



## ENVIRONMENTAL REPORT FOR THE INTERREG VI ROMANIA-HUNGARY PROGRAMME, 2021-2027

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**Waiver:**

The authors are solely responsible for the contents of this publication.

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## ABBREVIATIONS

EFA	Environment Fund Administration
MA	Managing Authority
EPA	Environmental Protection Agency
TA	Technical Assistance
CCA	Climate change adaptation
EC	European Commission
DNSH	Do No Significant Harm
EEA	European Environment Agency
EIA	Environmental Impact assessment
ESPON	European Spatial Planning Observation Network
EUSDR	EU Strategy for the Danube Region
EUSAIR	EU Strategy for the Adriatic-Ionian Region
GHG	Greenhouse gases
IT	Information Technology
DO	Sustainable Development Objectives
CO	Community Objective
PO	Policy Objective
JMC	Joint Monitoring Committee
OCT	Overseas countries and territories
PA	Programme area
RAMSAR	Convention on Wetlands of International Importance
RDF	Refuse-derived fuel
ER	Environmental Report
SEA	Strategic Environmental Assessment
IWMS	Integrated Waste Management System
SRF	Solid recovered fuel
ITC	Information and Communications Technology
TFEU	Treaty on the Functioning of the European Union
MBT	Mechanical-biological treatment
TAU	Territorial Administrative Unit
EU	European Union

## 1. Introduction

This is the Environmental Report for the Strategic Environmental Assessment of the *Interreg VI Romania-Hungary Programme for the period 2021-2027*, currently available on the site <https://interreg-rohu.eu/ro/cadrul-procedural/>, the section dedicated to the post-2020 programming.

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The present Environmental Report (ER) has been drafted in accordance with Annex 2 of GD 1076/2004 establishing the procedure for developing environmental assessments for plans and programmes, which transposes the SEA Directive, in accordance with the Recovery and Resilience Regulation Facility Regulation), (2021/C 58/01) DNSH – Technical guidance on the application of “do no significant harm” under the Recovery and Resilience Facility Regulation and in accordance with European Commission Notice - Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (2021 C 373/01).

*The Interreg VI Romania-Hungary Programme for the period 2021-2027* is managed by the Ministry of Development, Public Works, and Administration, as the Managing Authority.

On behalf of Hungary, the competent authority for the Programme in the programming period 2021-2027 is the same as in the previous period, the National Authority, based on the experience of the staff gained in the period 2014-2020.

Upon completion of the SEA procedure for the *Interreg VI Romania-Hungary Programme for the period 2021-2027*, an Environmental Endorsement will be issued, based on the Adequate Assessment Study and the Environmental Report, which may be subject to change during the procedure mentioned above. If the *Interreg VI Romania-Hungary Programme for the period 2021-2027* will undergo changes, the competent environmental protection authority will be notified and will decide whether a new SEA procedure should be carried out.

## 2. Overview of the contents and main objectives of the plan or programme, and their relationship with other relevant plans and programmes

### 2.1. Justification and purpose of the Programme

Priorities, measures and interventions mentioned in the *Interreg VI Romania-Hungary Programme for the period 2021-2027* will have an overall positive impact on the environment.

The *Programme Area (PA)* includes a vast network of protected natural areas with high conservation value, as well as an increased potential for tourism. Particular attention must be paid to the protection of these areas and existing biodiversity.

The Programme Area consists of 117 urban settlements and 672 villages. Romania's border area has 36 urban settlements and 307 villages, while Hungary's border area has 81 urban settlements and 365 villages.

The guidelines proposed by the *Interreg VI Romania-Hungary Programme for the period 2021-2027* can be defined as follows:

- ❖ **maximising the focus of resources on interventions where cross-border cooperation brings added value, and the Interreg programme is the main funding option;**
- ❖ **creating links between territories and communities based on shared territorial and intangible assets**, which can create common socio-economic opportunities for economic recovery (for example, renewable energies and the opportunity to create “green communities/renewable energy”, such as tourism and culture as areas of common interest, capable of mobilising funds and partnerships in a shared vision of territorial marketing);
- ❖ **promoting interpersonal interventions as a basis for a more structured cooperation**, with proven results in terms of building sustainable and inclusive communities and an open business environment that can support the design of customised solutions for future community-led local development initiatives and cross-border integrated socio-economic strategies, thus transforming the interpersonal actions into “laboratories” aimed at animating local communities;
- ❖ **building a common knowledge base, capabilities, shared systems and working procedures** as a prerequisite for project sustainability and for effective results of the programme implementation, learning lessons about cooperation, in terms of: developing joint strategies, effective cross-border systems and institutional cooperation frameworks in all selected POs; resolving legal and administrative barriers; creating more cohesive local and business communities through interpersonal exchanges.

The Programme Area benefits from the existence of a large area of national natural parks and the Natura 2000 network of protected areas, with values for tourism, culture and environment. The natural endowment of the Programme Area is rich and diverse, from landscapes specific to floodplains to spa heritage, nature areas, cave-rich karst areas, RAMSAR wetlands and a UNESCO World Heritage Site, the Hortobágy National Park (Hungary). The natural areas are very well represented on the entire PA territory, with Natura 2000 sites covering between 14.63% (Timis) and 47.29% (Hajdú-Bihar) of the county area. However, they are not always contiguous on both sides of the border, indicating the need to improve cooperation in the management of the Natura 2000 sites, as well as to carry out joint works/interventions and coordinated action for the development of the green infrastructure along the green border (including the buffer zones) or in cities. Although the region has a varied but consistent natural heritage, there is no joint branding or common understanding of the region’s natural potential and its various opportunities, which may contribute to poorer tourism results of the PA, reducing the number of nights spent in accommodation units for tourists.

**Strategies for** adaptation to climate change and the management of natural and man-made hazards, especially those concerning floods (especially in the northern and southern areas of the PA), landslides and fires caused by droughts and land abandonment have emerged as necessities and major priorities for interventions. A territorial analysis also shows that, although the potential for renewable energy (e.g., solar energy, biomass, geothermal energy) is substantial, this potential is not fully exploited or mapped at micro-zone level, which is another common need for interventions/works and a priority area for future cooperation. The PA is characterised by a green border and a high potential for capitalising on natural resources. However, the current management of protected sites is

very poorly coordinated between the two countries and does not reflect the true transboundary nature of the natural landscape. In addition, certain areas are affected by deforestation trends, which could further damage the territory's exposure to natural hazards (droughts, floods and landslides in hilly areas) and the impact of climate change. Cooperation in the field of protection of and capitalisation on natural resources, including green infrastructure, was thus highlighted as a common need for interventions/works for the PA.

With regard to modern and resilient health infrastructure and services, which are a major investment priority for all EU countries as a result of the SARS-CoV-2 pandemics, the basic endowment of the PA still seems inadequate compared to the needs, especially in terms of emergency response, exchange of information and community-based and personalised health services for specific target groups.

The PA benefits from a rich natural and cultural heritage, which provides the basis for cross-border capitalisation on tourism routes and cultural initiatives focused on local traditions, as catalysts for social inclusion. However, the area is not yet capable to attract and retain large flows of tourists (which is suggested by the declining average length of night stays, in relation to the number of days), while many local and county strategies are strongly focused on the resources and tourism potential of their territories, in close connection with traditional economic sectors such as local agriculture and food production.

The low level of monitoring of soil, water and air pollution diminishes the awareness of the population about the real level of pollution in their communities. The programme invests in actions and measures to raise the awareness on the importance of environmental protection and responsible behaviour.

This is why the programme proposes this specific objective, to finance green infrastructure works/interventions in urban areas, and to finance measures to raise the awareness of the resident population. This concept of "green infrastructure" is relatively new and special attention will be paid to its promotion and the development of pilot solutions that can be replicated later. The most common structures that will be targeted are: parks, tree-lined alleys, green roofs, open spaces, playgrounds, farmlands and forests inside cities, etc.

## 2.2. Programme Content

*Interreg VI Romania-Hungary Programme for the period 2021-2027* is structured in chapters as follows:

1. Programme strategy: main development challenges and policy responses;
2. Priorities (Priority 1: Cooperation for a greener and more resilient cross-border area between Romania and Hungary; Priority 2: Cooperation for a more social and cohesive PA between Romania and Hungary; Priority 3: More sustainable, more community-based and more efficient cross-border cooperation);
3. Financial plan (allocations for each year of the programming period, total financial allocations from the ERDF, IPA III CBC, NDICI-CBC, IPA III, NDICI, OCTP funds, and national co-financing);
4. Actions taken to involve programme partners in the Programme development and the role of these programme partners in its implementation, monitoring and evaluation;

5. Approach to the Programme spread and visibility (objectives, target audience, communication channels, including mobilisation of social media, if applicable, planned budget and applicable indicators for monitoring and assessing);
6. Support for small projects, including small projects funded through specific funds, dedicated to small projects;
7. Implementing provisions (programme structures, procedure for setting up the Joint Secretariat, assignment of responsibilities in case of financial corrections).

### **2.3. Objectives and suggested actions of the Programme**

*Interreg VI Romania-Hungary Programme for the period 2021-2027* justifies the choice of policy objectives and the specific objectives promoted by it. Thus, the Programme develops 3 priorities that are analysed:

**Priority 1 - Cooperation for a greener and more resilient cross-border area between Romania and Hungary**

The specific objectives of this priority are as follows:

- ✓ PO2– (ii) Promoting energy from renewable sources in accordance with Directive (EU) 2018/2002, including the sustainability criteria set out therein;
- ✓ PO2– (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;
- ✓ PO2– (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

**Justification for Priority 1:**

Types of related actions and their expected contribution to specific objectives and macro-regional strategies:

Action 1: update the Danube Flood Risk Management Plan (DFRMP); implementation of structural and non-structural measures related to flood risk management, support for improved forecasts and forecasts (pilot actions/joint strategies); increasing the readiness and resilience of communities in the face of floods (training courses, awareness-raising events), including the involvement of young people and gender aspect integration in civil protection actions; promoting the sustainable management of floodplains, including green infrastructure; promoting river basin management planning for specific issues (e.g., ice on rivers); pilot/demonstrative actions.

Action 2: training, developing capacity and procedures for better preparedness for disaster management, including the involvement of young people and women in civil protection actions; identifying innovative solutions to support disaster management (IT tools, VR, mobile applications, etc.) (pilot actions); strengthening the resilience of national/regional authorities (this type of intervention requires the development of a harmonised and standardised approach at cross-border level and then its application at national/regional level) (pilot actions/joint strategies) (pilot actions/joint strategies; support for the operational planning of flood management in cross-border river basins and harmonisation of available assets (pilot actions/joint strategies);

Action 3: providing support for risk assessment (e.g., hazard identification, consequence and probability assessment, risk and uncertainty characterization) at regional, national or macro-regional level, as well as related training and exchange of experience; supporting the monitoring and study of various environmental risks; harmonisation of climate change adaptation (CCA) strategies and action plans to enhance international cooperation and

coordinate activities in the Danube region; exploring the direct effects of climate change and implementing mitigation and adaptation measures in environmental risk management plans (joint strategies); improving cooperation on the use of climate change data and projections of the Copernicus Climate Change Service (C3S) and the Climate Data Repository (CDS), including training and exchange of experience in these areas; research regarding adaptation to climate change, including the promotion of a partnership between academic research and environmental youth NGOs; supporting natural water retention measures; pilot/demonstrative actions.

### **Priority 2 - Cooperation for a more social and cohesive PA between Romania and Hungary**

The specific objectives of this priority are as follows:

- ✓ PO4 - (v) Ensuring equal access to health services and encouraging the resilience of health systems, including primary care, and promoting the transition from institutional to family and community care;
- ✓ PO4 - (vi) Strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation.

#### **Justification for Priority 2:**

Types of related actions and their expected contribution to specific objectives and macro-regional strategies:

Actions 1: analysis of trends, needs, standards and barriers to cooperation for healthcare services in the PA (including the health of the population); training courses for public servants and civil society in the field of health services; networks for the exchange of good practice and mutual learning in the field of healthcare; drafting (transnational/cross-border) action plans and development strategies in the field of health (including joint response and mobilisation of civil protection); investments in infrastructure, equipment, IT software/hardware, support for e-Government in the field of health; pilot/demonstrative/innovative/research projects in the field of health.

Actions 2: identification of opportunities to make the tourism offering sustainable or to create new sustainable tourism products of public interest (including trend analysis, resource mapping, assessment of barriers to cooperation); developing sustainable tourism offerings and products, including works, integrated into common tourism strategies for local development; territorial marketing initiatives (marketing, communication, awareness-raising campaigns regarding local resources and traditions); training, capacity building and exchanges of experience between cross-border players; identification, mapping and further development of cultural heritage (tangible and intangible), including its conservation, protection and rehabilitation, as well as the development of joint strategies for promotion, conservation and assessment of barriers to cooperation; mapping the needs and possibilities of digitalising cultural heritage and developing joint strategies; improving the interpretation/adoption of innovative territorial marketing methods through "Storytelling Models" ("Living History" and "Living Heritage"); pilot actions for innovative solutions (including the purchase of hardware/software) and the creation of thematic routes, without a specific trademark) for the protection of and capitalisation on the cultural/rural/natural/religious heritage; involvement of local authorities and communities (including schools) in building inter- and cross-cultural links with various partners (skills development, educational content and cultural initiatives, joint events, etc.).

### **Priority 3 - More sustainable, more effective and more community-focused cross-border cooperation**

The specific objectives of this ISO 1 priority are as follows:

- ✓ ISO 1 - Better governance of cooperation.

#### Justification for Priority 3:

Types of related actions and their expected contribution to specific objectives and macro-regional strategies:

Actions: cross-border studies on barriers to cooperation; lessons learned from previous experiences; mapping standards and legislation; development of joint action plans/strategies/institutional agreements; joint training courses on how to address barriers to cooperation; pilot/demonstrative actions to remove barriers; cross-border studies in areas not covered by the objectives selected in PO2 and PO4; lessons learned from previous experiences; development of joint action plans/strategies/institutional agreements regarding the 2030 Agenda for sustainable development and customised solutions for territorial mechanisms integrated into the PA; joint training courses, events and exchange of experience regarding cross-border strategic planning, project development and joint intervention; small-scale pilot/demonstrative actions in areas not covered by the PO2 and PO4 selected objectives, focusing on cross-border policy/strategy/multiple funds coordination systems, cross-border monitoring and evaluation (M&E); small-scale training courses, events, peer exchanges and interpersonal actions.

ISO 1 interventions can have a crosswise approach (e.g., peer training and exchange of expertise regarding “cross-border strategic thinking”, analysis of cross-border public service quality standards/barriers to cooperation) or a sectoral approach (which, in this case, will consider non-selected PO-related topics, such as the creation of strategies and capacities related to innovation clusters, the mapping of cross-border value chains, the analysis of cross-border traffic flows, the piloting of Community initiatives starting from to human-to-human actions and more).

This priority meets the following specific Interreg objective (ISO1): *Better governance of cooperation - Strengthening the institutional capacity of public authorities, in particular those mandated to administer a given territory, and of the stakeholders.*

The policy objectives of the *Interreg VI Romania-Hungary Programme for the period 2021-2027* are as follows:

- ❖ A greener, low-carbon Europe by promoting the transition to clean and safe energy, green investment and “blue growth” interventions/works<sup>1</sup>, the circular economy, climate change adaptation, risk prevention and management, and sustainable urban mobility.
- ❖ A more social and inclusive Europe, implementing the European Pillar of Social Rights by improving access to inclusive services, improving access to education and quality of education, ensuring equal access to healthcare and developing the infrastructure needed to achieve these goals on the long-term across borders, as well as by increasing the role of culture and sustainable tourism in economic development, social inclusion and social innovation.
- ❖ Better governance of cooperation - an Interreg Specific Objective - by promoting

<sup>1</sup> [https://ec.europa.eu/maritimeaffairs/policy/blue\\_growth\\_ro](https://ec.europa.eu/maritimeaffairs/policy/blue_growth_ro)

actions to increase institutional capacity in the field of border management.

The programme supports the strategic guidelines set out in regional strategies and programmes, such as the EU Strategy for the Danube Region (EUSDR) based on four pillars, namely the Interconnection of the Danube Region, Environmental Protection in the Danube Region, Increasing Prosperity in the Danube Region and Strengthening the Danube Region which also correlate with the specific Programme priorities and objectives.

The European Commission recommends that both cross-border Member States, as individual states and as a cross-border area, support:

- ❖ *Focusing the resources on digital and green transition* (i.e., including the advancement of ICT, e-government services, as well as the development of joint strategies for the sustainable use of natural resources, vulnerability assessment and increased joint-response capacity in case of emergency);
- ❖ *Health sector resilience* (including mapping needs and developing a joint strategy, as well as strengthening the capacity to respond to health emergencies, reducing territorial disparities in access to health services and promoting patient mobility and the exchange of information);
- ❖ *Recovery of economy and labour market following the Covid-19 crisis* (including by mapping labour market exchanges, strengthening active labour measures and ensuring greater relevance of education and training in relation to skills needed in the cross-border labour market, promoting high value-added clusters and cross-border value chains, such as and supporting the recovery of tourism and culture as drivers for the socio-economic development of the PA, hard hit by the Covid-19 crisis);
- ❖ *Improved governance and decision-making processes* (including the assessment of legislative barriers to cooperation, the reduction of language barriers, the improvement of the exchange of data and information, the improvement of coordination with key programs and the involvement of stakeholders and social partners).

#### 2.4. Programme Area

Area for implementing the *Interreg VI Romania-Hungary Programme for the period 2021-2027* includes four counties in Romania (Satu Mare, Bihor, Arad, Timis) and four districts in Hungary (Szabolcs-Szatmár-Bereg, Hajdú-Bihar, Békés, Csongrád-Csanád). The total programme area (PA) is 50,435.31 km<sup>2</sup> (56.3% is the administrative area of the Romanian programme - 11.9% of the total national territory) and 43.7% the administrative area of the Hungarian programme - 14.15% of the total national territory). The programme area is divided into two NUTS2 regions in Romania (*Northwest (RO11)* - Bihor county, Satu Mare county and *West (RO42)* - Arad county and Timis county) and two NUTS2 regions in Hungary (*The Northern Great Plain (HU32)* - Hajdú-Bihar county, Szabolcs-Szatmár-Bereg county and *The Southern Great Plain (HU33)* - Békés county, Csongrád-Csanád county).

The border region of Romania has a total area of 28,396.50 km<sup>2</sup> (1.9% of the total national territory), and the border region of Hungary has a total area of 22,038.81 km<sup>2</sup> (14.15% of the total national territory) (Eurostat 2019).

The total border length is 450 km, crossed by 12 road corridors and 5 crossing points of the railway border.

The programme area is composed of 117 urban settlements and 672 villages. Romania's border area has 36 urban settlements and 307 villages, while Hungary's border area has 81 urban settlements and 365 villages.

## 2.5. Relationship with other relevant plans and programmes

The programme creates complementarities and synergies with other programmes and/or funding instruments.

The *Interreg VI Romania-Hungary Programme for the period 2021-2027* is in accordance with the following mainly EU (and obviously the national ones prepared by transposition by the Member States and not detailed here) strategies, programmes and contributes to their implementation<sup>2</sup>.

### 1. EU Strategy for the Danube Region (EUSDR)

The EU Strategy for the Danube Region (EUSDR) provides a general framework for parts of Central and South-Eastern Europe in order to support integration and integrated development. The Danube region consists of 14 countries (Germany, Austria, Slovak Republic, Czech Republic, **Hungary**, Slovenia, **Romania**, Bulgaria, Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Moldova and Ukraine).

The strategy is based on 4 pillars: Interconnecting the Danube Region, Protecting the Environment in the Danube Region, Increasing Prosperity in the Danube Region and Strengthening the Danube Region.

The strategy is accompanied by an “evolving” Action Plan which breaks down 11 Priority Areas into actions and project examples. Challenges and opportunities can be identified in all these areas of interaction, depending on the magnitude of phenomena (local, regional or international) and on the main determinants, such as global environmental changes or international tourism markets.

All four pillars of the Strategy are reflected in the Programme Priorities and Objectives. The Programme will seek to create synergies and complementarities with the EUSDR and to contribute directly to the implementation of the Macroregional Strategy for the Danube Region. Therefore, the Danube Region includes the entire area covered by the Programme. All projects to be funded will contribute in some way and to some extent to the achievement of the EUSDR objectives. The connections between the programme area and the Danube Region can be analysed in the following main areas: mobility, energy, environment, risks and socio-economic development.

### 2. Romania's Sustainable Development Strategy 2030

The strategy supports Romania's development on three main pillars, namely economic, social and environmental. The strategy is citizen-centric and focuses on innovation, optimism, resilience and confidence that the State serves the needs of every citizen, in a fair, efficient way, in a clean environment, in a balanced and integrated manner.

The strategy has 17 sustainable development goals, as follows: SDG1 - No poverty; SDG2 - Zero hunger; SDG3 - Health and well-being; SDG4 - High-quality education; SDG5- Gender equality; SDG6- Clean water and sanitation; SDG7 - Clean energy at affordable prices; SDG8 - Decent work and economic growth; SDG9 - Industry, innovation and infrastructure; SDG10 - Reducing inequalities; SDG11- Sustainable cities and communities; SDG12 - Responsible consumption and production; SDG13 - Climate change action; SDG14 - Aquatic life; SDG15 -

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<sup>2</sup> The list of relevant Hungarian strategies, plans and programmes is presented in Annex 1.

Terrestrial life; SDG16 - Peace, justice and efficient institutions; SDG17 - Partnerships for achieving goals.

The programme will try to create synergies and complementarities with Romania's Sustainable Development Strategy 2030 and to contribute directly to its implementation.

### **3. National Framework Strategy on Sustainable Development of Hungary 2012-2024**

The framework strategy is built around the introduction of the state of our national resources (i.e. of our human, social, natural and economic resources), the identification of procedures rendering future generations "indebted" as well as the concept of the institutional system enhancing the appropriate maintenance of resources. Improvement of the non-sustainable conditions with regards to national resources requires the management of the root causes and main motives of procedures and cause-effect relations.

The general goal is to ensure the conditions for adjusting to the external social/human-economic-natural environment which is under continuous change and to improve the quality of the necessary cultural adjustment. In this context, it sets specific objectives in the field relevant fields for this SEA, among others: human resources; health, social cohesion – integration of excluded groups; social resources; cultivation of inherited patrimony, development of cultural services; natural resources; biodiversity, renewable natural resources; reduction of the environmental effects on people.

The programme will try to create synergies and complementarities with the National Strategy on Sustainable Development of Hungary and to contribute directly to its implementation.

### **4. European Green Deal**

The European Green Deal is the new EU enlargement strategy that sets the line for the various European policies for a 5-year period. The document is closely related to several areas of interest, specifically, environment, climate change, energy, industry, transport, etc. The purpose of the document is to facilitate the achievement of the goal of climate neutrality.

The *Programme* contributes to achieving the goal proposed by the European Green Deal through its specific objectives, PO2– (ii) Promoting energy from renewable sources in accordance with Directive (EU) 2018/2002, including the sustainability criteria set out therein; PO2 - (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches; PO2– (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

### **5. EU Strategy on Climate Change Adaptation**

This strategy paper sets out a long-term vision for the European Union to become *a society resilient to climate change* and adapted to the effects of climate change for the 2050 time horizon. The measures set out in this strategy document provide for: better *data collection and sharing* to improve access to knowledge and the exchange of knowledge regarding the impact of climate change; *nature-based solutions*, to help build resilience to climate change and protect ecosystems; integrating adaptation into *macro-budgetary policies*.

The *Programme* contributes to achieving the goal proposed by the EU Strategy on Climate Change Adaptation through its specific objective PO2– (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches.

### **6. Water Framework Directive (2000/60/EC)**

According to the Water Framework Directive, it is “Common principles are needed in order to coordinate Member States’ efforts to improve the protection of Community waters in terms of quantity and quality, to promote sustainable water use, to contribute to the control of transboundary water problems, to protect aquatic ecosystems, and terrestrial ecosystems and wetlands directly depending on them, and to safeguard and develop the potential uses of Community waters”.

The *Programme* contributes to achieving the goal proposed by the Water Framework Directive through its specific objectives, PO2 - (iv) Promoting climate change adaptation, *disaster risk prevention and resilience*, considering the ecosystem-based approaches; PO2–(vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and *reducing all forms of pollution*.

## 7. EU Biodiversity Strategy for 2030

This strategy paper sets out a post-2020 global framework for biodiversity, and through it, the EU is committed to halting the loss of biodiversity and conserving and restoring its ecosystems.

The *Programme* contributes to achieving the goal proposed by the EU Biodiversity Strategy for 2030 through its specific objectives, PO2 - (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches; PO2–(vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

## 8. List of operational programmes:

### In Romania:

- ❖ Operational Programme for Smart Growth, Digitalization and Financial Instruments;
- ❖ Health Operational Programme;
- ❖ Education and Employment Operational Programme;
- ❖ Social Inclusion and Dignity Operational Programme;
- ❖ Sustainable Development Operational Programme;
- ❖ Transport Operational Programme;
- ❖ 2 regional operational programmes (Regional Operational Programme for the Western Region for the period 2021-2027, Regional Operational Programme for the North-West Region for the period 2021-2027);
- ❖ Operational programme for aquaculture and fishing;
- ❖ Operational programme for technical assistance.

### In Hungary:

- ❖ Business Development and Innovation Operational Programme (GINOP Plus);
- ❖ Green Infrastructure and Climate Protection Operational Programme (KEHOP Plus);
- ❖ Mobility Plus Operational Programme (IKOP Plus);
- ❖ Human Resources Development Operational Programme (EFOP Plus);
- ❖ Digital Renewal Plus Operational Programme (DIMOP Plus) and
- ❖ Hungarian Aquaculture Development Operational Programme Plus (MAHOP Plus)
- ❖ Regional Development Operational Programme Plus (TOP Plus)
- ❖ Implementation Operational Programme Plus (VOP Plus).

The relevance of the main operational programmes and other operational programmes that fall within the objective of territorial cooperation lies in the need for the interventions under the future Interreg programme between Romania and Hungary to be **complementary and synergistic**, thus stimulating a **mutual leverage effect on investment**, while avoiding duplication. In this regard, the proposed priorities for the future Interreg programme

between Romania and Hungary will strengthen the strategy adopted by each Member State to implement national and regional priorities, paying special attention to the needs and opportunities that can be better addressed through cross-border cooperation, adding value to other ERDF and ESF+ interventions financed under Member States' operational programmes, and will contribute to the further transposition of transnational cooperation programs and, in particular, SUERD and ESPON programmes into specific interventions tailored to the specifics of the Romania-Hungary border area.

### **3. Relevant aspects of the current environmental status and its potential evolution if the proposed plan or programme is not implemented**

#### **3.1. Air and climate change**

Air quality is determined by air emissions from fixed sources (machinery, installations, including ventilation, etc.), from diffuse sources of pollution and mobile sources (road traffic), predominantly in large cities, as well as immissions of long-distance pollutants.

The atmosphere can be affected by a multitude of solids, liquids or gases. Because the atmosphere is the largest and at the same time the most unpredictable vector of spreading pollutants, the effects of which are felt directly and indirectly by humans and other components of the environment, it is necessary that the prevention of air pollution is handled as a matter of public, national and international interest. Air pollution is the most serious problem, as it has short-, medium- and long-term effects.

Air quality monitoring involves tracking the elements included in these four categories of problems:

- sources and emissions of air pollutants;
- transfer of pollutants into the atmosphere;
- the level of pollutant concentrations in the atmosphere and their spatial and temporal distribution;
- the effects of air pollutants on humans and on the biotic and abiotic environment.

Air is the most important environmental factor for the transport of pollutants, because it is the means for their fastest transport in the environment, so that the monitoring of the atmosphere's quality has top priority in the monitoring activity.

In **Timis County**, air quality is monitored by continuous measurements at fixed points through 7 automatic stations, of which 4 are located in the municipality of Timisoara:

- ❖ traffic stations (TM-1 and TM-5) - located in two areas with heavy traffic, respectively Calea Sagului and Calea Aradului. The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, heavy metals (Pb, Ni, Cd, As - from gravimetric PM<sub>10</sub>), nephelometric and gravimetric PM<sub>10</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene);
- ❖ industrial station (TM-4) - located near the industrial area in the southeast of Timisoara, on str. I Bulbuca (Soarelui). The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, nephelometric PM<sub>10</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene); The station is also equipped with sensors for measuring meteorological parameters;
- ❖ urban background station (TM-2) - located in the central area of the city, specifically on the b-ul C.D. Loga, away from local sources of emissions, to highlight the level of

exposure of the population to the urban pollution. The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, heavy metals (Pb, Ni, Cd, As - from gravimetric PM<sub>10</sub>), nephelometric PM<sub>10</sub>, gravimetric and nephelometric PM<sub>2.5</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene) and weather parameters;

- ❖ suburban background station (TM-3) - located in the town of Carani. The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, O<sub>3</sub>, heavy metals (Pb, Ni, Cd, As - from gravimetric PM<sub>10</sub>), nephelometric and gravimetric PM<sub>10</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene) and weather parameters;
- ❖ TM-7 station, located in the municipality of Lugoj, is of industrial type. The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, nephelometric PM<sub>10</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene) and weather parameters;
- ❖ TM-6 station, located in Moravita, is an urban background station. The pollutants monitored are: SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, CO, heavy metals (Pb, Ni, Cd, As - from gravimetric PM<sub>10</sub>), nephelometric and gravimetric PM<sub>10</sub>, volatile organic compounds (benzene, toluene, ethylbenzene, o,m,p-xylene) and weather parameters.

During 2020, the limit values for SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> or the target value (daily average of 8 hours) for O<sub>3</sub> were not exceeded in the air quality monitoring stations in the Timis County.

There are no regional air quality monitoring stations in the Timis County.

The power industry remains the main source of air pollution, accounting for about 70% of the SO<sub>2</sub> emissions in Europe and 21% of the NO<sub>x</sub> emissions, despite a significant drop in emissions since 1990.

Road transport is another major source of pollution. Heavy vehicles are important sources of NO<sub>x</sub> emissions, while passenger cars are some of the most important sources of CO, NO<sub>x</sub>, PM<sub>2.5</sub> and non-methane volatile organic compounds.

Energy used in households (fuels such as wood or coal) is an important source of PM<sub>2.5</sub> emissions.

In Arad County, air quality is monitored by continuous measurements at fixed points through 3 automatic stations, of which 2 are located in the municipality of Arad:

- ❖ traffic/industry station (T/I) - AR1 station - Micalaca passage - located in an area with heavy traffic;
- ❖ urban background station (UB) - AR2 station - str. Fluieras nr. 10c - located inside the Technical College of Constructions and Environmental Protection, which is a residential area;
- ❖ traffic/suburban station/ (T/S) - AR3 station - the town of Nadlac, str. Dorobanti FN - located at the exit of the town, near the State border with the Republic of Hungary.

The maximum values allowed, regulated by Law 104/2011, were not exceeded at the 3 continuous monitoring stations in the city of Arad.

The maximum number of exceedances of the limit values of pollutant concentrations as specified in Law 104/2011 and the annual limit values were not exceeded at the level of the 3 continuous monitoring stations in the Arad County.

The population of the Arad County, and especially of the cities, is permanently exposed, all year round, to all types of pollutants, even if the limit values or no. of days stipulated in the law on ambient air quality are not exceeded. Air pollution means the introduction by man, directly or indirectly, of substances or energy into the air resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property and impair or interfere with amenities and other legitimate uses of

the environment, and “air pollutants” shall be construed accordingly (definition of the Geneva Convention).

In **Bihor County**, air quality is monitored by continuous measurements at fixed points through 4 automatic stations, of which 2 are located in the municipality of Oradea:

- ❖ Urban station (BH1 station) - located near the Bihor EPA premises, B-dul Dacia, nr. 25A, monitors the following pollutants online: CO, SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, gravimetric PM<sub>2.5</sub> (powder), nephelometric and gravimetric determination of PM<sub>10</sub>, BTX (benzene, toluene, xylene), weather parameters;
- ❖ Industrial station (BH2 station) - located in the courtyard of the Primary and Secondary School of the Diocese of Bihor, Str. Matei Corvin, nr. 106/A, with the following parameters monitored: CO, SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, nephelometric and gravimetric determination of PM<sub>10</sub>, weather parameters;
- ❖ Traffic station (BH3 station) - located in the Nufarul neighbourhood, near McDonald's-drive, monitors the following pollutants online: CO, SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, nephelometric PM<sub>10</sub>, BTX (benzene, toluene, xylene), weather parameters;
- ❖ Industrial station (BH4 station) - located in the town of Tetchea, monitors the following pollutants online: CO, SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, nephelometric determination of PM<sub>10</sub>, weather parameters.

There are no regional air quality monitoring stations in the Bihor County.

The maximum number of exceedances of the limit values of pollutant concentrations as specified in Law 104/2011 and the annual limit values were not exceeded at the level of the 4 continuous monitoring stations in the Bihor, however, there are some limitations:

- ❖ Benzene - an annual estimate cannot be made, because, for technical reasons, for this pollutant, there are no data collected/the data collected are insufficient to meet the quality criteria, according to Law 104/2011;
- ❖ Monitoring of particulate matter with dimensions less than 2.5 microns (PM<sub>2.5</sub>) is performed at the urban background station (BH1) located at the Bihor EPA premises. At the level of 2020, for technical reasons, there are insufficient data for this pollutant to comply with the quality criteria according to Law 104/2011, the arithmetic average for this pollutant being 11.16 for a data capture of 59.29%;
- ❖ In 2020, automatic PM<sub>10</sub> determinations were performed, at the BH1, BH2 and BH3, BH4 stations, and gravimetric at BH1 and BH2, exceeding the daily average concentrations (50 µg/m<sup>3</sup>) as follows: BH1 - 4 nephelometric measurements, BH2 - 3 nephelometric measurements, BH4 - 14 nephelometric measurements;
- ❖ At the level of 2020, the analyser for the BH2 monitoring station collected data only in a percentage of 36.34%, being insufficient to comply with the quality criteria according to Law 104/2011.

The main activity that produces pollution in the Bihor County is road traffic, as follows:

- ❖ Road transport - heavy vehicles contribute significantly with NO<sub>x</sub> emissions to the acidifying and eutrophinating pollutants, emissions of ozone-depleting atmospheric pollutants;
- ❖ Road transport - heavy vehicles contribute significantly with PM<sub>10</sub> emissions to the primary particulate matter;
- ❖ Road transport - cars contribute significantly with PM<sub>2.5</sub> emissions to the primary particulate matter;

- ❖ Road transport - heavy vehicles contribute significantly with Pb-Mg to heavy-metal emissions;
- ❖ Road transport - heavy vehicles/cars contribute significantly with Cd-Mg to heavy-metal emissions.

In **Satu-Mare County**, air quality is monitored by continuous measurements at fixed points through 2 automatic stations, of which 1 is located in the municipality of Satu-Mare:

- ❖ Urban background station (SM1 station) - located in Satu-Mare, Str. Slavici, nr. 4, in the courtyard of the Ioan Slavici National College, monitors the following parameters: SO<sub>2</sub>, NO<sub>x</sub>/NO/NO<sub>2</sub>, CO, O<sub>3</sub>, volatile organic compounds (benzene, toluene and xylenes), particulate matter PM<sub>2.5</sub> (gravimetric) and PM<sub>10</sub> (nephelometric and gravimetric);
- ❖ Suburban/traffic station - located in the municipality of Carei, Str. Somesului, nr. 15, to the border with Hungary, monitors the following parameters: SO<sub>2</sub>, NO<sub>x</sub>/NO/NO<sub>2</sub>, CO, volatile organic compounds (benzene, toluene and xylenes), particulate matter PM<sub>10</sub> (nephelometric and gravimetric).

There are no regional and industrial air quality monitoring stations in the Satu-Mare County.

The following were recorded for particulate matter PM<sub>10</sub> at the SM1 station: 12 exceedances of the daily limit value for the protection of human health/station in station SM1 and 12 exceedances of the daily limit value in station SM2, suburban/traffic type station. Particulate matter, PM<sub>10</sub> fraction still has problems in urban areas, although the industrial sector no longer makes a significant contribution. The particulate matter values are exceeded mainly due to the car traffic in the area, as well as the domestic heating and the improper green waste management, i.e., its burning caused these values to be exceeded during the autumn-winter period.

The main sectors that impact air quality, considering emissions of acidifying pollutants, ozone-depleting pollutants, particulate matter and heavy metals are: transport and residential heating, mainly in winter.

Climate change is a global process faced by humanity in this century in terms of environmental protection, with significant economic and social effects at global, regional and local levels. Considering the *National Climate Change and Low-Carbon Green Growth Strategy for 2016-2020*, as well as *National Action Plan for implementing the National Climate Change and Low-Carbon Green Growth Strategy for 2016-2020*, measures to mitigate GHG emissions and adapt the green systems to climate change continue to be taken and integrated. Regional cohesion policy, as well as European programmes, are an effective way of adopting the most effective measures to consolidate sustainable, low-carbon green growth in Romania.

The effects of climate change on the environment as a whole (natural environment, built environment, human beings, biodiversity, etc.) can be reduced through two categories of measures that are based on the general climate change objectives: measures to reduce GHG emissions and adaptation to the climate change effects, as well as measures to mitigate the climate change effects.

Reduction and mitigation measures include actions to reduce the impact of anthropogenic activities on the climate system and actions to avoid the impact of climate change on the environment.

Adaptation measures include actions that respond to current or forecast climate change. Given that changing climate conditions reflect a reality, appropriate measures are

essential to reduce the impact of climate change and to protect the population from the negative effects of climate change.

At regional level, the general trend of the process of mitigating and adapting to climate change will be followed by implementing a series of measures developed for the following areas:

- Energy efficiency: changing the behaviour of household consumers, which can lead to energy savings; providing leverage for the rehabilitation of public buildings, to ensure energy independence or minimize consumption; lower consumption of energy in industry;
- Transport: implementation of an efficient electric transport system in cities to reduce greenhouse gases; development of infrastructure related to an alternative transport system, without fuel consumption, green transport (bike lanes on the canopy of flood defence dams, interconnection with the existing ones), development of a sustainable system to improve social cohesion, access to peripheral areas, reducing the impact on the environment; facilitating and creating opportunities to encourage rail transport as an alternative to road transport;
- Agriculture/forestry: implementation of technologies for the collection and recovery of agricultural residues; ecological forest reconstruction by increasing the forest area and stopping illegal logging.

Climate scenarios for the periods 2011-2040 and 2021-2050 were developed and quantifiable effects on multiannual average temperature and multiannual average precipitation in Romania were analysed, under the ADER project - System of geo-referential indicators at different spatial and temporal scales for assessing the vulnerability and measures of adaptation of agroecosystems to global changes (2011-2014), developed by the National Meteorological Administration, funded by the Sectoral R&D Plan in the field of Agriculture and Rural Development for the years 2011-2014 - ADER 2020, coordinated by the Ministry of Agriculture and Rural Development.

Thus, an increase in the average annual temperature compared to the period 1980-1990 is expected in Romania, similar to the entire European space, with small differences between the results of the models for the first decades of the 21st century and higher at the end of the century:

- ❖ between 0.5°C and 1.5°C, for the period 2020-2029;
- ❖ between 2.0°C and 5.0°C, for 2029-2099, depending on the scenario (example: between 2.0°C and 2.5°C for the scenario with the lowest average global temperature rise and between 4.0°C and 5.0°C in the case of the most noticeable temperature rise scenario).

In terms of the precipitation regime, the analyses carried out for the period 1901-2010 indicate the existence, especially after 1961, of a general decreasing trend of the annual precipitation quantities throughout the country and especially a sharp increase of the precipitation deficit in the southern and eastern areas of Romania. Thus, the climate scenarios resulting from the research study conducted by the National Meteorological Administration refer to temperature increases, changes in precipitation patterns, extreme events and natural disasters related to the weather, ending as negative effects with growing areas exposed to desertification.

In order to estimate the impact of climate change on the runoff regime on Romanian rivers, in terms of average annual flow rates, the results obtained from complex national and international studies within the National Institute of Hydrology and Water Management

were processed and supplemented, where appropriate. In a first stage, the calculations were performed for 10 rivers from the 11 river basins/areas in Romania, namely: **Somesh-Tisza, Mures**, Jiu, Olt, Arges - Vedea, Ialomita - Buzau, and Siret, with the calculations for other rivers to be completed in the future.

As a result of these variation trends of the meteorological parameters, an analysis of the flow rate evolution simulations showed the following changes to the multiannual average flow regime are observed, for the rivers under review: Iza: decrease of approx. 1.9%; **Somesh: increase of approx. 6.2%**; Crasna: decrease of approx. 9.4%; **Mures: decrease of approx. 9.9%**; Jiu: decrease of approx. 11.0%; Olt: decrease of approx. 9.5%; Vedea: decrease of approx. 24.6%; Arges: decrease of approx. 8.6%; Ialomita: decrease of approx. 5.8%; Siret: decrease of approx. 9.6%.

A comparative analysis of the future period (2021-2050) vs the baseline period (1971-2000), as a result of the variation trends of the meteorological parameters, following the analysis of the flow rate evolution simulations showed that **the river basins with the highest deficits of the average multiannual flows are: Vedea, Jiu, Siret, Olt and Arges.**

Given that the phenomenon of climate change is a global process faced by the humanity in this century in terms of environmental protection, the Ministry of Environment, Water and Forests has developed *The National Climate Change and Low-Carbon Green Growth Strategy for 2016-2020 and the National Action Plan for implementing the National Climate Change and Low-Carbon Green Growth Strategy for 2016-2020*.

The *National Climate Change and Low-Carbon Green Growth Strategy for 2016-2020* addresses the issue of climate change in two distinct ways: **mitigation** - the process of reducing greenhouse gas emissions in order to achieve the assumed national targets, and **adaptation** - to the effects of climate change, considering the European Union's climate change policy and relevant documents developed at European level, as well as the experience and knowledge gained in collaborative actions with foreign partners and prestigious international institutions.

In the referred document ([http://www.mmediu.ro/app/webroot/uploads/files/A1\\_Strategia%20na%C8%9Bional%C4%83%20privind%20schimb%C4%83rile%20climatice%20%C8%99i%20cre%C8%99tere%C2%A0%20economic%C4%83%20bazat%C4%83%20pe%20emisi%C2%A0%20reduse.pdf](http://www.mmediu.ro/app/webroot/uploads/files/A1_Strategia%20na%C8%9Bional%C4%83%20privind%20schimb%C4%83rile%20climatice%20%C8%99i%20cre%C8%99tere%C2%A0%20economic%C4%83%20bazat%C4%83%20pe%20emisi%C2%A0%20reduse.pdf)), the following adaptation actions have been established for the water field at national, regional and local level, with reference to:

- ❖ adaptation actions at national and local level:
  - ✓ supporting climate change research and setting up an archive with information concerning climate change: adequate methods to contribute to the national research system with proposals for adaptation;
  - ✓ estimating the costs of climate change for each high-priority sector;
  - ✓ developing a national climate change adaptation agenda and integrating it into future and existing policies;
  - ✓ developing and implementing a campaign to raise awareness among all stakeholders.
- ❖ adaptation actions at local and regional level:
  - ✓ the use in agriculture of species resistant to intense and persistent droughts, while considering the risk to biodiversity;
  - ✓ afforestation of slopes with risk of flood propagation;
  - ✓ resizing sewers in urban agglomerations;

- ✓ reducing loss in water distribution networks (from 50% now to 20% in 2025);
- ✓ re-evaluation of water resources at the level of river basins and sub-basins in the conditions of climate change;
- ✓ planning actions at local and regional level in order to be able to cope with periods of heat waves.

The project “**Climate Change and Low-Carbon Green Growth Programme** ([www.operaclima.ro](http://www.operaclima.ro)) has been active so far, carried out by the Government of Romania, through the Ministry of Environment, Water and Forests, with the World Bank (project co-financed by the European Regional Development Fund through the Technical Assistance Operational Programme, 2007-2013), targeting climate change objectives, with reference to all sectors on which an impact of climate change has been found (water, biodiversity, agriculture, fishing, transport, regional development, energy, etc.). The current “Integrated National Energy and Climate Change Plan 2021-2030” (PNIESC) establishes national targets for 2030 in terms of reducing greenhouse gas (GHG) emissions, the share of renewable energy sources (RES) in final energy consumption and increasing energy efficiency. Thus, Romania has committed to reduce the ETS emissions by 43.9% by 2030, compared to 2005, and to increase the global share of energy from renewable sources in the gross final energy consumption by 30.7%. These commitments represent our country’s efforts to help meet the climate targets set by the European Union by 2030: reducing greenhouse gas emissions by at least 55% and increasing the share of energy from renewable sources in the gross final energy consumption 32%.

We can get a picture of the quality of air in Hungarian counties based on the data of measurement stations from the National Network for Measuring Air Pollution.

The manual NO<sub>2</sub> concentration measurement points are located in Békés county, at Békéscsaba, Gyula and Orosháza, Csongrád-Csanád county, at Hódmezővásárhely, Kistelek, Makó, Szeged, in Hajdú-Bihar county, at Debrecen and Hajdúszoboszló, and in Szabolcs-Szatmár-Bereg county at Kisvárda, Mátészalka, Nyíregyháza, Tiszavasvári, Záhony.

In spite of the slight decrease registered in 2020, there was a NO<sub>2</sub> growth tendency at almost all manual measurement stations of the counties in recent years. There was also an exceeding of the daily limits in certain spots (in 2020).

The locations of automatic measurement stations and atmospheric pollutants measured are included in the table below.

*Table 1 Data of automatic measurement stations operational in the four counties involved from Hungary*

			Measured atmospheric pollutants										
City	Address	Type of station	NO	NO <sub>2</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	O <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	COV	BTEX	
Nyíregyháza	Széna tér	Urban traffic	x	x	x	x	x	x	x	x	-	-	
Debrecen	Kalotaszeg tér	Urban fund	x	x	x	x	x	x	x	x	-	x	
Debrecen	Nagyerdéi krt. 98. (Clinică)	Sub-urban fund	x	x	x	x	x	x	x	-	-	-	
Debrecen	Hajnal u.	Urban traffic	x	x	x	x	x	-	x	-	-	x	
Szeged	Rózsa utca	Urban fund	x	x	x	x	x	x	x	x	-	x	
Hortobágy*	fond rural		x	x	x	x	-	x	x	x	-	-	

\*Fund station operated by the National Meteorology Administration.

According to the data from the temporal series of automatic measurement station, the concentration of benzen is decreasing, a similar trend being observed for PM<sub>10</sub> and PM<sub>2.5</sub>, that were measured recently, the ozone is decreasing in Szeged and stagnates in

other places and there are no significant changes in the concentrations of nitrogen oxides, azote dioxide and carbon monoxide, that does not causes problems. As regards the sulphide dioxide present in a low atmospheric concentration, there is an increase at Szeged, but there is no significant change in the other settlements recently.

The hourly limit value of azote dioxide was exceeded most of the time in Debrecen: 32, 7, 41 (Hajnal utca, Kalotaszeg tér, Klinikák), and, in Nyíregyháza, 7 excesses were registered (which remained below the limit value in Szeged). After UV radiations, the limit value for ozone, the secondary pollutant from nitrogen oxides, was exceeded only at the county seat of Hajdú-Bihar in 2020: 19, i.e. 8 times (Kalotaszeg tér, Klinikák).

The measured concentration exceeded the limit value of 24 hours for particulate matter ( $PM_{10}$ ) in Szeged in 14 days, in Nyíregyháza in 32 days, in Debrecen on Hajnal street in 11, in Kalotaszeg tér in 16 and at Klinikák in 5 days, and in 2020 in Debrecen in Kalotaszeg tér 2 times, at Klinika 1 time, and in Nyíregyháza and Szeged the information threshold was exceeded 1 time for each.

Békéscsaba, Kistelek, Debrecen, Hajdúbőszörmény and Nyíregyháza also particulate in the programme of sampling the samples of particulate matter; based on the most recent results, the air quality is good for  $PM_{10}$ , but Hajdúbőszörmény is polluttet by benzo(a)piren borne by particulate matters, and Kistelek registered appropriate results (the other localities).

The primary source of pollution is residential heating, which plays a key role in the concentration of particulate matter and non-methane volatile organic compounds (in cold weather). Although the connection to the gas grid is between 68% (Hajdú-Bihar county) and 81% (Csongrád-Csanád county), only collective dwellings, respectively 63% (Hajdú-Bihar county), 66% (Csongrád-Csanád and Szabolcs-Szatmár-Bereg) use gas for heating) and 75% (Békés county). The importance of heating in air quality dynamics (with the reduction of natural gas, which is considered to be the most favourable for air quality, and the possible use of biomass and e.g. of waste, such as rubber, plastics, etc.) for which combustion is increased throughout the country. The influencing role of weather conditions is also significant.

The table below containing the emissions reported by atmospheric pollutants with a reporting obligation (industrial and services) shows that the emissions of atmospheric pollutants from the studied counties are not significant at a national scale, except for emissions of greenhouse gas in Hajdú-Bihar County; not only exceeds the emissions of the other three counties but also represent around a third of the total emissions at national level! It must also be mentioned that the carbon monoxide which was the defining factor in Szabolcs-Szatmár-Bereg county, but even reported to the total national emissions, represents only a small quantity (~3%).

The main sources of emission are concentrated in the county seats.

*Table 2 A few typical data regarding emissions for the Hungarian area studied in 2020, kg (source: LAIR)*

Emissions	Békés County	Csongrád-Csanád County	Hajdú-Bihar County	Szabolcs-Szatmár-Bereg County
<b>Solid matter (kg)</b>	86 305	42 837	122 709	144 550
<b>Sulphur oxide (kg)</b>	297 979	12 847	52 519	18 965
<b>Carbon monoxide (kg)</b>	509 206	265 288	386 812	1 069 431
<b>Nitrogen oxide (kg)</b>	544 354	467 732	424 219	478 825
<b>Carbon dioxide (kg)</b>	277 831	424 275 961	10 378 187	371 977 083

Emissions	Békés County	Csongrád-Csanád County	Hajdú-Bihar County	Szabolcs-Szatmár-Bereg County
	497		569	
	<b>Békéscsaba</b>	<b>Szeged</b>	<b>Debrecen</b>	<b>Nyíregyháza</b>
<b>Solid matter (kg)</b>	9 510	7 482	18 551	9 080
<b>Sulphur oxide (kg)</b>	34 021	4 006	29 370	2 871
<b>Carbon monoxide (kg)</b>	313 952	66 045	213 591	57 632
<b>Nitrogen oxide (kg)</b>	60 024	138 577	304 099	114 800
<b>Carbon dioxide (kg)</b>	73 236 169	174 945 069	10 330 917 558	29 808 375

In relation to air pollution related to transportation, it can be said that, except for small particulate, **the vast majority of emissions of air pollutants (especially nitrogen oxides, nitrogen dioxide) are caused by transportation, especially road transportation in the region.** The traffic is intense in the center of significant settlements at the level of the county; based on the data from the Information and Database System of Transportation, this exceeds even the value of 20,000 units/day on the main roads from Debrecen, Szeged and Nyíregyháza, but is between 8,000 and 20,000 units/day and in Békéscsaba. In the localities with high transit and destination traffic, high concentrations of air pollutants from transportation cannot be excluded due to the density of buildings: first of all, in relation to nitrogen oxides and ozone, but volatile organic pollutants must also be mentioned. Moreover, not arranged, unpaved roads can be a significant source of dust when the weather is dry and windy.

The main railways from the studied area (the railway line 140 Cegléd–Szeged, no. 120 (Budapest–)Szolnok–Békéscsaba–Lőkösháza, no. 100 Szolnok–Debrecen–Nyíregyháza–Záhony, no. 100c Szerencs–Nyíregyháza) are electrified, however, there are a lot of secondary non-electrified or partially electrified lines in the area. Therefore, the emissions of atmospheric pollutants from the diesel traction must be taken into account.

The largest three towns in the area also have an international airport, the most important is Debrecen, the one in Nyíregyháza has lower traffic, and the one in Szeged is used mostly for leisure. [There is also a low-traffic airport in Békéscsaba.](#) The emissions of atmospheric pollutants from air traffic must be taken into account in the case of the county seat of Hajdú-Bihar county and of Szabolcs-Szatmár-Bereg county.

Among the other sources of air pollution, the following must be mentioned:

**Cultivated farmlands**, arable lands must be pollinated extensively in the periods uncovered by vegetation, in case of low precipitations. And during storage, handling and transportation of crops, a significant quantity of particulate matter is released in the air. The agriculture is also a major factor in emissions of ammonia.

Among domestic emissions, it must also be mentioned the possible **incineration of vegetation, garden waste** and, as applicable, of other waste.

Aside from the above, **the construction and demolition activities** also play a more significant role in the development of the concentrations of particulate matter.

The significant effects of climate changes are manifested at the level of the programming area from the Hungarian side. In the period 1901-1930, the area within the moderate warm-dry climate area (moderate cold – (moderate) dry in Szabolcs-Szatmár-Bereg) today mainly belongs to the warm-dry climate area, and Szabolcs-Szatmár-Bereg county has become warm-(Moderate) dry.

Aside from the visible effects of climate changes, the climate of the area is decisively affected by the landscape, by the features of the use of lands and especially in the larger and more urban settlements, by the growing heat island effect.

In the following short climate summary, we relied mainly on the information from the climate database of the National System of Geospatial Information of Adaptation (NATÉR) on the local processes of climate changes. The reference period of this database is 1971-2000, and the forecasts and projections for the future are valid for the periods 2021-2050 and 2071-2100. (Several climate models are used, and the conclusion of both models are presented in the table below to show the uncertainties). Certainly, significant differences can also be in the territory of the county, the table shows the smallest and the largest values estimated for the area (the values between brackets show the values that affect only a very small area).

*Table 3 Main characteristics of climate changes in the four counties of Hungary*

	1971-2000	Estimated change 2021-2050		Estimated change 2071-2100	
		ALADIN-Climate	RegCM	ALADIN-Climate	RegCM
Average temperature (°C)	9-10/10-11/(11-12)	1,5-2	1-1,5	3-3,5	3-3,5
Number of days with thermal discomfort warning *	3-4 – 8-9	15-20 – 25-30	0-5	40-45 – 50-55	15-20 – 25-30
Number of days of heat **	0,4-0,6 - 1,8-2	5-10 - 15-20	0-5	20-25 - 35-40	0-5
Global radiation (MJ/m <sup>2</sup> )	4400-4500 – 4700-4800***	(0-50)/50-100	0-50 - 100-150/(150-200)	100-150 – 150-200	150-200 - 350-400
Annual average precipitations (mm)	500-525 – 650-675	(-25-0)-50 - 25	-75 - 50 - 0-25	-100 -- 75 -- 50	-50 - 25 - 50-75
Number of days of precipitations beyond 30 mm	0-0.5-1	-0.5-0-0.5	0-0.5-1	0-0.5-1	0-0.5-1-1.5
Draught indicator Pálfa changed	3.5-3.75 - 5-5.25***	0.5-0.75-1	0-0.25-0.75-1	1-1.25-1.75-2	0.5-0.75-1.75-2

\* Day of thermal discomfort warning, when the daily average temperature exceeds 25°C.

\*\* Day of extreme heat, when the maximum daily temperature reaches or exceeds 35°C.

\*\*\* Data regarding the period 1961-1990.

The climate scenarios foresee a continuous significant increase until the end of the century, both of the average temperatures and of extremely high temperatures. The exposures to heatwaves is very high in Békés and Csongrád-Csanád counties, the highest in the country and in the other two counties it is lower; it is high, average and moderate in most of Szabolcs-Szatmár-Bereg county.

Aside from (and as a reaction to) temperature, in the last decades, the duration of sunshine and UV intensity also increased. A continuous increase is expected in the following decades.

In relation to the annual quantities of precipitations, it is expected a continuous decrease and change of the distribution of precipitations in the next period. The duration of periods of drought and the number of days with intense precipitations can increase more, namely precipitations will take more the form of torrential rain.

The frequency of days of storm (exceeding 15 m/s) is currently 35 days per year at national level in average, but due to the climate changes, it is estimated an increase of the frequency and in this sense.

All the four counties are very exposed to heatwaves, droughts, storms, floods and internal waters (in Hajdú-Bihar only for internal waters). The buildings' vulnerability to storms is a major concern in all four counties.

The endangerment of tourism is the highest in Békés county (especially tourism on the water shore, rural and of events in open air) and in Hajdú-Bihar county, while that of natural values is the highest in Hajdú-Bihar and Szabolcs-Szatmár-Bereg counties.

The conservation of natural values, especially in protected areas and Natura 2000 and Ramsar sites, is very important due to the effects of the increase of temperatures and precipitation deficits (and the reduction of the level of underground waters resulting from these) which are felt for a long time and will be exacerbated in the future.

The potential of generation of renewable energy is significant in all four counties due to the favourable geothermal and sun conditions, and of the biological waste from agriculture available for energy production, and the wide scale use of renewable energy sources is a priority at county and national level, as also highlighted in the county and national strategies.

The affected population is more and more aware of the changes and underlying problems: In 2015, the population of Szabolcs-Szatmár-Bereg and Csongrád counties, proved to have a more favourable attitude towards climate changes than the national average, and in Békés, it has proven to have a more favourable attitude compared to the average only among those in Hajdú-Bihar county. Climate changes are considered a social issue of lower levels compared to the national average in Szabolcs-Szatmár-Bereg and Csongrád-Csanád counties, and in Békés and Hajdú-Bihar at the same level with the national average. The intention to emigrate due to climate changes is concurrent with the national average in Csongrád-Csanád and Hajdú-Bihar counties, but surprisingly higher in Szabolcs-Szatmár-Bereg county and below the national average in Békés.

The Programme Implementation Region will have to respond through the proposed projects, taking measures to mitigate and adapt to the climate change effects, in terms of flood prevention, desertification, GHG emissions and energy efficiency.

### 3.2. Water

The Programme Area is rich in water resources (surface and groundwater), that offer excellent potential for energy generation and tourism.

**Banat river basin** is located in the south-west and west of the national territory and borders Serbia on the west, Hungary on the north-west, the Mures river basin and the Hungarian border on the north, the Danube river on the south, and the Mures river basin and Jiu river space on the east.

From an administrative point of view, the Banat river basin completely passes 2 territorial administrative units (**Timis County** and Caras-Severin County), and partly 3 other territorial administrative units (**Arad County**, Gorj County and Mehedinți County).

The total surface water resources in the Banat river basin amount to about 3,380 million m<sup>3</sup>/ year, of which the usable resources are approx. 392.2 million m<sup>3</sup>/year. These represent approx. 12% of the total resources and are formed mainly by the Timis, Bega, Barzava, Caras, Nera, Cerna rivers and their tributaries.

There are 9 important reservoirs in the Banat river basin (with an area of more than 0.5 km<sup>2</sup>), which have a complex use and amount to a useful volume of 290 million m<sup>3</sup>.

In relation to the population within the basin, the specific usable resource is 354 m<sup>3</sup>/place/year, and the specific resource calculated considering the theoretically available stock (multiannual average) is 3047 m<sup>3</sup>/place/year. The water resources in the Banat river basin can be considered sufficient and unevenly distributed in time and space.

Multiannual average flow rates for the main rivers in the Banat river basin are as follows: Bega 16 m3/s, Timis 37.6 m3/s, Barzava 6.37 m3/s, Caras 6.99 m3/s, Nera 15.1 m3/s and Cerna 19.1 m3/s.

Of the total length of the watercourses in the Banat river basin registered in cadastre records, the non-permanent watercourses represent about 60%.

A number of 311 surface water bodies have been identified in the Banat river basin, of which:

- ✓ 236 natural bodies of water, of which 236 are rivers;
- ✓ 74 heavily modified bodies of water, of which: 65 rivers and 9 reservoirs;
- ✓ 1 artificial water body.

In 2019, a number of 83 human agglomerations were identified in the Banat river basin (>2,000 PE), classified as follows: 1 urban agglomeration with (>150,000 PE) population, 5 urban agglomerations with a population between 15,000 and 150,000 PE, 1 urban agglomeration with a population between 10,000 and 15,000 PE, and 76 agglomerations with a population between 2,000 and 10,000 PE.

**Crisuri river basin** is located in the north-western part of the country and borders Somes river basin on the north and north-east, with Mures river basin on the south and east, and with the Republic of Hungary on the west.

From an administrative point of view, the Crisuri river basin completely passes 1 territorial administrative unit (Bihor County), and partly 5 other territorial administrative units ( Arad County, Hunedoara County, Cluj County, Salaj County and Satu Mare County).

Total population is about 835,187 inhabitants, the population density being 56.2 inhabitants/km<sup>2</sup>. The main urban agglomerations are as follows: Oradea, Salonta, Marghita, Beius, Alesd, **Brad, Santana, Ineu**, Huedin, Tasnad.

The total surface water resources in the Crisuri river basin amount to about 2,937.4 million m<sup>3</sup>/year, of which the usable resources are approx. 394.734 million m<sup>3</sup>/year. These represent approx. 13% of the total theoretical surface resources and are formed mainly by the Crisul Alb, Crisul Negru, Crisul Repede, Barcau and Ier rivers, and their tributaries.

There are 8 important reservoirs and an artificial lake in the Crisuri river basin (with an area of more than 0.5 km<sup>2</sup>), with complex use. The distribution of runoff during the year is uneven, the maximum volume spilled over the entire space being generally recorded in March-May, and the minimum in September-November. Of the total length of the watercourses in the Crisuri river basin registered in cadastre records, the non-permanent watercourses represent about 40%.

A number of 241 surface water bodies have been identified in the Crisuri river basin, of which:

- ✓ 226 rivers, of which 72 water bodies are non-permanent and the remaining 154 are permanent;
- ✓ 8 reservoirs;
- ✓ 7 artificial water bodies, of which 6 rivers - canals and derivations and 1 anthropic (artificial) lake.

In 2013, a number of 70 human agglomerations were identified in the Crisuri river basin (>2,000 PE), classified as follows: 1 urban agglomeration with (>150,000 PE)

population, 3 urban agglomerations with a population between 15,000 and 150,000 PE, 5 urban agglomerations with a population between 10,000 and 15,000 PE, and 61 urban agglomerations with a population between 2,000 and 10,000 PE.

**Mures river basin** is located in the north-western part of the country and borders with the Somes-Tisza river basin and Crisuri river basin on the north, with Crisuri river basin, Banat river basin and the border with Hungary on the west, with Siret river basin and Olt river basin on the east, and with Banat river basin, Jiu river basin and Olt river basin on the south.

From an administrative point of view, the Mures river basin passes the territory of 12 counties, as follows: Alba, **Arad**, **Bihor**, Bistrita-Nasaud, Brasov, Caras-Severin, Cluj, Harghita, Hunedoara, Mures, Sibiu, **Timis** (no towns).

Total population identified in 2011 is about 1,937,130 inhabitants, the population density being 68.4 inhabitants/km<sup>2</sup>. The main urban agglomerations are Targu Mures, Arad, Tarnaveni, Medias, Turda, Deva, Hunedoara, Sighisoara, Reghin, Odorheiu Secuiesc, Sovata, Campia Turzii, Copsa Mica.

The total surface water resources in the Mures river basin amount to about 5,876.3 million m<sup>3</sup>/year, of which the usable resources are approx. 1,054.07 million m<sup>3</sup>/year. These represent approx. 88.9% of the total resources and are formed mainly by the Mures, Tarnave, Aries, Strei and Cerna rivers, and their tributaries. There are 13 important reservoirs in the Mures river basin (with an area of more than 0.5 km<sup>2</sup>), which have a complex use and amount to a useful volume of 419.85 million m<sup>3</sup>.

In relation to the population within the basin, the specific usable resource is 544.14 m<sup>3</sup>/place/year, and the specific resource calculated considering the theoretically available stock (multiannual average) is 3033.5 m<sup>3</sup>/place/year. The water resources in the Mures river basin can be considered sufficient, but unevenly distributed in time and space. The theoretical underground resources in the Mures river basin are estimated at 729.55 million<sup>3</sup>/year of which the usable underground resources are 672.31 million<sup>3</sup>/year (representing 92.15% of the theoretical resources).

A number of 532 surface water bodies have been identified in the Mures river basin, of which:

- ✓ 414 natural bodies of water, of which 411 are rivers and 3 are lakes;
- ✓ 115 heavily modified bodies of water, of which 102 are rivers and 13 are reservoirs;
- ✓ 3 artificial water bodies (3 rivers - canals and derivations).

In 2019, a number of 184 human agglomerations were identified in the Mures river basin (>2,000 PE), classified as follows: 2 urban agglomerations with (>150,000 PE) population, 16 urban agglomerations with a population between 15,000 and 150,000 PE, 6 urban agglomerations with a population between 10,000 and 15,000 PE, and 160 urban agglomerations with a population between 2,000 and 10,000 PE.

**Somes-Tisza river basin** is located in the northern and north-western part of the country and is bounded by a natural border - the Tisza river with Ukraine for a length of 61 km on the north, with the border with Hungary on the west, and on the territory of the country is bordered on the east by the Siret river basin, on the south by the Mures river basin and on the south-west with the Crisuri river basin.

From an administrative point of view, the Somes-Tisza river basin covers the territories of 7 counties, specifically: Cluj, Salaj, Bistrita-Nasaud, Maramures, **Satu-Mare**, Alba and **Bihor**. The share of the last 2 counties is insignificant.

Total population is about 1.89 million inhabitants, the population density being 84.6 inhabitants/km<sup>2</sup>. The main urban agglomerations are as follows: Cluj-Napoca, Baia Mare, Satu Mare, Bistrita, Zalau, Sighetul Marmatiei, Dej, Borsa, Carei, Gherla, Viseul de Sus, Simleul Silvaniei, Negresti Oas, Targu Lapus, Jibou, Beclean, Nasaud, Sangeorz Bai, Cehu Silvaniei.

The total surface water resources in the Somes-Tisza river basin amount to about 6,361 million m<sup>3</sup>/year, of which the usable resources are approx. 971 million m<sup>3</sup>/year. Of these, approx. 70% are insured naturally, the main watercourses being: **Tisza, Somes**, Viseu, Somesul Mic, Lapus, Iza and Sieu, and their tributaries. The difference in water resources is ensured by reservoirs. There are 9 important reservoirs in the Somes-Tisza river basin (with an area of more than 0.5 km<sup>2</sup>), which have a complex use and amount to a useful volume of 291.3 million m<sup>3</sup>.

In relation to the population within the basin, the specific usable resource is 504 m<sup>3</sup>/place/year, and the specific resource calculated considering the theoretically available stock (multiannual average) is 3504 m<sup>3</sup>/place/year. The water resources in the Somes-Tisza river basin are sufficient, with a potential reserve, being evenly distributed in time and space. Multiannual average flow rates for the main rivers in the Somes-Tisza river basin are as follows: 130 m<sup>3</sup>/s (Tisza river at the exit of the country), 131 m<sup>3</sup>/s (Somes river at the Satu Mare hydrometric station), 5.83 m<sup>3</sup>/s (Crasna river at the Domanesti station).

Of the total length of the watercourses in the Somes-Tisza river basin registered in cadastre records, the non-permanent watercourses represent about 30.7%. The usable groundwater resources at the basin level are estimated at 316 million<sup>3</sup>, of which 59% come from groundwater and 41% from deep sources.

A number of 279 surface water bodies have been identified in the Somes-Tisza river basin, of which:

- ✓ 246 natural water bodies;
- ✓ 15 heavily modified rivers and 13 reservoirs;
- ✓ 5 artificial water bodies.

In 2013, a number of 130 human agglomerations were identified in the Somes-Tisza river basin (>2,000 PE), classified as follows: 3 urban agglomerations with (>150,000 PE) population, 12 urban agglomerations with a population between 15,000 and 150,000 PE, 5 urban agglomerations with a population between 10,000 and 15,000 PE, and 110 urban agglomerations with a population between 2,000 and 10,000 PE.

The quality of water on the Hungarian side of the implementation of the Programme is presented per counties. The presentation per counties corresponds approximately to the territories of water administrations (the conformity is not 100%, but covers approximately the territories of the counties). The presentation is based on the following: Szabolcs-Szatmár-Bereg county: the territory of Water administration for the Felső-Tisza region, Hajdú-Bihar county: Water administration for Tiszántúl, Békés County: Water administration for the Körös region, Csongrád-Csanád county: the territory of the water administration for the Alsó-Tisza region. Due to the high number of ground water bodies, the following table summarizes the integrated state of ground water bodies of the counties involved, based on the data from the 2<sup>nd</sup> Management plan of the hydrographic basin (hereinafter: VGT2 Plan).

Table 4 State of ground water bodies in the counties involved from Hungary (Source: VGT2)

Code VIZI G	County	Number of water courses	Excellent / good state	Moderate state	Low/poor state	Number of bodies of standing waters	Excellent/good state	Moderate state	Poor/bad state
FETI	Szabolcs	40	5 (good)	22	12	12	1 (good)	5	2
TI	Bihar	40	3 (good)	21	15	13	1 (good)	1	2
KÖ	Békés	29	1 (good)	21	7	6	0	3	0
ATI	Csongrád	53	0	9	31	24	0	6	9

As can be seen in the table, the integrated state of ground water bodies from the counties involved (except for Csongrád county) is considered moderate, taking into account the ecological and chemical evaluation. In the south part of the area, no water body was classified as excellent or of good quality, but the majority of water bodies are in a poor state.

Among the water bodies affected in the area, we mention the following water bodies:

- In Szabolcs-Szatmár-Bereg county, Szamos, Túr and 3 of the 4 sections affected of Tisza are in a moderate state (Tisza section from Túr to the Szipa canal is in a good state)
- In Hajdú-Bihar county, Berettyó, of major importance is also of moderate category, along with the main canals of Keleti and Nyugati of the area.
- In Békés county, the Hortobágy-Berettyó state, that belongs to the operating area of KÖVIZIG, is poor; between the Cris rivers, both Sebes-Körös, and Kettős-, Hármas-, Fekete- and Fehér-Körös are of moderate state (In the natural classification, there are only upper sections of water bodies Sebes-Körös and the lower ones of Hármas-Körös)
- In Csongrád county, Mureş and the involved section of Tisza (from Hármas-Körös to the south border) are also in a moderate state.

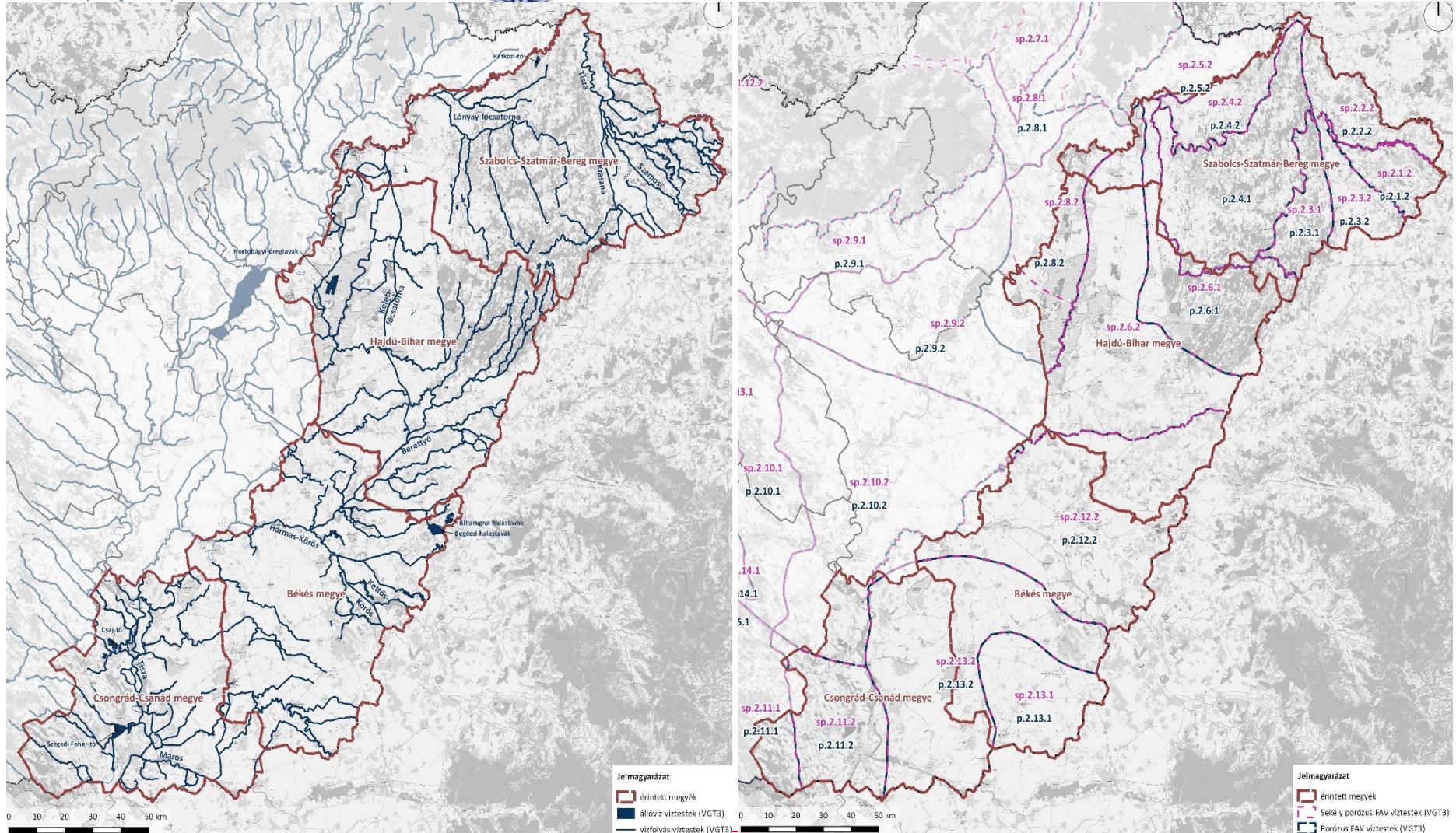
For ground water bodies involved in the counties, the main diffused source of pollution mainly comes from underground waters in case of nitrogen pollution and in case of phosphorus, the erosion of farmlands is the primary source of pollution. VGT2 identified 147 pollutions of the municipal waste water from the area, among which the effect of pollution by nutrients and organic matter on the reception point is significant in the 27 cases. Among the 225 industrial sources and other punctiform sources, the impact is significant in 96 of the cases.

The following table resumes the state of underground water bodies from the counties involved, for which the quantitative and chemical state were evaluated separately in VGT2. The table shows that there is no problem with the chemical state of water bodies, with 2 exceptions, but the quantitative state is where we can notice a few weak classifications that mainly affect shallow porous water bodies close to the area.

Table 5 State of underground water bodies in the counties involved from Hungary (Source: VGT2)

Code VIZIG	Water body code	Water body	Aggregate quantitative state	Aggregate chemical state
ATI	sp.2.11.1	Duna-Tisza közi hátság - Tisza-vízgyűjtő Southern part	poor	Good, with a risk of being poor
ATI	sp.2.11.2	Alsó-Tisza-völgy	Poor	good
ATI	p.2.11.1	Duna-Tisza közi hátság - Tisza-vízgyűjtő Southern part	good	good
ATI	p.2.11.2	Alsó-Tisza-völgy	poor	good
ATI	sp.2.13.1	Maros-hordalékkúp	good	good, with risk of being poor
ATI	p.2.13.1	Maros-hordalékkúp	good	good
ATI	pt.2.1	Dél-Alföld	good, with risk of being poor	good
FETI	sp.2.3.1	Nyírség Eastern edge	poor	poor
FETI	sp.2.3.2	Kraszna-völgy, Szamos-völgy	good, with risk of being poor	good
FETI	p.2.3.1	Nyírség marginea estică	good	good
FETI	p.2.3.2	Kraszna-völgy, Szamos-völgy	good	good
FETI	sp.2.1.2	Szatmári-sík	good, with risk of being poor	good
FETI	p.2.1.2	Szatmári-sík	good	good
FETI	sp.2.4.1	Nyírség - Lónyay-főcsatorna-vízgyűjtő	poor	good
FETI	sp.2.4.2	Rétköz	poor	good
FETI	p.2.4.1	Nyírség - Lónyay-főcsatorna-vízgyűjtő	good	good
FETI	p.2.4.2	Rétköz	poor	good
FETI	sp.2.2.2	Beregi-sík	poor	good, with risk of being poor
FETI	p.2.2.2	Beregi-sík	poor	good
KÖ	pt.2.3	Délkelet-Alföld	good	good
KÖ	sp.2.12.2	Körös-vidék, Sárrét	poor	good
KÖ	p.2.12.2	Körös-vidék, Sárrét	poor	good
KÖ	sp.2.13.2	Körös-Maros köze	Poor	poor
KÖ	p.2.13.2	Körös-Maros köze	good	
TI	sp.2.8.2	Sajó-Takta-völgy, Hortobágy	poor	good
TI	p.2.8.2	Sajó-Takta-völgy, Hortobágy	poor	good
TI	sp.2.6.1	Nyírség partea sudică, Hajdúság	poor	good
TI	sp.2.6.2	Hortobágy, Nagykunság, Bihar Northern part	poor	good, with risk of being poor
TI	p.2.6.1	Nyírség partea sudică, Hajdúság	good	good
TI	p.2.6.2	Hortobágy, Nagykunság, Bihar Northern part	poor	good

<b>Water body</b>	<b>Aggregate quantitative</b>	<b>Aggregate chemical state</b>
Tl pt.2.4 Északkelet-Alföld	Good	good



**Figure 1** Ground water bodies (left) and underground water bodies (right) in the Hungarian specific area (Source: VGT2)

**In terms of the technical-utility infrastructure**, there are water and wastewater infrastructure projects currently in various stages of implementation for the Programme implementation area, which will significantly contribute to the improvement of the environmental conditions regarding the water supply and the sewerage system (e.g., The regional project for the development of water and wastewater infrastructure in Timis County, in the period 2014-2020; eligible value: €159.56 mil.). Please note that the aforementioned project is financed from the Large Infrastructure Operational Programme 2014-2020.

Throughout Timis County, 97 localities were connected to the water distribution network in 2019, out of which 10 municipalities and cities, with a total length of the water distribution network of 3,618.1 km. Also, 48 localities were connected to the public sewerage network in 2019, out of which 10 municipalities and cities, with a total length of the sewerage pipes of 1,748.4 km.

Throughout Arad County, 70 localities were connected to the water distribution network in 2019, out of which 10 municipalities and cities, with a total length of the water distribution network of 3,038.6 km. Also, 38 localities were connected to the public sewerage network in 2019, out of which 10 municipalities and cities, with a total length of the sewerage pipes of 1,383.6 km.

Throughout Bihor County, 74 localities were connected to the water distribution network in 2019, out of which 10 municipalities and cities, with a total length of the water distribution network of 2,818.8 km. Also, 37 localities were connected to the public sewerage network in 2019, out of which 10 municipalities and cities, with a total length of the sewerage pipes of 1,383.4 km.

Throughout Satu-Mare County, 57 localities were connected to the water distribution network in 2019, out of which 6 municipalities and cities, with a total length of the water distribution network of 1,848.5 km. Also, 25 localities were connected to the public sewerage network in 2019, out of which 6 municipalities and cities, with a total length of the sewerage pipes of 987.1 km. The *Regional project for the development of water and wastewater infrastructure in Satu-Mare County, in the period 2014-2020* is currently under way.

According to the data of the Central Institute of Statistics, the water utility infrastructure from Hungary is characterized by the following data in 2020, per counties:

The total length of the drinking water network of Békés county is 3118.4 km, and the level of connection of the houses in the county is 94%. The waste water sewage is 2206.1 km long and the rate of connection is 78.5%. The public sewage is in a separate system, almost the entire quantity of discharged waste water (98.4%) is treated in the 3rd stage of treatment.

In Csongrád-Csanád county, the public drinking water supply network is 2664 km long, the rate of connection being of 92.6%. From the public sewage of 1988 km, less than 16% is in unitary system. The network serves 81.3% of the county's houses. 97.2% of the waste water discharged is treated in the 3rd stage of treatment.

Hajdú-Bihar county has a drinking water network of 3063.4 km in length, the rate of connection being of 94.7%. 79.3% of the houses are connected to the public sewage network having a total length of 2579.4 km. Only an insignificant part of the sewage network (0.6%) is in unitary system and 99.9% of the discharged waste water goes through the 3<sup>rd</sup> stage of treatment.

In Szabolcs-Szatmár-Bereg county, the drinking water network of 3975.3 km in length supplies 92.99% of the houses. Only 74.8% of the houses were connected to the waste water sewage network of 3248.3 km in length and is almost exclusively in a separate system. 91.7% of waste water discharged goes through a 3rd stage of treatment.

Due to Hungary's natural resources, the water supply of public services is predominantly based on groundwater sources. Two-thirds of drinking water supply is from vulnerable sources.

The following figure presents the protection areas for underground water intakes, showing that the intakes of the area are mainly from porous water bodies. According to the VGT2 records, in the area there are 438 databases in total, of which 364 are operational, the water base being unequivocally vulnerable in 95 of the cases. Surely, most of the production that must be protected is located in the largest cities (Debrecen, Nyíregyháza, Szeged).

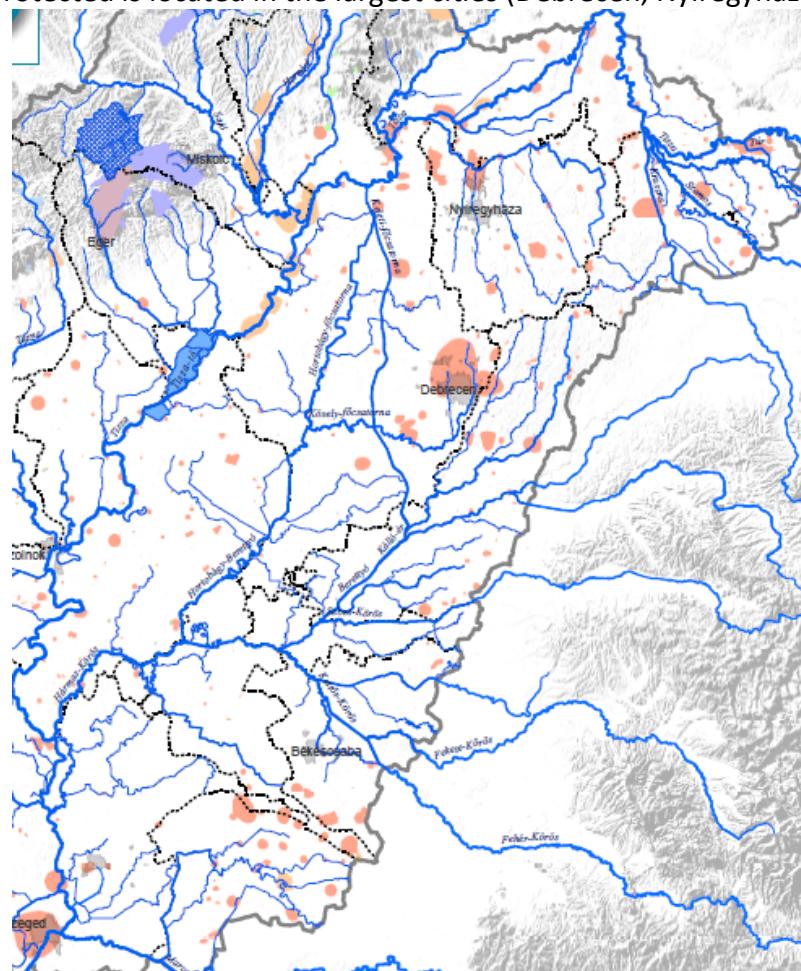


Figure 2 Areas for protection of underground drinking water bodies (Source: VGT2)

We saw that, regarding the ecological/chemical state of the water bodies in the Romanian Programme Area, they are evaluated as “good” changing to “average” towards the border. Thus, water pollution is a vulnerability in the area, which could be addressed through joint actions under risk prevention strategies, but which are not related to climate change.

### 3.3. Soil and land use

Soil quality is affected by varying degrees of pollution caused by various industrial and agricultural activities (especially in the Hungarian part of the PA). In terms of soil protection, pollution means any interference that affects their quality from a qualitative and/or quantitative point of view.

The main economic sectors with a significant impact on the soil come from: mining and metallurgy (by processing and storage of waste, tailings ponds and tailings dumps), chemical industry (by the storage of waste from chemical, petrochemical and drug plants, abandoned sites), oil industry (by polluting the soil with hydrocarbons and heavy metals), old pesticide storage and other large-scale activities (metal processing, non-compliant municipal landfills, military sites, wood processing industry, coal-fired power plants, transport activities, service activities, etc.).

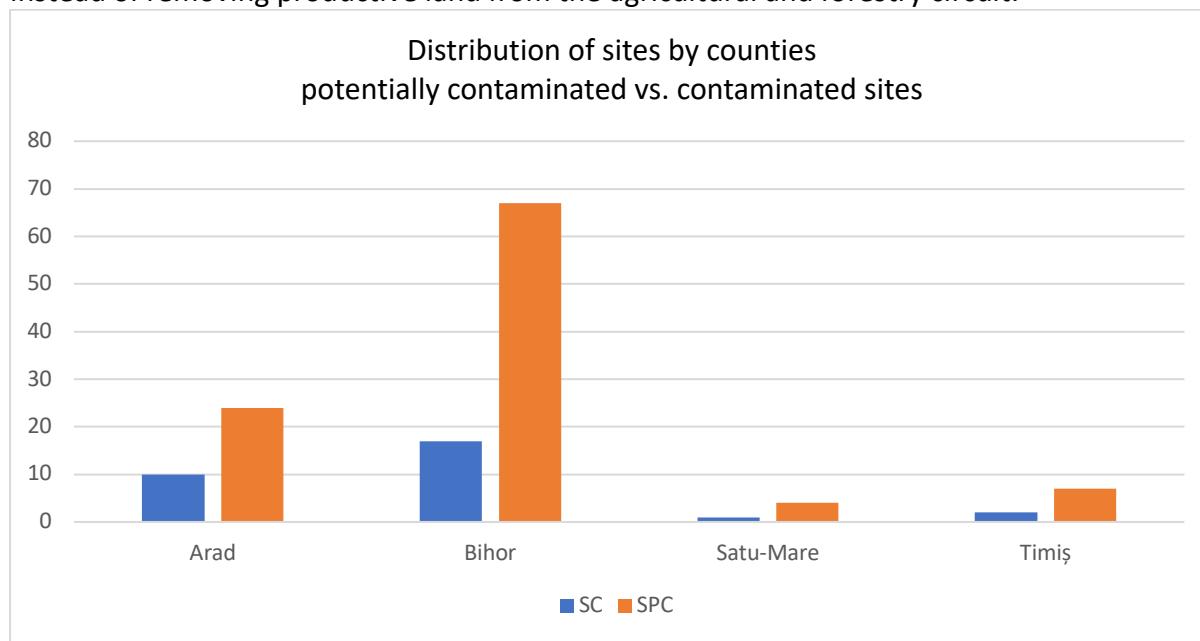
GD no. 683/2015 was published in the Official Gazette in 2015, which approved the National Strategy and the National Plan for the Management of Contaminated Sites in Romania, based on the national inventory updated by the National Agency for Environmental Protection. This document proposes a series of environmental and socio-economic objectives.

Specific environmental objectives:

- ✓ Reducing the area occupied by contaminated sites;
- ✓ Improving the quality of environmental factors in the occupied areas and implementing a unitary management nationwide.

Specific socio-economic objectives:

- ✓ Remediation of contaminated sites to achieve an appropriate condition for the subsequent planned use;
- ✓ Ensuring the protection of water resources, food security and human health;
- ✓ Promoting the future use of restored sites for economic and social development instead of removing productive land from the agricultural and forestry circuit.



\* PCS - potentially contaminated sites; CS - contaminated sites.

*Figure 3 Distribution by counties in the Programme area of potentially contaminated sites vs. contaminated sites (Source: National Strategy and National Action Plan for the Management of Contaminated Sites in Romania)*

Figure 3 shows that, following analyses, the situation is as follows on the territory of the 4 counties in the *Programme* area: Bihor County has the most contaminated sites, 17, followed by Arad County, 10. In the other two counties, specifically Timis, there are 2 contaminated sites, followed by Satu-MARE county with 1 contaminated site.

Regarding the potentially contaminated sites, the counties that have the most such sites are: Bihor County, 67, followed by Arad County, 24. In the other two counties, specifically Timis, there are 7 potentially contaminated sites, followed by Satu-Mare county with 4 potentially contaminated site.

In Hungary, the geological characteristics and those of the soil are approached separately below.

### Geology

The Carpathian-Panonic region is divided in two large blocks of rock with different geological evolutions through a main structural line, the alignment of Central Hungary, on the Zagreb–Kaposvár–Sátoraljaújhely line: the border area is located South-east of the alignment, on the Tisza-Dacia unit. Under the studied area, the mesozoic basin is located at a medium depth of 1000-3000 m, and above it there are eocene layers, to a small extent and more thick, oligocene layers. These contains thinner and thicker panonic layers of miocen and a thin layer of quaternary sand-gravel. Due to the nature of the planned programme, the ground geological formations and the closest to the ground can be firstly affected. So we offer a short description of their evolution.

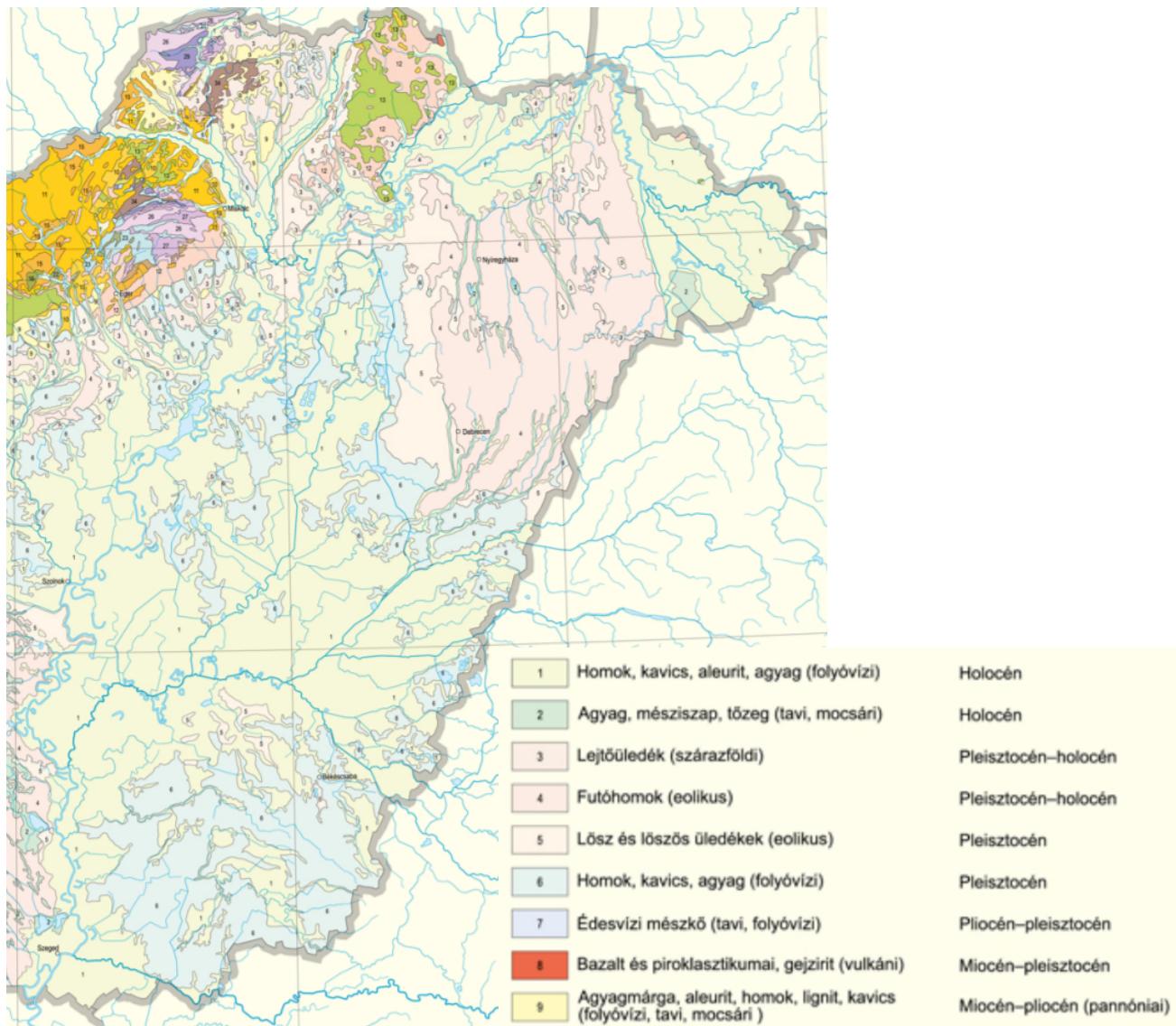
Millions of years ago, the Carpathic basin had been covered by sea. At the end of Pliocene, due to the elevation of the Dinaric Alps, the connection with the Mediteranean was interrupted, and due to the elevation of the Meridional Carpathians, the one with the Black Sea. In this basin, they brought the predecessors of the current rivers, their waters being collected from the precipitations from the Carpathians and the Alps. In time, the waters that entered sweetened the water of the basin and along with their water also supplied abundant sediments to the Panonic Sea.

In the meantime, the rivers became longer, continuing their winding path on the silts that they brought and deposited. The former sea of the Caprathian Basin was loaded slowly with many silts. The different types of silts were created in different layers, alternating and overimposing each other, storing large quantities of water.

Quaternary geological formations were determined by the continuous subsidence. In the second half of the geological quaternary, the Great Plain of Alföld was created during the elevation of the Danube-Tisza area and of the sandy region of Nyírség and of the simultaneous subsidence of the southern and central parts. The same rocks that were at the surface of the local mountain regions submerged at 1,500-3,000 m depth inside the Great Plain. As the subsidence process slowed down, the great lake was filled slowly and was transformed into a marshy meadow. The river course is dictated by the rift lines created during the subsidence and elevation. This is when Tisza was created through the interconnection of the rivers from the Northern edge and on the plain filled by them it went south, where the end of the plain corridor descended the most. The quaternary formation and the pliocene layer are the thickest over the parts of base rick submerged at the deepest level. Well over half of the surface of the pleistocene ensemble is loose sand (see *Figure 4*).

The quaternary formations mainly consist of series of reef facies interrupted by thinner clay-sandy sediments of the floodable area. Usually, they are from the pleistocene in the Southern and central area and from the holocene in the North-eastern part and Körös

region. Wind formations (wind sands and loess) are mainly found in the Nyírség area (see *Figure 4*).



*Figure 4 Geological ground formation of the border region (Source: Kocsis, K. (ed-şef.) (2018): Magyarország Nemzeti Atlasza – Természeti környezet. Budapest, MTA CSFK Földrajztudományi Intézet. 187 p. /National Atlas of Hungary – Natural environment)*

## Pedology

An important national value of the area is the arable land rich in humus. The various types of soil from the area of study have a mosaic arrangement. The sandy version of the highest quality cernosiom soils also appears. In the floodable areas along the rivers there is a low quality alluvial soil created. In the high floodable areas there is a medium quality meadow soil. Nyírség are is renowned for the sandy soil with a low water management, where ground erosion is characteristic. Salin, salty soils can be observed in Hortobágy, and this type of soil is also characteristic for Békés county (see *Figure 5*).

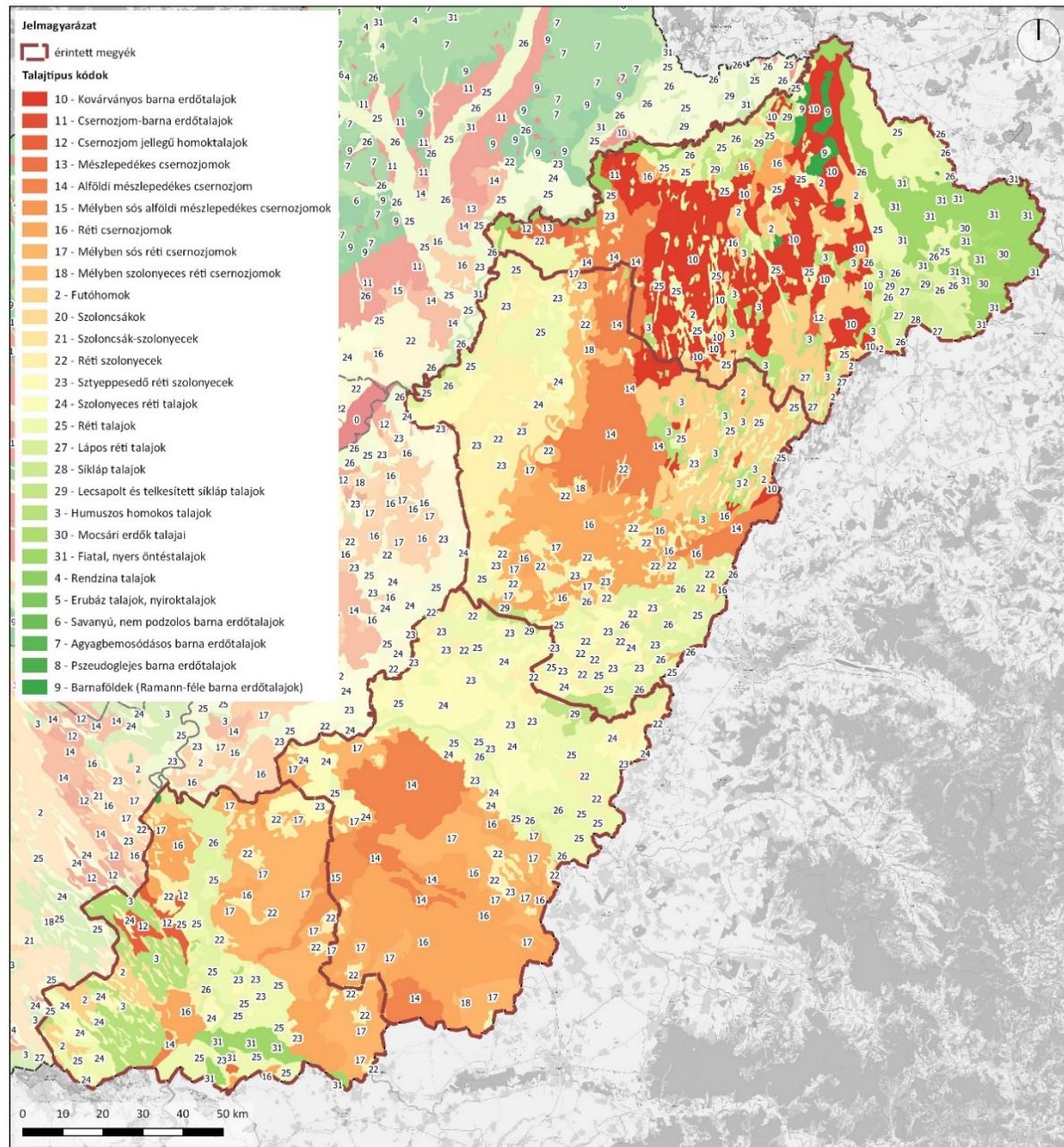


Figure 5 Types of soil characteristic for the studied area (Source: series of agrotopographical maps, 2009)

Soils are threatened by various effects. The predisposition of drought and the intensification of extreme weather phenomena are pronounced in the region. The area threatened by wind erosion is due to the high rate of loose sand and wolian sand soils, and wind erosion also threatens the layer of humus of cernosiom soils. Today, the planted forests reduced the level of danger, but outside the vegetation period, the damaging effect of the wind over the soil grows. Cultivated areas are exposed to a higher risk, where the eolian erosion activity increases significantly at the beginning of spring (a period characterized by higher medium wind speed) and in late autumn, due to the low coverage of the land. The process of salinization can be observed in several areas, with direct effects that inhibit the fertility of the soil.

The use of organic, anorganic fertilizers and pesticides is also a key risk factor for the conditions of the soil. Lately, there is a tendency to increase their application, and

Hungarian soils are more exposed to chemical pollution than Romanian soils. According to the National Institute of Statistics, agriculture in Hungary uses approx. two times more chemical fertilizer and pesticides in agricultural activities compared to Romania.<sup>3</sup> Therefore, in relation to the risk of pollution of soil and underground water resources from agricultural activities that involve the use of chemical substances, these are a more pressing problem for Hungary due to the high quantities of chemical substances for a longer period of time.

The pollution of the soils in the area is caused firstly by sources from various industrial storage activities and possibly failures. Soil pollutions are usually local and rarely disclosed. They are most frequent in the vicinity of the railway infrastructure, of industrial installations and former sovietic barracks. These are caused mainly by the contamination with aliphatic and aromatic hydrocarbons from the improper handling of tanks, eventually caused by heavy metals, ammoniac or pesticides. Currently, the remedy at Tiszavasvári on the territory of Alkalodia is ongoing (solvents from pharmaceutical production and HAP compounds), in Békéscsaba at Fényes-tanya (toluene and chloride hydrocarbons from the printing industry) and Balmazújváros, Lászlóháza (cyanide and trichloroethylene compounds from the collection and transportation of dangerous waste).<sup>4</sup>

### Risks of industrial accidents

The operation of installations entails a significant risk for the environment, mainly due to the dangerous properties (toxic, explosive, inflammable etc.) of the materials used in the installation, regardless whether the installation carries out industrial, agricultural or other type of activities (for example storage).

The categories of risk of the installations are defined in the Government Ordinance 219/2011 (X. 20.) on protection against serious accidents that involve hazardous substances, depending on the quality and quantity of present hazardous substances. In the administrative area of the counties studied there are 58 hazardous installations in total, of which 33 are deemed of low risk and 25 of high risk.

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<sup>3</sup> In 2018, in Hungary there were 1.59 kg of active ingredients pesticides per hectares of farmland and 88.97 kg of active ingredients nitrogen and phosphorous per hectare of farmland, compared to 0.83 kg/ha and 41.07 kg/ha in Romania. (Source: <https://www.ksh.hu/sdq/3-17-sdq-12.html> and <https://www.ksh.hu/sdq/3-16-sdq-12.html>)

<sup>4</sup> In Békés county, for example, there are 34 potentially polluting areas affected by the active remedy, of which 7 are part of the National Programme of Environment Remedy.

Table 6 Hazardous installations located in Hungarian counties studied

Name	County	City	Hazardous level <sup>5</sup>	Activity
Borealis L.A.T Hungary Kft.	Békés	Békéscsaba	Low threshold operation	Chemical fertiliser deposit
Magyar Földgáztároló Zrt.		Kardoskút	High threshold operation	Gas industry
IKR Termelésfejlesztési és Kereskedelmi Zrt.		Kardoskút	Low threshold operation	Chemical fertiliser deposit
Henkel Magyarország Kft.		Körösladány	Low threshold operation	General chemical industry
Guardian Orosháza Kft.		Orosháza	High threshold operation	Heavy industry, machinery, rubber industry, glass industry, plastic industry
KITE Zrt.		Telekgerendás	Low threshold operation	Chemical fertiliser deposit
Kígyós Major Kft.		Újkígyós	Low threshold operation	Chemical fertiliser deposit
MOL Nyrt. KTD Algyő Főgyűjtő /Colector principal/		Algyő	Low threshold operation	Gas industry
MOL Nyrt. Algyő Metanol Tároló /Rezervor metanol	Csongrád	Algyő	Low threshold operation	Gas industry
MOL Nyrt. KTD Algyő E-10 tartálypark /parc rezervoare/		Algyő	High threshold operation	Gas industry
MOL Nyrt. KTD Algyő Gázüzem /Instalație gaz/		Algyő	High threshold operation	Gas industry
PRÍMAGÁZ HUNGÁRIA Zrt.		Algyő	High threshold operation	Gas industry
MOL Nyrt. KTD Algyő Vasúti- Közúti Töltő és Gázterméktisztító /stație încărcare și epurare gaze feroviară-rutieră/		Algyő	High threshold operation	Gas industry
MMBF Zrt.		Algyő	High threshold operation	Gas industry
MOL Nyrt. Algyő Vasútüzem		Algyő	High threshold operation	Oil industry
IKR Agrár Kft.		Hódmezővásárhely	High threshold operation	Chemical fertiliser deposit
KITE Zrt. alközpont		Hódmezővásárhely	Low threshold operation	Chemical fertiliser deposit
DIÓ 896 Kft		Hódmezővásárhely	High threshold operation	Deposit, logistical center
Szegedi Energia Zrt.		Szeged	High threshold	Electrical station,

<sup>5</sup> High threshold hazardous substance installation: those in which the quantity of hazardous substances present (including hazardous substances that are estimated to be generated by the loss of control over the technology) reaches or exceeds the higher limit determined according to annex 1 to the aforementioned regulation.

Low threshold hazardous substance installation: those in which the quantity of hazardous substances present (including hazardous substances that are estimated to be generated by the loss of control over the technology) reaches or exceeds the lower limit determined according to annex 1 to the aforementioned regulation.

Name	County	City	Hazardous level <sup>5</sup>	Activity
Medikémia Ipari és Kereskedelmi ZRt.	Hajdú-Bihar		operation	heating station
Florin Vegyipari és Kereskedelmi Zrt.		Szeged	Low threshold operation	General chemical industry
Muligrade Kft.		Szeged	Low threshold operation	General chemical industry
FAG Magyarország Ipari Kft.		Szeged	Low threshold operation	Hazardous waste
TEVA Gyógyszergyár Zrt.	Szabolcs-Szatmár-Bereg	Debrecen	Low threshold operation	Heavy industry, machinery, rubber industry, glass industry, plastic industry
KRISTÁLY-99 Környezetgazdálkodási, Szolgáltató Kft.		Debrecen	Low threshold operation	Pharmaceutical industry
Hajdú Refuse Burner Környezetvédelmi Szolgáltató Kft.		Debrecen	Low threshold operation	Hazardous waste
E.ON Energiatermelő Kft.		Debrecen	High threshold operation	Hazardous waste
KITE Zrt.		Derecske	Low threshold operation	Electrical station, heating station
KISS-OIL-ÁRUHÁZ Kereskedelmi Rt.		Hajdúböszörmény	High threshold operation	Agriculture
PÉBÉ-COOP Gázipari Fejlesztő Forgalmazó és Gyártó Kft.		Hajdúszoboszló	Low threshold operation	Oil industry
MOL Magyar Olaj- és Gázipari Nyrt.		Hajdúszoboszló	High threshold operation	Gas industry
Evonik Agroferm Fermentációipari Zrt.		Kaba	Low threshold operation	Gas industry
CHEMICAL-SEED Mezőgazdasági, Beszerző, Értékesítő, Fejlesztő, Szolgáltató, Export-Import Kft.		Kaba	High threshold operation	Agriculture
Nádudvari Agrokémiai Kereskedelmi és Szolgáltató Kft.	Szabolcs-Szatmár-Bereg	Nádudvar	Low threshold operation	Deposit, logistic center
KITE Zrt.		Nádudvar	Low threshold operation	Chemical fertiliser deposit
MOL Magyar Olaj- és Gázipari Nyrt.		Nagyhegyes	High threshold operation	Production, storage of pesticides
Magyar Földgáztároló Zrt.		Nagyhegyes	High threshold operation	Gas industry
KLORID Vegyi- és Műanyagipari Rt.		Püspökladány	High threshold operation	General chemical industry
MOL Magyar Olaj- és Gázipari Nyrt.	Szabolcs-Szatmár-Bereg	Fényeslitke	High threshold operation	Oil industry
Tranzit Speed Kft.		Mándok	Low threshold operation	Chemical fertiliser deposit
NZRT-TRADE Kft.		Nagykálló	Low threshold operation	Chemical fertiliser deposit

Name	County	City	Hazardous level <sup>5</sup>	Activity
KITE Zrt.		Nagykálló	Low threshold operation	Production, storage of pesticides
Unilever Magyarország Kereskedelmi Kft.		Nyírbátor	High threshold operation	General chemical industry
FARMOL Hungary Termelő és Kereskedelmi Kft.		Nyírbátor	High threshold operation	Others
BU-GÁZ LUX Kereskedelmi és Szolgáltató Kft.		Nyíregyháza	Low threshold operation	Gas industry
E. ON Energiatermelő Kft.		Nyíregyháza	Low threshold operation	Centrală electrică, centrală termică
Anti-Germ Hungary Kereskedelmi Kft.		Nyíregyháza	Low threshold operation	General chemical industry
FARMMIX Kereskedelmi Kft.		Szamosszeg	Low threshold operation	Producție, depozitare pesticide
ZÁHONY-PORT Záhonyi Logisztikai és Rakománykezelési Kft		Tiszabezdéd	Low threshold operation	Chemical fertiliser deposit
Alfagas Kft.		Tiszabezdéd	High threshold operation	Gas industry
ZÁHONY-PORT Záhonyi Logisztikai és Rakománykezelési Zrt.		Tiszabezdéd	Low threshold operation	Chemical fertiliser deposit
PRÍMAGÁZ HUNGÁRIA Zrt.		Tiszabezdéd	High threshold operation	Gas industry
ALKALOIDA Vegyészeti Gyár Zrt.		Tiszavasvári	Low threshold operation	Pharmaceutical industry
ECOMISSIO Kereskedelmi és Szolgáltató Kft.		Tiszavasvári	Low threshold operation	Hazardous waste
Géptám Kft.		Tuzsér	High threshold operation	Gas industry
Várda-Garden-2001 kereskedelmi és Szolgáltató Kft.		Záhony	Low threshold operation	Chemical fertiliser deposit
KELET-TRANS 2000" Fuvarozó és Kereskedelmi Kft.		Záhony	High threshold operation	Chemical fertiliser deposit
TRANSFER-R KFT		Záhony	High threshold operation	Gas industry

Source: Revision of the Management Plan of the hydrographic basin, 2015

### Land use

At territorial level, there were 2,841,286 hectares of land area in the Programme implementation region at the end of 2014, distributed according to the figure below.

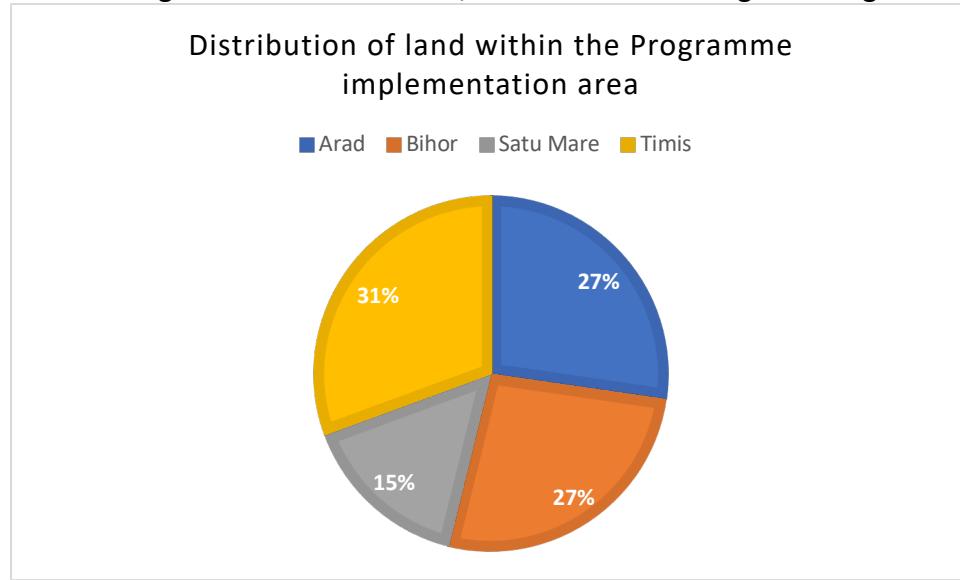


Figure 6 Distribution of land within the Programme implementation area (Source: Tempo On-line, INSSE)

Thus, Figure 6 shows that the highest percentage is in Timis County, 31% of the total implementation area followed by Arad and Bihor Counties, with 27% of the total implementation area. Satu-Mare County has about 15% of the total implementation area.

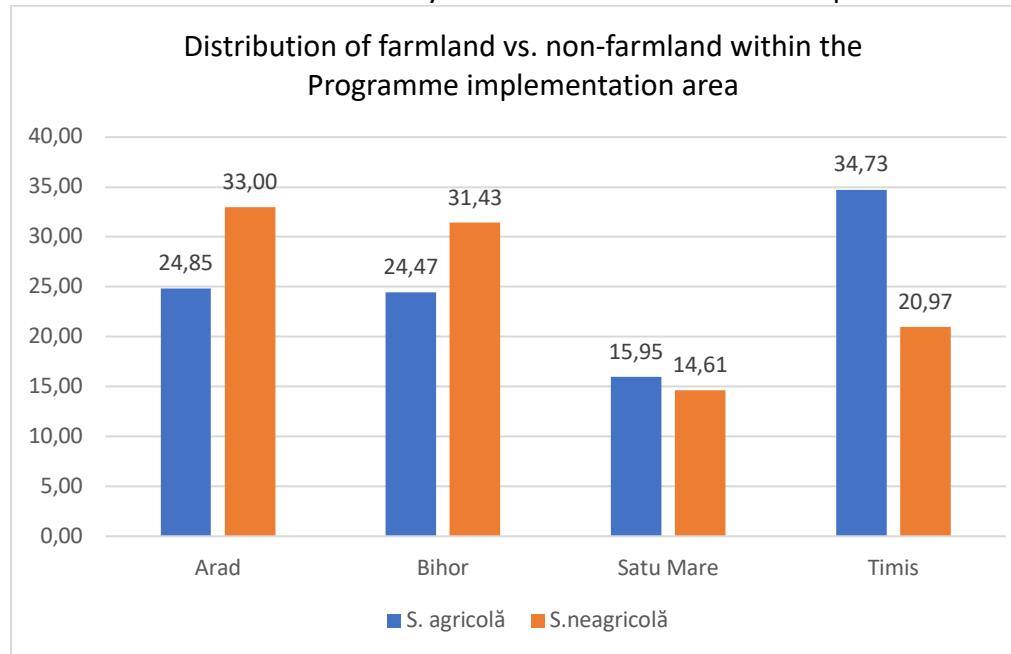
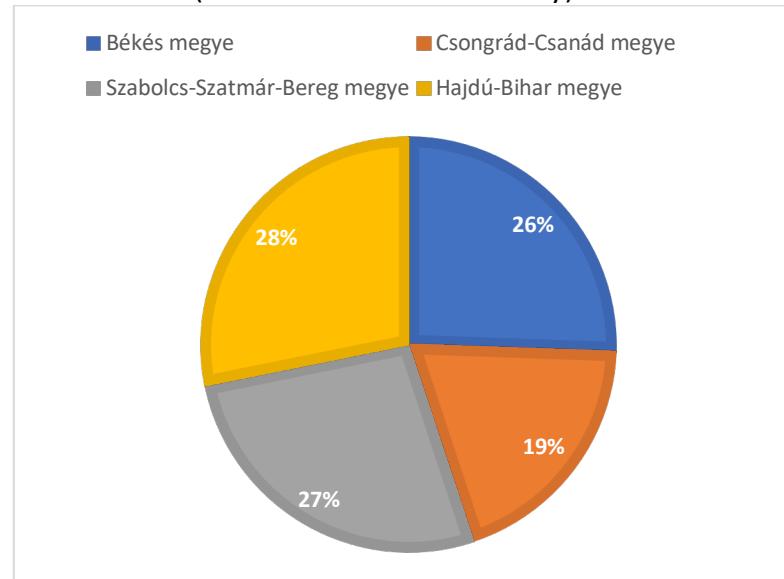


Figure 7 Distribution of farmland vs. non-farmland within the Programme implementation area (Source: Tempo On-line, INSSE)

**Error! Reference source not found.** shows the distribution of farmland and non-farmland areas for each County in the Programme implementation area. Thus, it can be seen that the farmland land surface is best represented in Timis County (34.73%), followed by Arad County (24.85%). The other counties have the following percentages regarding agricultural areas: Bihor County (24.47%) and Satu-Mare County (15.95%). In terms of non-agricultural

areas, Arad County has the highest percentage, respectively 33%, followed by Bihor County (31.43%). The other counties have the following percentages: Timis County (20.97%) and Satu-Mare County (14.61%).

In Hungary, the total area of the counties involved in the Programme is approx. 2,201,500 ha, split per counties according to the following figure. In Figure 8 the highest rate of the area involved is in Hajdú-Bihar County – 28% of the total area –, followed by Szabolcs-Szatmár-Bereg county (27%) and Békés county (26%), while Csongrád-Csanád county is smaller compared to the first (19% of the studied territory).



*Figure 8 Territorial distribution between the hungarian counties involved (drafted by the authors)*

The agricultural activity is the most characteristic method of using lands in all the Hungarian counties involved (see *Figure 9*).

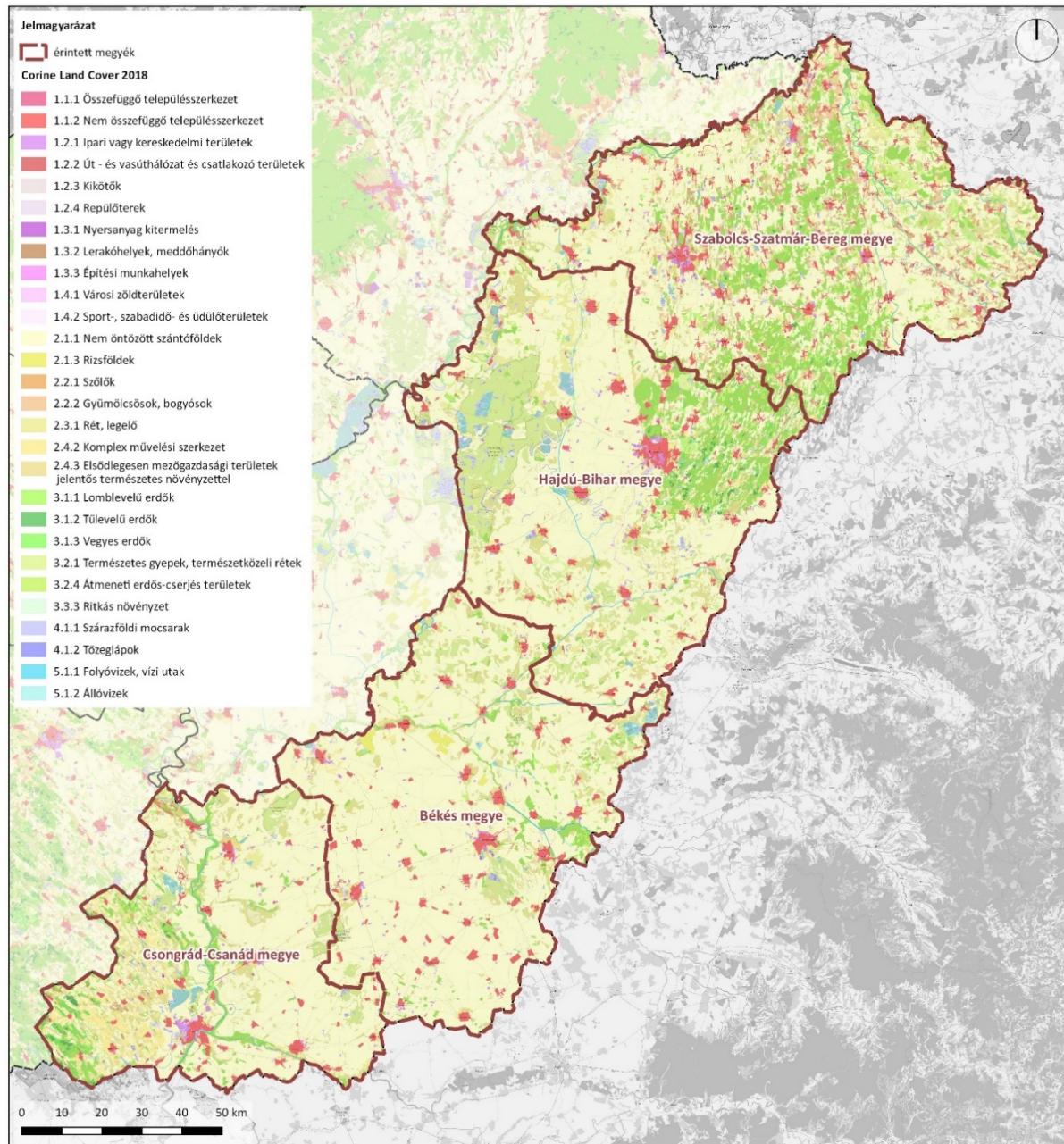


Figure 9 Categories of soil coverage in the Hungarian counties involved (drafted by the authors based on Corine Land Cover 2018)

By summarising based on the categories of soil coverage from Corine Land Cover 2018, the highest rate of use of farmlands in the country's "pantry" is in Békés county (89,5%), followed by Csongrád-Csanád county (83,6%), then by Hajdú-Bihar county (80,3%). In these counties, the agriculture on arable lands is predominant (77.5% in Békés County, 60.8% in Csongrád-Csanád county and 55.9% in Hajdú-Bihar county, compared to the total area of the counties. In Szabolcs-Szatmár-Bereg county, the agricultural exploitation barely exceeds 69% (the dominance of agriculture is characteristic here, of approx. 49.6% of the total area of the county), here there is the largest rate of forest areas out of all the counties involved (approx. 21.9%).

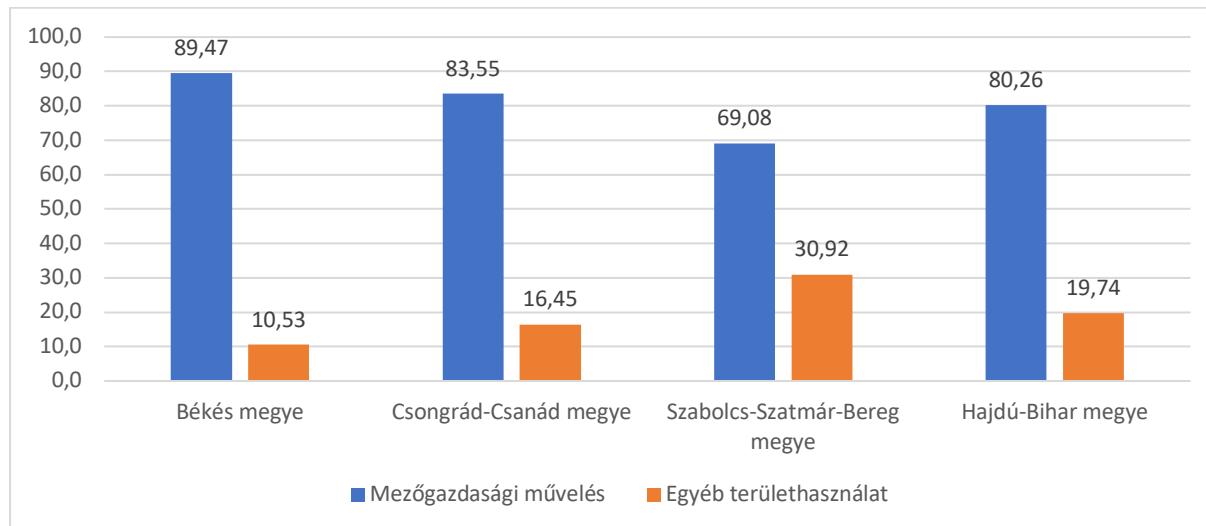


Figure 10 Use of lands for agricultural purposes and other land uses in the Hungarian counties involved (%)

### 3.4. Biodiversity

In the area under review, the conservation of biodiversity is achieved through a network of protected natural areas designated due to the special ecological, scientific or cultural value.

The Natura 2000 network, the largest ecological network of protected areas in the world, was established in Romania in 2007 and in Hungary in 2005. In both countries, it comprises sites of Community importance (SCIs, designated for the protection of habitats and species listed in Annexes I and II of the Habitats Directive) and special bird protection areas (SPAs, designated for the protection of bird species listed in Annex I of the Birds Directive). The creation of the Natura 2000 network has established a special protection regime for natural habitats and wild species of flora and fauna, as well as for species of wild birds, existing in the EU territory, that are considered rare, have a small or strongly fragmented area or are threatened with extinction, while protecting other species and natural habitats not listed in Annexes I or II of the Habitats Directive or Annex I of the Birds Directive. The Natura 2000 ecological network has been set up not only to protect wildlife species and natural habitats, but also to conserve them, maintain the diversity of natural capital, promote traditional activities and develop long-term sustainability.

The codes and names of the Natura 2000 sites designated in the counties involved from Romania and Hungary and the registration number and the names of the areas protected by national importance are listed in Table 7 and Table 8 (Romania), and Table 9 and Table 10 (Hungary) and those from the Hungarian counties are presented in Figure 11 and Figure 12.

The fragmentation of ecosystems or habitats is the phenomenon by which, where before there was a continuous habitat of great extension, several patches of small habitats are formed (Wilcove et al. 1986). Habitats are surrounded by an environment that differs from the characteristics of the original habitat, which may include roads, streams, man-made areas, mine dumps, etc.

Migration between these habitats is possible for some species, but for others it is totally or partially prevented. This situation affects the existing populations in this area in two ways, specifically, by reducing the total area of the initial habitat, the size of the

populations is negatively influenced, which significantly increases the possibility of their extinction and, on the other hand, the settlement of the resulting fragments and the complex systems of connections between them impact migration or dispersal of populations. Habitat fragmentation is not exclusively due to direct human activity, changing categories of use or infrastructure investments; often, the process of general habitat degradation leads to a higher degree of fragmentation. (The National Ecological Network of Hungary was also established to protect the remaining connection elements (See Figure 13).

Biological diversity is a continuous threat due to the intensification of economic activities that exert great pressure on the environment and nature.

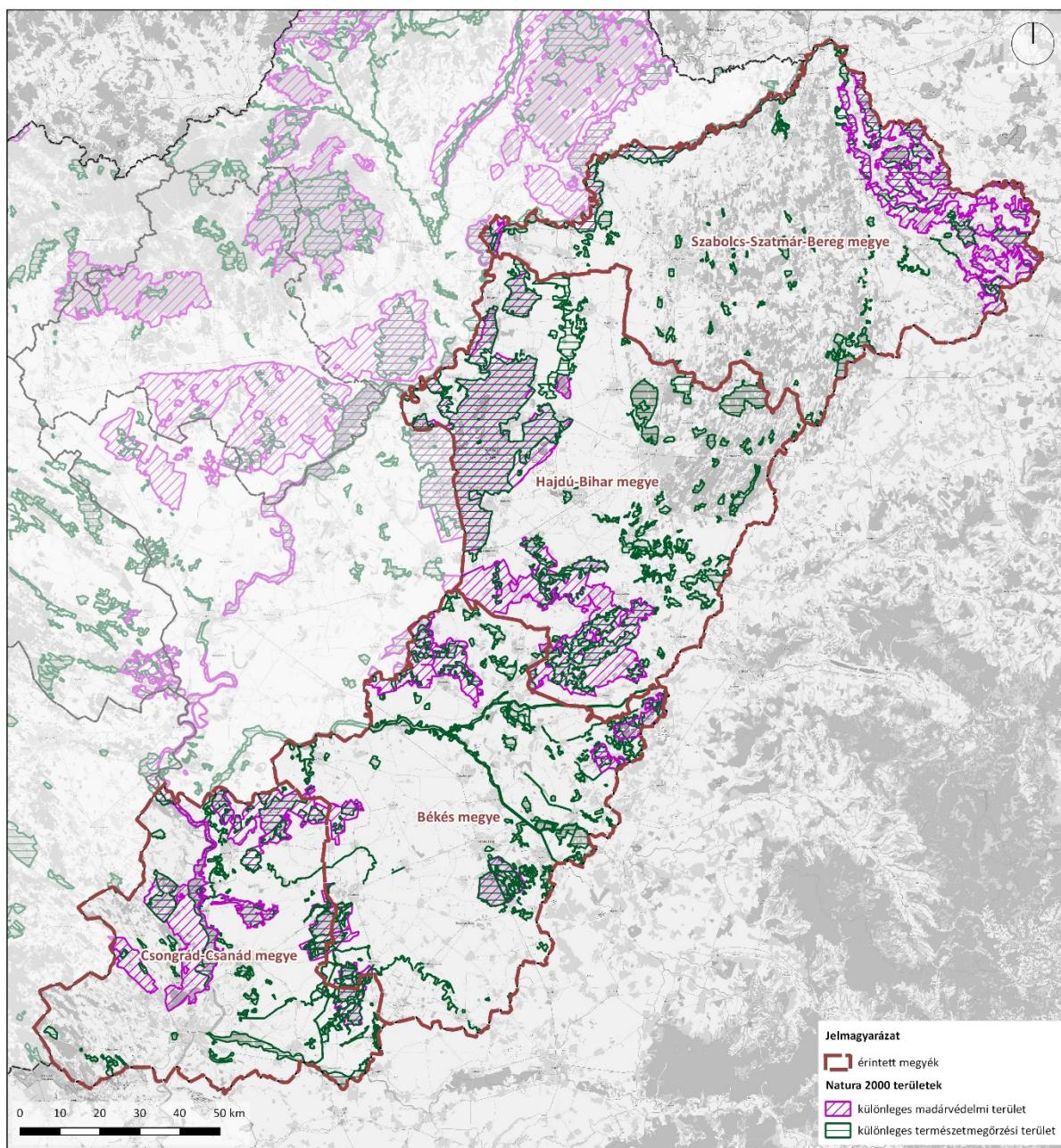


Figure 11 Elements of the Natura 2000 Network of Hungary (Source: TIR)

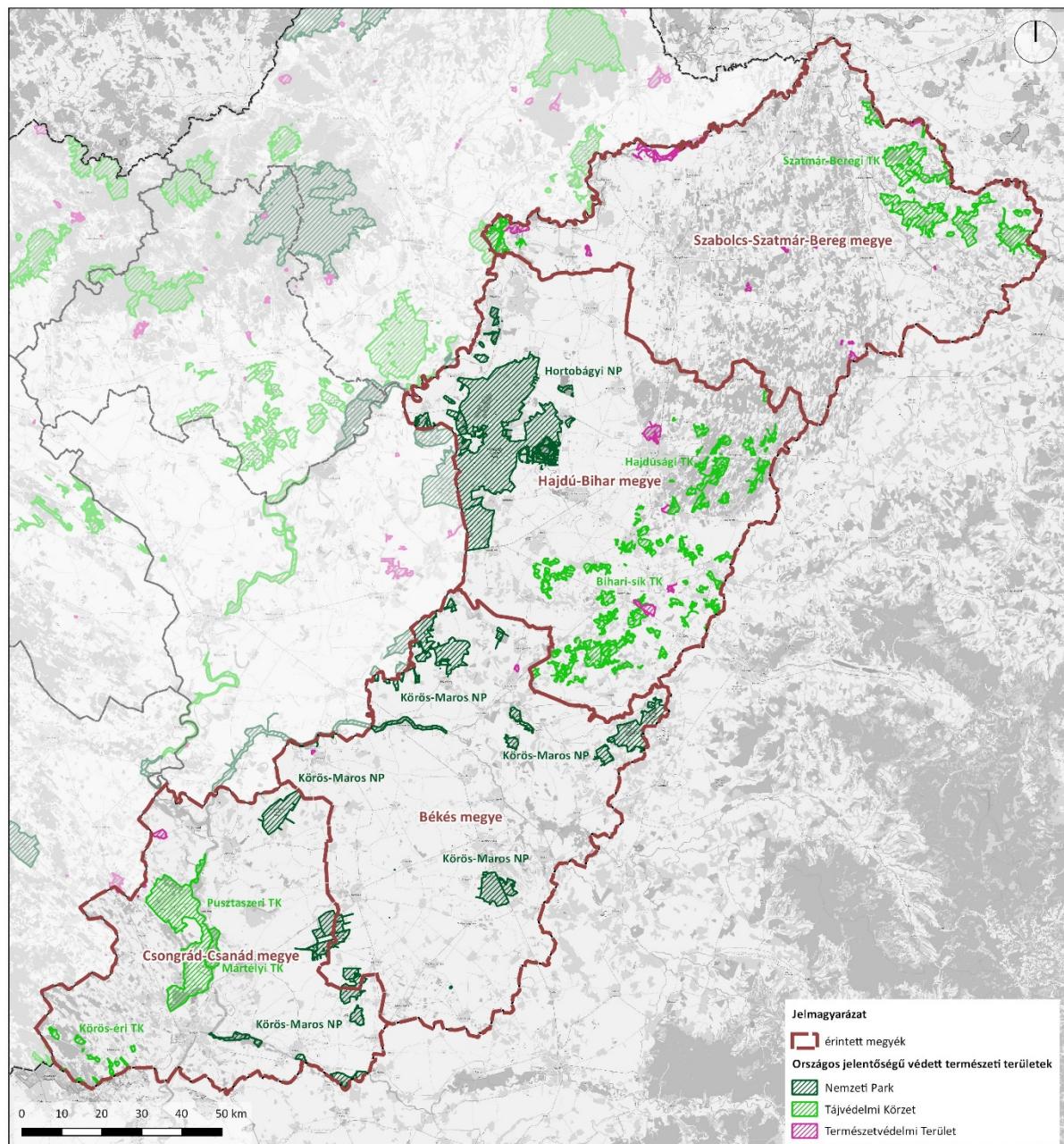


Figure 12 Protected natural areas of national importance of Hungary (Source: TIR)

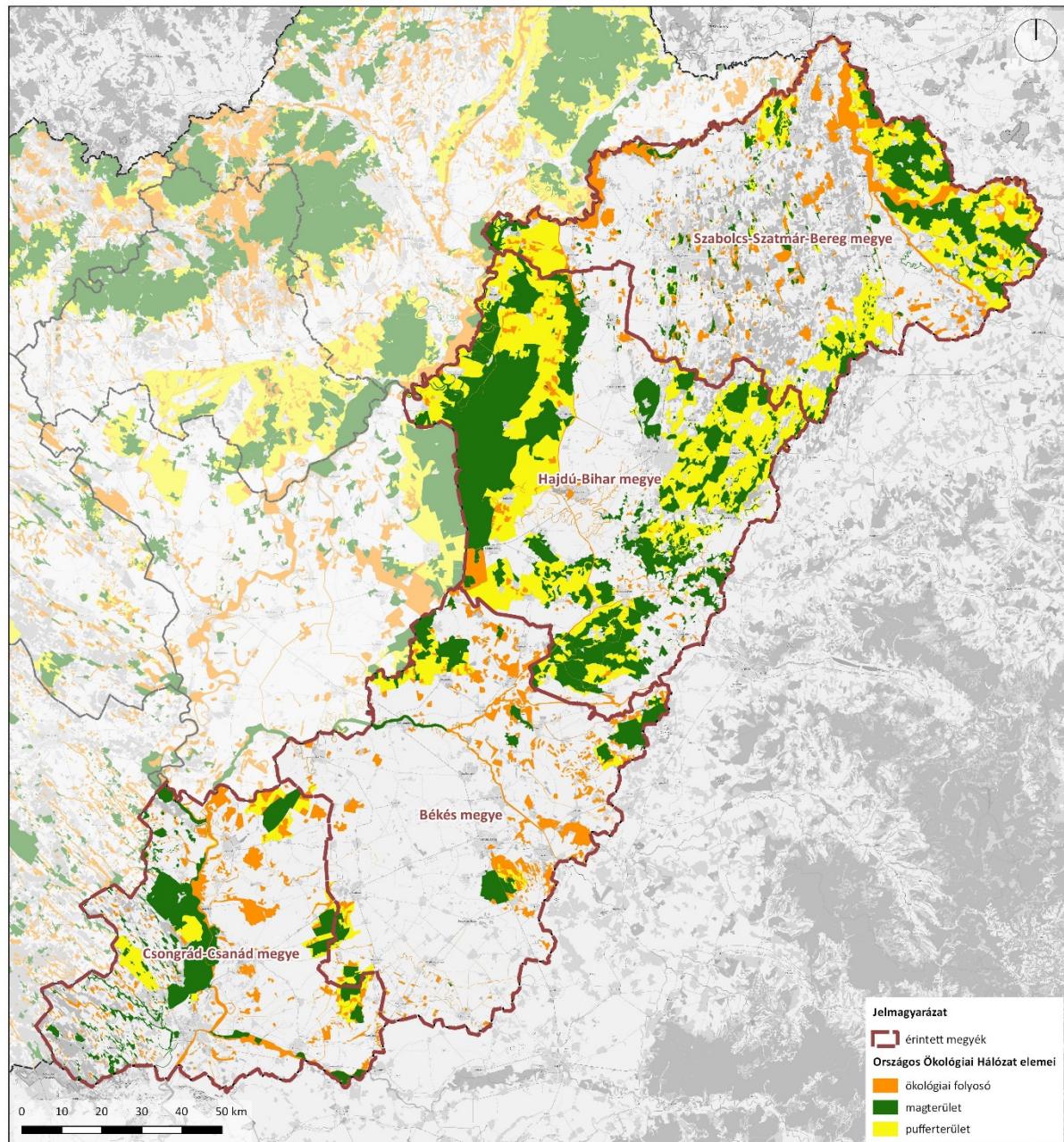


Figure 13 Elements of the National Ecological Network of Hungary (Source: TIR)

Anthropogenic pressures are mostly manifested by increasing land use, population size, development of the intensity of agriculture and economy, changing landscapes and ecosystems, destruction of natural space, irrational land use, over-concentration of activities on sensitive areas with high ecological value.

The deterioration of natural capital is a real process with complex long-term manifestations and an evolution that is dependent on the pace, forms and extent of the development of socio-economic systems. The anthropic modification of the habitats takes place mainly through the conversion of farmlands, urbanization, pollution, deforestation.

The main causes that determine the modification of habitat structures are represented by:

- development of residential areas;
- promoting economic interests;

- illegal logging;
- adverse changes in sustainable management activities;
- slow adaptation of water management and water governance to accelerated environmental change;
- pollution of surface water, groundwater and soil with petroleum products or salt water, sewage, improper waste management;
- modification of land morphology due to the extraction of some mineral resources (quarries, gravel pits);
- changing the category of land use (extension of the built-up area, temporary or permanent removal from the forest circuit);
- use of agricultural technologies unsuitable for the conditions;
- use of herbicides and other chemical substances;
- uncontrolled tourism in protected natural areas.

Diversification and globalization of human activities (economic activities) lead to the accelerated deterioration of natural capital, due to strong pressure on the environment, requiring measures to protect and conserve biological diversity.

*Table 7 - Code and names of the Natura 2000 sites within the implementation region of the InterReg Romania - Hungary programme (Romania)*

ARAD	TIMIȘ	BIHOR	SATU MARE
ROSCI0042 Codru Moma	ROSCI0425 Pădurea Semiu	ROSCI0002 Apuseni	ROSCI0020 Câmpia Careiului
ROSCI0048 Crișul Alb	ROSCI0414 Lovrin	ROSCI0008 Betfia	ROSCI0021 Câmpia Ierului
ROSCI0049 Crișul Negru	ROSCI0402 Valea din Sânandrei	ROSCI0016 Buteasa	ROSCI0214 Râul Tur
ROSCI0064 Defileul Mureșului	ROSCI0390 Sărăturile Diniș	ROSCI0020 Câmpia Careiului	ROSCI0275 Bârsău - Somcuta
ROSCI0070 Drocea	ROSCI0388 Sărăturile de la Foeni – Grăniceri	ROSCI0021 Câmpia Ierului	ROSCI0358 Pricop - Huta – Certeze
ROSCI0108 Lunca Mureșului Inferior	ROSCI0355 Podișul Lipovei - Poiana Ruscă	ROSCI0025 Cefa	ROSCI0416 Măgura Bătarci
ROSCI0115 Mlaștina Satchinez	ROSCI0349 Pajiștea Pesac	ROSCI0042 Codru Moma	ROSCI0436 Someșul Inferior
ROSCI0200 Platoul Vașcău	ROSCI0348 Pajiștea Jebel	ROSCI0049 Crișul Negru	ROSPA0016 Câmpia Nirului - Valea Ierului
ROSCI0218 Dealul Mocrei - Rovina – Ineu	ROSCI0346 Pajiștea Ciacova	ROSCI0050 Crișul Repede amonte de Oradea	ROSPA0068 Lunca inferioară a Turului
ROSCI0231 Nădab - Socodor - Vărșad	ROSCI0345 Pajiștea Cenad	ROSCI0061 Defileul Crișului Negru	
ROSCI0289 Coridorul Drocea - Codru Moma	ROSCI0338 Pădurea Paniova	ROSCI0062 Defileul Crișului Repede - Pădurea Craiului	
ROSCI0291 Coridorul Munții Bihorului - Codru Moma	ROSCI0337 Pădurea Neudorfului	ROSCI0068 Diosig	
ROSCI0294 Crișul Alb între Gurahonț și Ineu	ROSCI0336 Pădurea Dumbrava	ROSCI0084 Ferice – Plai	
ROSCI0298 Defileul Crișului Alb	ROSCI0287 Comloșu Mare	ROSCI0098 Lacul Pețea	
ROSCI0324 Munții Bihor	ROSCI0277 Becicherecu Mic	ROSCI0104 Lunca Inferioară a Crișului Repede	
ROSCI0325 Munții Metaliferi	ROSCI0250 Tinutul Pădurenilor	ROSCI0145 Pădurea de la Alparea	
ROSCI0337 Pădurea Neudorfului	ROSCI0219 Rusca Montană	ROSCI0155 Pădurea Goroniște	
ROSCI0350 Lunca Teuzului	ROSCI0115 Mlaștinile Satchinez	ROSCI0185 Păduricea de la Santău	
ROSCI0355 Podișul Lipovei - Poiana Ruscă	ROSCI0109 Lunca Timișului	ROSCI0200 Platoul Vașcău	
ROSCI0370 Râul Mureș între Lipova și Păuliș	ROSCI0108 Lunca Mureșului Inferior	ROSCI0220 Săcueni	
ROSCI0401 Turnu - Variașu	ROSPA0144 Uivar Diniș	ROSCI0240 Tășad	

ARAD	TIMIŞ	BIHOR	SATU MARE
ROSCI0406 Zarandul de Est	ROSPA0142 Termia Mare - Tomnatic	ROSCI0260 Valea Cepelor	
ROSCI0407 Zarandul de Vest	ROSPA0128 Lunca Timişului	ROSCI0262 Valea Iadei	
ROSPA0014 Câmpia Cermeiului	ROSPA0127 Lunca Bârzavei	ROSCI0267 Valea Roşie	
ROSPA0015 Câmpia Crişului Alb și Crişului Negru	ROSPA0069 Lunca Mureşului Inferior	ROSCI0291 Coridorul Munţii Bihorului - Coridorul Moma	
ROSPA0029 Defileul Mureşului Inferior - Dealurile Lipovei	ROSPA0047 Hunedoara Timişană	ROSCI0322 Muntele Ses	
ROSPA0047 Hunedoara Timişană	ROSPA0029 Defileul Mureşului Inferior - Dealurile Lipovei	ROSCI0324 Munţii Bihor	
ROSPA0069 Lunca Mureşului Inferior		ROSCI0347 Pajiştea Fegernic	
ROSPA0117 Drocea – Zarand		ROSCI0350 Lunca Teuzului	
ROSPA0153 Defileul Crişului Alb		ROSCI0387 Salonta	
ROSPA0164 Pescăria Nădlac		ROSPA0015 Câmpia Crişului Alb și Crişului Negru	
		ROSPA0016 Câmpia Nirului - Valea Ierului	
		ROSPA0067 Lunca Barcăului	
		ROSPA0081 Munţii Apuseni - Vlădeasa	
		ROSPA0097 Pescăria Cefa - Pădurea Rădvani	
		ROSPA0103 Valea Alceului	
		ROSPA0115 Defileul Crişului Repede - Valea Iadului	
		ROSPA0123 Lacurile de acumulare de pe Crişul Repede	

In addition, the following nationally protected areas are designated within the implementation region of the **INTERREG VI Romania-Hungary Programme for the period 2021-2027**.

*Table 8- Names of protected natural areas of national interest in the implementation region of the INTERREG VI Romania - Hungary programme for the period 2021-2027 (Romania)*

ARAD	TIMIS	BIHOR	SATU MARE
RONPA0101 Peştera Valea Morii	RORMS0004 Parcul Natural Mureşului	RONPA0004 Lunca Mureşului	RONPA0601 Pădurea cu pini Comja

ARAD	TIMIS	BIHOR	SATU MARE
RONPA0102 Dosul Laurului	RONPA0926 Parcul Natural Lunca Mureșului	RONPA0077 Fânațele Bârca	RONPA0693 Pădurea Urziceni
RONPA0103 Baltele Gurahot	RONPA0867 Pădurea Pleșu	RONPA0158 Groapa Ruginoasă - Valea Seacă	RONPA0694 Dunele de nisip Foieni
RONPA0104 Runcu-Groși	RONPA0765 Lacul Surduc	RONPA0159 Pietrele Galbenei	RONPA0695 Tinoavele din Munții Oaș
RONPA0105 Poiana cu narcise Rovina	RONPA0764 Pajiștea cu narcise Bătești	RONPA0160 Piatra Bulzului	RONPA0696 Mlaștina Vermes
RONPA0106 Balta Rovina	RONPA0763 Sărăturile Diniș	RONPA0161 Ghețarul Focul Viu	RONPA0697 Râul Tur
RONPA0107 Balta Șoimoș	RONPA0762 Insula Igriș	RONPA0162 Avenul Ghețarul Borțig	
RONPA0108 Pădurea Sâc	RONPA0761 Insula Mare Cenad	RONPA0163 Vârful Buteasa	
RONPA0109 Peștera lui Duțu	RONPA0760 Mlaștinile Murani	RONPA0164 Molhașurile din Valea Izbucelor	
RONPA0110 Peștera Sinesie, Căprioara	RONPA0759 Beba Veche	RONPA0165 Fâneata Izvoarelor Crișul Pietros	
RONPA0111 Locul Fosilifer Monoroștia	RONPA0758 Pădurea Bistra	RONPA0166 Cetățile Ponorului	
RONPA0112 Locul Fosilifer Zăbalț	RONPA0757 Mlaștinile Satchinez	RONPA0167 Valea Galbenei	
RONPA0113 Pădurea de stejar pufos de la Cărand	RONPA0755 Arboretumul Bazoș	RONPA0168 Valea Sighiștelului	
RONPA0114 Rezervația de soluri sărăturate	RONPA0754 Movila Șișitac	RONPA0169 Pietrele Boghii	
RONPA0115 Arboretul Macea	RONPA0753 Lunca Pogănișului	RONPA0170 Săritoarea Bohodeiului	
RONPA0756 Locul fosilifer Rădmănești	RONPA0752 Pădurea Cenad	RONPA0171 Cetatea Rădesei	
RONPA0762 Insula Igriș		RONPA0172 Poiana Florilor	
RONPA0926 Lunca Mureșului		RONPA0173 Platoul carstic Padış	
RORMS0004 Parcul Natural Lunca Mureșului		RONPA0174 Depresiunea Bălileasa	
		RONPA0175 Groapa de la Barsa	
		RONPA0176 Vârful Biserica Moțului	
		RONPA0178 Izbucul intermitent de la Călugări	
		RONPA0179 Fâneata Valea Roșie	

ARAD	TIMIS	BIHOR	SATU MARE
		RONPA0180 Ferice Plai și Hoanca RONPA0181 Avenul Câmpeneasa cu Izbucul Boiu RONPA0182 Defileul Crișului Repede RONPA0183 Peștera Ciurului Ponor RONPA0184 Peștera Ciurului Izbuc RONPA0185 Peștera Osoiu RONPA0186 Peștera Urșilor de la Chișcău RONPA0187 Peștera cu Apă din Valea Leșului RONPA0188 Peștera Vântului RONPA0189 Peștera lui Micula RONPA0190 Peștera Gălășeni RONPA0191 Defileul Crișului Negru la Borz RONPA0192 Pădurea cu narcise din Oșorhei RONPA0193 Vârful Cârligați RONPA0194 Pârâul Pețea RONPA0195 Dealul Păcău RONPA0196 Poiana cu narcise de la Goroniște RONPA0197 Piatra Grăitoare din coasta de S-E a Brăieseii RONPA0198 Valea ladei cu <i>Syringa josichaea</i> RONPA0199 Pășunea cu Corynephorus de la Voievozi RONPA0200 Complexul hidrografic Valea Rece RONPA0201 Lacul Cicoș RONPA0202 Gruiul Pietrii RONPA0203 Calcarele tortoniene de la Miheleu RONPA0204 Locul fosilifer de pe Dealul Șomleului RONPA0205 Calcarele tortoniene de la Tășad RONPA0206 Locul fosilifer din Valea Lionii - Peștiș RONPA0207 Lentila 204	

ARAD	TIMIS	BIHOR	SATU MARE
		Brusturi – Cornet RONPA0208 Calcarele cu hipuriți din Valea Crișului RONPA0209 Locul fosilifer de la Cornițel RONPA0210 Peștera Meziad RONPA0211 Colonia de păsări de la Pădurea Rădvani RONPA0212 Izvoarele mezotermale Răbăgani RONPA0213 Peștera Vacii RONPA0214 Peștera Gruiețului RONPA0215 Peștera Igrita RONPA0216 Peștera Farcu RONPA0217 Peștera Toplița RONPA0354 Peștera din Piatra Ponorului RONPA0357 Molhașul Mare de la Izbuce RONPA0860 Complexul carstic din Valea Ponorului RONPA0861 Sistemul carstic Peștera Cerbului - Avenul cu Vacă RONPA0953 Cefa	

Tables 9 and 10 below show the codes and names of the Natura 2000 sites related to the Interreg VI-A Romania-Hungary Programme implementation are

Table 9 - Code and names of the Natura 2000 sites within the implementation region of the InterReg Romania - Hungary programme (Hungary)

Szabolcs-Szatmár-Bereg County				Hajdú-Bihar County				
HUHN20057	Grófi-erdő	HUHN20045	Kaszonyi-hegy Dé dai-erdő	-	HUHN10002	Hortobágy	HUBN20069	Kesznyéteni Sajó-öböl
HUHN10008	Felső-Tisza	HUHN20062	Ófehértói lőtér	HUHN20014	Kismarjai Nagy-szik	HUHN20105	Csökmői gyepek	
HUHN20002	Hortobágy	HUHN20064	Rohodi-legelő	HUHN20005	Nagy-Széksós Rakottya s	-	HUHN20021	Halápi Álló-hegy
HUHN20032	Gúti-erdő	HUHN20071	Nyírmihálydi-legelő	HUHN20002	Hortobágy	HUKM20014	Dévaványa környéki gyepek	
HUHN20040	Apagyi Albert-tó	HUHN20055	Rozsály Csengersima	-	HUHN20007	Szentpéterszeg- hencidai gyepek	HUHN20028	Csohos-tó
HUHN20048	Tarpa-Tákos	HUHN20056	Jánki-erdő	HUHN20019	Bánki-erdő	HUHN20022	Rauchbauer-erdő	
HUHN20049	Lónya-Tiszaszalka	HUHN20067	Csikós-lápos	HUHN20020	Monostorpályi- legelő	HUHN20033	Debrecen-hajdú- böszörményi tölgyesek	
HUHN20053	Magosligeti-erdő és gyepek	HUBN10005	Kesznyéten	HUHN20017	Hajdúbagosi-legelő	HUHN20011	Hencidai Csere-erdő	
HUHN20058	Teremi-erdő	HUHN20129	Nyírbogdányi rét	HUHN20032	Gúti-erdő	HUHN20024	Martinkai-legelő	
HUHN20065	Nyírturai-legelő	HUHN20128	Nyírség-peremi égeresek	HUHN20029	Létavértesi Falu-rét	HUHN20012	Sándorosi tavak	
HUHN20041	Apagyi Falu-rét	HUHN20125	Nyírgyulaji Kis-rét	HUHN20026	Nyírábrányi Káposztás-lapos	HUHN20016	Kék-Kálló-völgye	
HUHN20046	Gelénes Beregdaróc	-	HUHN21165	Penészleki gyepek	HUHN20027	Nyírábrányi Kis- mogyorós	HUHN20008	Kismarja - Pocsaj - Esztári-gyepek
HUHN20124	Daru-rét	HUBN20071	Bodrogzug és Bodrog hullámtere	HUHN20070	Darvasi Csiff-puszta	HUKM20018	Holt-Sebes-Körös	
HUHN21164	Liget-legelő	HUBN10001	Bodrogzug-Kopasz- hegy-Taktaköz	HUHN20069	Hajdúszoboszlói szikes gyepek	HUHN20103	Berekböszi - körmösdpuszta legelők	
HUHN20114	Tiszalöki szikesek	HUHN10001	Szatmár-Bereg	HUHN21164	Liget-legelő	HUHN20098	Dél-ásványi gyepek	
HUHN20001	Felső-Tisza	HUHN20035	Ömbölyi-erdő és Fényi-erdő	HUHN20025	Kőrises - Jónás-rész	HUBN10005	Kesznyéten	

Szabolcs-Szatmár-Bereg County				Hajdú-Bihar County				
HUHN20060	Nyíregyházi lótér	HUHN20043	Paszabi kubikgödrök	HUHN20006	Pocsaji csordalegelő	HUHN20100	Gatály	
HUHN20039	Piricsei Júlia-liget	HUHN20038	Újtanyai lápok	HUHN20010	Pocsaji-kapu	HUHN20092	Hajdúszováti gyepek	
HUHN20042	Napkori legelő	HUHN20050	Kömörő-Fülesd	HUHN20018	Mikepércsi Nyárfáshegyi-legelő	HUKM20016	Sebes-Körös	
HUHN20072	Bökönyi Közös-legelő	HUHN20127	Kraszna menti rétek	HUHN20031	Hanelek	HUHN10003	Bihar	
HUHN20037	Bátorligeti-láp	HUHN20063	Baktai-erdő	HUHN20023	Hármashegyi-tölgyesek	HUHN20013	Közép-Bihar	
HUHN20107	Nagy-Vadas	HUHN20109	Sóstói-erdő	HUHN20030	Fülöpi láprétek	HUHN20093	Kaba-földesi gyepek	
HUBN20069	Kesznyéteni Sajó-öböl	HUHN20113	Kisvárdai gyepek	HUHN20004	Felső-Sebes-Körös	HUHN20003	Tisza-tó	
HUHN20160	Gőgő-Szenke	HUHN20120	Vajai-tároló	HUHN20095	Lányi-legelő	HUHN20009	Derecske - konyári gyepek	
HUHN21163	Biri Nagy-rét	HUHN20116	Tiszavasvári szikesek	HUHN20101	Bihari-legelő	HUHN20121	Czakó-tó	
HUHN20036	Bátorligeti Nagy-legelő	HUHN20133	Balkányi Libegős	HUHN20122	Tócó völgye	HUHN20161	Sámoni úti Bellegelő	
HUHN20047	Vámosatya-Csaroda	HUHN20134	Kállósemjéni Csordalegelő					
HUHN20051	Eret-hegy	HUHN20131	Orosi gyepek					
HUHN20054	Csaholc - Garbolc	HUHN20106	Újfehértói gyepek					
HUHN20059	Bika-rét	HUHN20159	Tunyogmatolcsi Holt-Szamos					
Békés County				Csongrád-Csanád County				
HUKM10004	Hódmezővásárhely környéki és csanádi-háti puszták			HUKM10004	Hódmezővásárhely környéki és csanádi-háti puszták			
HUKM20004	Száraz-ér			HUHN20015	Közép-Tisza			
HUKM20013	Bélmegyeri Fás-puszta			HUKM20004	Száraz-ér			
HUKM20022	Köles-ér			HUKM20027	Cserebökény			
HUKM20025	Gyantéi erdők			HUKM20028	Tőkei gyepek			
HUKM20027	Cserebökény			HUKM20003	T-erdő			
HUHN20004	Felső-Sebes-Körös			HUKN20008	Déli-Homokhátság			
HUKM10001	Kígyósi-puszta			HUKN20027	Péteri-tó			



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Szabolcs-Szatmár-Bereg County		Hajdú-Bihar County	
HUKM10005	Cserebökényi-puszták	HUHN10004	Közép-Tisza
HUHN20105	Csökmői gyepek	HUKM10005	Cserebökényi-puszták
HUKM20017	Hármás-Körös	HUKM20002	Hódmezővásárhelyi Kék-tó
HUKM20014	Dévaványa környéki gyepek	HUKM20017	Hármás-Körös
HUKM20015	Hortobágy-Berettyó	HUKM20031	Kurca
HUKM20009	Mezőhegyes-battfonyai gyepek	HUKN20031	Alsó-Tisza hullámtér
HUKM20018	Holt-Sebes-Körös	HUKM20001	Hódmezővásárhely környéki és csanádi-háti puszták
HUKM20021	Sarkadi Fási-erdő	HUKM20008	Maros
HUKM20001	Hódmezővásárhely környéki és csanádi-háti puszták	HUKM20005	Deszki gyepek
HUKM20011	Körösközi erdők	HUKM20030	Lapistó-Fertő
HUKM20023	Korhány és Holt-Korhány	HUKN10004	Alpár-bokrosi tisza-ártéri öblözet
HUKM20024	Orosi tölgyes	HUKM20006	Mágocs-ér
HUKM20006	Mágocs-ér	HUKN30001	Csongrád-bokrosi Sóstó
HUKM20019	Dél-Bihari szikesek	HUKN30002	Gátéri Fehér-tó
HUKM20007	Csorvási löszgyep	HUKN10007	Alsó-Tisza-völgy
HUKM20012	Fekete-, Fehér- és Kettős-Körös	HUKN10008	Balástya-Szatymaz környéki homokvidék
HUKM20016	Sebes-Körös	HUKM20029	Szentesi gyepek
HUHN10003	Bihar	HUKN20017	Közép-csongrádi szikesek
HUKM10002	Kis-Sárrét	HUKN20019	Baksi-puszta
HUHN20013	Közép-Bihar	HUKN20012	Szegedi ürgés gyep
HUKM10003	Dévaványai-sík	HUKN20028	Tiszaalpár-bokrosi ártéri öblözet
HUKM20020	Gyepes csatorna	HUKN20029	Csongrádi Kónya-szék
HUKM20010	Gyula-szabadkígyósi gyepek		
HUKM20026	Tóniszállás-szarvasi gyepek		

*Table 10 Names of protected natural areas of national interest from the region of implementation of the INTERREG VI-a Romania – Hungary Programme for the period 2021-2027 (for Hungary):*

Szabolcs-Szatmár-Bereg County		Hajdú-Bihar County		Békés County		Csongrád-Csanád County	
Kaszonyi-hegy TT	244/TT/91	Debreceni Nagyerdő TT	249/TT/92	Bihari-sík TK - 10	284/TK/98	Körös-Maros NP - Körös-ártér	276/NP/97
Tiszadobi-ártér TT	148/TT/77	Hortobágyi NP - 03	97/NP/73	Szarvasi arborétum TT	13/TT/43	Körös-Maros NP - Maros-ártér 3	276/NP/97
Tiszatelek-Tiszaberceli-ártér TT	164/TT/78	Hajdúbagosi földikutyarezervátum TT	136/TT/76	Dénesmajori Csigás-erdő TT	281/TT/97	Péteri-tavi madárezervátum TT	124/TT/76
Tokaj-Bodrogzug TK	183/TK/86	Bihari-sík TK - 10	284/TK/98	Szeghalmi Kék-tó TT	306/TT/06	Pusztaszeri Fülöp-szék TT	214/TT/90
Kesznyéteni TK	232/TK/90	Bihari-sík TK - 01	284/TK/98	Szarvasi Történelmi Emlékkpark TT	241/TT/91	Körös-éri TK - XI. Kelebiai halastavak és erdők	330/TK/12
Hajdúsági TK	201/TK/88	Bihari-sík TK - 07	284/TK/98	Körös-Maros NP - Körös-ártér	276/NP/97	Körös-éri TK - XII. Öttömösi baromjárás	330/TK/12
Cégénydányádi-park TT	74/TT/60	Bihari-sík TK - 06	284/TK/98	Körös-Maros NP – Dévaványai-Ecsegi puszták	276/NP/97	Körös-éri TK - II. Madarásztó	330/TK/12
Szatmár-beregi TK 1	171/TK/82	Bihari-sík TK - 09	284/TK/98	Körös-Maros NP - Csorvási löszgyep	276/NP/97	Mártélyi TK	94/TK/71
Szatmár-beregi TK - 03	171/TK/82	Bihari-sík TK - 05	284/TK/98	Körös-Maros NP - Mágörpuszta	276/NP/97	Körös-Maros NP - Maros-ártér 2	276/NP/97
Szatmár-beregi TK - 10	171/TK/82	Bihari-sík TK - 04	284/TK/98	Körös-Maros NP - Tompapusztai löszgyep	276/NP/97	Körös-Maros NP - Maros-ártér 1	276/NP/97
Szatmár-beregi TK - 11	171/TK/82	Bihari-sík TK - 03	284/TK/98	Körös–Maros NP - Tatársánci ősgyep	276/NP/97	Pusztaszeri Hétvezér Emlékmű TT	213/TT/90
Szatmár-beregi TK - 09	171/TK/82	Bihari-sík TK - 02	284/TK/98	Körös-Maros NP - Kígyósi-puszta	276/NP/97	Csongrádi Kónyaszék TT	291/TT/98
Szatmár-beregi TK - 05	171/TK/82	Bihari-sík TK - 08	284/TK/98	Körös-Maros NP - Bélmegyeri fás pusztta	276/NP/97	Körös-éri TK - I. Nagy-Széksóstó	330/TK/12
Bátorligeti-legelő TT	182/TT/86	Bihari-legelő TT	184/TT/86	Körös-Maros NP - Csanádi puszták	276/NP/97	Körös-Maros NP - Csanádi puszták	276/NP/97
Szatmár-beregi TK - 02	171/TK/82	Hortobágyi NP - Árokötő	97/NP/73	Körös-Maros NP - Kardoskúti Fehértó	276/NP/97	Körös-Maros NP - Kardoskúti Fehértó	276/NP/97
Szatmár-beregi TK - 07	171/TK/82	Hortobágyi NP - 09	97/NP/73	Körös-Maros NP - Cserebökény	276/NP/97	Körös-Maros NP - Cserebökény	276/NP/97
Szatmár-beregi TK - 06	171/TK/82	Hortobágyi NP - 06	97/NP/73	Körös-Maros NP - Kis-	276/NP/97	Pusztaszeri TK	122/TK/76



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Szabolcs-Szatmár-Bereg County		Hajdú-Bihar County		Békés County		Csongrád-Csanád County	
				Sárrét 1			
Szatmár-beregi TK - 04	171/TK/82	Hortobágyi NP - 04	97/NP/73	Körös-Maros NP - Kis-Sárrét 2	276/NP/97	Körös-éri TK - VI. Kissori-semlyék	330/TK/12
Szatmár-beregi TK - 08	171/TK/82	Hortobágyi NP - 11	97/NP/73			Körös-éri TK - III. Csipak-semlyék	330/TK/12
Baktalórántháza-erdő TT	149/TT/77	Hortobágyi NP - 02	97/NP/73			Körös-éri TK - IV. Tanaszi-semlyék	330/TK/12
Bátorligeti-ősláp TT	18/TT/50	Hortobágyi NP - 08	97/NP/73			Körös-éri TK - IX. Bogárzó	330/TK/12
Fényi-erdő TT	49/TT/54	Hortobágyi NP - 05	97/NP/73			Körös-éri TK - V. Ásotthalom láprétek	330/TK/12
Kállósemjéni Mohos-tó TT - 02	52/TT/54	Hortobágyi NP - 01	97/NP/73			Körös-éri TK - VII. Rivó erdő és semlyék	330/TK/12
Kállósemjéni Mohos-tó TT - 01	52/TT/54	Borsodi-Mezőség TK	212/TK/89			Körös-éri TK - VIII. Emlékerdő	330/TK/12
Vajai-tó TT	268/TT/96	Kesznyéteni TK	232/TK/90			Körös-éri TK - X. Átokházi-tőzegbánya	330/TK/12
Tiszavasvári Fehér-szik TT - 01	142/TT/77	Tiszadorgmai Göbe-Erdő TT	175/TT/84			Öthalom földtani alapszelvény TE	389/TE/15
Tiszavasvári Fehér-szik TT - 02	142/TT/77	Hajdúsági TK	201/TK/88				
		Hencidai Csere-erdő TT	222/TT/90				

### 3.5. Cultural heritage and landscape

According to Government Emergency Ordinance no. 57/2007 on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna, approved with amendments and completions by Law no. 49/2011, the landscape is defined as “an area perceived by the population as having specific characteristics resulting from the action and interaction of natural and/or human factors”. Landscape importance is underlined by Law no. 451/2002 for the ratification of the European Landscape Convention, adopted in Florence on 20 October 2000, according to which the landscape is an important part of the quality of life, which contributes to the formation of local cultures, while being the basic component of the European natural and cultural heritage, which participates in the consolidation of the European identity.

The visual impact is generated by a series of anthropic actions, including:

- ❖ Conversion of natural and semi-natural ecosystems into agricultural production systems;
- ❖ High level of industrialisation due to the development of production infrastructure into large units. The impact on the landscape in this case is indirect, caused by increasing consumption of non-renewable mineral and energy resources, an action with a major contribution to air, surface water, groundwater and soil pollution;
- ❖ Forest overexploitation, with direct consequences on the structure and functions of ecosystems, generating ecological imbalances, especially within the river basins in the mountainous area;
- ❖ Carrying out extensive hydrotechnical works for reservoirs;
- ❖ Increasing electricity production capacity in the context of increasing population needs and continuous urbanisation, which leads to consumption of inferior coal, as well as the exploitation and expansion of surface mining activities by expanding the areas occupied by ungreened mine dumps and increasing electricity distribution infrastructure by increasing the number of overhead power lines (OHL), both contributing to the qualitative degradation of the landscape;
- ❖ Urban development, in particular the growth of urban population, leads to the deterioration of the urban landscape by reducing the surface of green spaces or by building on them, cutting down trees, or by the existence of inefficient measures for the collection and treatment of waste and domestic water;
- ❖ Development of transport infrastructure by fragmenting natural habitats and, implicitly, the landscape;
- ❖ Overexploitation of renewable and non-renewable natural resources to fuel production processes.

Because the *programme* does not propose an exact list of projects at the time of writing this Environmental Report, a potential impact on a number of cultural heritage objectives cannot be estimated. The cultural heritage will be considered at a later stage of approval of the *programme* and the actions to be further established regarding the promotion of cultural-tourist objectives and the development of cultural services.

From the point of view of landscape protection, on the Hungarian side of the Programme, the current land uses, the main landscape values and the valuable areas in terms of landscape protection are highlighted. As briefly shown in *this chapter*, the current use of landscapes in the studied counties is determined to a large extent by agricultural uses. Based on the Corine Land Cover (2018) database, the use of the land in the studied area is summarized in the *Table 11*. In the studied counties, the share of built-up areas, traffic areas and destroyed areas is around 5%, except for Szabolcs-Szatmár-Bereg county, where this exceeds 7%. The rate of meadows is higher in Hajdú-Bihar county (21,3%), in which more than half is natural meadow, especially due to the extended protected natural areas and Natura 2000 areas (mainly: Hortobágy National park and Bihari-sík Tájvédelmi Körzet). The ratio of water areas and wetlands (marshes, ponds) is again the highest in Hajdú-Bihar county (3.1%), a great part of these being ponds and marshes within the Hortobágy National Park. The ratio of orchards is the highest in Szabolcs-Szatmár-Bereg county (approx. 5%), mainly occupied by the production of apples.<sup>6</sup> Farmlands are characteristic in all counties. Preserving traditional landscape management, farm settlement structure and landscape character are of great importance in the area.

*Table 11 Uses of the lands in the studied counties*

Combined CLC categories – with codes (2018)	Csöngrád-Csanád County		Békés County		Hajdú-Bihar County		Szabolcs-Szatmár-Bereg County	
	Area (ha)	Proportion(%)	Area (ha)	Proportion(%)	Area (ha)	Proportion(%)	Area (ha)	Proportion(%)
Inside the built-up area and traffic areas, destroyed areas (1.1.1., 1.1.2., 1.2.1., 1.2.2, 1.2.3., 1.2.4., 1.3.1., 1.3.2., 1.3.3., 1.4.1, 1.4.2)	217 44	5.1	28 56 9	5.1	32 91 1	5.3	42 98 3	7.3
Arable land (2.1.1)	258 914	60.8	43 59 58	77.5	34 64 87	55.9	29 41 64	49.6
Meadows (2.3.1., 3.2.1., 3.3.3.)	557 33	13.1	49 38 8	8.8	13 19 79	21.3	54 14 0	9.1
Other agricultural areas (2.1.3, 2.2.1, 2.2.2, 2.4.2, 2.4.3)	412 79	9.7	17 98 9	3.2	19 39 7	3.1	61 13 4	10.3
... of which orchards (2.2.2)	136 4	0.3	70 8	0.1	15 59	0.3	29 05 7	4.9
Forests, forest areas (3.1.1., 3.1.2., 3.1.3., 3.2.4.)	384 29	9.0	23 63 7	4.2	70 03 6	11.3	12 99 06	21.9
Water areas, wetlands (4.1.1., 4.1.2., 5.1.1., 5.1.2.)	989 5	2.3	70 11	1.2	19 46 5	3.1	10 39 5	1.8

Source: Calculations of the authors based on the Corine Land Cover 2018 database

<sup>6</sup> <https://www.ksh.hu/interaktiv/storytelling/gyumolcs/index.html>

Aside from the agricultural activity, forestry also shapes the studied area. The majority of the forest areas in the area are forest areas of a primarily economic use.<sup>7</sup> According to the data of the National Institute of Statistics, the situation of the **planned forest areas** between 2017 and 2020 is summarized in the following table. According to it, Szabolcs-Szatmár-Bereg county has the highest forest coverage (21.5%), followed by Hajdú-Bihar county (11.3%), by Csongrád-Csanád county (8.9%), while Békés county has the lowest forest area (4.6%). Only Szabolcs-Szatmár-Bereg county exceeds the national average forest coverage (20.9%). In the period 2017-2020, there is a growing tendency in all the studied counties, related to the objective of the National Forest Strategy<sup>8</sup> to reach 27% forest coverage at a national level until 2050.

*Table 12 The planned forest areas covered with a wooden mass and forest coverage in the studied counties (2017-2020)*

Areas	Forest areas covered by wooden mass	2017	2018	2019	2020
Hajdú-Bihar	Coverage (ha)	66 154	66 447	66 477	67 239
	Forest coverage (%)	11,3	11,3	11,2	11,3
Szabolcs-Szatmár-Bereg	Area (ha)	118 240	118 028	118 558	119 241
	Forest coverage (%)	21,3	21,4	21,4	21,5
Békés	Area (ha)	23 849	23 887	24 010	23 982
	Forest coverage (%)	4,6	4,6	4,6	4,6
Csongrád-Csanád	Area (ha)	36 558	36 624	36 478	36 821
	Forest coverage (%)	8,9	8,9	8,9	8,9
Entire county	Area (ha)	1 869 213	1 867 479	1 867 558	1 872 778
	Forest coverage (%)	20,9	20,8	20,8	20,9

Source: [https://www.ksh.hu/stadat\\_files/kor/hu/kor0058.html](https://www.ksh.hu/stadat_files/kor/hu/kor0058.html) és  
[https://www.ksh.hu/stadat\\_files/kor/hu/kor0059.html](https://www.ksh.hu/stadat_files/kor/hu/kor0059.html)

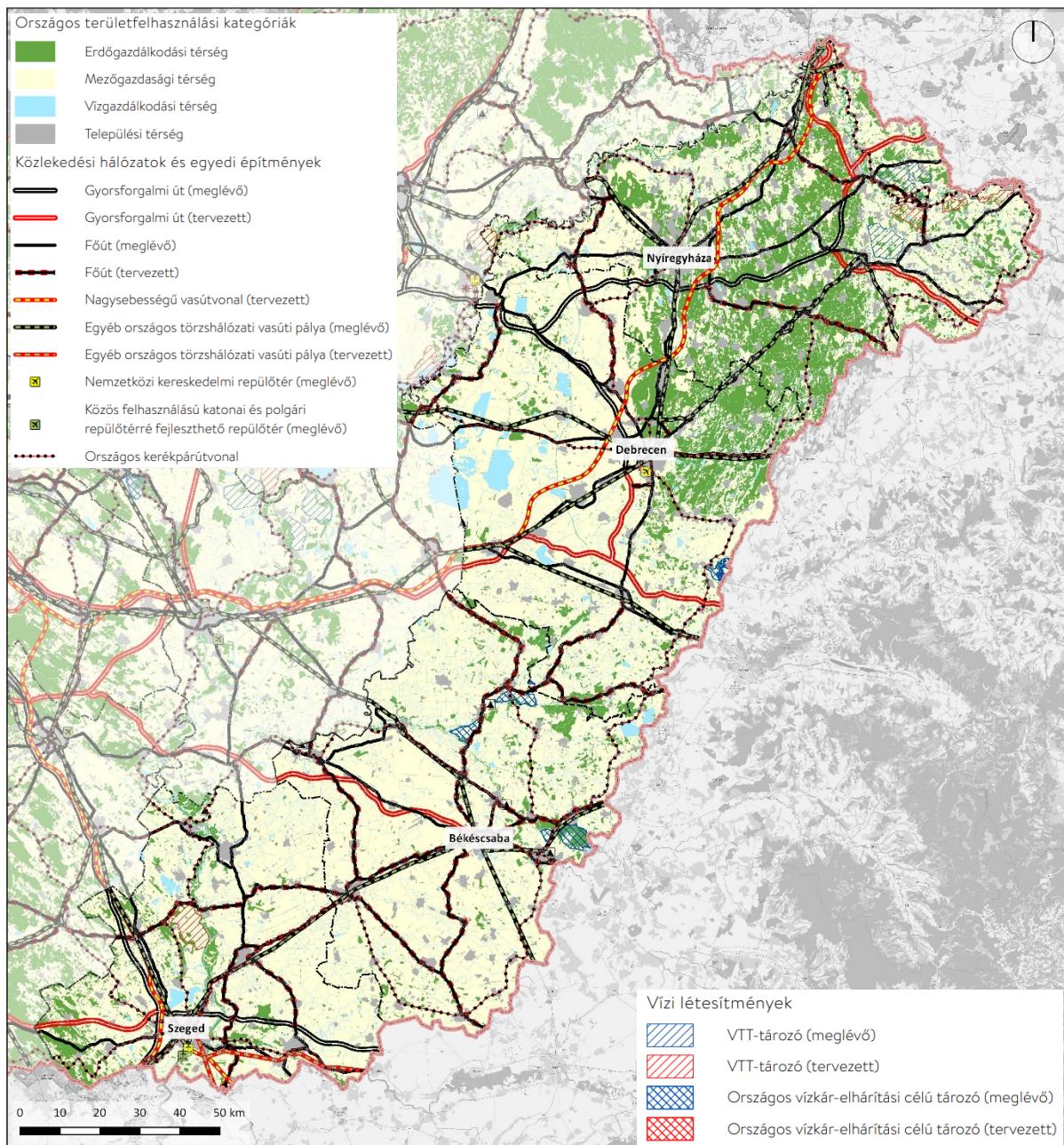
Aside from the actual land uses, the (planned) use of the land in the region is regulated by the structural plan of the National Territory Arrangement Plan (OTrT). OTrT is regulated by the Hungarian Law CXXXIX of 2018 regarding the territory arrangement plan of Hungary and priority regions and by Order 9/2019 (VI. 14.) MvM on the additional regulation of the drafting and implementation of the territory arrangement plans. According to the above, the use of farmlands is dominating in the studied area and the central part of the Szabolcs-Szatmár-Bereg (Nyírség) county and the north part of the Hajdú-Bihar (Hajdúság) county are dominated by forest areas (see Figure 14). OTrT includes ponds and marshes west of Debrecen, that belong to the National Park of Hortobágy and the ponds around Szeged (for example Fehér-tó) in the water management regions. The structural plan shows that in the area there are many existing and planned VTT tanks<sup>9</sup>. Among the primary changes foreseen regarding the use of the land, we must highlight the estimated development of the network of roads, since the **studied area is crossed by several express roads** (e.g. M34, M35, M4, M44, M49, M9) and **planned main roads** [e.g. Nyíregyháza area (M3) – Nyírbátor – Vállaj – (Romania), R44: Békéscsaba – Gyula – (Romania), (main road no. 44) – Orosháza – Mezőkovácsbánya – Battonya – (Romania)]. The network of roads planned is

<sup>7</sup> [https://www.ksh.hu/stadat\\_files/kor/hu/kor0058.html](https://www.ksh.hu/stadat_files/kor/hu/kor0058.html)

<sup>8</sup> [http://erdo-mezo.hu/wp-content/uploads/2016/10/nemzeti\\_erdeosteategia\\_2016.pdf](http://erdo-mezo.hu/wp-content/uploads/2016/10/nemzeti_erdeosteategia_2016.pdf)

<sup>9</sup> Emergency tanks for preventing destructions caused by water in the development of the Vásárhelyi plan.

expected to impact the evolution of the use of the land in the wider area and can be favourable to tourism (e.g. improving the accessibility of certain areas, improving Hungarian-Romanian transportation connections).

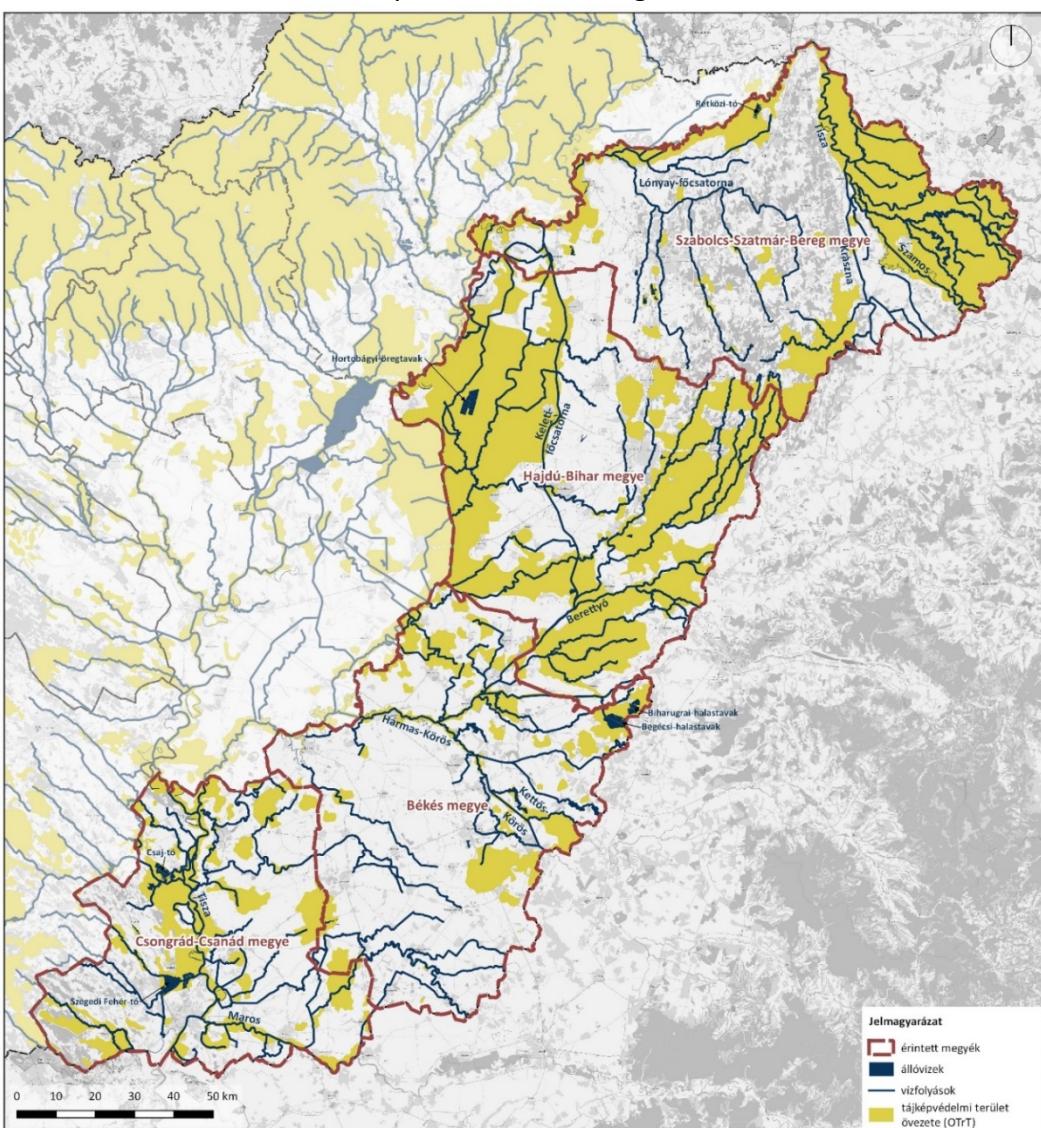


*Figure 14 Use of the lands from the region in the studied counties – based on the structural plan from the National Territory Arrangement Plan* Source: authors, based on <https://www.oeny.hu/oeny/4tr/>

The landscape and natural values include protected natural areas, Natura 2000 sites and elements of the national ecological network described in [chapter 3.4](#). Aside from these, in terms of landscape protection, the large number of **cunic mounds and fortified hills** must be highlighted (protected according to the Hungarian law LIII of 1996 for nature

conservation) and the natural parks of the region (Szatmár-Bereg Natural Park, Körösök Völgye Natural Park) and Hortobágyi Csillagoségbolt Park.<sup>10</sup>

The **landscape protection areas** are regulated by the Hungarian Law CXXXIX of 2018 regarding the National Territory Arrangement Plan. According to the law, an „area” includes *areas formed after the interaction and change of the natural fittings, systems and human activities, that have the aesthetic landscape characteristics and of specific importance, that are worth preserving.*“ These areas significantly overlap protected natural area and areas of national importance and Natura 2000 areas described in [chapter 3.4.](#), and in several cases these are connected to ground waters (for example, Szatmár-Beregi Tájvédelmi Körzet and the landscape protection area in its vicinity, determined by the water streams of Felső-Tiszavidék sau Bihari-sík Tájvédelmi Körzet created in the area of Berettyó and Sebes-Körös rivers and the landscape protection area designated in its vicinity). The landscape protection areas from the studied counties are presented in the figure below.



*Figure 15 Landscape protection area (National Territory Arrangement Plan) in the Hungarian counties studied* Source: authors, based on <https://www.oeny.hu/oeny/4tr/>

<sup>10</sup> <http://web.okir.hu/map/?config=TIR&lang=hu>

As regards the **built area**, Hungary and especially the counties involved in the Programme have remarkable cultural and historical monuments. Especially in certain seats from the former historical system of counties, and in other central settlements, the historical center of the city survived, which usually included very beautiful castle ruins, castles, churches, monumental houses or even industrial monuments (e.g. Debrecen, Gyula). Vestiges of the built patrimony are found partially or fully in the area outside the lived environment (e.g. elements of the old war roads, of old forms of landscape arrangement etc.). The most remarkable representatives of the Hungarian built patrimony are churches, castles and castle ruins, fortresses and fortress ruins from the arpadian period.

According to the Hungarian Law LXIV of 2001 on protection of the cultural heritage, the elements of the **cultural heritage** are the archeological patrimony, the elements of military history that can be investigated through archeological methods, monumental values, national memorial sites, priority national memorial sites and the protected area of the urban landscape and cultural goods. The protection of the **archeological patrimony**<sup>11</sup>, which is a collective memory source and instrument for historical and scientific studies, is also served by the legal frameworks, regulations and databases at international and national level. The law offers general protection to publically registered archeological sites.

**Monumental values**<sup>12</sup> can be considered **historical monuments** if by decision or ministry order or based on a ministry order by the meaning of Law LXXVII of 2011 were declared protected and registered in a public registry. Most of the identifiable monuments (based on the muemlekem.hu database) and of locally protected buildings from the administrative area of the studied localities are situated practically in the built-up area of settlements, usually the majority are residential houses, public institutions, churches and other works of sacred fine art.

The category of **national memorial site** is included in the cultural heritage patrimony protection law of 2012. Such places area „Ópusztaszeri Nemzeti Történeti Emlékpark” (Csanád-Csongrád county) and Máriapócs Nemzeti Kegyhely (Szabolcs-Szatmár-Bereg county).

According to Law XXX of 2012 regarding the *Hungarian national values and Hungarian specific products*, **Hungarian national values**, including Hungarian specific products must be kept and represent unique values.<sup>13</sup> According to the law, the county administration can establish a county collection of valuables and a county committee for collection of valuables that organizes the centralization of the data regarding the local and regional collections of valuables identified in the county, identifies the values that will be

<sup>11</sup> Include structurile, construcțiile, ansamblurile arhitecturale, siturile amenajate, mărturiile mobile, monumente de altă natură, precum și contextul lor, fie că se situează în sol sau sub apă. (Convenția europeană pentru protecția patrimoniului arheologic – La Valletta, 1992) - [http://www.europatanacs.hu/pdf/regeszeti\\_orkseg.pdf](http://www.europatanacs.hu/pdf/regeszeti_orkseg.pdf)

<sup>12</sup> Toate clădirile, grădinile istorice, locurile de înmormântare istorice sau zonele monumentale, precum și rămasările acestora, și ansamblul și sistemul lor logic, care au o semnificație națională istorică, artistică, științifică și tehnică pentru trecutul țării noastre și pentru națiunea maghiară sau pentru conștiința de apartenență a altelor comunități, împreună cu componentele, accesoriile și mobilierul încorporat, împreună sau împreună cu privința anumitor valori specificate.

<sup>13</sup> Este important de remarcat faptul că această formă de clasificare a fost desemnată de obicei pentru siturile care beneficiază deja de protecție oficială națională sau locală privind moștenirea culturală construită.

included in the county collection and creates the county collection. According to the law, “the wide scale promotion of our national values in the country and abroad, the recognition of our linguistic, intellectual, cultural, economic patrimony, obtaining recognition for our natural and built valuables and strengthening the national image are of major importance”.

According to the Government Ordinance no. 324/2020 (VII. 1.) *regarding the registration of Hungarian national valuables and Hungarian specific products in collections of valuables and regulating the activity of boards for collections of valuables*, the national values are identified and classified on 9 specialized categories. In this case, *the cultural inheritance and the built area* must be highlighted.

**A Hungarian specific product (hungaricum)<sup>14</sup>** is practically a collective term that designates the national values that deserve to be distinguished and highlighted, among which, in relation to the programming area, we mention in the category of cultural patrimony the *Hungarian farm, Hortobágy – Puszta National Park (also a site of the World Patrimony and a county value of Hajdú-Bihar county), Bereg cross stitch in the Felső-Tisza region, and Máriapócs Nemzeti Kegyhely and the pilgrimages from Pócs* (which are also county valuables of Szabolcs-Szatmár-Bereg county).

**The collection of valuables of Szabolcs-Szatmár-Bereg county<sup>15</sup>** includes 71 elements of cultural patrimony, of which, among others, we note the *Reformed cemetery from Szatmárcseke with funerary monuments in the shape of a boat, the Hungarian and gipsy dance traditions from Nagyecsed, the life and work of Gyula Krúdy – the dreamer from Nyírség and the Museum Village of Sóstó, as a centre of ethnographic values*. The collection of county valuables includes 37 national valuables in the built area, including, among others, *farms of shrubs from Nyíregyháza, the medieval churches of Szatmár-Bereg, the water mill from Túristvánd, Vay Castle of Berkesz, the dry mill of Tarpa and the Museum of the Dégenfeld Castle (Baktalórántháza)*.

**The collection of values from Hajdú-Bihar county<sup>16</sup>** includes around 60 elements of cultural heritage, of which we mention as examples, among others, *the German popular customs and traditions from Balmazújváros, the structure of the settlement from Hajdúnánás, the fair of the Hortobágy bridge and the tradition of minstrels “regölés”*. The collection of county valuables includes 12 national valuables in the built area, including, among others, the building of the *Vadas inn from Hajdúhadház, the structure of the settlement from Hajdúböszörmény*.

**The collection of values from Békés county<sup>17</sup>** contains around 24 elements of cultural heritage, of which we mention as examples, among others, *Békés wicker products, the artistic heritage of Mihály Munkácsy*. The collection of county valuables contains 5 national valuables of the built area, including among others the building Gyula fortress, the building of the former palace of justice (Gyula). There is no specific national valuable for the county (that is not found in other counties) to be highlighted as a distinctive *hungaricum*.

**The collection of values from Csongrád-Csanád county<sup>18</sup>** contains around 41 elements of cultural heritage, of which we mention for example, among others, *the zither from the great plain, the Feszty panorama, the castle and the garden of the Gerliczy castle*,

<sup>14</sup> <http://www.hungarikum.hu/hungarikumok/kat/151>

<sup>15</sup> <http://szszbm-ertektar.hu/dokumentumok/%C3%89rt%C3%A9klista%202022-01-21.pdf>

<sup>16</sup> <https://www.hbmo.hu/ertektar/>

<sup>17</sup> <http://ertektar.bekesmegye.hu/>

<sup>18</sup> <https://www.csongrad-megye.hu/site/index.php/onkormanyzat/ertektar>

*the digging activity “kubikos”, the Roman-Catholic fortified church (Óföldeák). The collection of county valuables contains 8 national valuables in the built area, including, among others, the fishermen houses from Csongrád and the wind mill from Kiskundorozsma.* There is no specific national valuable for the county (that is not found nationally) which is highlighted as a distinctive hungaricum.

In the localities from the programme area, **historical memorial sites**<sup>19</sup> were declared the fortress and the territory of the memorial site of the defense officers from Gyula, the seat of the hajdú rayon from Hajdúböszörmény, the reception palace of the Báthori castle and the reformed church from Nyírbátor, in Pócspetri the building of the City Hall, in Szarvas geographical center of the historical Hungary and the memorial place of Trianon, in Szatmárcseke the place of the Kőlcsey mansion, and at Szeged the Dóm market and the Auditorium Maximum building of Szeged University.

**World heritage Sites** were established based on the Convention of the World Patrimony UNESCO. The management and development of our world heritage valuables are currently regulated by a dedicated law (Law LXXVII of 2011). Among the **world heritage sites** of Hungary, only Hortobágy – Puszta National Park (1999), as *cultural site*, is in the programme area.

Based on the legal regulations, world heritage management plans are drawn up for the areas that prioritize the natural and landscape conditions of the areas, in accordance with the nature preservation regulations. The sites are also important travel destinations. Aside from already recognized areas, other sites are in the process of recognition, among which, in the studied area, there are:

- The state herd of Mezőhegyes (2000)
- The wood bell towers from the Felső-Tisza region (2000) – Position on the indicative list, initially included as part of an international extended site (planned with the participation of Poland, Romania, Slovakia, Ukraine and Hungary), called „The wooden churches from the North-Eastern arch of the Carpathians”.

As regards the quality and the valuables of the Hungary’s built heritage and, therefore, in the programme area, this is of European and international value, but often provides a limited aesthetic experience and possibility of exploitation because of its state, the non-restoration at scientific standards, the environment in disarray, inadequate or absent use. The same thing partly applies to the construction fund from the country. Environmentally speaking, regardless of the heritage protection statute, these objectives can also serve to reduce certain greenfield investment rates, if by some new or existing functions they can be activated in the life of the locality. Therefore, it is important to register decommissioned buildings and constructions, to evaluate their state and adequacy and to determine their future fate based on an assessment of appropriateness. A cadastre of decommissioned buildings, constructions or of „rusty areas”, split per localities or centralized at national level, is not available in an online and transparent public domain (database with maps or series of data).

The situation in Hungary is very influenced by the activity of the non-profit company for protection of the national heritage Nemzeti Örökségvédelmi Fejlesztési Nonprofit Kft., that contributes to the conservation and promotion of the national built heritage by

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<sup>19</sup> Ordonanța guvernului ungar 303/2011 (XII. 23.) privind siturile memoriale istorice

renovating monument buildings owned by the state and of national importance and by responsible exploitation thereof. The consequences of this activity can be observed in the programme area in the case of the Wenckheim Castle from Szabadkígyós, the Becsky-Kossuth Mansion from Komlódtótfalu and the Tisza Castle from Geszt.

In the case of the archeological and monument patrimony, as well as in the case of the World Heritage Sites and national memorial sites, **historical memorial sites** and buildings under **local protection**, the direct effects can be identified only knowing the actual sites for intervention.

The built values related to ground waters, protected natural areas, landscape protection areas and the cultural heritage from the studied areas of Hungary determine together the main possible target areas for tourism and leisure.

### 3.1 Noise, vibrations

Among the localities from the four Hungarian counties, a strategic map of noise (and a map of conflicts that shows the deviation from strategic thresholds) was made in 2012 for Debrecen, Nyíregyháza and Szeged, as cities with a population of over 100,000 inhabitants, providing information about road and railway, air transportation and industrial installations (only IPPC installations). The Electronic Data Base on Air Protection and Noise contains road and railway noise maps also for the localities of Balmazújváros, Békés, Békéscsaba, Berettyóújfalu, Csongrád, Gyula, Hajdúbószörmény, Hajdúnánás, Hajdúszoboszló, Hódmezővásárhely, Kisvárda, Makó, Mátészalka, Orosháza, Püspökladány, Szarvas, Szentes.

These also confirm that narrow, built parts of very large cities and smaller settlements crossed by major transportation routes, are significantly polluted by noise and vibrations. Noise and vibrations – in spite of the development of public transportation in the last decade and the construction of bypass roads – continues to be a major problem for the quality of the urban environment due to the increase of road traffic. In areas affected by more intense road traffic, traffic noise can also exceed the limit values set out in Annex 3 to the Common Order 27/2008 (XII. 3.) KvVM-EÜM for the roads that will be built or extended and modernized, affecting the objectives subject to protection that are close to the road (a few tens of meters).

The noise and vibrations in the localities is equally very impacted by railway traffic and related activities (vocal announcements, honking). As for railway transportation, to mention are the main railway limits of MÁV number 100 Budapest-Debrecen-Nyíregyháza-Záhony, and number 120 Budapest-Szolnok- Békéscsaba-Lőkösháza and number 140 Cegléd-Szeged, and because of their significant international traffic of goods.

Air transport is to mention especially in the case of Debrecen, where there is the second most crowded airport of Hungaria but also the airport of Nyíregyháza open to international traffic (and the Szeged airport, although the latter is used mostly for sport events and for private aircrafts). The airport operating in Békéscsaba is currently not busy, but the need for its development arises from time to time.

The operational noise usually affects smaller areas and fewer persons. Large industrial installations have constantly introduced measures to reduce noise by applying strict regulations. Problems may appear especially if these are close to residential areas or, possibly, intertwined. Complaints can appear especially in the case of night operation, usually regarding the operation of ventilation and evacuation systems, boiler rooms, compressors and cooling equipment.

The impact of noise from small and private enterprises from residential areas (like domestic and garden activities) can disturb the environment immediately although the limits of sound pollution are observed.

In the case of leisure and public food units, especially those dotted between residential buildings (possibly summer houses), the disturbance is mainly caused by the sound systems and the outdoor units of air conditioning and cooling systems. Open air music events (festivals) can also be a source of conflict, the same of large scale or prolonged construction-installation activities.

Based on the above considerations, **transportation is the major source of noise (and vibrations) in Békés, Csongrád-Csanád, Hajdú-Bihar and Szabolcs-Szatmár-Bereg counties**, the effect of pollution being mainly caused in areas adjacent to national roads and railway lines crossing localities.

### 3.6. Population and human health

No significant effects on the environment are expected through the *Programme objectives do not*, and mitigation and monitoring measures are proposed. Application of these measures to the specific projects in this *Programme*, will have significant positive effects on the environment, including on environmental aspects such as biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material goods, cultural heritage, including architectural and archaeological heritage, landscape and the relationship between these factors.

In 2019, 3.85 million people lived in the programme area, representing 13.2% of the total population of Hungary and Romania combined, distributed territorially in eight counties with various population volumes (from 338,025 inhabitants in Békés to 701,499 in Timis) and densities between 54.1/km<sup>2</sup> (Arad) and 93.9 inhabitants per km<sup>2</sup> (Csongrád-Csanád). The territory has high population density groups in the south (areas around Szeged, Timisoara, Arad) and north (areas around Oradea, Debrecen and, to a large extent, the territory of Szabolcs-Szatmár-Bereg and the northern half of Satu Mare). The Békés - Arad area is characterized by a lower density; these are the counties having the highest rate of negative natural variation of the population in 2018 on both sides (-7.4‰ in Békés and -4‰ in Arad), which indicates complex reasons behind the lower attractiveness.

In the last 10 years, the PA has consistently registered a decrease in population, Timis being a significant exception due to the positive variation of the natural and migratory population (+1.1, +0.5‰). Emigration has been a problem especially for Hajdú-Bihar, Bihor and Satu Mare Counties, which form a contiguous area in the northern part of the PA. The dynamic trends of the intra-regional population highlight the existence of peri-urbanisation phenomena, especially around Timisoara and Oradea, but also around Szeged and Arad, which indicate increasing differences between urban and rural areas and a more intensive model of urbanisation, with implications on the demand for services and infrastructure, and concerning the impact on the environment. The population aging in the area in the last 10 years and, as a result, the dependency rate by ages have steadily increased, albeit at a faster pace in Békés (158.5% aging rate in 2018) and Csongrád-Csanád (147.9%), which are the highest in the PA. The negative rate of natural change in the Hungarian PA territory is twice as high as in the Romanian territory (-3.8‰, compared to -1.9‰), a significant difference recognized in the European demographic trend projections (ESPON ESCAPE, 2019), showing Békés and Szabolcs-Szatmár-Bereg as significantly declining rural areas.

At county level, in terms of population dependency rates, there are clear disparities between Békés (33%) and Csongrád-Csanád (31.2%) and the remaining counties (from 22.4% in Timis to 27.7% in Arad). However, a more in-depth assessment of demographic dependency rates at the UAL2 level highlights a different pattern, in which predominantly rural areas in the eastern Romanian counties (especially Arad and Bihor) have a more vulnerable, older population, with dependency rate values of over 50 people. This difference between the county average, which is positive for the Romanian counties, and the situation at ULA2 level, underlines the deeper urban-rural disparities in the Romanian counties and the formation of interior peripheries in the rural areas of Békés-Arad-Bihor.

The demographic trends and territorial concentration of the population suggest that the two sides of the border have common challenges related to depopulation, demographic aging and sub-urbanization trends in major cities, while rurality is also an important feature of the PA, generating interior peripheries and rural-urban disparities.

The decrease in the birth rate in recent years in the PA, as in the rest of the country, is based on a number of economic and social factors, especially characteristic of the post-revolutionary period. These are primarily:

- the significant transformation of the occupational structure of the population, which imposed, especially on young people, a special territorial and professional mobility and, at the same time, the extension of the training period, all to the detriment of the role of parent;
- social insecurity;
- gradual decrease in infant mortality;
- changing the demographic behaviour of married couples.

In relation to human health, it is important to mention the natural therapeutic factors from the studied area (see the table below), that in certain cases is also a significant touristic attraction, and therefore have a great economic significance.

*Table 13 Natural therapeutic factors registered in the relevant counties of Hungary*

<b>Békés County</b>
<i>Medicinal water well:</i> Battonya, Békés, Békéscsaba, Dévaványa, Füzesgyarmat, Gyomaendrőd, Gyula, Mezőberény, Mezőkovácsháza, Orosháza, Szarvas, Tótkomlós; Fântână de apă minerală: Biharugra, Mezőkovácsháza, Orosháza;
<i>Spas:</i> Békés, Békéscsaba, Gyomaendrőd, Gyula, Orosháza-Gyopáros, Szarvas;
<i>Hotels with spa treatment:</i> Füzesgyarmat, Gyula; Stațiune balneară: Gyula, Orosháza.
<b>Csongrád-Csanád County</b>
<i>Medicinal water well:</i> Algyő, Csongrád, Hódmezővásárhely, Kistelek, Makó, Mórahalom, Szeged, Székkutas, Szentes;
<i>Mineral water well:</i> Nagymágocs, Szeged, Szentes, Zsombó; Nămol medicinal: Makó; Băi termale: Algyő, Csongrád, Makó, Mórahalom, Szeged, Szentes; Hoteluri cu tratament balnear: Szeged; Stațiune balneară: Mórahalom.
<i>Note:</i> Medicinal mud from Makó (număr licenței: 607/OTH/2010) ajunge în Ungaria din direcția România, ca sediment al râului Mureș, care este colectat în timpul revărsării râului.
<b>Hajdú-Bihar County</b>
<i>Medicinal water well:</i> Balmazújváros, Berettyóújfalu, Debrecen, Hajdúböszörmény, Hajdúdorog, Hajdúnánás, Hajdúszoboszló, Hortobágy, Kaba, Nádudvar, Polgár, Püspökladány, Tiszacsege;
<i>Mineral water well:</i> Berettyóújfalu, Debrecen, Furta, Hajdúsámson, Hajdúszoboszló, Létavértes, Újléta; <i>Băi termale:</i> Balmazújváros, Debrecen, Hajdúböszörmény, Hajdúnánás, Hajdúszoboszló, Kaba, Nádudvar, Püspökladány;
<i>Hotels with spa treatment:</i> Debrecen, Hajdúszoboszló; Stațiune balneară: Debrecen, Hajdúnánás, Hajdúszoboszló.

### Szabolcs-Szatmár-Bereg County

*Medicinal water well:* Fehérgyarmat, Kisvárda, Máriapócs, Nagykálló, Nyírbátor, Nyíregyháza, Nyíregyháza-Sóstófürdő, Penészlek, Tiszavasvári, Vásárosnamény;

*Mineral water well:* Cégénydányad, Kisvárda, Komoró, Kömörő, Milota, Penészlek, Terem, Zsurk;

*Spas:* Fehérgyarmat, Kisvárda, Nyírbátor, Nyíregyháza, Nyíregyháza-Sóstófürdő, Penészlek, Tiszavasvári; *Statjune balneară:* Nyírbátor, Nyíregyháza.

- *Source:* <https://www.kormanyhivatal.hu/hu/budapest/jarasok/orszagos-nyilvantartas-gyogytenyezokrol>

In addition, light pollution has a negative impact on wildlife but is also harmful to human health, not only because of the risk of accidents but also because of its physiological effects, especially in urban areas.

### 3.8. Waste management

Permanent improvement of waste management contributes to the reduction of health and environmental problems, the reduction of greenhouse gas emissions (directly by reducing emissions from landfills and indirectly by recycling materials that can be extracted and processed) and avoiding the local adverse impact, such as damaged landscape due to landfills, local water and air pollution, and inadequate waste management.

#### Presentation of the current situation in Timis County

In order to optimise collection and transport, Timis County was divided into 5 collection areas as follows: Area 0 – Ghizela; Area 1 – Timisoara; Area 2 – Jimbolia; Area 3 – Deta; Area 4 – Faget.

In accordance with the Timis County Waste Management Plan (2019-2025), regarding collection and transport, Area 0 includes 23 settlements, Area 1 includes 32 settlements, Area 2 includes 29 settlements and Area 4 includes 12 settlements from where similar household waste is collected; Area 3 includes 16 settlements from where similar household waste and street waste from parks, gardens or markets is collected

The collected waste is transported directly to the transfer station, specifically, 3 collection centres as follows:

- Timisoara transfer station serving Area 1 Timisoara; the transfer station does not provide compaction and is equipped with: weighing gate cabin, 3 unloading areas for waste, 32m<sup>3</sup> containers (6 pcs), transfer vehicles. The transfer station also has a collection platform for bulky and hazardous waste;
- Jimbolia collection centre serving Area 2 Jimbolia; the transfer station does not provide compaction and is equipped with: weighing gate cabin, 4 unloading areas for waste, 32m<sup>3</sup> containers (7 pcs), transfer vehicles. The transfer station also has a collection platform for bulky and hazardous waste;
- Deta collection centre serving Area 3 Deta; the transfer station does not provide compaction and is equipped with: weighing gate cabin, 3 unloading areas for waste, 32m<sup>3</sup> containers (6 pcs), transfer vehicles. The transfer station also has a collection platform for bulky and hazardous waste;
- Faget collection centre serving Area 4 Faget; the transfer station does not provide compaction and is equipped with: weighing gate cabin, 3 unloading areas for waste, 32m<sup>3</sup> containers (4 pcs), transfer vehicles. The transfer station also has a collection platform for bulky and hazardous waste.

Currently, there are 2 sorting stations for municipal waste in Timis County, specifically:

1. Ghizela sorting station for the following waste codes (15 01 01, 15 01 02, 15 01 04, 20 01 01, 20 01 39, 20 01 40), with a design capacity of 16,111 t/year;

2. Timisoara sorting station for class 15 and 20 waste codes, with a capacity of 47,180 t/year for recyclable waste and 115,810 t/year for residual waste.

Waste recovery in the Timis County is performed by 11 economic operators for the following waste codes: 15 01 02, 15 01 03, 15 01 09, and the recovery through energy recovery plants is carried out by 3 economic operators for the following waste codes: 15 01 01, 15 01 02, 15 01 03, 15 01 04, 15 01 09; dangerous waste.

In terms of waste storage in the Timis County, the Ghizela Non-Hazardous Waste Landfill is functional since 2013, located in the town of Ghizela. It is operated by SC retim Ecologic Service SA.

### **Presentation of the current situation in Arad County**

In order to optimise collection and transport, Arad County was divided into areas assigned to 16 economic operators that serve most of the settlements within the county and from where municipal and similar waste, recyclable, non-hazardous solids, street waste, non-hazardous waste that cannot be recovered is collected and transported.

The waste collected in Arad County is transferred to the following sorting stations:

- Arad sorting station, for the following waste codes: 15 01 01, 15 01 02, 15 01 04, 20 03 01;
- Ineu sorting station, for the following waste codes: 02 01 04, 03 03 08, 15 01 01, 15 01 02, 15 01 04, 15 01 09, 16 01 19, 20 01 02;
- Mocrea-Ineu sorting station, for the following waste codes: 15 01 01, 15 01 02, 15 01 04, 15 01 06, 20 01 01, 20 01 39, 20 01 40.

According to FCC Environment Romania SRL Arad there is a landfill in the Arad County.

### **Presentation of the current situation in Satu-Mare County**

In order to optimise collection and transport, Satu-Mare County was divided into areas assigned to 17 economic operators that serve most of the county settlements, and which collect and transport the following categories of waste: household waste, similar waste from commercial activities, from industry and institutions, including separately collected fractions, notwithstanding the flow of electrical and electronic equipment waste, batteries and accumulators.

The waste collected in Satu-Mare County is transferred to the following sorting stations:

- Doba Regional Landfill sorting station for the following waste codes: 15 01 01; 15 01 02; 15 01 03; 15 01 04; 15 01 05; 15 01 06; 15 01 07; 15 01 09; 20 01 01; 20 01 10; 20 01 11; 20 01 38; 20 01 39; 20 01 40 with a design capacity of 26,292 t/year;
- Tiream sorting line/SC Ierul Tiream SRL, for the following waste codes: 15 01 01; 15 01 02; 20 01 01; 20 01 39; 20 01 40 with a design capacity of 2,055 t/year;

and recovery through recovery facilities is carried out by 7 economic operators, as follows:

- SC GLOBAL SRL, Botiz, by grinding, for the following types of waste: 15 01 02 with a capacity of 100 t/month;
- SC MONDOREK SRL, Carei, by bale press, for the following types of waste: 15 01 01 and 15 01 03 with a capacity of 2,400 t;
- SC ALPIN RECYCLING SRL, Viile Satu Mare, by granulation, bale press, for the following types of waste: 15 01 01 and 15 01 03 with a capacity of 1-4 t/h;
- SC ALPIN SRL, Viile Satu Mare, by bale press, for the following types of waste: 15 01 01 and 15 01 03;

- FURNITURE & GEOMETRIC SRL, Satu Mare, through semi-automatic pallet dismantling machine, semi-automatic table for manufacturing pallets, wood chopping plant for the following type of waste: 15 01 03;
- BREK ROM SRL, Valea Vinului, through semi-automatic pallet dismantling machine, semi-automatic table for manufacturing pallets, wood chopping plant for the following type of waste: 15 01 03;
- BRELA INT SRL, Lipau, through semi-automatic pallet dismantling machine, semi-automatic table for manufacturing pallets, wood chopping plant for the following type of waste: 15 01 03 and 15 01 04.

### **Presentation of the current situation in Bihor County**

In order to optimise collection and transport, Bihor County was divided into areas assigned to 17 economic operators, which serve 6 settlements, from where the following categories of waste are collected and transported: household waste, similar, street waste, waste from parks, gardens and markets, as well as sludge from septic tanks.

The waste collected in Bihor County is transferred to the following sorting stations:

- Beius sorting/transfer station, for the following waste categories: 15, 16, 17, 18, 19, 20 with a design capacity of 7,000/16,100/t/year;
- Valea lui Mihai sorting station, for the following waste categories: 15 and 17, with a design capacity of 4,500/t/year;
- Sacuieni transfer station, for the following waste categories: 15 and 17, with a design capacity of 4,500/t/year;
- Salonta sorting station, for the following waste categories: 15, 16, 17, 18, 19 and 20 with a design capacity of 4,500/9,000/t/year;
- Marghita sorting/transfer station, for the following waste categories: 15, 16, 17, 18, 19 and 20 with a design capacity of 4,500/10,600/t/year;
- Alesd sorting/transfer station, for the following waste categories: 15, 16, 17, 18, 19 and 20 with a design capacity of 4,000/12,700/t/year;
- Stei transfer station, for the following waste categories: 15, 16, 17, 18, 19 and 20 with a design capacity of 3,500/t/year;
- Waste sorting station for the following categories in the municipality of Oradea: 15, 16, 17, 18, 19 and 20 with a design capacity of 39,000/t/year.

Waste recovery in Bihor County is conducted as follows:

1. By disposal - at the Oradea Ecological Landfill with a design capacity of 3,800.00 m<sup>3</sup>;
2. By composting: Oradea composting station with a design capacity of 20,000 t/year; Valea lui Mihai composting plant with a design capacity of 1,000 t/year;
3. By heat treatment - Holcim Ciment Alesd with a heat treatment capacity of 267,000 t/year.

**In comparison with the waste management and recycling infrastructure from Hungary,** we reckon that it is more developed in the Hungarian counties (expressed in the number of units) than in Romania. The relevant waste volumes and available waste management installations are presented below in the form of a table.

Table 14 Quantity of waste collected and exploited or discharged in 2018, in t

	Békés County	Csongrád-Csanád County	Hajdú-Bihar County	Szabolcs-Szatmár-Bereg County
Total solid municipal waste transported	97752.6	129209.9	152878	144419.4
Of which taken from the population by traditional means	66060.5	78318.3	97799.1	85314.8
Of which taken from the population by selection collection	18859.4	17626.4	11636.2	11655.6
total waste exploited and discharged	97752.6	129209.9	152878	144419.4
Of which exploited by energy exploitation	10170.4	13135	0.1	0
Exploited by recycling	23738.8	45537.7	20558.7	24408.3
Of which exploited by composting	16175.7	25930.6	13549.9	11658.6
Solid waste stored at the waste deposit	63843.4	70537.2	132319.2	120008.1

Source: National Institute of Statistics

In the following table, we present the local installations of collection and treatment and the recovery and discharge, based on the National Waste Management Plan 2021-2027.

Table 15 Installations of collection and treatment in the Hungarian counties involved

	Békés County	Csongrád-Csanád County	Hajdú-Bihar County	Szabolcs-Szatmár-Bereg County
Waste collection island	Gyula, Kunágota, Mezőhegyes, Szeghalom, Vésztő	Ásotthalom, Baks, Balástya, Csenger, Csongrád, Deszk, Kiszombor, Kübékhet, Makó, Mórahalom, Ópusztaszer, Pusztaszer, Röszke, Sándorfalva, Szatymaz, Szentes, Szeged (8 buc), Tiszasziget, Újszentiván, Zákányszék	Debrecen și Hajdúszoboszló	Nyíregyháza (2 buc)
Sorting installation	Békéscsaba, Gyomaendrőd	Felgyő, Szeged	Berettyóújfalu, Debrecen, Hajdúbőszörmény, Nádudvar	Kisvárda, Nagyecsed, Nyíregyháza
Transfer station	Mezőhegyes, Orosháza, Szeghalom	Mórahalom, Makó, Szentes (2 buc)	Hajdúszoboszló	
Mechanical-biological waste treatment station	Békéscsaba	Felgyő		Nyíregyháza, Nagyecsed, Kisvárda
Bio waste treatment	Békés, Békéscsaba (2 buc), Dévaványa, Gyomaendrőd, Gyula, Orosháza, Szarvas	Felgyő, Szentes, Szeged (3 pc.)	Berettyóújfalu, Debrecen, Hajdúbőszörmény, Hajdúszoboszló	Kisvárda, Nagyecsed, Nyírbátor, Nyíregyháza (2 buc)

Table 16 Recovery and discharge installations in the Hungarian counties involved and their capacity at the end of 2018

	Békés County	Csongrád-Csanád County	Hajdú-Bihar County	Szabolcs-Szatmár-Bereg County
Energy recovery installation				Mátészalka (10 t/year), Nyíregyháza (624 t/year), Kisvárda (310 t/year)
Hazardous waste incineration station				Tiszavasvári (6750 t/year)
Inert waste deposit			Hajdúszoboszló (22 688 m <sup>3</sup> )	
Inorganic non-hazardous waste deposit				Demecser (270 000 m <sup>3</sup> ), Ibrány (220 000 m <sup>3</sup> ), Szakoly (300 000 m <sup>3</sup> )
Hazardous waste deposit			Debrecen (2600 m <sup>3</sup> )	
Mixed deposit for non-hazardous waste	Békéscsaba (406294 m <sup>3</sup> ), Gyomaendrőd (179848 m <sup>3</sup> )	Felgyő (125547 m <sup>3</sup> ), Hódmezővásárhely (235438 m <sup>3</sup> ), Szeged (301537 m <sup>3</sup> )	Berettyóújfalu (87818 m <sup>3</sup> ), Debrecen (620106 m <sup>3</sup> ), Hajdúbőszörmény (na.), Nádudvar (111839 m <sup>3</sup> )	Kisvárda (574880 m <sup>3</sup> ), Nyíregyháza (1425000m <sup>3</sup> ), Nagyecsed (560000m <sup>3</sup> )
Composting station	Gyomaendrőd	Algyő, Felgyő, Hódmezővásárhely (2 buc), Szeged, Szentes	Berettyóújfalu, Hajdúbőszörmény, Hajdúszoboszló (2 buc), Debrecen	Kisvárda, Nagyecsed, Nagykálló, Nyíregyháza

For protection against municipal waste arriving from abroad by water, which is a serious problem, an investment was made to protect the entire Tisza valley, by which the water administration can intervene and discharge the waste during the flood period. However, interventions that require a sustainable and real Hungary's competence.

### **3.9. Evolution of the environment if the Programme is not implemented**

The evolution of the state of the environment if the Programme is not implemented involves analysing how the specific objectives and the types of actions proposed by it respond to the requirements and needs of the state of the environment within the PA. Thus, the programme develops specific objectives that are analysed under the environmental report on the strategic environmental impact assessment of this *Programme*, through further interventions to create a framework for sustainable development:

- **maximising the focus of resources on interventions where cross-border cooperation brings added value, and the Interreg programme is the main funding option;**
- **creating links between territories and communities based on shared territorial and intangible assets**, which can create common socio-economic opportunities for economic recovery (for example, renewable energies and the opportunity to create “green communities/renewable energy”, such as tourism and culture as areas of common interest, capable of mobilising funds and partnerships in a shared vision of territorial marketing);
- **promoting interpersonal interventions as a basis for a more structured cooperation**, with proven results in terms of building sustainable and inclusive communities and an open business environment that can support the design of customised solutions for future community-led local development initiatives and cross-border integrated socio-economic strategies, thus transforming the interpersonal actions into “laboratories” aimed at animating local communities;
- **strengthening the common knowledge base, capabilities, shared systems and working procedures**, as a prerequisite for the project sustainability and for effective results (e.g., soft measurements for all selected POs and specific measures under ISO1 on other topics not related to the selected POs). Using ISO 1 as a resource for systemising the lessons learned at the end of the programme implementation, learning lessons about cooperation in various areas, in terms of: developing shared strategies, effective cross-border systems and institutional cooperation frameworks in all selected POs; resolving legal and administrative barriers; creating more cohesive local and business communities through interpersonal exchanges.

Subchapters 2.1 - 2.7 highlight the conclusions of the analysis of the state of the environment if the *Programme* is not implemented.

Below are briefly presented the disadvantages resulting if the *Programme* is not implemented:

- ❖ Maintaining the current level of air quality, which may lead to the failure of both countries to achieve climate neutrality objectives and targets;
- ❖ Maintaining a high level of greenhouse gas emissions;
- ❖ Unsustainable energy consumption;
- ❖ Lack of opportunities for flood prevention and risk management;
- ❖ Lack of information opportunities regarding the occurrence of water-related extreme phenomena;
- ❖ Lack of investment in health services;

- ❖ Poor capitalisation on the heritage and sustainable tourism;
- ❖ Lack of cooperation between the two States.

If the *Programme* is not implemented, the environmental issues analysed in this environmental report will persist and may have adverse effects on the environment.

### **3. Environmental characteristics of the area that could be significantly affected**

The *Interreg VI Romania-Hungary Programme for the period 2021-2027* addresses four counties in Romania (Satu Mare, Bihor, Arad, Timis) and four districts in Hungary (Szabolcs-Szatmár-Bereg, Hajdú-Bihar, Békés, Csongrád-Csanád), the locations for the relevant types of interventions/works not being known.

The main environmental characteristics that can be significantly affected by the implementation of the types of interventions/works are represented by: air, water, soil, natural landscape, biodiversity.

These were presented in the previous chapter for the whole *Programme* implementation area, being evaluated in this report in general lines.

#### Air quality

The main pressures on air quality are determined by road traffic, burning of fuels from various technological processes or in industrial/residential thermal power plants, exploitation of raw materials, construction works, agricultural and/or farming/zootechnical activities (use of pesticides and intensive animal husbandry). The most affected areas are represented by urban settlements, where most of the industrial objectives that release pollutants into the atmosphere and household heating installations are concentrated, and the road traffic is intense.

#### Water quality

In the *Programme* implementation area, water resources are represented by underground sources and by the surface sources (rivers/lakes) within the river basins: Mures, Crisuri, Somes – Tisza.

The main pressures on water quality are caused by the contamination with wastewater containing particulate matter, organic matter, nutrients and pollutants such as heavy metals, detergents, petroleum hydrocarbons, fertilisers, pesticides used in agriculture. It is worth mentioning that pollution with nitrites and phosphates of surface waters does not record values above the allowed limit required by the national legislation.

#### Soil quality

In the *Programme* implementation area, soil quality is increasingly affected by various degradation processes, whether we are talking about processes derived from human activity or natural phenomena. The main economic sectors with a significant impact on the soil come from: mining and metallurgy (by processing and storage of waste, tailings ponds and tailings dumps), chemical industry (by the storage of waste from chemical, petrochemical and drug plants, abandoned sites), oil industry (by polluting the soil with hydrocarbons and heavy metals), old pesticide storage and other large-scale activities (metal processing, non-compliant municipal landfills, military sites, wood processing industry, coal-fired power plants, transport activities, service activities, etc.), agriculture.

#### Natural landscape

The degradation of the landscape is closely related to the degradation of the state of conservation of biological diversity. The National Strategy and Action Plan for Biodiversity Conservation 2014-2020 highlight the fact that the main anthropogenic elements that have

induced changes to the ecosystem composition and functions, including the productive and support capacity of biodiversity in Romania derive from the objectives of socio-economic development strategies, as well as from the means used for their implementation in the period 1950-1989.

Regarding the natural landscape and the distribution of landforms in the Hungarian PA, part of the Pannonian region, it can be seen that anthropogenic interventions are present especially in county seats and mainly in urban areas, covering mostly plains and hills, to a lesser extent. The main level of anthropogenic intervention on hill relief is located on the Hungarian side of the programme, which proves a better accessibility, connectivity and exploitation of local resources. In terms of land use, most of the PA territory is arable land.

#### Biodiversity

Because the *Programme* can finance types of interventions/works covering its entire implementation area on different priority axes, there is the possibility that they take place in the vicinity or within protected natural areas or areas of Community interest. Moreover, the *Programme* does not currently have a list of such types of predefined interventions/works in its composition, nor the intentions of the future beneficiaries to apply for their financing are known. Below is a list of protected natural areas and areas of Community interest, the impact being assessed accordingly.

In the Romanian part of the *Programme* implementation area, 105 Natura 2000 sites and 107 natural areas of national interest have been designated, of which 66 in Bihor County. In the Hungarian part of the *Programme* implementation area, 148 Natura 2000 sites and 36 protected areas have been designated. In the PA, 3 biogeographical regions were identified: alpine, continental (only in the Romanian PA), and Pannonian (in the entire PA). Regarding the location of land areas related to the biogeographical regions, we mention that they are influenced by relief and altitude. The degree of urbanisation or use of land surfaces influences the distribution of protected natural areas. This can be explained by the large areas of land used in the historical past, but also today, as farmland for which it was necessary to convert them from meadows, hayfields, forests, wetlands to land suited for agriculture. Human settlements (rural or urban) have also undergone the same type of work, thus, many wild or natural areas have been lost over time. Anthropogenic pressures are still present. Expansion of built-up areas and road networks and the growing need to provide food for the population still have effects through land conversion.

Details of the environmental characteristics of the areas where the future types of interventions/works promoted by the *Programme* will be described and analysed in the environmental impact assessment procedure.

## **5. Any existing environmental issues that are relevant to the plan or programme, including in particular those related to any area of particular importance for the environment, in accordance with Directives 79/209/EEC and 92/43/EEC**

The current state of the environment at PA level was presented in Chapter 2. Relevant aspects of the current state of the environment and likely developments if the *Interreg VI Romania-Hungary Programme for the period 2021-2027* is not implemented, is an alternative without a programme, without its actions and interventions. The table below shows the main environmental issues - and with direct impact for the *Programme*.

*Table 17 Relevant existing environmental issues and reducing the negative impact through the specific priorities/objectives for the Interreg VI Romania-Hungary Programme for the period 2021-2027*

Relevant environmental issues	Relevant existing environmental issues for the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>	Reducing the negative impact on the environment through the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>
Air	Existence of a significant number of industrial objectives, which are not upgraded with emission abatement facilities, mainly sulphur oxides, nitrogen and carbon compounds.	It is proposed to reduce the impact by: <i>PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i>
Water	Altering the condition of surface watercourses by developing various hydropower constructions, aggregate exploitation areas, etc.; The trend of loading surface water with organic substances, particulate matter from various industrial plants, which have not been upgraded, obsolete or non-existent sewerage systems;	It is proposed to reduce the impact by: <i>PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i> <i>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</i>
Soil	Presence of contaminated areas around oil and gas sites; Soil pollution with fertilisers used in agriculture;	It is proposed to reduce the impact by: <i>PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i> <i>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</i> <i>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</i>
Climate change	High greenhouse gas emissions from energy/industrial activities; Extreme phenomena (floods, heat waves)	It is proposed to reduce the impact by: <i>PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i> <i>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</i> <i>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</i>
Biodiversity	Inadequate location of new objectives (industry, agriculture, trade, residential) in relation to protected natural areas. Absence of cumulative assessments on	It is proposed to reduce the impact by: <i>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-</i>

Relevant environmental issues	Relevant existing environmental issues for the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>	Reducing the negative impact on the environment through the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>
	<p>the impact of each sector of activity, and lack of cumulative assessments on the agglomeration of objectives (residential areas, expanding industrial areas) in small areas.</p> <p>Unfit ecological reconstruction works that would not allow the restoration of natural habitats.</p>	<p>based approaches;</p> <p>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</p>
Landscape	<p>Degradation of the natural landscape due to the abandonment of industrial objectives/sites.</p>	<p>It is proposed to reduce the impact by:</p> <p>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</p> <p>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</p>
Population and human health	<p>Lack of rehabilitation of contaminated and potentially contaminated sites with an impact on human health.</p>	<p>It is proposed to reduce the impact by:</p> <p>PO2 (ii) – <i>Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i></p> <p>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</p> <p>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</p>
Cultural aspects	<p>Degradation of areas of cultural interest as a result of the development of areas with functions incompatible with the areas that house cultural objectives.</p>	<p>It is proposed to reduce the impact by:</p> <p>PO4 (vi) Strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation;</p>
Conservation of natural resources	<p>Exploitation of non-renewable resources at a fast pace.</p>	<p>It is proposed to reduce the impact by:</p> <p>PO2 (ii) – <i>Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i></p> <p>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</p> <p>PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.</p>

Relevant environmental issues	Relevant existing environmental issues for the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>	Reducing the negative impact on the environment through the <i>Interreg VI Romania-Hungary Programme, for the period 2021-2027</i>
		areas, and reducing all forms of pollution.
Energy efficiency	Lack of infrastructure for waste recovery in order to reduce the exploitation of depletable natural resources.	It is proposed to reduce the impact by: PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein; PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;
Waste	Uncontrolled storage of all types of waste.	It is proposed to reduce the impact by: PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein; PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;
Sustainable transport	Exceeded values of pollutants released by car traffic (PM <sub>10</sub> , PM <sub>2.5</sub> , NO <sub>x</sub> , etc.)	It is proposed to reduce the impact by: PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;

## 6. Environmental protection objectives, set at national, Community or international level, which are relevant to the *Programme* and how these objectives and any other environmental considerations have been considered during the preparation of the plan or programme

To assess the environmental effects generated by the implementation *Interreg VI Romania-Hungary Programme for the period 2021-2027*, a number of relevant objectives were selected and analysed, directly related to:

- Environmental issues relevant to the *Interreg VI Romania-Hungary Programme for the period 2021-2027*, resulted from the analysis of the current state of the environment;
- Objectives and measures proposed through the *Interreg VI Romania-Hungary Programme, for the period 2021-2027*;
- The consultations that took place with the members of the inter-institutional task force for the environmental assessment for the Interreg VI-A Romania-Hungary Programme 2021-2027, in the two meetings dated 24 November 2021 and 28 January 2022, respectively.

The table below presents the environmental objectives relevant for the Programme:

*Table 18 Environmental objectives for the Interreg VI Romania-Hungary Programme, for the period 2021-2027*

Environmental issues	Proposed environmental objectives
Air	<b>EO.1</b> Improving air quality by reducing emissions from industry, agriculture, etc.; <b>EO.2</b> Improving air quality in large urban agglomerations within the PA;
Water (surface and groundwater)	<b>EO.3</b> Improving water quality by reducing emissions from industry, agriculture, etc.; <b>EO.4</b> Improving the condition of water bodies and not damaging their condition (Water Framework Directive);
Soil	<b>EO.5</b> Limiting and reducing the punctual soil pollution; <b>EO.6</b> Maintaining the green state of the soil;
Climate change	<b>EO.7</b> Reducing greenhouse gas emissions from various areas of activity to meet EU targets; <b>EO.8</b> Adapting to climate change, preventing natural hazards, promoting ecosystem benefits, anticipating the effects of climate change and taking adequate measures to prevent or minimise the effects;
Noise	<b>EO.9</b> Limiting the noise generated by various activities, especially in urban areas;
Biodiversity	<b>EO.10</b> Improving and maintaining the status of conservation of habitats and species of flora and fauna of Community importance; <b>EO.11</b> Maintaining the national network of protected natural areas;
Landscape	<b>EO.12</b> Protection and conservation of the natural landscape;
Cultural aspects	<b>EO.13</b> Preservation and conservation of cultural heritage elements; <b>EO.14</b> Preservation and conservation of local traditions and customs through sustainable tourism;
Conservation of natural resources	<b>EO.15</b> Reducing the exploitation of depletable resources and facilitating the use of renewable ones;
Waste	<b>EO.16</b> Preventing waste generation and promoting the concept of "circular economy", reducing the amount of waste generated by increasing the degree of recycling/recovery for reintroduction into the economic circuit for all types of waste, integrating circular economy solutions;
Population and human health	<b>EO.17</b> Reducing emissions of environmental pollutants, which could improve the health of the population and thus increase the quality of life; <b>EO.18</b> The use of clean (advanced) technology that poses as little risk as possible for the staff from units involved in various fields of activity;
Issues concerning sustainable transport	<b>EO.19</b> Facilitating the infrastructure for electric and non-motorized transport;
Energy efficiency	<b>EO.20</b> Improving energy efficiency and sustainable use of resources.

### **6.1 Assessing the compatibility between the Programme objectives**

The main common challenges across the programme territory can be identified in the following main areas: **socio-economic development, mobility, energy, natural and cultural resources, sustainable tourism, management of risk of dangerous natural phenomena, border management**.

During the programming process, a territorial analysis was carried out as a joint effort of the programme bodies, stakeholders and the joint programming task force.

The main coordinates of the conceptual framework used in the *Programme* evaluation are the following:

- 1. Correct identification and implementation of environmental obligations** from the areas mentioned above (including historical debts: contaminated sites, land surfaces and water bodies that need ecological rehabilitation or reconstruction);
- 2. Reducing environmental pollution** related to the operation of current industrial capacities (reduction of air pollutant emissions, reduction of water consumption, proper collection and treatment of discharged wastewater, reduction of quantities and increase of waste recovery);
- 3. Promoting those projects that ensure a minimum impact on the environment** (do not affect species or habitats that are subject to conservation, include measures to prevent, reduce or compensate for adverse effects);
- 4. Increasing the share of use of renewable resources in energy production;**
- 5. Increasing energy efficiency** on all segments (from operation to consumption).

Below is the evaluation matrix in which compatibility has been identified, coded as follows:

- “+” (if the objectives are compatible),
- “-” (if the objectives are not compatible),
- “/” (where other factors have been found, not depending on the two types of objectives),
- “=” (when the objectives were found to be identical). When it was found that there was no compatibility, no sign of the above was used.

*Table 19 Matrix for assessing the compatibility between the objectives of the Interreg VI Romania-Hungary Programme for the period 2021-2027 and the relevant environmental objectives*

	EO1 Air	EO2 Air	EO3 Water	EO4 Water	EO5 Soil	EO6 Soil	EO7 Climate change	EO8 Climate change	EO9 Noise	EO10 Biodiversity	EO11 Biodiversity	EO12 Landscape	EO13 Cultural aspects	EO14 Cultural aspects	EO15 Conservation of natural resources	EO16 Waste	EO17 Population and human health	EO18 Population and human health	EO19 Transport	EO20 Energy efficiency
<i>family and community care;</i>																				
<i>PO4 (vi) Strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation</i>	/	/	/	/	/	/	/	/	+	+	+	+	+	/	/	/	/	/	/	
<b>Priority 3: More sustainable, more community-based and more efficient cross-border cooperation</b>																				
<i>ISO 1 - Better governance of cooperation</i>	+	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	

The analysis of the compatibility of the 20 environmental objectives with the 6 specific objectives of the Programme showed that in the case of 52.5% of them, there are other factors which the two types of objectives do not depend on; 43.3% of the cases are compatible; 4.1% of the objectives are identical.

## 7. Potential significant effects on the environment, including aspects such as biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material values, cultural heritage, including architectural and archaeological heritage, landscape and the relationship between these factors

### Assessment methodology

The methodology for assessing potential significant effects on the environment is that set out in the SEA Directive.

The main purpose of the Strategic Environmental Assessment (SEA) is to assess the *Programme*, interventions and actions in terms of the environment and sustainability. Assessment is aimed at how the *Interreg VI Romania-Hungary Programme for the period 2021-2027* contributes to a significant positive impact on the environment.

The *Interreg VI Romania-Hungary Programme for the period 2021-2027* aims to achieve the following:

- ❖ Promoting compliance of the programme with the Recovery and Resilience Facility Regulation, (2021/C 58/01) DNSH – Technical guidance on the application of “do no significant harm” under the Recovery and Resilience Facility Regulation and with the European Commission Notice - Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (2021 C 373/01), national and European environmental protection strategies and sustainability criteria, with the achievement of the environmental targets proposed and accepted by Romania and Hungary;
- ❖ Managing as accurately and quickly as possible the potential risks, in the short, medium and long term, which may arise during the implementation of the proposed actions;
- ❖ Defining and presenting alternative solutions, risk prevention and mitigation measures at the level of each project, including climate change adaptation and mitigation measures.

Expected results of the SEA procedure:

- ❖ Highlighting the fact that the new situation, which appears after the *Programme* implementation allows to achieve environmental performance and sustainability;
- ❖ Assessing how the new conditions arising from the implementation of the proposed programme can ensure environmentally friendly solutions, responding to the sustainability goal. Those actions that arise from the *Programme* are defined in the sense of compliance with environmental regulations.

In case of potential impact generated by the implementation of specific objectives and types of actions/works under the *Programme*, the assessment was performed in relation to the eligible categories considered by it.

The impact assessment for each specific objective is based on the matrix.

*Matrix for assessing the significance of the potential effects of the implementation of the types of actions financed under the Programme:*

Impact significance		Impact magnitude						
		Negative			No change	Positive		
		High	Moderate	Low		Low	Moderate	High
Area sensitivity	Very high	-3	-3	-2	0	+2	+3	+3
	High	-3	-2	-2	0	+2	+2	+3
	Moderate	-2	-2	-1	0	+1	+2	+2
	Low	-2	-1	-1	0	+1	+1	+2
	Very low/insensitive	-1	-1	0	0	0	+1	+1

*Key:*

Colour Code	Impact significance
	Significant negative impact
	Moderate negative impact
	Insignificant negative impact
	No impact
	Insignificant positive impact
	Moderate positive impact
	Significant positive impact

In order to justify the values for the type of impact, the evaluation criteria were considered in accordance with the implementation guidelines of the SEA procedure, as well as the impact characteristics:

- ❖ Nature of effects: negative - when the total impact of the types of intervention/works may have adverse effects on the environmental objectives; positives - when the total impact of the types of intervention/works may have positive effects on the environmental objectives; without impact - when the total impact of the types of interventions/works may have a neutral impact or may not have any impact on the environmental objectives;
- ❖ Cumulative, synergistic and side effects associated with the Programme: side effects - side effects and indirect effects do not result directly from the implementation of a type of action, but may occur remotely from the direct effect or as a result of a propagation pathway; cumulative - occur when several types of action are implemented, which taken individually do not have insignificant effects or when an individual effect of one type of action produces an effect combined with a broad individual effect of another type of action; synergistic - occur when the individual effects interact, resulting in a greater effect than the previous ones;
- ❖ Duration of effects: short term - effects that occur in a given period of time (maximum 3 years) and will cease once the activity ceases; medium term - manifest themselves over a moderate period, even after the completion of the activity; long term - manifest themselves during the operation of the types of intervention and after their termination, for a long period of time (about 10 years);
- ❖ Temporary or permanent effects: temporary - when the effects manifest themselves in a short period of time and are reversible; permanent - when the effects occur over a medium period of time and are not reversible.

The table below shows the results of the environmental impact assessment generated by the Programme implementation, for each specific objective and type of action.

*Table 20 Environmental impact assessment generated by the Programme implementation, for each specific objective and type of action*

Priority	Specific objective	Types of actions	Impact significance vs. impact magnitude
Priority 1	PO2 (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;	<b>Action 1:</b>	
		Updating the Flood Risk Management Plan (including contributing to the Danube Flood Risk Management Plan (DFRMP), if applicable);	+2
		Implementing structural and non-structural measures related to flood risk management, support for better prognosis and forecasting (pilot actions/joint strategies);	+2
		Increasing the readiness and resilience of communities in the face of floods (training courses, awareness-raising events), including the involvement of young people and gender perspective integration in civil protection actions;	+3
		Promoting sustainable management of floodplains, including green infrastructure;	+2
		Encouraging basin-level management planning for specific issues (e.g., river ice);	+2
		Pilot/demonstrative actions.	0
		<b>Action 2:</b>	
		Training, capacity building and procedures for better preparedness for disaster management, including the involvement of young people and women in civil protection actions;	+1
		Identifying innovative solutions to support disaster management (IT tools, mobile apps, etc.) (pilot actions);	+2
		Strengthening the resilience of national/regional authorities (this type of intervention requires the development of a harmonized and standardised approach at cross-border level and then its application at national and regional level) (pilot actions, joint strategies);	+1
		Support for the operational planning of flood management in transboundary river basins and harmonisation of available resources) (pilot actions/joint strategies).	+2
		<b>Action 3:</b>	

Priority	Specific objective	Types of actions	Impact significance vs. impact magnitude
		<p>Provision of support for risk assessment (e.g., by identifying hazards, assessing consequences and probabilities, characterising risks and uncertainties) at regional, national or macro-regional level, as well as for training and exchange of experience in this field;</p> <p>Supporting the monitoring and study of various environmental risks;</p> <p>Harmonisation of climate change adaptation strategies and action plans to enhance international cooperation and coordinate activities in the Danube region;</p> <p>Exploring the direct effects of climate change and implementing mitigation and adaptation measures from environmental risk management plans (joint strategies);</p> <p>Improving cooperation on the use of climate change data and projections within the Copernicus Climate Change Service (C3S) and the Climate Data Store (CDS), including training and exchange of experience in these areas;</p> <p>Climate change adaptation research, including the promotion of partnerships between academic research and environmental youth NGOs;</p> <p>Supporting natural (small) water retention measures;</p> <p>Pilot/demonstrative actions.</p>	+1 +2 +2 +2 +1 +1 +1 0
PO2 (ii) Promoting energy from renewable sources in accordance with Directive (EU) 2018/2002, including the sustainability criteria set out therein;		<p>Training (classroom format and e-learning), exchange of good practices, capacity building for a better understanding of the benefits of using renewable energy sources, adapted to the needs of different stakeholder groups (political-legislative, technical, public authorities, young people and women, etc.);</p> <p>Encouraging the generation of cross-border projects related to the spread of sustainable use of renewable energy sources;</p>	+2 +1
		<p>Training (classroom format and e-learning), exchange of good practices, capacity building for a better understanding of the benefits of using renewable energy sources, adapted to the needs of different stakeholder groups (political-legislative, technical, public authorities, young people and women, etc.);</p>	+1
		<p>Renewable energy projects based on the high geothermal/photovoltaic/wind/biomass potential of the pilot actions;</p>	+2
		<p>Renewable energy mapping, barrier assessment and development of joint strategies for coordinated actions in the energy market.</p>	+2
	PO2 (vii) Strengthening	Developing the Master Plan for Natura 2000 border areas or sensitive areas to focus on identifying major biodiversity hotspots, jointly establishing conservation objectives, identifying priority sites for restoration	+2

Priority	Specific objective	Types of actions	Impact significance vs. impact magnitude
the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.		and biodiversity integration measures;	
		Projects to support the sustainable use of protected areas to increase the support and ownership of the local population, such as events (workshops, conferences); good practice reports (case studies); workshops/study trips;	+2
		Developing and/or implementing action plans for conservation and/or management plans for endangered umbrella species within the Natura 2000 protected areas;	+2
		Developing and/or implementing action plans for conservation and/or management plans focusing on certain aspects of species conservation;	+2
		Developing and implementing the most appropriate methods for the prevention and control of invasive allogeic species and the management of their priority access routes to border areas (pilot actions);	+2
		Measures to restore the ecosystems where invasive species are present (pilot actions);	+2
		Training courses, capacity building and raising awareness concerning biodiversity conservation;	+1
		Conservation and restoration of biodiversity and creation and improvement of green infrastructure (pilot actions);	+2
		Construction of green permanent leisure model-facilities (pilot actions);	+2
		Promoting ecosystem services to assess the progress of activities aimed at promoting and conserving biodiversity (pilot actions);	+1
		Capacity building, training and awareness concerning the blue and green infrastructure;	+1
		Developing the use of strategic environmental assessments in the decision-making process, with the integration of green and blue infrastructures in the planning documents;	+2
		Establishing cooperation between macro-regional strategies approaches to set the green connectivity and green infrastructure.	+1
Priority 2	PO4 (v) Ensuring equal access to health services and encouraging the resilience of health systems,	Analysis of trends, needs, standards and barriers to cooperation for health care services in the programme area (including the health status of the population);	0
		Training courses for public employees and civil society in the field of health services;	0
		Networks for the exchange of good practice and mutual learning in the field of healthcare services;	0
		(including joint response and mobilisation of civil protection	0

Priority	Specific objective	Types of actions	Impact significance vs. impact magnitude
PO4 (v) Strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation.	including primary care, and promoting the transition from institutional to family and community care;	Investments in infrastructure, equipment, IT software/hardware, support for e-Government in the field of health;	0
		Pilot/demonstrative/innovative/research projects in the field of health.	0
		Identifying opportunities to make the tourism offering sustainable or to create new sustainable tourism products of public interest (including trend analysis, resource mapping, assessment of barriers to cooperation);	+2
		Developing sustainable tourism offers and products, including investments, integrated into common tourism strategies for local development;	+1
		Territorial marketing initiatives (marketing, communication, awareness campaigns concerning local resources and traditions);	+1
		Training, capacity building and exchanges of experience between cross-border players;	+1
		Identification, mapping and further development of cultural heritage (tangible and intangible), including its conservation, protection, conservation and rehabilitation, as well as the development of joint strategies for promotion and conservation, and assessment of barriers to cooperation;	+2
		Mapping the needs and possibilities of digitalizing the cultural heritage and developing joint strategies;	+1
		Improving the interpretation/adoption of innovative territorial marketing methods through "Storytelling Models" ("Living History" and "Living Heritage");	+1
		Pilot actions for innovative solutions (including the purchase of hardware/software) and the creation of thematic routes, without a specific trademark) for the protection and capitalisation of the cultural/rural/natural/religious heritage;	+1
		Involvement of local authorities and communities (including schools) in building intercultural and cross-cultural links with different partners (skills development, educational content and cultural initiatives, joint events, etc.).	+2
○ ← → +	ISO 1 Better	Cross-border studies on barriers to cooperation;	0

Priority	Specific objective	Types of actions	Impact significance vs. impact magnitude
governance of cooperation.	Lessons learned from previous experiences; Mapping standards and legislation; Developing joint action plans/strategies/institutional agreements; Joint training on how to address barriers to cooperation; Pilot/demonstrative actions to remove barriers; Cross-border studies in areas not covered by the objectives selected under PO2 and PO4 Lessons learned from previous experiences; Development of joint action plans/strategies/institutional agreements on the 2030 Agenda and customised solutions for territorial mechanisms integrated into the programme area; Joint trainings, events and exchange of experience concerning cross-border strategic planning, project development and joint intervention; Small-scale pilot/demonstrative actions in areas not covered by the objectives selected under PO2 and PO4, focusing on cross-border multi-fund coordination, monitoring and evaluation (M&E) policies/strategies/systems; Small-scale training, events, exchanges between individuals and interpersonal actions.	0	
		0	
		+1	
		0	
		0	
		0	
		0	
		+1	
		0	
		0	

The analysis of the environmental impact assessment generated by the Programme implementation showed 63 types of intervention, of which 1.58% have a significant positive impact, 31.74% have a moderate positive impact, 38.09% have an insignificant positive impact and 28.57% have no impact.

## 8. Potential significant environmental effects, including on health, in a transboundary context

The objective of protecting the environment and the health of the population is to identify a balanced system of harmonisation of the environment and human activities, which will result in the sustainable development of anthropogenic activities, quality of environment and quality of life, and of health respectively. Assessing the potential impact of the *Interreg VI Romania-Hungary Programme for the period 2021-2027* on the environment through a strategic assessment is a means of going towards a balanced and ecological development of the area under review.

Priorities, measures and interventions of the *Interreg VI Romania-Hungary Programme for the period 2021-2027* will have an overall positive impact on the environment and on **human health**.

The Programme promotes the following types of measures:

- **maximising the focus of resources on interventions where cross-border cooperation brings added value, and the Interreg programme is the main funding option;**
- **creating links between territories and communities based on shared territorial and intangible assets**, which can create common socio-economic opportunities for economic recovery (for example, renewable energies and the opportunity to create “green communities/renewable energy”, such as tourism and culture as areas of common interest, capable of mobilising funds and partnerships in a shared vision of territorial marketing);
- **promoting interpersonal interventions as a basis for a more structured cooperation**, with proven results in terms of building sustainable and inclusive communities and an open business environment that can support the design of customised solutions for future community-led local development initiatives and cross-border integrated socio-economic strategies, thus transforming the interpersonal actions into “laboratories” aimed at animating local communities;
- **strengthening the common knowledge base, capabilities, shared systems and working procedures**, as a prerequisite for the project sustainability and for effective results (e.g., soft measurements for all selected POs and specific measures under ISO1 on other topics not related to the selected POs). Using ISO 1 as a resource for systemising the lessons learned at the end of the programme implementation, learning lessons about cooperation in various areas, in terms of: developing shared strategies, effective cross-border systems and institutional cooperation frameworks in all selected POs; resolving legal and administrative barriers; creating more cohesive local and business communities through interpersonal exchanges.

The concepts of “eco-infrastructure and green infrastructure” are recent, occurring after 2016, and require special attention, dedicated to their promotion and the development of pilot solutions that can be reproduced later. The guiding principles of the Programme can be defined as: adaptation to the effects of climate change, protection of the environment and ecosystems, energy transition and low-carbon economy, high and very high potential for geothermal heating, etc.

The most common structures that will be targeted are: parks, tree-lined avenues, green roofs, open spaces, playgrounds, farmlands and forests inside cities, etc.

The table below shows the potential effects of the Programme in a cross-border context, as follows:<sup>20</sup>

*Table 21 Potential cross-border effects generated by the Programme*

No.	Priority	Specific objectives	Cross-border effects
1	Priority 1 - Cooperation for a greener and more resilient cross-border area between Romania and Hungary	PO2– (iv) Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;	Given the effects of such an activity leading to the achievement of the specific objective, the types of interventions eligible for funding are not likely to have significant cross-border effects.
2		PO2– (ii) Promoting energy from renewable sources in accordance with Directive (EU) 2018/2002, including the sustainability criteria set out therein;	Given the effects of such an activity leading to the achievement of the specific objective, the types of interventions eligible for funding are not likely to have significant cross-border effects.
3		PO2– (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.	Given the effects of such an activity leading to the achievement of the specific objective, the types of interventions eligible for funding are not likely to have significant cross-border effects.
4	Priority 2 - Cooperation for a more social and cohesive Programme area between Romania and Hungary	PO4 - (v) Ensuring equal access to health services and encouraging the resilience of health systems, including primary care, and promoting the transition from institutional to family and community care;	The types of intervention eligible for funding to achieve the specific objective are not likely to have significant cross-border effects.
5		PO4 - (vi) Strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation.	The types of intervention eligible for funding to achieve the specific objective are not likely to have significant cross-border effects.
6	Priority 3 - More sustainable, more effective and more community-focused cross-border cooperation	ISO 1 - Better governance of cooperation.	The types of intervention eligible for funding to achieve the specific objective are not likely to have significant cross-border effects.

<sup>20</sup> Considering also the proposal COM/2007/0470 presented by the Board (Decision of the Council of approval, on behalf of the European Community, of the first and second amendment to the EEC/UN Convention from Espoo on the assessment of the environmental impact in a cross-border context).

## 8.1 Description and analysis of the alternatives reviewed

An analysis was performed regarding three alternatives, **the basic one, Alternative 1** and **Alternative 2** - the one with the implementation of the *Interreg VI Romania-Hungary Programme for the period 2021-2027*.

**The basic alternative** is the one in which the situation in the eligible area remains unchanged vs. the solution without the *Programme*. It is an alternative without action, that of a scenario that preserves the status quo. Projections in this situation are based on the extrapolation of current trends or the adoption of measures imposed by specific situations, without positively influencing the state of the environment, reducing pollution or current risks and disasters caused by climate change and anthropogenic activities, this being the “zero” variant.

**Alternative 1** proposed adoption of measures with positive influences on the state of the environment, the reduction of pollution or the risks and disasters caused by climate change and anthropogenic activities. 5 policy objectives were reviewed for Alternative 1, resulting from the analysis of the cross-border impact, risks and complementarity. This represents the analysis of scenarios under the Financing Strategy<sup>21</sup>.

The following policy objectives of this alternative were analysed:

- ❖ PO5 - A Europe closer to the people, with two specific objectives:
  - ✓ Promoting integrated territorial interventions in rural peripheral areas and small town centres;
  - ✓ Supporting potential functional urban areas across borders.

Considering that the need is important and extended over a wide area, thus the potential impact is medium/low, and the risks and complementarities are high/medium.

This SO is not considered a priority for the programme.

- ❖ ISO 2. A safer Europe:
  - ✓ Strengthening the ROHU border management through cooperation

Considering that the need is potential, the potential impact is medium to low, and the risks and complementarities are high.

ISO 2 was not considered a priority for the future programme.

*Programme* implementations is the proposed **Alternative 2**, through which, at regional level but with a direct influence on the national level, the targets concerning pollution reduction and mitigation can be achieved, as showed in the *Programme* priorities and objectives. The alternative with the *Programme* is a basis for the continuation of public policies for the introduction of “green scenarios”, to complement other strategies and plans that respond to the EU Green Agenda and internal investment needs for improving the environment in the 2 partner states, Hungary and Romania. In order to assess the influence of the interventions and the measures proposed by each of the analysed priorities, the trends related to the regional and national development objectives were considered. This alternative was compared with the basic alternative, considered as a reference alternative, the one without changes to the environmental policy, public policies, as well as with Alternative 1.

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<sup>21</sup> Excerpt, adapted and synthesised from the TIA Paper, which is a supporting document prepared by the Consultants, during the programming process, as a basis for defining the intervention logic of the programme, respectively for the decision-making process of the Programming Committee members regarding the financing strategy.

The following criteria substantiated the selection of Alternative 2:

- ❖ Recommendations of the representatives of the environmental authority and of the members of the task force, communicated in the two meetings, from November 2021 and January 2022;
- ❖ Conclusions of the Adequate Assessment Study conducted for the *Programme*;
- ❖ Lessons learned from previous funding periods;
- ❖ Recommendations provided by various guidelines (General Guidance on Environmental Assessment for Plans and Programmes; Handbook for Implementing the Environmental Assessment Procedure for Plans and Programmes);
- ❖ Provisions of the 3 Regulations of the European Parliament and of the European Council:
  - ❖ 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;
  - ❖ Regulation (EU) 2021/1059 on specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments;
  - ❖ Regulation (EU) 2021/1058 of the European Parliament and of the Council of 24 June 2021 on the European Regional Development Fund and on the Cohesion Fund.

A comparative analysis of the effects on the environment associated with the proposed implementation alternatives is presented in the table below.

*Table 22 Comparative analysis of the effects on the environment associated with the proposed implementation alternatives*

Effects on the environment	Alternative 0	Alternative 1	Alternative 2
Biodiversity	The analysis is presented in Chapter 2	The studied alternative associates similar effects by nature, but, in terms of magnitude and significance of the impact over time, is expected to have medium- and long-term negative effects in the implementation phase of future types of interventions. Because it promotes integrated territorial interventions in rural peripheral areas and in the centres of minor cities, and because there is a significant number of protected natural areas within the PA, a negative effect on biodiversity is expected.	The effects on the environment are presented in this Environmental Report

Effects on the environment	Alternative 0	Alternative 1	Alternative 2
Population and human health		<p>The measures proposed, through the two policy objectives, in the urban environment, are some with a direct effect on the comfort of the population and on its health.</p> <p>The measures proposed for the effects on water quality, air, climate change, soil, cultural heritage and landscape are mostly positive.</p> <p>They were not chosen for reasons of complementarity with other national programs financed by the ERDF and the Cohesion Fund (Regional Operational Programmes - Integrated Urban Development Measures); EAFRD-funded national programmes (measures to create LAGs); national programs through the ESF for the development of administrative capacity.</p> <p>There are other EU-funded programs, such as the future Asylum and Migration Fund (AMF, and the Integrated Border Management Fund (IBMF)), with allocations increasing by 36% to 197% in the next programming period, which will allow for a better coordination and management of migration and border management policies in a wider EU context.</p>	
Water			
Air and climate change			
Soil			
Cultural heritage			
Landscape			

An analysis of the effects associated with the presented alternatives showed that **Alternative 2** is the one with the most environmental benefits.

## 9. Proposed measures to prevent, mitigate and compensate as completely as possible any adverse environmental effects caused by the plan or programme implementation

The adverse effects on the environment can be prevented and mitigated by considering the environmental assessment at all Programme preparation and implementation stages.

For the implementation of certain types of works/interventions under the *Interreg VI Romania-Hungary Programme for the period 2021-2027*, a set of global measures is proposed:

- ❖ GM1 - Staging the construction works under the projects (resulting from the types of intervention) in the same area or those in adjacent areas and correlating the prevention, mitigation, compensation measures (if necessary) with those established following evaluations for other strategies, plans and programmes;
- ❖ GM2 - Considering all aspects of the construction phase under the environmental impact assessments, from site organisation, construction of technological roads, provision of utilities to areas where land is to be prepared for construction (deforestation, if absolutely necessary for project realization, excavations, embankments), quarries and/or gravel pits for obtaining raw materials, etc.;
- ❖ GM3 - Avoiding the location of projects inside or in the immediate vicinity of protected natural areas; if this cannot be avoided, the establishment of adequate measures in accordance with the management plans of the protected areas or by the

application of measures to avoid, mitigate, compensate the significant effects on the environment laid down in the relevant assessment procedure;

- ❖ GM4 - Location of projects outside the areas where there is/will be extended/will be implemented the infrastructure necessary for waste management;
- ❖ GM5 - Ensuring the correlation of urban planning with waste management planning;
- ❖ GM 6 - Avoiding water body pollution;
- ❖ GM 7 - Development of environmental management plans for projects, so that environmental performance can be assessed throughout their development (design, construction and operation stage).

In order to achieve the objectives proposed under “Priority 1: Environmental protection and risk management”, PO2 (ii) – *Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein*; PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches; PO2 (vii) – Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution, *considering the ecosystem-based approaches*, the following measures can be proposed to prevent and mitigate the adverse effect on the environment:

## Air

With regard to air protection, the general priority measures for air quality are as follows:

- fitting and maintaining green infrastructure in both urban and rural areas, with the protection and conservation of biodiversity especially in protected areas, natural capital and environmental indicator with high impact on air quality;
- environmental regulation of sources with significant impact;
- correlating the planning of several sectors (urbanism - energy strategy - mobility planning, etc.);
- energy efficiency and reduction of fuel consumption through thermal rehabilitation;
- implementation of BAT document recommendations at IPPC installations;
- identification of financing programs for the development of the county, communication and public involvement in the environmental decision;
- planning and setting objectives through the Local Environmental Action Plan;
- integration of environmental issues in local public administration decisions;
- providing support through consultancy for the implementation of energy efficiency projects;

## Water

The global measures for the prevention and reduction of water pollution to be adopted under the projects to be developed through the Programme are as follows:

- In case of any sustained activity, it must be ensured that the state of underground waters or water courses does not deteriorate. To keep a good state of waters and water bodies, it is important to incorporate preventive measures in projects involving investments in constructions from the stage of design.
- Prohibition of the accidental dumping and storage of waste of any kind on the banks or in riverbeds;
- Covering with soil and vegetation of the surfaces occupied by landfills for municipal and industrial waste;

- Controlling the storage and disposal of solid waste, so that harmful substances do not infiltrate the groundwater;
- Prevention of water pollution with fertilisers or pesticides from agriculture, avoiding water eutrophication;
- Monitoring watercourses in terms of quality, quantity and potential sources of pollution, interventions for the retention of floats of anthropogenic origin;
- Construction of dams, raising dykes and ensuring efficient management to lower the risks of pollution by industrial operators through accidental spill prevention plans;
- Construction of special basins for the collection of waste and residues, in order to prevent their direct discharge into surface waters;
- Proper organization of drinking water and sewerage systems at local level;
- Construction of wastewater treatment plants or systems at settlement level;
- Destruction by disinfection of pathogens contained in the wastewater from some institutions (hospitals), slaughterhouses, meat industry units;
- Equipping with systems for the containment and collection of chemical/radioactive pollutants in the wastewater of industrial units, in order to retain and neutralise potentially toxic chemicals
- Adopting rapid response measures for cleaning pollutants from water in case of accidental pollution, and flood response.

In addition and in general, a coordinated cross-border cooperation must be prioritized to protect wetlands and the quality of ground waters, as well as interventions to reduce pollution and waste disposal in relation to the management of floodable areas and coastal areas.

### Biodiversity

Regarding the measures to prevent, mitigate and compensate the impact on biodiversity in the programme area, the protected natural areas described in Chapter 2.4 will be adopted.

In accordance with the Programme, Priority 1 includes measures that can bring improvements to the conservation status of habitats and species in the Programme area in the 4 Romanian counties and in the 4 Hungarian counties.

The aims related to the protected natural areas and the Natura 2000 sites and the necessary actions to achieve the purposes are presented in the management and maintenance plans. In the case of the elements of the programme in which the protected areas /Natura 2000 can be affected directly or indirectly, environmental impact evaluations are needed and, if Natura 2000 sites are impacted, an estimate of the Natura 2000 impact will be prepared. For this purpose, it must also be examined the possibility to observe the management/maintenance plans. At the touristic exploitation of the natural potential of the area, the stress capacity of areas of value from the perspective of nature conservation must be considered and efforts must be made to ensure a sustainable tourism and nature-oriented.

### Climate change:

For climate change issues, the recommendations and measures are mainly adaptation-related and are applicable to both Romania and Hungary. These recommendations and measures are in line with the agreed country programme documents and relate to:

- promoting effective prevention and quick-response systems in case of extreme weather phenomena;
- promoting natural water retention;
- minimising the risk caused by periods of excessive heat, by increasing the areas of green spaces;
- development of construction standards and solutions to improve the thermal insulation performance of buildings, in order to make energy consumption more efficient;
- implementation of modern solutions in the field of construction to promote renewable energy sources;
- promoting construction materials and solutions appropriate to the potential effects of climate change;
- expanding the application of technology and practices for the use of renewable energy sources to ensure the necessary utilities;
- promoting vocational training and public awareness programmes necessary for the implementation of the identified adaptation measures and vocational training programmes covering the resilience of buildings to the effects of climate change.

#### **Purpose and use of lands**

- In the case of supporting infrastructure interventions, it is essential to ensure the quantitative protection of arable lands and the use of decommissioned areas must be prioritized as much as possible.

#### **Built area**

- Aside from the fulfilment of the requirements regarding the urban landscape, it is recommended to make efforts to develop the urban landscape and to create an attractive urban landscape to exploit the potentials of development of local architectural values, for projects that require construction and establishment.

### **10. Explanation of the reasons for the selection of the selected options and a description of how the assessment was carried out, including any difficulties (such as technical deficiencies or lack of know-how) encountered in processing the required information**

The reasons that led to the selection of the recommended alternative concerned, first of all, the effects associated with the *Programme* implementation on the environmental factors. The impact of the alternative **with the Programme** on the environment was assessed considering the nature of the positive, neutral and negative effects associated with the specific objectives and types of actions to be funded, including their potential to create side effects/cumulative effects/synergistic effects, and whether they would manifest themselves in the long medium or short term, would be temporary or permanent.

The types of actions/works that will be financed through the Programme represent the only element of uncertainty in the assessment carried out. Thus, the environmental assessment followed the effects of the Programme implementation and the forms of impact associated with them. Potential short-term negative effects may occur during the implementation stages of the types of intervention/works.

The environmental assessment for the Programme aimed to highlight the effects on the environment from the perspective of a programmatic document, in the long and medium term, but without omitting the potential for a significant negative impact even in the short term.

## **11. Description of measures envisaged for monitoring the significant effects of the plan or programme implementation, in accordance with Article 27**

This assessment examined whether any of the identified actions that have an impact require constant monitoring under the proposed programme and assessed the applicability of the proposed programme indicators for the collection of any relevant environmental data. To this end, the proposed indicators for each of the priority axes have been reviewed.

Following the SEA, the table below proposes indicators, measurement methods and recommendations for their use.

The monitoring programme must:

- include frequent observations on the conservation status of habitats and species for which Natura 2000 sites have been designated, to confirm that they have not been affected by the project implementation and that the proposed avoidance/mitigation/compensation measures have been effective in avoiding any damage to the conservation status of the target species and habitats;
- identify unforeseen problems that could not be anticipated in the planning stages of a project;
- include procedures to enable corrective or adaptive measures to be taken to address unforeseen problems.

The following two key components must be considered in the development of monitoring programs:

- ❖ checking and controlling the effectiveness of the proposed measures by assessing some local variables, and when non-conformities are registered, corrective measures can be applied to solve the identified problems. Examples of activities that can be included in this type of monitoring: identifying the extent to which constructive solutions are used for the wildlife species of Community interest and the frequency of use; recording the number of victims and locating the “black spots” where a high number of deaths have been recorded; checking the efficiency of reducing the noise level in a certain area by implementing soundproofing panels; checking how a new habitat created as a compensatory measure is used by the target species, etc.;
- ❖ monitoring the effects of measures on habitats and species of Community interest: focuses on the ecological effects of proposed avoidance/mitigation/compensation measures and is intended to identify changes in habitats, distribution of species of Community interest, population dynamics, genetic diversity etc., the characteristics of the habitats and species of Community interest, as well as the natural processes recorded after the completion of a certain project, being compared with the initial conditions. Thus, this type of monitoring requires long-term and larger-scale approaches. Examples of activities that can be included in this type of monitoring: changes in species behaviour due to the interference caused by high noise levels; changes in the distribution, composition and quality of habitats adjacent to the proposed projects due to the generated air pollutants; changes in the migration

routes of aquatic species caused by changes in the water flow; the incidence of mortality caused by the proposed projects and the effects on the population dynamics of the target species.

*Table 23 Proposal for a monitoring programme for species and habitats of Community interest*

Month Group \ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Habitats and flora of conservative interest												
Flora - invasive species												
Mammals												
Birds												
Amphibians and reptiles												
Fish												
Invertebrates												

Key:

Monitoring period (depending on location - plain-mountain)	Optimal monitoring period
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Table 24 *Proposed indicators for monitoring and control of environmental effects in the context of the implementation of the Interreg VI Romania-Hungary Programme for the period 2021-2027*

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
Air/climate change	<b>EO.1</b> Improving air quality by reducing emissions from industry, agriculture, etc.; <b>EO.7</b> Reducing greenhouse gas emissions from various areas of activity to meet EU targets; <b>EO. 8</b> Adapting to climate change, preventing natural hazards, promoting ecosystem benefits, anticipating the effects of climate change and taking adequate measures to prevent or minimise the effects.	The number of projects that will make a positive contribution to reducing emissions of pollutants into the atmosphere (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , particulate matter, heavy metals, VOC, PAH), resulting during the period of construction and implementation of projects proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027	Quarterly measurements in the construction phase; Half-yearly measurements in the operation phase;	By implementing the projects, it is possible that pollutant emissions have values that exceed the permissible limits set by ambient air quality legislation in the construction phase, but in the operation phase they may record a significant decrease compared to the current situation, by implementing non-polluting technology;	Project owner:

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
Water (surface and groundwater)	<b>EO.2</b> Improving water quality by reducing emissions from industry, agriculture, etc.; <b>EO.3</b> Improving the condition of water bodies and not damaging their condition (Water Framework Directive);	<p>The number of projects that will contribute to the reduction of surface water pollution by connecting to the sewerage system respecting the limit values allowed by the specific legislation for the concentration of pollutants (heavy metals, CBO5, CCO<sub>Cr</sub>, petroleum products, etc.) in the sewerage system or in natural receivers;</p> <p>The number of projects that will contribute to improving the condition of water bodies;</p> <p>The number of projects that will not affect the condition of water bodies;</p>	<p>Half-yearly, in the operation phase, for the projects proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027, by taking water samples from the wastewater/treated water discharge points;</p>	<p>Maintaining the allowed limit values for wastewater discharge in the sewerage system - NTPA002, respectively the allowed limit values for the treatment of treated water in natural receivers - NTPA001;</p> <p>Compliance with the requirements of the Water Framework Directive, considering the provisions of the Management Plans of transboundary river basins/river spaces;</p>	Project owner:

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
Soil	<b>EO.4</b> Limiting and reducing the punctual soil pollution; <b>EO.5</b> Maintaining the green state of the soil; <b>EO.6</b> Rehabilitation of former industrial areas (mine dumps);	The number of projects that will make a positive contribution to reducing emissions of pollutants into the atmosphere (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , particulate matter, heavy metals, VOC, PAH), resulting during the period of construction/operation of projects proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027; The number of accidental pollution events registered and the areas affected (as a result of the projects proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027), including the quantity and type of substances that caused the accidental pollution;	Quarterly measurements in the construction phase; Half-yearly measurements in the operation phase;	The evolution of pollutant emissions into the atmosphere can lead to an estimate of the evolution of soil quality;  This indicator is relative, the number of accidental pollution events does not depend entirely on the design of the investments proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027, these can also be caused by human errors, means of transportation, etc.	Project owner:

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
Biodiversity	<b>EO.9</b> Conservation of habitats and species of flora and fauna of Community importance; <b>EO.10</b> Conservation of biodiversity and maintaining the national network of protected natural areas;	The number of projects that will contribute to maintaining or improving the conservation status of species and habitats within protected natural areas and in their proximity.	In the construction phase and in the operation phase, through monitoring programs, which cover different stages of the biological cycle, depending on each taxonomic group	Project location will be selected to avoid as much as possible the placement inside protected natural areas, and, if this is not possible, the conservation status of the habitats and species of Community interest will not be affected	Project owner:
Landscape	<b>EO.11</b> Protection and conservation of the natural landscape;	The number of projects that will target landscape transformations that could occur as a result of the implementation of projects proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027 (permanently and temporarily occupied land areas, number of disused buildings);	In the construction phase, through specific annual measurements;	Implementation of projects by maintaining the percentage of green spaces and natural environment elements related to the area;	Project owner:
Cultural aspects	<b>EO.12</b> Preservation and conservation of cultural heritage elements; <b>EO.13</b> Preservation and conservation of local	The number of projects that will target the number of archaeological sites open on various sections of the proposed	During the construction works;	Land areas permanently occupied by the projects proposed under the Interreg VI Romania-Hungary Programme for the period	Project owner:

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
	traditions and customs through sustainable tourism;	investments following the discovery of archaeological sites, etc.;		2021-2027. In the construction phase and in the operation, phase through specific annual measurements; if the implementation of measures does not have the expected results, they will be permanently adapted according to the situation on the ground. Upon completion of works, the new objectives must fit into the landscape of the area;	
Conservation of natural resources	<b>EO.14</b> Reducing the exploitation of depletable resources and facilitating the use of renewable ones;	The number of projects that will use alternative fuels as energy and transport sources;	Yearly	During the design phase, measures may be required to equip installations that use depletable sources with technology/plants that may also use alternative fuels; The data will be compared with those from the period prior to project implementation;	Project owner:
Waste	<b>EO.15</b> Reducing the quantities of waste generated and increasing the degree of recycling/recovery, for all	The number of projects aimed at reducing the amount of waste generated (tonnes/year) -	Monthly, both during the construction period and during the	The amount of waste generated will be reported both during the construction period and during the	Project owner:

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
	types of waste, integrating the solutions of the circular economy;	proposed under the Interreg VI Romania-Hungary Programme for the period 2021-2027;	operation period.	operation period;	
Population and human health/Noise	<b>EO.16</b> Reducing emissions of environmental pollutants, which could improve the health of the population and thus increase the quality of life; <b>EO.17</b> The use of clean (advanced) technology that poses as little risk as possible for the staff from units involved in various fields of activity;	The number of projects that will contribute positively to decreasing the number of people at risk of being exposed to high concentrations of pollutants in the atmosphere in the implementation area of the project financed under the Interreg VI Romania-Hungary Programme for the period 2021-2027; The number of projects that will contribute positively to reducing the number of occupational and vocational diseases that could result from project implementation;	Yearly	During the design phase, measures will be taken to protect the population against the risks associated with the objectives, which will be implemented by the contractors. The data will be compared with the baseline scenario;	Project owner: Territorial Labour Inspectorate Competent health authority;

Environmental issues	Relevant environmental issues for the Interreg VI Romania-Hungary Programme for the period 2021-2027	Monitoring indicators	Frequency	Description	Task Owner
Transport	<b>EO.18</b> Facilitating the infrastructure for electric and non-motorized transport;	The number of projects that will contribute to ensuring a sustainable, electric and/or clean transport;	Yearly	-	Competent transportation authority;
Energy efficiency	<b>EO.19</b> Improving energy efficiency and sustainable use of resources.	The number of projects aimed at rehabilitating public units;	Yearly	-	Competent energy authority

## 11.1 The Do No Significant Harm (DNSH) Principle

### The DNSH (DO NO SIGNIFICANT HARM) Concept

Pursuant to Article 9(4) of Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility, the objectives of European funds will be pursued in accordance with the objective of promoting sustainable development, as set out in Article 11 of the TFEU<sup>22</sup>, considering the UN Sustainable Development Goals, the Post Paris Agreement and progress at COP 26 in Glasgow and the “do no significant harm” principle.

Significant progress was made at the United Nations Climate Change Conference in Glasgow, which ended on 13 November after two weeks of negotiations between parties to the United Nations Framework Convention on Climate Change (UNFCCC).

Key initiatives included: increased commitments to provide funds to help developing countries fight climate change, adoption of the global methane commitment, finalisation of regulatory framework of Paris.

Environmental protection measures also require a “do no significant harm” (DNSH) assessment under the Recovery and Resilience Facility Regulation (2021/C 58/01), DNSH - Technical guidance on the application of “do no significant harm” under the Recovery and Resilience Facility Regulation and under the European Commission Notice - Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (2021 C 373/01), as follows:

- Energy efficiency - climate change mitigation measures, i.e., cost-effective alternative energy efficiency measures when making work/intervention decisions, in particular cost-effective end-use energy savings;
- Climate change adaptation and risk management - proposes climate change adaptation measures for infrastructure projects that focus on ensuring an adequate level of resilience to the climate change impact, which includes extreme phenomena such as more intense floods, cloudbursts, drought, heat waves, forest fires, storms, landslides and hurricanes.

Thus, the 6 objectives provided in the document of the European Commission “Technical guidance on the application of “do no significant harm” under the Recovery and Resilience Facility Regulation” in relation to the objectives provided under the draft *Interreg VI Romania-Hungary Programme for the period 2021-2027* are shown in tabular form:

<b>Environmental objectives according to the DNSH Principle</b>	<b>Specific objectives under the Interreg VI Romania-Hungary Programme for the period 2021-2027</b>
<i>Climate change mitigation by significantly reducing greenhouse gas (GHG) emissions;</i>	<i>PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;</i>
<i>Adapting to climate change by reducing the increased negative impact on the current climate and the expected future climate, on the activity itself or on people, nature or goods;</i>	<i>PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</i>

<sup>22</sup> Treaty of the Functioning of the European Union (TFEU)

Environmental objectives according to the DNSH Principle	Specific objectives under the Interreg VI Romania-Hungary Programme for the period 2021-2027
<i>Sustainable use and protection of water and marine resources;</i>	N/A
<i>Circular economy, including waste prevention and recycling;</i>	N/A
<i>Prevention and control of air, water or soil pollution;</i>	N/A
<i>Protecting and restoring biodiversity and ecosystems.</i>	PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

### The concept of Climate Change Mitigation and Adaptation

Cohesion Policy states that the Funds should support activities that meet the EU climate standards and environmental objectives, and would not significantly harm the environmental objectives proposed under Article 17 of Regulation (EU) No 2020/852 of the European Parliament and of the Council (6) (Taxonomy Regulation).

Article 17 of Regulation (EU) No 2020/852 defines the “significant harm” related to the 6 environmental objectives, as follows:

- ❖ An activity is considered to cause significant harm in terms of “...climate change mitigation, where that activity leads to significant greenhouse gas emissions”;
- ❖ An activity is considered to cause significant harm in terms of “... climate change adaptation, where that activity leads to an increased adverse impact of the current climate and the expected future climate, on the activity itself or on people, nature or assets”;
- ❖ An activity is considered to cause significant harm in terms of *the sustainable use and protection of water and marine resources*, where that activity is detrimental to the good status or the good ecological potential of bodies of water, including surface water and groundwater, or to the good environmental status of marine waters;
- ❖ An activity is considered to cause significant harm in terms of *the circular economy, including waste prevention and recycling*, where it leads to significant inefficiencies in the use of materials or in the direct or indirect use of natural resources, or leads to a significant increase in the generation, incineration or disposal of waste, or if the long-term disposal of waste may cause significant and long-term harm to the environment;
- ❖ An activity is considered to cause significant harm in terms of *pollution prevention and control*, where it leads to a significant increase in the emissions of pollutants into air, water or land;
- ❖ An activity is considered to cause significant harm in terms of *protection and restoration of biodiversity and ecosystems*, where it is significantly detrimental to the good condition and resilience of ecosystems or detrimental to the conservation status of habitats and species, including those of Union interest.

Climate change mitigation and adaptation will be applied under the SEA procedure framework for those Priorities/Specific Objectives from which future projects will be developed, which will be found later in the annexes to the EIA Directive (2011/92/EU on the assessment of the effects of certain public and private projects on the environment).

As relevant for the European Commission document, Technical guidance on the climate proofing of infrastructure in the period 2021-2027, the *Interreg VI Romania-Hungary Programme for the period 2021-2027* proposes the following through priority 1 - Environmental protection and risk management and its specific objectives, specifically:

- PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;
- PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;
- PO2 (vii) Strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution.

Thus, below are listed the issues concerning climate change related to the draft *Romania-Hungary Interreg VI Programme for the period 2021-2027*:

Climate change mitigation	Climate change adaptation
Increasing energy consumption from industrial activities and related GHG emissions: Not applicable;	Heat waves (including impact on human, animal and plant health, crop damage and forest fires); This climate change adaptation is supported by promoting PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches.
Energy demand in the housing and construction sectors and related GHG emissions;	N/A
GHG emissions in agriculture; Not applicable;	N/A
GHG emissions in waste management; Not applicable;	N/A
Travel patterns and greenhouse gas emissions generated by transportation; Not applicable;	N/A
GHG emissions from energy production;	PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein;
Land use, land use change, forestry and biodiversity; Not applicable.	N/A

The *Interreg VI Romania-Hungary Programme for the period 2021-2027* meets the major challenges of tackling climate change by respecting the following EU directions for action:

- is in line with the goals of the Paris Agreement and the EU's climate goals by promoting renewable energy and energy efficiency that converge towards GHG reduction; they can contribute to the targets assumed by Romania for the time horizons 2030 and 2050, respectively;

Significant progress was made at the United Nations Climate Change Conference in Glasgow, which ended on 13 November after two weeks of negotiations between parties to the United Nations Framework Convention on Climate Change (UNFCCC).

Key initiatives included: increased commitments to provide funds to help developing countries fight climate change adoption of the global methane commitment finalisation of the regulatory framework of Paris.

- GHG emission reduction targets for 2030 will have to be set by the end of 2022, as concluded at the CP 26 Glasgow discussions
- ensures/facilitates works/interventions that “do not significantly harm” environmental objectives by strengthening the protection and conservation of nature, biodiversity and green infrastructure, including in urban areas, and reducing all forms of pollution;
- ensures an adequate level of resilience to the extreme and slowly-evolving effects of climate change by promoting climate change adaptation, disaster risk prevention, and resilience, through ecosystem-based approaches.

Analysis of the specific objectives under the *Interreg VI Romania-Hungary Programme for the period 2021-2027* in terms of climate change mitigation:

Main EU concerns	Identification of issues related to climate change mitigation	Measures concerning climate change mitigation under the Interreg VI Romania-Hungary Programme for the period 2021-2027
Transition to a low carbon economy and society	<p>Consistency with the Paris Agreement temperature target (Article 2) and the transition to the zero GHG emissions and climate neutrality targets by 2050;</p> <p>Consistency with the EU's long-term strategy and emissions targets for 2020;</p> <p>Consistency with the National Energy and Climate Plan (NECP) (when it will be amended in 2023 in line with the new EU targets for 2030 and climate neutrality by 2050);</p> <p>Consistency with the “energy efficiency above all” principle;</p> <p>Consistency with the “do no significantly harm” principle for the environmental objectives in question.</p>	<ul style="list-style-type: none"> <li>➤ PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</li> <li>Increasing the capacity and efficiency of emergency and risk prevention services (whether or not related to climate) due to cooperation.</li> </ul>
Energy demand in the housing and construction sectors	<i>Not applicable.</i>	N/A

Main EU concerns	Identification of issues related to climate change mitigation	Measures concerning climate change mitigation under the Interreg VI Romania-Hungary Programme for the period 2021-2027
GHG emissions from energy production	The Interreg VI Romania-Hungary Programme for the period 2021-2027 will determine a reduction of energy consumption; will promote the supply of energy from renewable energy sources, which will help reduce GHG emissions in the region	<p>➤ PO2 (ii) – Promoting energy from renewable sources in accordance with Directive (EU) 2018/2021, including the sustainability criteria set out therein:</p> <p>Increasing cooperation in the field of renewable energies, contributing to the creation of green and renewable energy communities within the PA, including through experimentation with pilot actions and joint initiatives to further expand and promote RES in the PA.</p>

Analysis of the specific objectives under the Interreg VI Romania-Hungary Programme for the period 2021-2027 in terms of climate change adaptation:

Main EU concerns	Identification of issues related to climate change adaptation	Measures concerning climate change mitigation under the Interreg VI Romania-Hungary Programme for the period 2021-2027
The transition to a climate-resilient economy and society	<p>Consistency with the overall objective of the Paris Agreement on adaptation;</p> <p>Consistency with the transition to a climate-resilient economy (with an adequate level of resilience to extreme effects and slowly evolving climate change);</p> <p>Consistency with other relevant strategic documents concerning climate change adaptation;</p> <p>Consistency with the EU Strategy on Climate Change Adaptation.</p>	<p>➤ PO2 (iv) – Promoting climate change adaptation, disaster risk prevention and resilience, considering the ecosystem-based approaches;</p> <p>Increasing the capacity and efficiency of emergency and risk prevention services (whether or not related to climate) due to cooperation.</p>
Heat waves/Drought	Urban areas vs. population categories or economic activities vulnerable to heat waves	<p>Green infrastructure works/interventions, especially in urban areas (e.g., stormwater management, sustainable urban drainage systems, green streets, green roofs, permeable/porous pavements, urban forests, natural cooling of buildings, blue and/or green infrastructure);</p> <p>Measures related to the prevention and management of climate risks: drought;</p>
Extreme flood and precipitation regimes	<p>Infrastructure at risk due to its location in floodable areas;</p> <p>The capacity of drainage networks to handle potential extreme rainfall;</p>	<p>Green infrastructure works/interventions, especially in urban areas (e.g., stormwater management, sustainable urban</p>

Main EU concerns	Identification of issues related to climate change adaptation	Measures concerning climate change mitigation under the Interreg VI Romania-Hungary Programme for the period 2021-2027
	The capacity of ecosystems and floodplains for natural flood management;	drainage systems (SUSDS), green streets, green roofs, permeable/porous pavements, urban forests, natural cooling of buildings, underground containment, stormwater tanks and barrels and blue and/or green infrastructure; Restoration of natural areas (e.g., forests, riverbanks) to prevent floods and landslides; Afforestation and reforestation (e.g., protected forests) of areas vulnerable to floods and landslides;
Storms and wind gusts	Infrastructure/areas (e.g., cultural heritage) will be threatened by storms and strong winds;	Measures related to the prevention and management of climate risks, such as fires, storms, drought;
Landslides	Areas (people and objectives) are at risk due to landslides and their vulnerabilities	Afforestation and reforestation (e.g., protected forests) of areas vulnerable to floods and landslides; Restoration of natural areas (e.g., forests, riverbanks) to prevent floods and landslides;
Cold waves	Critical areas/infrastructure are in danger due to short periods of unusually cold weather/blizzard/frost	No measures are proposed to adapt to the “cold waves”
Damage caused by the freeze-thaw cycles	Critical areas/infrastructures are in danger due to the freeze-thaw phenomenon	No measures are proposed to adapt to the “freeze-thaw phenomenon”
Sea level rise, storms, waves, coastal erosion, hydrological regimes and saline intrusion	Not applicable	Not applicable

## 12. Non-technical summary

This paper is the Environmental Report for the Strategic Environmental Assessment of the *Interreg VI Romania-Hungary Programme for the period 2021-2027*, currently available on the site <https://interreg-rohu.eu/ro/cadrul-procedural/>, the section dedicated to the post-2020 programming.

Priorities, measures and interventions mentioned in the *Interreg VI Romania-Hungary Programme for the period 2021-2027* will have an overall positive impact on the environment.

The Programme Area includes a vast network of protected natural areas with high conservation value, as well as an increased potential for tourism. Particular attention must be paid to the protection of these areas and existing biodiversity.

The Programme Area consists of 117 urban settlements and 672 villages. Romania's border area has 36 urban settlements and 307 villages, while Hungary's border area has 81 urban settlements and 365 villages.

The policy objectives of the Interreg VI Romania-Hungary Programme for the period 2021-2027 are as follows: (i) A greener, low-carbon Europe by promoting the transition to clean and safe energy, green investment and "blue-growth" interventions/works, circular economy, climate change adaptation, risk prevention and management, and sustainable urban mobility; (ii) A more social and inclusive Europe, implementing the European Pillar of Social Rights by improving access to inclusive services, to education and the quality of education, ensuring equal access to healthcare services and developing the infrastructure needed for the transboundary achievement of these long-term goals, as well as by increasing the role of culture and sustainable tourism in the economic development, social inclusion and social innovation; (iii) Better governance in cooperation - an Interreg Specific Objective - by promoting actions to increase institutional capacity in the field of border management.

The programme covers 3 priorities which are analysed and justified in section 1.3 of the Environmental Report. These priorities are: 1. Cooperation for a greener and more resilient cross-border area between Romania and Hungary; 2. Cooperation for a more social and cohesive PA between Romania and Hungary; 3. More sustainable, more effective and more community-focused cross-border cooperation. Each comprises a number of objectives and actions.

This Report analyses the environmental aspects, the current state of the environment and the potential impact by applying the 3 alternatives. Zero alternative, which is the current one, of the baseline scenario. The alternative in which all priority, specific objectives and eligible actions would be implemented, this being a maximum scenario. The optimal alternative, proposed by this report and which represents the choice of those priority objectives and actions that can be effectively applied in both countries, within the time horizon covered by the Programme.

Environmental aspects were proposed and for each one several environmental objectives (EO) were formulated and analysed for the Interreg VI Romania-Hungary Programme for the period 2021-2027.

In case of potential impact generated by the implementation of specific objectives and types of actions/works under the Programme, the assessment was performed in relation to the eligible categories considered by it.

The impact assessment for each specific objective is based on a matrix to assess the extent of the potential effects of the implementation of the types of actions funded under the Programme. A colour code has been established for the matrix, in which red represents a significant negative impact, orange a moderate negative impact, yellow an insignificant negative impact, blue means lack of impact, light green a negligible positive impact and dark green a moderate positive impact.

Below is a table of the environmental impact assessment generated by the Programme implementation, for each specific objective and type of action (20). The analysis of the environmental impact assessment generated by the Programme implementation showed 63 types of intervention, of which 1.58% have a significant positive impact, 31.74%

have a moderate positive impact, 38.09% have an insignificant positive impact and 28.57% have no impact.

The table also analyses the potential cross-border effects generated by the Programme. The adverse effects on the environment can be prevented and mitigated by considering the environmental assessment at all Programme preparation and implementation stages, specifically: (i) The strategic environmental assessment will be considered in the realization and implementation of the lower-tier plans that will fall under the Programme provisions; (ii) The types of interventions/works proposed to be carried out, with an impact on the environment, will have to be assessed in terms of environmental impact, a process that will be carried out in accordance with the requirements of national and EU legislation in force. Thus, it will be possible to identify: environmental effects within the project area, the best techniques and solutions available for the proposed activities, measures necessary to prevent, mitigate and compensate the negative environmental effects generated by the targeted projects, measures to monitor the environmental effects of project implementation; (iii) A cumulative assessment shall be performed simultaneously with the impact assessments. The cumulative impact may be the result of a series of situations associated with the interaction between similar development projects or the accumulation of different effects in a given area. Thus, the impact assessment carried out at project level is not enough to identify the wide range of cumulative environmental effects generated both by the existing pressures and by the new projects proposed under the Programme; (iv) The impact assessments for the projects financed under the Programme will be based on actual, reliable data, obtained also through measurements carried out directly in the field and obtained by processing these data on the initial state of the environment within the project area. This will allow the best decisions to be made, including further monitoring of the effects of project implementation.

Measures have been proposed to mitigate the negative impact for each priority objective.

The Environmental Report proposes indicators for monitoring and control of environmental effects in the context of the implementation of the Interreg VI Romania-Hungary Programme for the period 2021-2027, establishing the frequency and responsibilities.

The consultation regarding the Competence Report was held in Hungary between September and October 2021. In parallel, inter-institutional consultations also took place in Romania, starting with the establishment of the SEA Work Group (SEA WG) in October, in which the members of 8 institutions are represented. The activity of SEA WG was carried out in 3 (4) meetings, with a series of comments that were fully resolved by adopting the content for the Republic of Moldova. In parallel, the Hungarian side received a series of proposals of amendments and completions from the 38 Hungarian authorities contacted. Some of them did not refer directly to the Environmental Report, but either to the framework content of SEA, or to the studied Programme. Therefore, the report was either rectified or the comments presented were taken into account. The proposals regarding the Programme were sent to the Programme developers. Moreover, some of the comments received referred to points/issues related to the raw materials of the Programme and not to the Report. The issues concerning the development of the Programme were sent to the developers. [In addition, some of the comments received referred to points/aspects related to the content of the Programme and not to the Environmental Report.](#)

According to the studies developed within the SEA procedure, the impact of the Programme is predominantly positive on the environment and the health of the population, bringing benefits both to the natural environment and to the population in the implementation area.

### **13. List of sources**

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**For Hungary:**

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- The 4th National Environmental Protection Programme 2015-2020;
- The 5th National Environmental Protection Programme 2021-2026 – Project;
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- National Clean Development Strategy;
- First Action Plan for Climate by the end of 2020;
- National Energy Strategy 2030;

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