. Therefore, the recommendation is already reflected in the future programme.
	2. On page 14 in the section Measure 2.1 Development and provision of framework support to local enterprises for growth, expansion and better performance in a "greener" and smarter competitive global market, add Development of circular economy	2. At this stage, the Integrated Territorial Strategy (ITS) does not impose thematic limitations for interventions supported under Measure 2.1 Development and provision of framework support to local enterprises for growth, expansion and better

		performance in a "greener" and smarter competitive global market. Moreover, the explanatory text of the measure emphasized on the framework support for green transition, whose scope cover all aspects of the circular economy. In addition, one of the horizontal principles of the strategy aims to integrate green solutions in every supported intervention, which encourages project promoters to come up with green solutions to the territorial needs and challenges.A key decisive factor for funding circular economy initiatives are the individual needs of potential project promoters and their degree of activeness during open calls for application. Therefore, the recommendation is already reflected in the future programme.
	3. On page 15 at the end of the text of Measure 2.2 Rationalization of the use of tourist resources of the cross-border cooperation region, including providing faster, fair and environmentally friendly access and conditions for networking of cultural heritage and tourist locations in the cross-border cooperation region add: Special mark and develop infrastructure routes of European pedestrian roads E4 (passes through the territory of	3.The support for development of European long-distance paths (E-paths) through the CBC area is completely consistent with the strategic scope of

	eastern Serbia) and E7 because both enter from the territory of Bulgaria into the territory of Bulgaria in the covered area	the Measure 2.2. Streamline the utilization of the CBC region's tourist resources. However, we would suggest that developing infrastructure routes of European pedestrian roads E4 may become a separate work package of a joint integrated project, instead of presenting it as a stand-alone project. It should be pointed out, that neither the program, nor the strategy aims to present lists of exhaustive measures eligible for support, therefore both program documents have focused on types of measures, and those measures mentioned in the comment might be referred to as such. Therefore, the recommendation is already reflected in the future programme and ITS.
	4. On pages 17 and 18 in part C. Plans, programs and strategies on the territory of the Republic of Serbia related to PPS and TSIM 2021-2027, the following amendments should be made: Instead of • Replace the Biodiversity Strategy of the Republic of Serbia for the period from 2011 to 2018 - the Nature Protection Program of the Republic of Serbia for the period from 2021 to 2023, which revises the Draft Nature Protection Strategy of the Republic of Serbia for the period from 2019 to 2025 , emphasize that the Waste	4. The documents are reflected in accordance with the recommendations made in item 1.4 of the EAR.

	Management Strategy is still in the project and has not yet been adopted, add the National Action Program (NAP) to combat desertification and land degradation according to the UN Convention (in the project) and the Public Health Strategy (which links health and environmental protection , emphasize that the Forestry Development Strategy has long been surpassed, ie, its validity has expired, etc. 5. On page 25 in section 2.1.5. The condition of the land, in the part referring to the border region of Serbia, replace the term "assume" with a more adequate term "cause, or create degraded areas" 6. On page 25 in section 2.1.6. The status of biological diversity states that in the cross-border area there are numerous BIODIVERSITY CENTERS, protected areas, ecological networks, IBA, IPA, PBA areas. 7. On page 27 in section 2.1.12. Explain waste management that the new Waste Management Strategy in Serbia has not yet been adopted and add that the concept of circular economy is being developed in Serbia 8. On page 32 at the end of part 9. Methods of conducting environmental impact assessment, used normative basis and documents, and difficulties in gathering the necessary information, add the document: Code of good practice for citizen participation in the decision-making process (INGO Conference) Council of Europe) as a public hearing on the Cross-Border Cooperation Program and the Strategic Environmental Assessment Report will be organized. Also add a new item 12. Organizing an early public inspection and public hearing on the Report 9. On page 34 at the end of Part B. For the Republic of Serbia, add the following normative acts: Law on Ratification of the Aarhus Convention, Law on Nature Protection, Decree on Ecological Networks and Decree on Methodology of Public Policy Management, Analysis of the Effects of Public Policies and Regulations and Content of Individual Public Policy Documents. In addition to environmental reports, the use of climate change reports should be added as a source of information.	Under i. 5 the recommendation is consistent with item 2.1.5 of the EAR. Under i. 6 the recommendation is consistent with item 2.1.6 of the EAR. Under i. 7. The recommendation has been reflected. Under item 8 Item 9 of the EAR describes the methodology for the preparation of the EAR and not the methodology for conducting the EA procedure, which is conducted, including the public discussions to it, in accordance with the relevant national legislation, in the respective country. Under i. 9. To the applicable legislation in item 9 of the EAR are listed the mentioned documents.

	10. On page 36, in the section Conclusion of the Environmental Impact Assessment, it should be added that the report will list all opinions, assessments and proposals from the public hearing and that it will be taken into account when defining the conclusion of the SEA report.	Under i. 10. The EAR's conclusion takes into account the opinions received at the relevant stage of the EA procedure.

13. Non-technical summary of the environmental assessment

The non-technical summary of the EAR has been prepared as a separate document, submitted to **Appendix 3** of the EAR.

14. Appendices to the environmental assessment report

1) *Tabulated list of the experts and the manager who prepared the Environmental Assessment Report, in which each expert has certified with a signature the sections of the report and declarations of the experts developed by him, in accordance with the requirements of Art. 16, para. 1 of the EA Ordinance;*
2) *Copies of all opinions received as a result of the consultations on the scope and content of the Environmental Assessment Report within the EA procedure.*
3) *Non-technical summary of the Environmental Assessment Report.*