TERRITORIAL ANALYSIS

for the future
INTERREG NEXT Hungary-Slovakia-Romania-Ukraine
CBC programme

2nd December 2020

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Contents

1 Introduction

1.1 About the process

In May 2018, the European Commission published the draft Cohesion Policy regulatory package designed for the next 7-year budgetary/programming period. The above documents were adopted in their draft version in spring 2018, and, at the moment they are under finalisation by the Member States and the European institutions which is a long-standing iterative process. The final regulations which can differ from the draft ones in many factors will define the framework for planning and implementation of the future INTERREG NEXT CBC programme. The final regulations are expected to be available in the second half of 2020, however, the preparation for the next programme can and should already be started – especially the elaboration of the territorial analysis which is a precondition for the adoption of the programme itself.

In summer 2019 the Ministry of Foreign Affairs and Trade of Hungary as the Managing Authority of the current Hungary-Slovakia-Romania-Ukraine European Neighbourhood Instrument Cross-border Cooperation Programme (ENI CBC) requested the Central European Service for Cross-Border Initiatives (CESCI) to elaborate the territorial analysis of the INTERREG NEXT Hungary-Slovakia-Romania-Ukraine CBC programme. In October 2019 a proposal package was already submitted to the partner countries1 on the approach of the programming process based on previous consultations, which needed to be amended to fit current circumstances due to the delay in nomination exercise to the programming committee of some participating countries. After the nomination was finalized, the COVID-19 Pandemic caused further delay. In March 2020, the MA started consultations with the NAs on different options and proposal how to proceed in the current situation, disseminated the recommendations of the European Commission summarised in ANNEX III of Paper on strategic programming of the future programmes on the EU external borders with neighbouring countries. The NAs agreed on taking on board the priority areas of the current HUSKROUA ENI CBC programme fitting the EC recommendations and those fields will serve as the basis/starting point for the territorial analysis. The Inception Report approved by the PC on 1st June 2020 summarised the principles, the methodology and the working plan of the delivery. The current territorial analysis was elaborated based on the principles of this Inception Report.

The main objective of the territorial analysis (as the basis of the joint strategy prescribed by Art. 17 of the INTERREG Regulation and the Art. 10 of the NDICI Regulation) is to provide the stakeholders involved in the Programming Committee (hereinafter PC) with an overview on the territorial processes of the borderland and information on the intentions and opinions of the territorial and sectorial actors on the content of the future programme. The mission does not contain the designing of the next programme but the elaboration of the territorial analysis which can be carried out without the final adoption of the Cohesion Policy Regulations and the Multiannual Financial Framework of the EU. Thanks to the delivery, the PC members will be enabled to select the thematic areas, the policy objectives and the relevant specific objectives of the future programme which should be drafted later on.

[1] The four participating countries: Ministry of Investment, Regional Development and Informatization of the Slovak Republic, Ministry of Public Works Development and Administration of Romania, Secretariat of Cabinet of Ministry of Ukraine, Ministry of Foreign Affairs and Trade, Hungary

1.2 Methodology

The main aim of the territorial analysis is to provide an updated comprehensive overview of the programme area and about the current situation and trends of the preselected topics. It served the preparation of the next programme. For this purpose, the planners used different indicators besides the classic statistical indicators, which can illustrate cross-border flows and procedures. Not only secondary research activities but also the results of an online questionnaire have been used to analyse the programme area's situation.

The structure of the territorial analysis follows the relevant TESIM guidance[2]. After the introduction, the second chapter presents the key characteristics of the programme area. The next chapters present the main challenges of the prefiltered topics based on the PC's decision.

Table 1: Summary table of the TOs and POs according to the chapters of the territorial analysis

	PO1 Smarter	PO2 Greener	PO3 Connected	PO4 Social	PO5 Citizens	ISO1 Better	ISO2 Safer	Chapter
TO3-P1 Heritage	+			+	+			**2.6**
TO6-P1 Environment		+						**2.2**
TO7-P1 Transport			+				+	**2.4**
TO8-P1 Disasters		+						**2.3**
TO8-P2 Health				+				**2.5**
ISO1 Governance						+		**2.7**

The first five chapters (2.2-2.6) have the same structure, after the general, statistics and data based analysis of the given topic, the related possible cross-border functional areas are presented, which is followed by the representation of the topic relevant results of the online survey (opinions and project ideas). After the analysis of the topics there is an overview about the main characteristics of the analysed area's governance conditions (e.g. public administration; cross-border bodies; experiences in the cooperation of local institutions and governments; cooperation with other territorial programmes and the EU macro-regional strategies). After this chapter the results of the online questionnaire are presented. In the chapter 2.8 the main recommendations from the different relevant orientation papers have been collected. The last chapter is about the conclusions of the whole analysis in the form of a special SWOT-table.

To the analysis the following sources of information have been used:

- the European Commission's orientation paper on INTERREG NEXT programmes and its Annex III;
- the territorial analysis of the HUSKROUA ENI CBC 2014-2020 programme;

[2] TESIM (June 2020): Guidance and Template on the Design of the Territorial Analysis. Territorial analysis of Interreg NEXT programmes. Strategic considerations at design stage and suggested template. https://tesim-enicbc.eu/download/guidance-and-template-on-the-design-of-the-territorial-analysis/?wpdmdl=4542&refresh=5f3530ffd381d1597321471

- the first phase evaluation of the HUSKROUA ENI CBC 2014-2020 programme;
- statistical information of the national statistical offices and the Eurostat;
- further statistical data gathered by the national members of the PC;
- other available studies and evaluations.

Applied methods during the elaboration of the analysis:

- desk research;
- gathering and processing of data (in cooperation with the member states);
- GIS-based mapping and figures;
- textual analysis;
- special SWOT analysis.

It should be noticed that the proper implementation of the applied methodology was significantly hampered by the overall lack of comparable statistical data between the four sides of the borders. Many indicators are missing or are different country by country.

The territorial analysis has been completed with a **SWOT analysis** *(see in the chapter '4 Conclusions')* to identify those strengths, weaknesses, opportunities, and threats that are prevalent in the programme area. The matrix is intended to specify the potential objectives of the programme area by naming those internal and external factors that are favourable and unfavourable to the successful development of the programme territory. Furthermore, this last chapter also contains an overview on the main conclusions and decision points regarding the POs as well as horizontal issues and other cross-border topics are briefly discussed.

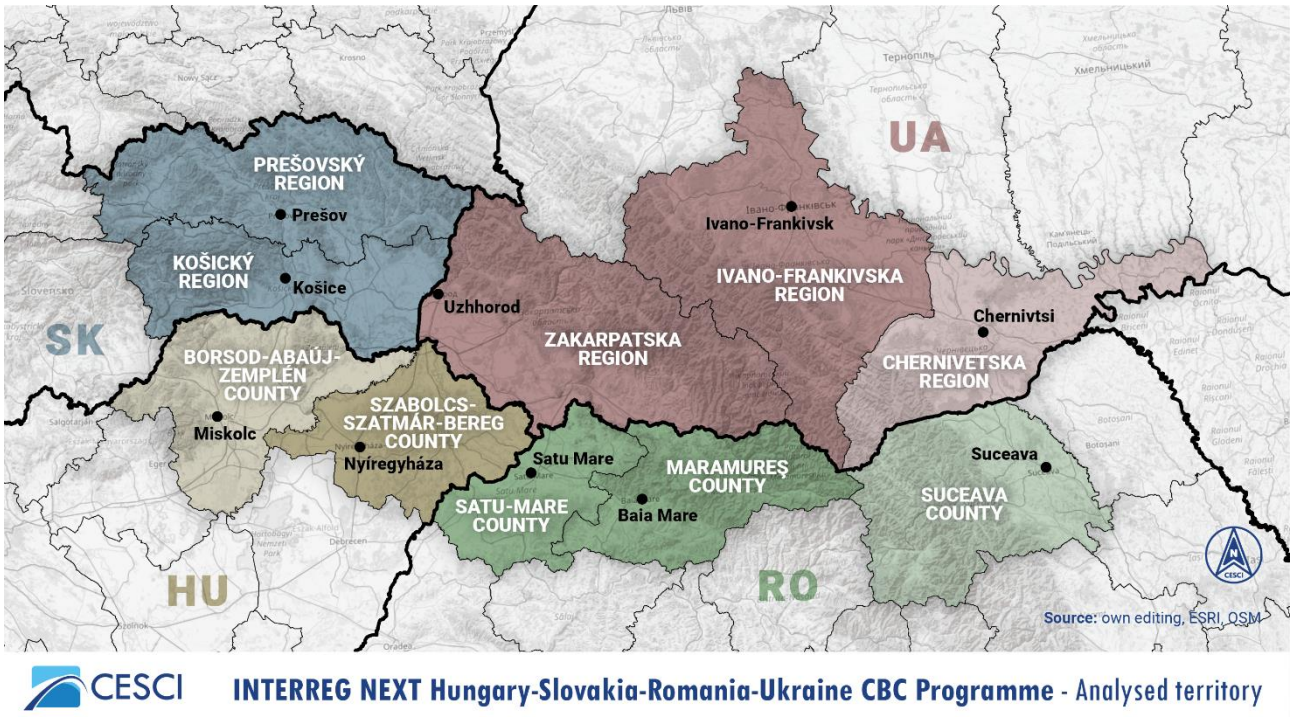
2 Analysis

2.1 Key characteristics of the programme area

2.1.1 Cooperation area

The **cooperation area** of the Hungary-Slovakia-Romania-Ukraine Interreg NEXT Programme consists of various regions of Hungary, Slovakia, Romania as EU Member States and Ukraine as Partner Country. The total cooperation area covers a territory of 83 057 km^2 (size of Austria) with a population of 8 078 324 (size between Austria and Bulgaria). Thus, the cooperation area is as large as an EU Member State, a middle-sized European country. However, administratively its territory is divided between four countries with different roles and responsibilities of their respective NUTS III regions.

Figure 1: The analysed territory of the INTERREG NEXT Hungary-Slovakia-Romania-Ukraine CBC Programme



Based on EUROSTAT methodology[3] the programme area can be considered as a large continuous rural area with only few urban cores and urban regions. Except for Košický Region and Borsod-Abaúj-Zemplén, which are in the intermediate category, all NUTS III regions are in the predominantly rural category. Based solely population density and the level of urbanisation the Ukrainian regions are also predominantly rural and/or intermediate, with a very strong duality in each of the three regions

[3] EUROSTAT: Urban-Rural Typology: **https://ec.europa.eu/eurostat/web/rural-development/methodology**

where the plains and valleys (e.g. around Chernivtsi, Uzhhorod, Ivano-Frankivsk) are more populated and urban than the higher parts of the Carpathian mountain ranges.

Table 2: The area and population sizes of the affected counties

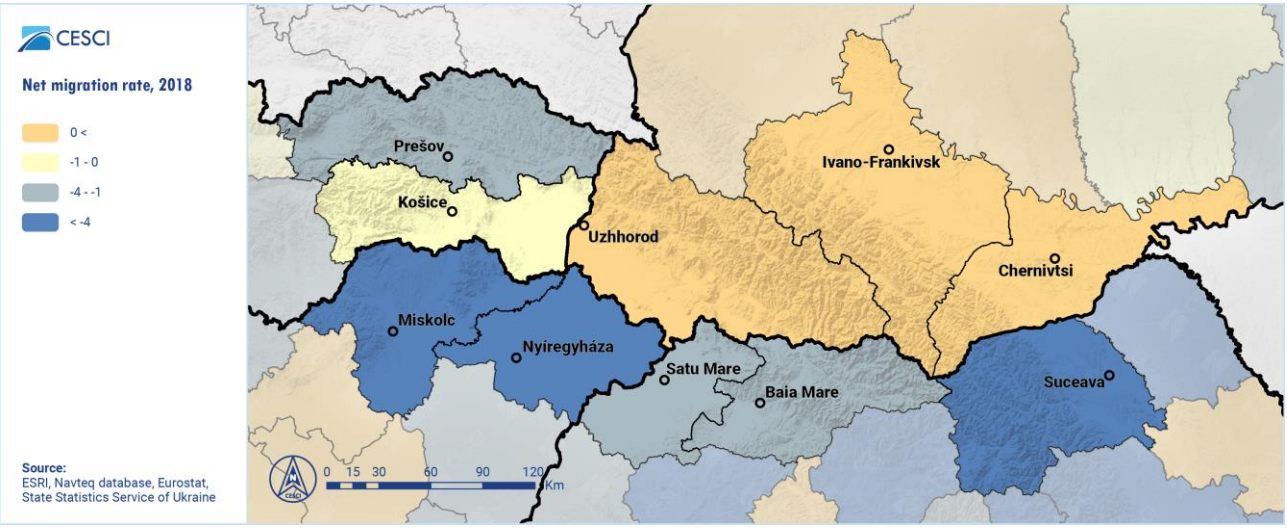
County	Country	Area (km2)	Population
Borsod-Abaúj-Zemplén	Hungary	7 246.19	676 093
Chernivetska	Ukraine	8 095.47	901 309
Ivano-Frankivska	Ukraine	13 959.28	1 370 526
Košický	Slovakia	6 756.93	800 414
Maramureş	Romania	6 286.95	522 302
Prešovský	Slovakia	8 981.33	825 022
Satu-Mare	Romania	4 408.71	387 918
Suceava	Romania	8 632.94	761 808
Szabolcs-Szatmár-Bereg	Hungary	5 933.65	578 963
Zakarpatska	Ukraine	12 755.67	1 253 969
		83 663,00	8 078 324,00

2.1.2 Demography

The **population density** of the total area is relatively low, 97.26 persons/km^2. There are 5 regions with above the average population density (Szabolcs-Szatmár Bereg: 97.57 inhabitants/km^2, Zakarpatska: 98.31, Ivano-Frankivska: 98.18, Chernivetska: 111.33, Košický: 118.46) and 5 regions with density under the average of the analysed area (Maramureş: 83.08 ingabitants/km2, Satu-Mare: 87.99, Suceava: 88.24, Prešovský: 91.86, Borsod-Abaúj-Zemplén: 93.3). There is a continuously low-populated area including all the three Romanian regions, while all the three Ukrainian regions have relatively high population density.

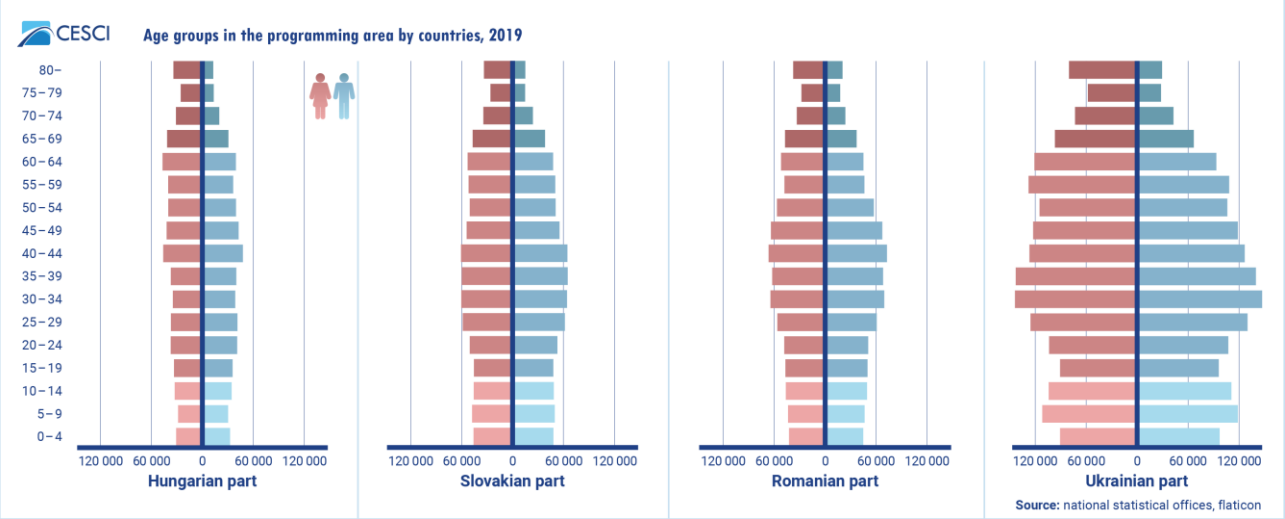
The analysed area has long been affected by **emigration** (net migration rate in 2018: -1.89), which is one of the main reasons of depopulating areas. The main migration targets are usually capital city and metropolis regions, better performing western regions of the given countries or Western European destinations. The target of the Ukrainian international migration also includes surrounding countries, partly Slovakia and Hungary too. Only the Ukrainian part, namely Ivano-Frankivska (0.41), Chernivetska Region (0.24) and Zakarpatska Regions (0.07) have population surplus due to slightly higher number of immigrants than emigrants according to data of 2018. In the Hungarian counties of Szabolcs-Szatmár-Bereg (-7.64) and Borsod-Abaúj-Zemplén (-5.77) and the Romanian counties of Maramureş (-9.97), Suceava (-4.17) and Satu-Mare (-3.6) in particular the population loss is significant due to outmigration. With a lower pace but population decrease by migration is valid also in the case of Prešovský (-1.77) and Košický Counties (-0.58) as well.

Figure 2: Net migration rate



Regarding the population size of 2014 and 2018 the **number of inhabitants** decreased by 21,429 from 8,099,753 to 8,078,324 inhabitants. Taking into account the population change between 2014 and 2018 in all the related regions apart from Suceava County (+2.43%) , where by far the highest increase took place, and the Slovak regions (Prešovký: +0.62%, Košický: +0.61%) population decrease was a decisive demographic trend. Compared to the slight decrease on the level of the whole area (-0.26%) the population shrinkage was significant in Borsod-Abaúj-Zemplén County (-2.83%), Satu-Mare County (-1.11%), Maramureş County (-1%), Ivano-Frankivska Region (-0.67%) and Chernivetska Region (-0.62%) in particular.

Figure 3: Age groups in the countries of the programming area



The **age structure** of the population within the analysed area has been changing; in general the share of elderly people is growing in parallel with the decreasing of the young generations. Based on the distribution of various age groups shown on the population pyramid the age cohorts of under 25 are not populous, and the share of adults, middle aged people are relatively high. The most populous age groups are around the age of 40-44 except for Ukraine where it is the group of age 30-34. The process of ageing has led to on the Hungarian side that there are more elderly people (65 or older) living than children (under 15), and it has a pyramid closest to the so-called

"constructive" pyramid out of the four. The age structure is still relatively young excluding the Hungarian side (ageing index: 110) since in all regions of the analysed area young people still outnumber the elderly (Romanian side: 90, Slovakian side: 83, Ukrainian 75). The age structure is the most youthful in Ukraine which is in big contrast with the Hungarian and Romanian counterparts.

2.1.3 Economic structure and performance

There are huge inequalities in terms of **economic performance** within the analysed area. There is an order of magnitude difference between the worst and the best performing regions in relation to GDP per capita. Regional disparities have a strong east-west divide in favour of the westernmost and more prosperous regions. The most developed ones are situated in Slovakia (Košický County: 12,900 EUR/person, Prešovský: 9300) and Hungary (Borsod-Abaúj-Zemplén: 9600). The least developed, which have been historically lagging behind, are all located in Ukraine (Chernivetska: 1036, Zakarpatska: 1125, Ivano-Frankivska: 1523) and Romania (Suceava: 5500, Maramureş: 6800) in a peripherial situation. Satu-Mare and Szabolcs-Szatmár-Bereg Counties (both 7100) are having identical performance according the GDP per capita. In a wider context, the cooperation area consists of territories which are part of a group of regions having the lowest GDP per capita in their respective countries. Prešovký Region from Slovakia, Szabolcs-Szatmár-Bereg County from Hungary, Suceava County from Romania, Chernivetska and Zakarpatska Regions from Ukraine are all such regions.

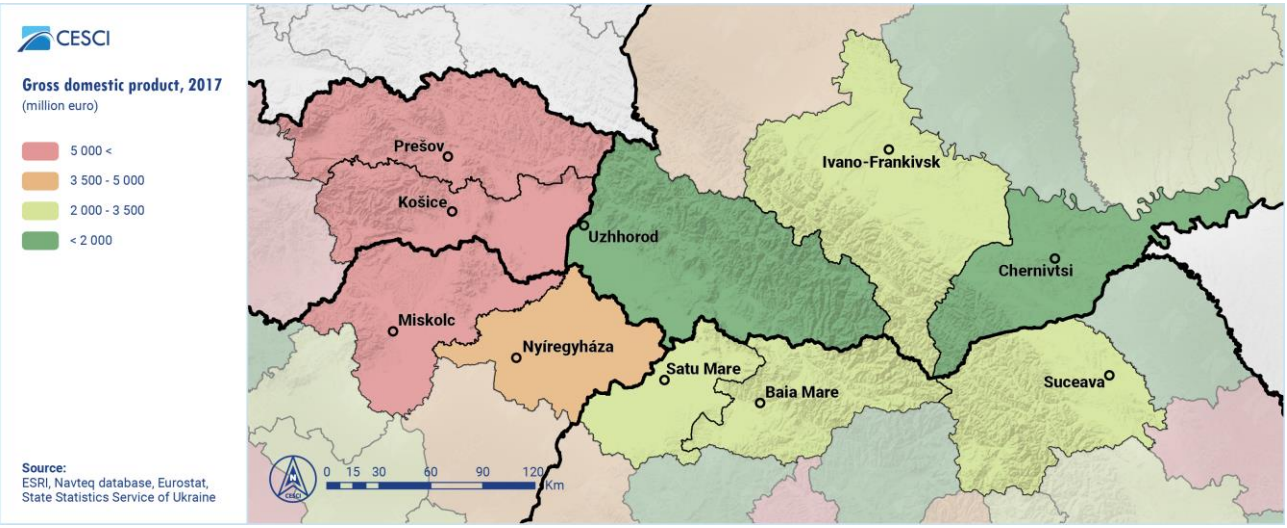
In relation to GDP volumes (million EUR, 2017) again a strong east-west divide can be detected. The Slovak side lead by Košicky Region (24.7%) concentrates 43.1% of the total GDP, and together with Borsod-Abaúj-Zemplén (15%) it is responsibe for by far more than half of the GDP generation. In contrast, Chernivetska Region (2.3%), Zakarpatska Region (3.4%) and Ivano-Frankivska (5%) together make up just a bit than one-tenth of the total GDP volume (10.7%), which is only a percentage higher than of Szabolcs-Szatmár Bereg County (9.8%).

Taking into account the changes in GDP per capita between 2013 and 2017 there is a major difference in the direction of them: Ukraine heavily affected by the Russo-Ukrainian War experienced a severe shrinkage (Ivano-Frankivska: -31%, Zakarpatska: -28%, Chernivetska: -26%), while the rest of the analysed area was able to increase its economic development level. The highest increase was realised in Borsod-Abaúj-Zemplén (+48%) and in the Romanian counties (Maramureş: +42%, Satu-Mare: +37%, Suceava: +31%). The growth rate was mediocre regarding the Slovak regions (Prešovský: +16%, Košický: +21%). Thus, except for Ukraine the less developed regions managed to catch up by having highwe growth rates than the already more developed Slovakian regions. Owing to the changes Borsod-Abaúj-Zemplén County have overtaken Prešovký Region on the development chart. However, it has to be noted that Ukrainian economy in the region is on the way of recovery despite its former deep crisis and long-term backwardness, the growth rates were among the highest in the region by +25.8, +24.1 and +16.1 percentages.

Given the lagging-behind character of the often peripheral analysed area, the general catching-up of the regions to the economically core areas of the EU would be supported. Especially for Ukraine but for the Member States too encouraging EU integration is of crucial importance. To fully use the growth potential of the national economies there encouraging economic cohesion within the area is much needed. The obstacles related cross-border economic relations are still hindering factors in

field of actions like foreign investment, trade relations, value chains and supplier networks, business development etc.

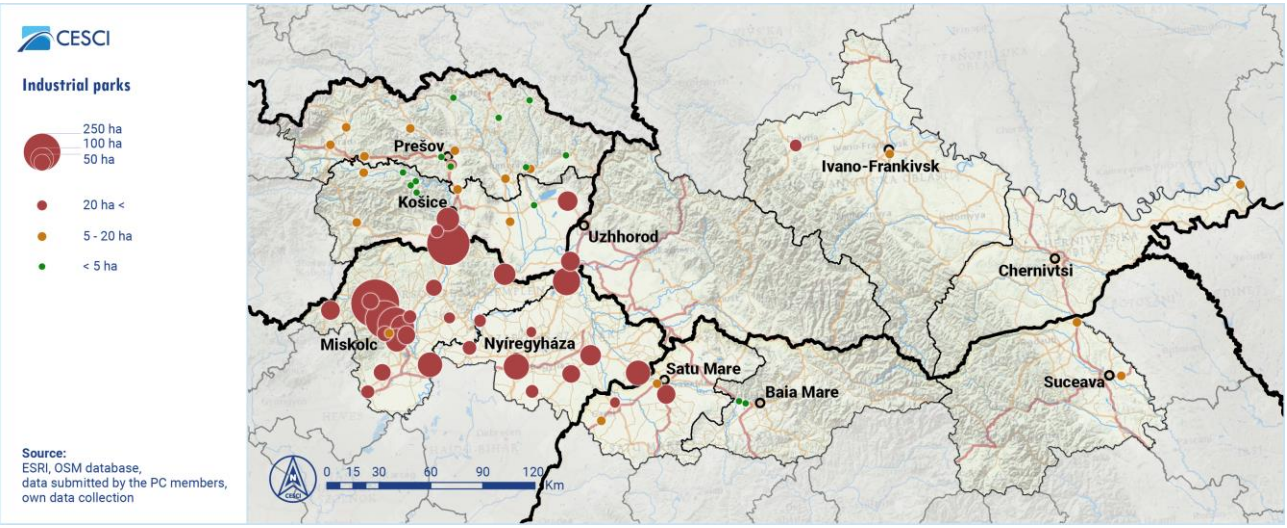
Figure 4: GDP distribution in the counties of the programme area



Various zones to support business development have been designated and created within the analysed area. Such zones may vary in terms of ownership, management, economic-legislative background, terminology. Huge differences persist in relation to their size, number of residing companies and the number of employees. In the followings the officially recognised and introduced so-called **industrial parks** (ipari park/priemyselný park/parc industrial/industrial'nyy park) are presented. The highest number and the largest parks have been established in the Hungarian counties. Apart from Priemyselný park Kechnec (332 hectares) and Priemyselný park Košice Immopark (97.5 hectares) the ten largest parks by total area are operating in Hungary (Felsőzsolcai Logisztikai Ipari Park: 103.7, Tiszaújvárosi Ipari Park: 116.07, Csengeri Ipari Park: 116.96, Nyíregyházi Ipari Park: 125, Tuzséri Ipari Park: 136, MIP Miskolci Ipari Park: 224.97, Sajóbábonyi Vegyipari Tudományos és Technológiai Park: 252, Borsodchem Ipari Park/Kínai-Magyar Borsod Ipari Park: 429.79). The uneven spatial distribution of the parks is very apparent, and has a strong East-West divide in favour of Hungary, Slovakia and Satu-Mare County. However, it has to be noted that size (total surface area) of the infrastructure is only one parameter that can describe the potentials in such economic development tools.

Nevertheless, cross-border economic cooperation in the field of such parks can also be forseen to exploit synergies in joint and complementary features of the related infrastructure and services. Cross-border axes, zones can be formed in relation to e.g.Miskolc and Košice or within the area bordered by Košice, Miskolc, Uzhhorod/Chop, Satu Mare and Nyíregyháza owing to their geographic proximity and high capacities. Along with the creation of commonly used infrastructure joint business development, investment promotion, networking, knowledge exchange can also be crucial to capitalise from the gateway location of the region and the fundamentally distinct characteristics of the four countries.

Figure 5: Industrial park sin the programme territory



There are significant inequalities with regard to **enterprise density** (enterprises per 1000 inhabitants) in the analysed area. However, the differences in the methodology in the registration and publication of enterprises should be reminded, but the main characteristics and trends can be detected from data. The western part of the area (Košický Region: 29.5, Borsod-Abaúj-Zemplén County: 27.1, Prešovský County: 25.6, Szabolcs-Szatmár-Bereg County: 24.9) has sometimes even 6-7 times higher densities than the easternmost, mostly Ukrainian areas (Suceava County: 16.8, Ivano-Frankivska Region: 6.1, Zakarpatska Region: 5.1, Chernivetska Region: 4.5). Taking into account the changes between 2014 and 2018 in all regions business development took place, excluding the Hungarian counties (Szabolcs-Szatmár-Bereg: decrease by 10.9%, Borsod-Abaúj-Zemplén: decrease by 9.8%). The highest growth in enterprise density as a sign of certain business posperity was registered in Košický (increase by 18.8%) and Prešovský Regions (increase by 17.8%), furthermore in Suceava County (17.5%).

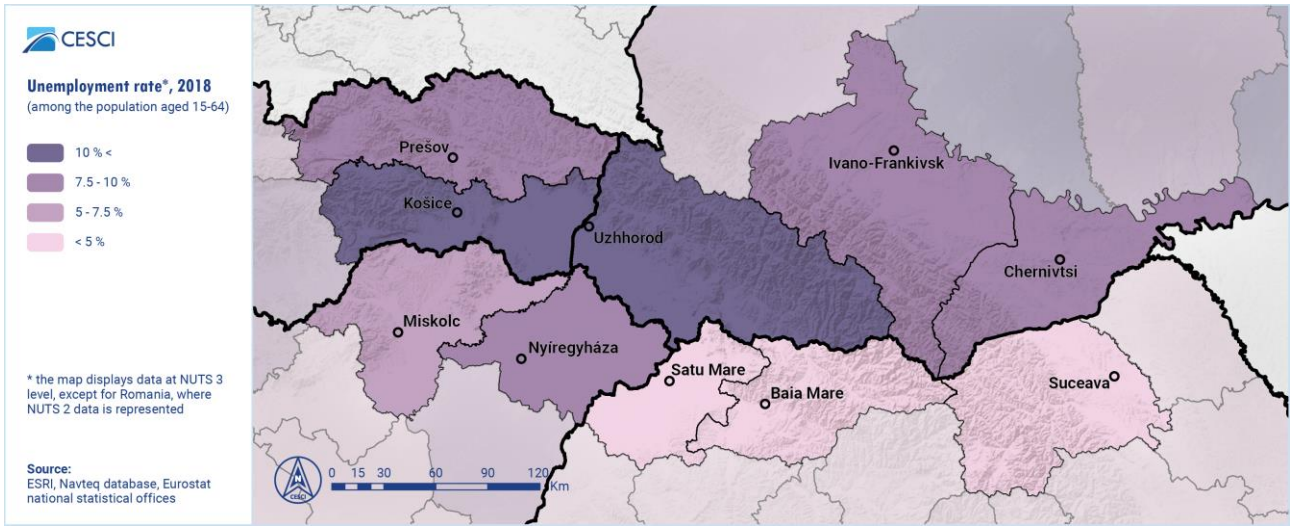
2.1.4 Social challenges

High **unemployment** is a profound problem across the majority of the analysed area. Unemployment is also a reflection of low educational attainment, unfavourable and economic structure, lack of major employer companies, and a real poverty threat. Based on the data given by the national statistical offices Zakarpatska Region (10.3%), Košický Region (10.1%) and Prešovký Region (10%) suffer from the highest unemployment. The rates are rather low or mediocre in the case of the NUTSII regions of North-West (2.6% including Satu Mare and Maramureș Counties) and North-East (2.9% including Suceava County) and Borsod-Abaúj-Zemplén County (5.2%). Apart from the Romanian regions and the Hungarian county in all the related territories unemployment exceeds 8%. It is worth noting that stastical methods may vary from country to country, thus the low Romanian data is also because of different data collection. Within Romania the employment rate based on the data of the National Institute of Statistics on NUTSIII level, Suceava is part of the country's most unfavourable part in terms of employment (5.1%). Maramureș (3.2%) and Satu-Mare (2.6%) especially are in a considerably better situation.

However, in-work poverty has to be mentioned as well meaning that even the employed people can suffer from certain level of poverty in the region. In Romania 2012: 18.9, 2017: 17.1%) and Hungary (2012: 5.7, 2017: 10.2%) the in-work poverty rate is above the EU28 average (2012: 8.9% in 2012, 2017: 9.4%). Regarding Slovakia the rate is below average, however slightly increased in recent years (from 6.2 to 6.5).[4]

All this leads to the recognition of the importance in actions tackling unemployment on a cross-border level. Inequalities in the labour market needs and offers are significant across the analysed area, thus certain harmonisation and cooperation in the field of cross-border employment and related services might be integral part of the future joint fight against unemployment. Even nowadays intensifying labour migration can be detected from Ukraine towards Slovakia and Hungary in particular, which can be managed jointly to create win-win situations of all sides of the border instead of massive depopulation and break-up of local communities in the sending areas.

Figure 6: Unemployment rate in the the analysed territory



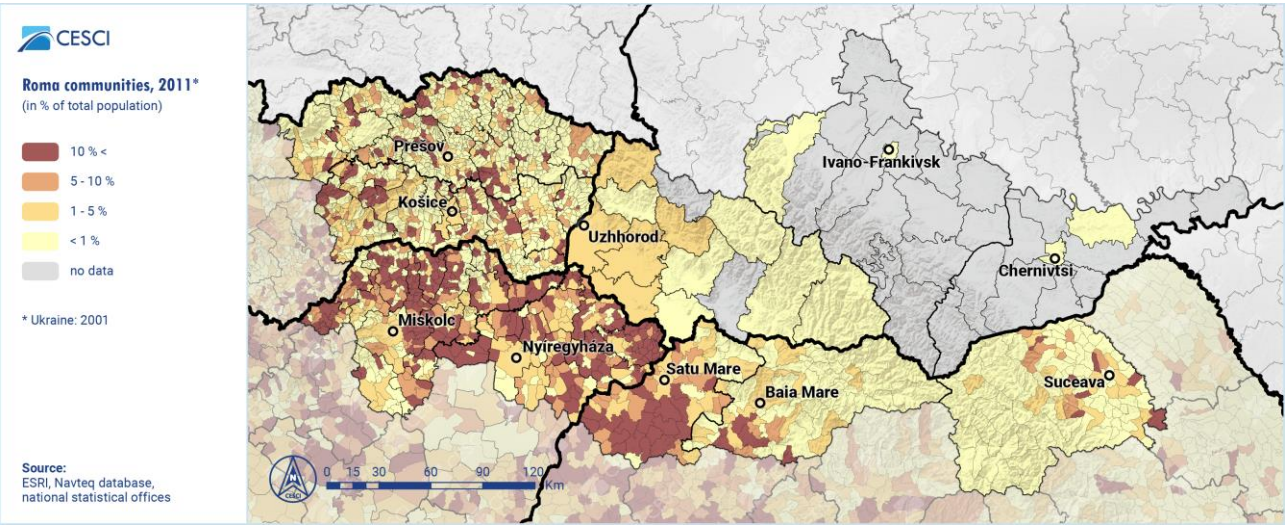
Roma communities are often exposed to severe social challenges such as low income, exclosure from labour market, and suffer from financial and material deprivation. The share of Romas living in or at risk of poverty is very high, making this group part of the most vulnarable population within the analysed area. The Roma minority is also theatened by further physical segregation, even ghettoisation. Such negative socio-geographical processes are taking place in large part of the area, especially in relation to rural areas. Furthermore, the most populous and peripheral communities live in small remote villages and/or border areas having disadvantageous socio-economic situation like bad infrastructure, weak accessibility, lack of workplaces, housing problems, low educational attanment etc.

Based on the population censuses, which tend to underestimate the real size of the Roma population, there are a significant number of local municipalities where their share exceeds 10%. Such often spatially continous areas inhabitated by Romas include large areas of Borsod-Abaúj-Zemplén (e.g. Cserehát, districts of Encs, Edelény, Szikszó, Putnok, Ózd), Szabolcs-Szatmár-Bereg (e.g. district of

4 In-work poverty in Europe A study of national policies
https://ec.europa.eu/social/BlobServlet?docId=21240&langId=en

Fehérgyarmat, Záhony or Nyírbátor), Satu-Mare Counties (south of Satu Mare City), but in many microregions of Slovakia (e.g. districts of Kežmarok, Gelnica, Rožňava) and Ukraine (especially Berehove and Uzhhorod Raions in Zakarpatska Region).

Figure 7: The ratio of roma communities in the analysed territory



2.1.5 Data on the impact of COVID-19 crisis

Besides the huge impact on the health sector, the COVID-19 outbreak is bringing considerable socio-economic disruption. The effects of the current crisis are affecting the cross-border dynamics and will certainly influence the socio-economic perspectives of all cooperation areas. Consequently, it is of importance to include in the territorial analysis some reflections on the impacts of the current crisis.

Based on the latest available data[5] on the actual impacts on the European economy, it can be concluded that the continent and some related countries have already been hit hard by the pandemic situation. After the recovery from the global financial and economic crisis of 2008-2009 and the following fast-paced growth in Hungary, Romania and Slovakia the four related countries again have to face economic decline. In the second quarter of 2020, still marked by COVID-19 containment measures in the analyed area, seasonally adjusted GDP decreased by 11.7% in the EU compared with the previous quarter. Hungary was hit the hardest, and it seems the eastern regions of the country have suffered more from the economic downturn. Hungaray is one of the most affected by the new crisis (GDP change: -14.5%), but Romania (-12.3%) was also hit harder than the EU average. The fall of GDP was slightly less severe in Ukraine (-9.9%) and Slovakia (-8.3%). There is a clear accelaration of the negative processess as in the first quarter the changes were less notable except for Slovakia (Hungary: +0.4%, Romania: 0.3%, Ukraine: -1.3%, Slovakia: -5.2%). Compared with the same quarter of the previous year, seasonally adjusted GDP decreased by 14.1% in the EU in the second quarter of 2020. In Hungary the data was worse than the EU average (-13.5%), while in the other states the rates

[5] EUROSTAT: GDP and employment flash estimates for the second quarter of 2020 (**https://ec.europa.eu/eurostat/documents/2995521/10545332/2-14082020-AP-EN.pdf/7f30c3cf-b2c9-98ad-3451-17fed0230b57**)

were all negative, but stayed below the average (Romania: -10.5%, Ukraine: 11.4%, Slovakia: -12.1%). Consequently in all national economies GDP growth turned into decline, and the tendencies are negative. Tourism is one of the sectors which will be suffering the most from the crisis.

OECD in its Employmen Outlook 2020 states there has been jobs crisis evolved from a health crisis.[6] Employment decreased by 2.6% in the EU in the second quarter of 2020, compared with the previous quarter. In the first quarter employment decreased by 0.1% in the EU, thus there is a decline in the field of labour markets too.

Unemployment is has been increasing steadily in the related countries. Seasonally adjusted unemployment was 7.1% in the EU in 20 June 2020. The rates were still lower in Slovakia (6.6%), Romania (5.2) and Hungary (4.8%, as of 20 May).[7] The youth women are the most exposed to unemployment, which will require job retention and other type of actions.

The COVID-19 crisis, uncovered pre-existing gaps in poor social protection provision, employment protection. According to an assessment respondents indicated that the government's performance in these fields was often poor.[8] Telework, home office gained high popularity, but many have been excluded from its positive effects. Vulnerable workers are bearing the brunt of the shock, with low-skilled workers and those in non-standard employment having been particularly exposed.

In education inequalities have increased as many are (partly) excluded from e-learning because of weak digital skills (persisting digital divide) and lack of smart devices. Rural areas, Roma communities and poor population are the most exposed to the negative effects of the pandemic in education.

There is a general consensus about the negative present and predicted long-term impacts on people already experiencing poverty and social vulnerability. These people started with a disadvantage compared to other groups who were not in poverty, in terms of prevalent diseases, disabilities, badly perceived health status and low levels of wellbeing, as well as lack of savings, debts, precarious jobs (if any), low-amounts of benefits. Access to health care, employment services, housing and anti-poverty initiatives has become more elementary than only a few quarter years earlier. The crisis higlighted the importance of social inclusion for vulnerable groups.

Poverty projections suggest that the social impacts of the crisis are likely to be quite significant. Estimates based on growth projections from the June 2020 Global Economic Prospects report show that, when compared with pre-crisis forecasts, COVID-19 could push 71 million people into extreme poverty in 2020.[9] According to the scenarios the most vulnerable regions where poverty rates are

6 OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis: **https://www.oecd-ilibrary.org//sites/1686c758-en/1/3/1/index.html?itemId=/content/publication/1686c758-en&_csp_=fc80786ea6a3a7b4628d3f05b1e2e5d7&itemIGO=oecd&itemContentType=book#chapter-d1e511**

7 EUROSTAT: Unemployment rates: **https://ec.europa.eu/eurostat/documents/2995521/11156668/3-30072020-AP-EN.pdf/1b69a5ae-35d2-0460-f76f-12ce7f6c34be**

8 The impact of COVID-19 on people experiencing poverty and vulnerability: **https://www.eapn.eu/wp-content/uploads/2020/07/EAPN-EAPN_REPORT_IMPACT_COVID19-4554.pdf**

9 World Bank: Projected poverty impacts of COVID-19 (coronavirus) **http://pubdocs.worldbank.org/en/461601591649316722/Projected-poverty-impacts-of-COVID-19.pdf**

already high, are the most exposed to the negatice impacts, and extremely poverty rate is expected to grow across the globe.

Environmental impacts are rather positive on the short term, and hurried governments to take steps in implementing measures. To summarise the impacts, it is worth noting that the Earth Overshoot Day, which marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year, arrived more than three weeks later than in 2019 (on 22 August in spite of was on July 29). The date reflects the 9.3% reduction of humanity's ecological footprint. The main drivers were the carbon footprint (reduced 14.5% from 2019) and the forest product footprint (reduced 8.4% from 2019).[10] Despite of globally positive changes, the date has not moved to later period in any of the related countries, and it even deteriorated by a day in Slovakia and Romania with regard to the analysed area (Slovakia: 21 May, Hungary: 14 June, Romania: 11 July, Ukraine: 24 July). Air quality (e.g. decreased concentrations of NO_2 and PM 2.5) has improved during the travel and self-quarantine restrictions. GHG emission level have decreased, but it would be difficult to keep it low on a longer term. Thus, major negative environmental impacts could quickly return to post-lockdown regions and cities. There are also negative aspects of the pandemic situation, such as the reduction in recycling and the increase in waste, further endangering the contamination of physical spaces (water and land), in addition to air.[11] Social distancing on the other hand, leads to more congested road and shift to individual traffic due to fear from infection. Therefore, some countries and cities in particular are trying to create a safe and attractive public transport system, and supporting carbon-free modes of transport with never-before size of development budgets (e.g. see Deutsche Bahn in Germany). Due to travel restrictions, quarantine obligation and lockdown of state borders, cross-border mobility has decreased, and instead of international journeys inland destinations will be more favoured in the short and medium term.

10 Calculating the Earth Overshot Day 2020: **https://www.overshootday.org/content/uploads/2020/06/Earth-Overshoot-Day-2020-Calculation-Research-Report.pdf**

11 Indirect effects of COVID-19 on the environment: **https://www.sciencedirect.com/science/article/pii/S0048969720323305**

2.2 PO2 Greener / TO6-P1 Environment

Related thematic field based on the current programme: Thematic Objective 6: Environmental protection, climate change mitigation and adaptation - Priority 1: Sustainable use of the environment in the cross-border area - preservation of natural resources, actions to reduce GHG emission and pollution of rivers

Expected results in the current programme: An increased capacity in the programming area to address challenges in the field of environmental protection and climate change mitigation; Successful protection of common natural values with demolishing the effects of borders on habitats and increasing the awareness of people living in the area; Improved water quality of rivers crossing the borders as a result of interventions related to waste management and waste water treatment; Increased awareness, competence and skills of renewable energy technologies and energy efficiency interventions among citizens, businesses and institutions; As a final outcome less dependency on imported energy sources in the programming area.

Short summary of the topic: The protection and management of common natural values are relevant in several respects within the programme area. Nature reserves are often transboundary and species and habitats take on a different configuration from administrative boundaries. Central and large landscapes, biogeographical regions such as the Carpathian Range or the Pannonian Plains are shared by several states, but their values and challenges are very similar. The management of each of the differently regulated, classified and protected areas, the coordination of the nature and environmental protection activities on them, the development of ecological corridors and green infrastructures still require serious efforts from the partners.

One of the most significant natural geographical features of the border area as a whole is its hydrography. The importance of regional water management is underlined by the fact that the region is part of the catchment area of Tisa / Tisza and (less importantly) Siret / Szeret rivers, where both sub- and upstream countries are located, so wastewater and waste management gaps pose a cross-border environmental challenge. In Ukraine, in particular, the lack of adequate environment protection infrastructure and waste management is an unsolved problem.

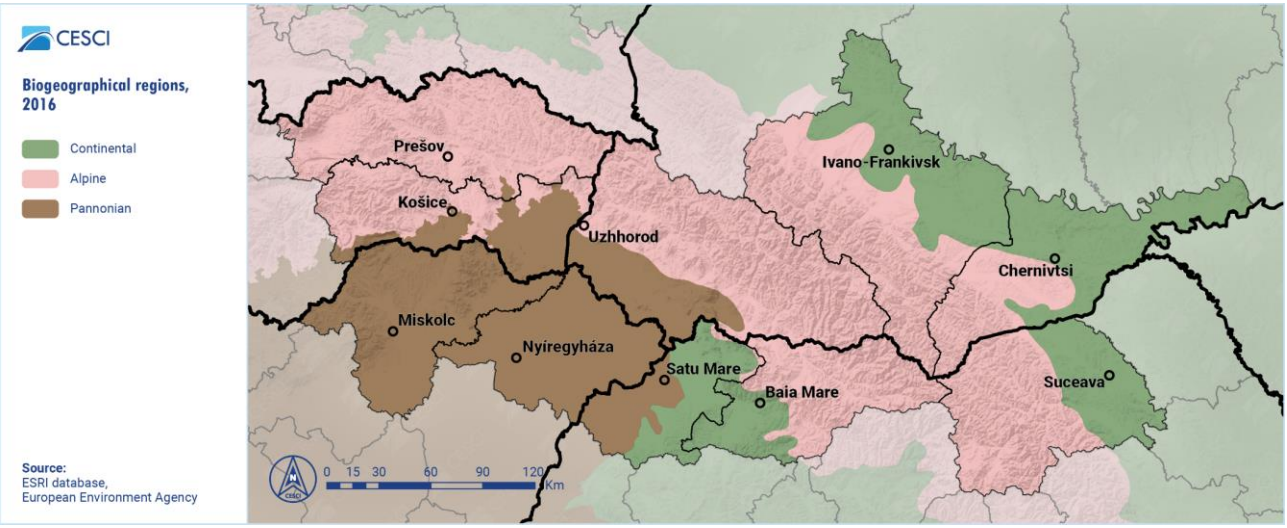
Although the level of greenhouse gas emissions has improved significantly since the change of regime, it has been in recent years that the countries concerned have been able to show little progress in terms of joint energy management, renewable energy resources and self-sufficiency. Efficient technologies and the use of alternative energy resources can still be supported, given that, with the exception of Ukraine, emission levels have not decreased substantially.

2.2.1 Statistical and data-based analysis

2.2.1.1 Natural regions

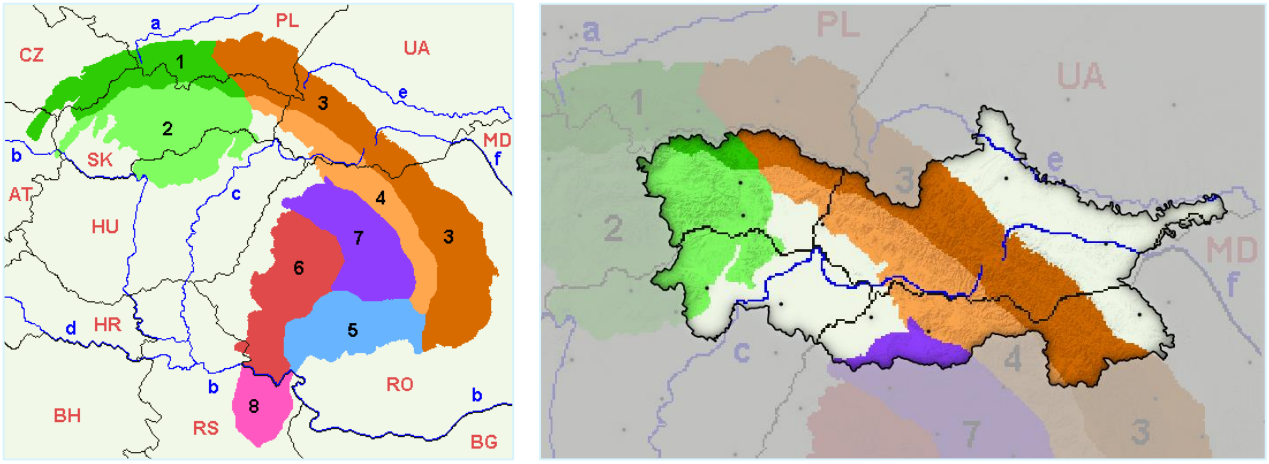
The analyzed area covers the following three of the seven biogeographical regions designated in Europe: Continental, Alpine and Pannonian. The delimitation of biogeographical regions is based on similar natural features (climate, geological, pedological features, flora, fauna). Many of the environmental challenges in the programme area can be deduced from this landscape diversity.

Figure 8: Biogeographical regions of the programme area



The Carpathians, which bisect the area in a northwest-southeast direction, are the main watershed in the region and the physiographic unit of the three countries of the programme area (Slovakia, Ukraine, Romania). The youngest and most easterly mountain of the **Alpine region**[12] is the Carpathians. The programme area affects two major parts of the Carpathians, namely the Western and the Eastern Carpathians. The Western Carpathians cover the western counties of the programme area. Its parts above 1 000 m are located in the Košický Region and in the western part of the Prešovský Region, where also the highest point of the Carpathians, Gerlachovský štít (2 655 m) rises. The Easter Carpathians form a natural watershed between the four counties of the programme area, between Zakarpatska Region and Maramureş County on the western side of the range, and between Ivano-Frankivska Region and Suceava County on the eastern part of the range.

Figure 9: Main divisions of the Carpathians



1=Outer Western Carpathians, 2=Inner Western Carpathians, 3=Outer Eastern Carpathians, 4=Inner Eastern Carpathians, 5=Southern Carpathians or Transylvanian Alps, 6=Romanian Western Carpathians, 7=Transylvanian Plateau, 8=Serbian Carpathians.

Source: Markussep (CC BY-SA 3.0); https://commons.wikimedia.org/wiki/File:Mapcarpat2.png

12 EC Environment Directorate General (2005): Natura 2000 in the Alpine Region. **https://ec.europa.eu/environment/nature/info/pubs/docs/brochures/nat2000_alpine.pdf**

In general the Carpathians have a relatively low altitude, the upper alpine and nival zones are generally missing. In fact, only 5% of the land is above the tree line. Instead, montane forests cover most of the range. The foothills are dominated by sessile oak, whilst beech forests prevail in the montane region. These natural montane forests are the most extensive in the EU (over 300 000 ha in total) and contain some of the most important vestiges of virgin beech forest left on the continent. As a consequence, they are extremely rich in species. Over 300 bird species can be found here, lot of them are included in the Habitats Directive due to their restricted range. However, the Carpathians are famous for harbouring Europe's most significant populations of large carnivores. Roughly 8 000 bears, 4 000 wolves and 3 000 lynxes still roam the mountains, representing more than 40% of their total population on the EU's territory. Although under increasing pressure from excessive hunting, these flocks provide a vital source of animals for the rest of the EU. The Carpathians are one of the most significant corridors for species migration and dispersal due to their strategic location between east and west. In the frame of the BioREGIO Carpathians project, not only the list of threatened but also the list of invasive alien species were compiled[13].

Southwest from the Carpathians lies the **Pannonian Region**[14], which is dominated by a large flat alluvial basin. The sheltered position of the region beneath the mountains has had a significant impact on biodiversity here. It has also influenced the climate. Wet weather coming in from the west is tempered by drier warmer winds rising up from the Mediterranean and cooler temperatures coming from the Carpathians and Alps nearby. The surrounding hills and mountains are an important source of water for this otherwise arid. At one time the basin was covered in large tracts of oak-dominated thermophilous forests and forest steppes but, over centuries, these were gradually cut down to make way for extensive grasslands which stretch out as far as the eye can see across the flat plains. Native forests of the Pannonian region are under pressure from another factor as well. The alien tree *Robinia pseudoacacia* has shown to thrive on the extensively drained sandy grasslands. Thus, there are more extensive plantations of *Robinia pseudoacacia* in the region than anywhere else in Europe. The invasive behaviour of this species, spreading uncontrollably, is a threat to the native vegetation. Non-native conifer species such as *Pinus sylvestris* are also widely distributed particularly on higher land, as well as non-natural *Populus spp. clones* in floodplain areas.

In the northern part of the Region (Slovak-Hungarian region of the programme area), the hills merge with the Carpathians to form a typical karst landscape. Aggtelek and Slovensky Kras are prime examples. Beneath their surface a massive subterranean labyrinth of caves, underground rivers and aquifers carves its way through the porous limestone rocks.

Europe's second-largest biogeographical region surrounds the two previously mentioned regions. Similar natural conditions characterize the huge **Continental Region**[15] over most of Europe. The

[13] Key outputs and publications of the BioREGIO Project: **http://www.bioregio-carpathians.eu/key-outputs-and-publications.html**

[14] EC Environment Directorate General (2009): Natura 2000 in the Pannonian Region. **https://ec.europa.eu/environment/nature/info/pubs/docs/biogeos/pannonian.pdf**

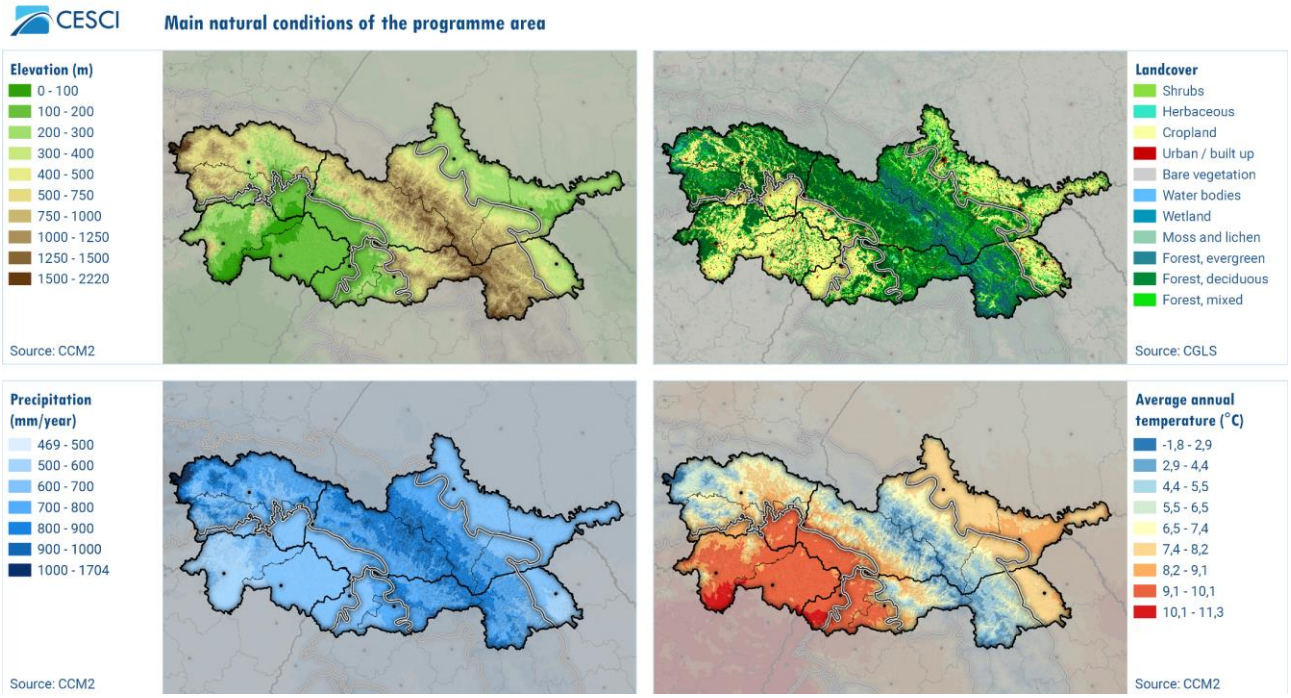
[15] European Environment Agency (2002): Biogeographical regions in Europe: The Continental biogeographical region – agriculture, fragmentation and big rivers. **https://www.eea.europa.eu/publications/report_2002_0524_154909/biogeographical-regions-in-europe/continental_biogeografical_region.pdf**

eastern part of the Region reaches as far as the border of Asia, just south of the Ural Mountains (outside of the programme area). Both parts of the region that are affected by the programme area are a transition between lowlands and mountainous areas. This characteristic is also reflected in the different natural features.

2.2.1.2 Natural conditions

The above biogeographic regions are well illustrated in the figures of the main natural features of the programme area. While the Carpathians of the Alpine Region are characterized by mountainous areas, the Pannonian and Continental Region are essentially lowlands and only the parts close to the Carpathians become hilly.

Figure 10: Main natural conditions of the programme area

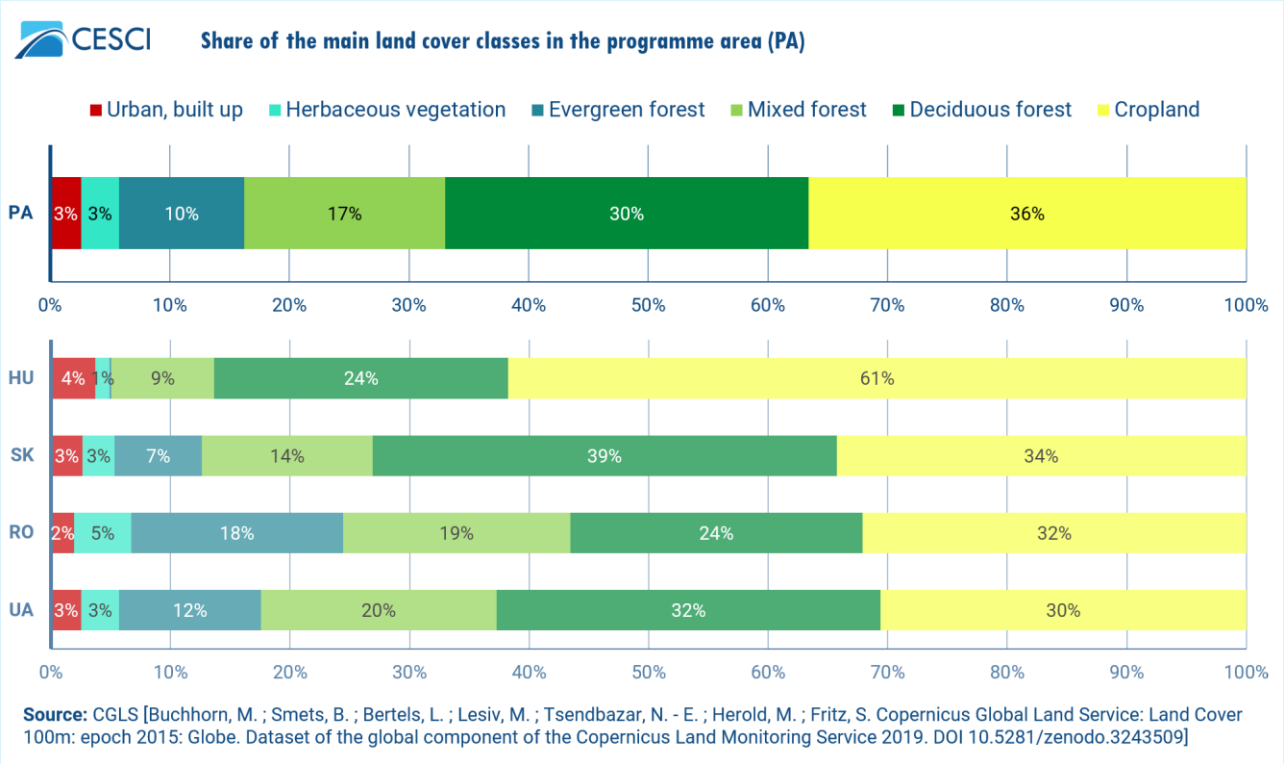


The topography is closely followed by the main climatic conditions. The average annual precipitation in the Pannonian Region and almost in the entire Continental Region is below 700 mm. In the western parts of Borsod-Abaúj-Zemplén County and in the south-eastern part of Suceava County, the annual precipitation does not even reach this value, it is typically between 5-600 mm. In the lower parts of the Carpathians the precipitation is 7-800 mm, while in the higher parts it is between 8-1000 mm. Territorially, the average temperature conditions are similar, with the main difference that the areas inside the Carpathians are much warmer than the eastern areas outside the Carpathians. While the average annual temperature in the parts of the programme area belonging to the Pannonian Region is between 9-10°C, the average temperature in the areas belonging to the Continental Region beyond the Carpathians is only between 8-9°C. Compared to these values, much cooler values characterize the higher parts of the Carpathians, where the average temperature is below 5°C.

Just like its previous environmental conditions, also the typical land cover largely follows the location of the biogeographical regions. The dominant land cover of the programme area is various **forest areas** (57% in total) as well as arable lands (36%). Although forest areas appear in all three

biogeographical regions, they clearly dominate in the areas of the Carpathians. In accordance with the topography, deciduous forests have the highest proportion (more than 50%) within the forest areas, followed by mixed forests (less than 30%), while the evergreen coniferous forests are present in the programme area with the lowest proportion (less than 20%).

Figure 11: Land cover classes in the analysed territory



The forests are indispensable for the sustainability of the landscape. They mitigate greenhouse gases and provide resilience to climate hazards by regulating soil and water regimes as well as protect biodiversity. Despite of these facts these areas are in serious danger because of deforestation. Deforestation and forest degradation are driven by many different factors. Forests have to face the effects of the climate change, increased number of forest fires and pressure from invasive species. Forests are also under pressure due to intensification of forestry, agriculture and infrastructure. The amount of forest has declined because of formal wood harvesting, but also illegal logging.[16] The impacts of deforestation are more and more relevant for the programme area as well: Increased vulnerability to extreme weather; Loss of rainfall and crop pollinators; Respiratory illness due to forest fires; Unsustainable management of water resources; Unsustainable economic growth and lack of

[16] Alberton, M.; Andresen, M.; Citadino, F.; Egerer, H.; Fritsch, U.; Götsch, H.; Hoffmann, C.; Klemm, J.; Mitrofanenko, A.; Musco, E.; Noellenburg, N.; Pettita, M.; Renner, K.; Zebisch, M. (2017). Outlook on climate change adaptation in the Carpathian mountains. United Nations Environment Programme, GRID-Arendal and Eurac Research, Nairobi, Vienna, Arendal and Bolzano. **http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/02%20Activities/Climate%20Change/MP_Carpathians_lores.pdf**

decent work; Income inequality; Unsustainable consumption and production patterns; CO2 emissions; Biodiversity loss.[17]

Illegal logging is one of the most important drivers of the deforestation in the Danube Carpathian Region. It is hard to estimate the share of illegal logging, because official, comprehensive, and comparable statistics do not exist. According to the news, the situation in Ukraine and Romania is the worst, however the fight against these kinds of illegal activities still last in Slovakia and Hungary as well. The fight against illegal logging and trade under the EUTR[18] is becoming more and more effective in Slovakia and in Hungary. The cross-border cooperation in the controlling of the illegal trade in timber is furthermore essential.

In 2019, SLDI (Slovak Forestry and Timber Inspectorate) performed 730 inspections focused on timber transport and found some kind of violation in 38 percent of cases. However, these were mainly administrative breaches.[19]

The Hungarian competent authority for EUTR, the NÉBIH (National Food Chain Safety Office) in its last report about the illegal logging announced a modest but sure improvement in this field. In the report, it has been also stated, that the risk of the illegal logging in Szabolcs-Szatmár-Bereg county is high, while in Borsod-Abaúj-Zemplén county it is very high.[20]

In Romania, the implementation of the EUTR is not going so well. In July 2020 the Commission was urging Romania to properly implement the EU Timber Regulation (Regulation (EU) 995/2010), which forbids producing and placing on the EU market products made from illegally harvested logs. In the reasoned opinions of the Commission it has been stated, that the Romanian national authorities had been unable to effectively check the operators and apply appropriate sanctions. Inconsistencies in the national legislation do not allow Romanian authorities to check large amounts of illegally harvested timber. In addition, the Commission had also found that protected forest habitats have been lost within protected Natura 2000 sites in breach of the Habitats and Birds Directives.[21] Based on the Greenpeace's report about illegal logging in Romania's forest, the volume of timber that was illegally logged, the highest values were registered in 2018 in Maramureș County (99 389.17m^3), and the sixth highest values in Suceva (5 278 m^3). The report has been also stated, that the control authorities trace only 1% of the total illegal logging happening in Romania.[22]

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17 EU Communication (2019) on stepping up EU action to protect and restore the world's forests. **https://ec.europa.eu/info/sites/info/files/communication-eu-action-protect-restore-forests_en.pdf**

18 EU Timber Regulation (EUTR) entered into force in 2013, aiming to ensure that illegally logged timber and timber products are no longer sold on the European market.

19 News about the SLDI's effectiveness: **https://www.mpsr.sk/aktualne/slovenska-lesnicko-drevarska-inspekcia-odhalila-porusenia-zakona-v-38-percentach-kontrol/15006/**

20 NÉBIH (2020): Statistical data on the risk of illegal logging in 2016-2019, as well as summary results of the implementation of inspections in connection with the timber trade chain in 2017-2019**https://portal.nebih.gov.hu/documents/10182/1277079/Az+illeg%C3%A1lis+fakitermel%C3%A9s+kock%C3%A1zat%C3%A1val+kapcsolatos+adatok.pdf**

21 European Commission (2020): July infringements package: key decisions **https://ec.europa.eu/commission/presscorner/detail/en/INF_20_1212**

22 Greenpeace (2019): Illegal logging in Romania's forests. 2018 Report. **https://storage.googleapis.com/planet4-romania-stateless/2019/11/5cbe6848-greenpeace-illegal-logging-report-2018.pdf**

More complicated is the illegal logging situation in Ukraine. Despite the plenty of official announcements the reports and the news show huge difficulties and anomalies in this topic. The official figures on volumes of illegally logged timber held by the SFRAU (State Forest Resources Agency of Ukraine) correspond to 0.1% of total timber harvest. Different NGOs estimate it between 5% and 30%. The SEIU (State Environmental Inspection of Ukraine) states that there are two aspects of illegal logging. The first is 'illegal logging' or wood theft done by private people or criminal groups, and the second is 'illegal forest management' or 'illegal forest activities'. The second is connected with cutting wrong volumes, in wrong areas, tree species or sizes, at a wrong time of cutting and similar (e.g. illegal sanitary felling), while the cutting licence is present. The SEIU admits that the second kind of illegal logging causes a much larger damage.[23] All three Ukrainian regions in the programme are seriously affected by these problems.

Within the program area, it is only Hungary where the forest coverage falls below 60%. **Arable land** dominates the Pannonian Region as well as the Continental region. Accordingly, among the countries, the proportion of arable land within the program area is exceptionally high in the case of Hungary alone, exceeding 60%. Szabolcs-Szatmár-Bereg County and Satu-Mare County have the highest proportion of arable land. In the Carpathians crops are restricted to the valleys and lower altitudes, while higher grasslands are suitable for animal husbandry.

As the land cover data shows, the original vegetation of the Pannonian region (mix of two major vegetation zones – broadleaved forests and forest-steppes) was replaced in most places by agricultural land use. This transformation has involved various artificial interventions in the last centuries. In 19th Century massive land reclamation and river regulation projects were launched to drain the wetlands, create new agricultural land and control floods. After World War II the agricultural activities reached an industrial scale. The extent of the fragile steppic grasslands was decreased even more. After the regime change, the different habitat rehabilitation projects co-financed through the EU brought possible wildlife-friendly farming. Despite these positive trends, there is still plenty of pressure on the biodiversity of these lands, e.g. through large scale commercial plantation of invasive species.

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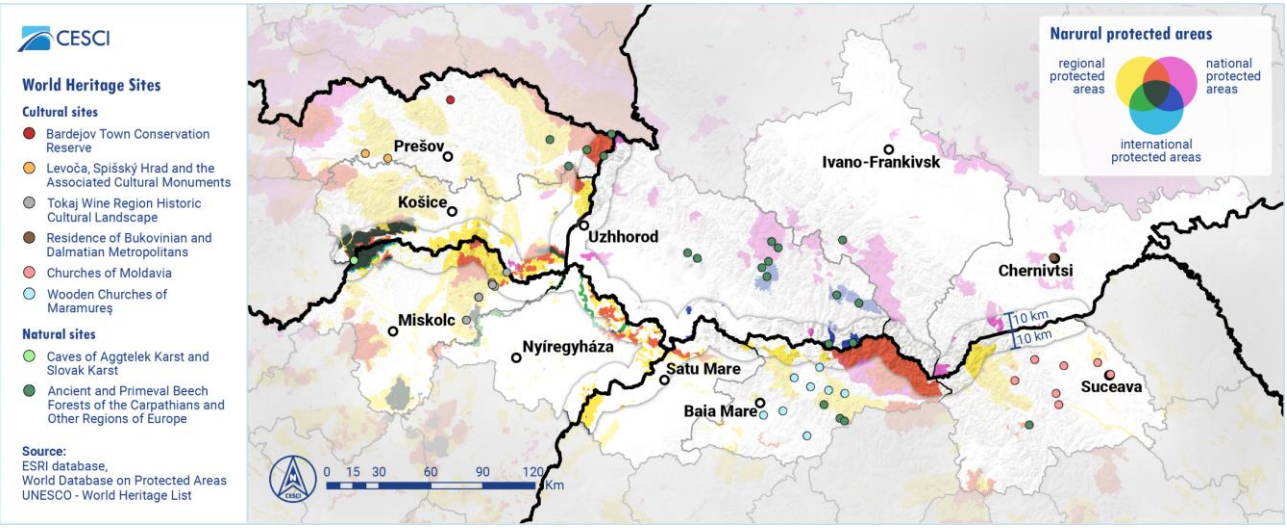
23 EU TAIEX (2018): Reform of Forest Governance in Ukraine. **https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/eu_taiex_mission_report_january_2018_public.pdf**

2.2.1.3 Protected areas

There are different levels of nature conservation areas such as international, European and national in the programme area. International as well as nationally protected areas are located in all four countries. In addition to the national protected areas in the three EU Member States belonging to the programme area, the sites of the European ecological network, Natura 2000, have already been designated. Protected areas, often in territorial overlap with each other, play a significant role in the preservation and survival of the biodiversity and other natural values of the program area.

Areas under international protection include the Ramsar Sites, the UNESCO-MAB Biosphere Reserves and the World Heritage Sites (category: natural or mixed). Inside the programme area 18 **Ramsar Sites** (wetlands of international importance) are located: Atak - Borzhavske; Baradla Cave System and related wetlands; Black Bog; Bodrogzug; Borsodi-Mezöség; Burshtyn Water Reservoir; Dnister River Valley; Domica; Hortobágy; Latorica; Narcissi Valley; Ozirnyi-Brebeneskul; Pohorilets River Headwaters; Prut River Headwaters; Romania-Friendship Cave; Senné fishponds; Tisa River. Upper Tisza (Felső-Tisza). A number of these wetlands provide breeding and roosting areas for birds during migration periods. These sites are associated also with different human activities including regulated scientific research and nature conservation. Several sites fulfil additional functions such as flood control and habitat connectivity and provide numerous social and economic services including irrigation for agricultural land, fishing, recreation and education. The main threats are among others the following (however, these differ site by site): uncontrolled tourism and fishing; intensification of forestry and eutrophication; spreading of invasive species of flora; pollution from wastewater and domestic waste; heavy metal pollution; etc.[24]

Figure 12: Nature protected areas in the programme area



One of the two **natural world heritage** sites in the program area is the „Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe". This transboundary property stretches over 12 countries from Germany to Bulgaria. From the programme area's countries, Slovakia, Ukraine and Romania are affected by 21 component areas. The total size of the affected component areas is

24 Ramsar Sites Information Service: **https://rsis.ramsar.org/**

37 709.18 ha and their buffer zone covers 57 402.68 ha.[25] All component areas have a high legal protection status. These undisturbed, complex temperate forests exhibit the most complete and comprehensive ecological patterns and processes of pure stands of European beech In addition to climate change, the main threat in these areas and their surroundings is the intensification of logging.

Table 3: Component areas of the world heritage site: „Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe"

County	ID	Name and Location	Property (ha)	Buffer Zone (ha)
Suceava County	1133ter-052	Codrul Secular Slătioara	609.12	429.43
Maramureş County	1133ter-058	Grosii Țibleșului – Izvorul Șurii	210.55	563.5
	1133ter-059	Grosii Țibleșului - Preluci	135.82	
	1133ter-061	Strimbu Băiuț	598.14	713.09
Prešovský Region	1133-002	Havešová Primeval Forest	171.30	63.99
	1133-005	Rožok	67.10	41.40
	1133-006	Stužnica – Bukovské Vrchy	2 950.00	11 300.00
	1133-010	Vihorlat	2 578.00	2 413.00
Zakarpatska Region	1133-001	Chornohora	2 476.80	12 925.00
	1133-003	Kuziy-Trybushany	1 369.60	3 163.40
	1133-004	Maramarosh	2 243.60	6 230.40
	1133-007	Stuzhytsia – Uzhok	2 532.00	3 615.00
	1133-008	Svydovets	3 030.50	5 639.50
	1133-009	Uholka – Shyrikyi Luh	11 860.00	3 301.00
	1133ter-073	Synevyr – Darvaika	1 588.46	312.32
	1133ter-074	Synevyr – Kvasovets	561.62	333.63
	1133ter-075	Synevyr – Strymba	260.65	191.14
	1133ter-076	Synevyr – Vilshany	454.31	253.85
	1133ter-077	Zacharovanyi Krai - Irshavka	93.97	1 275.44
	1133ter-078	Zacharovanyi Krai - Velykyi Dil	1 164.16	
Ivano-Frankivska Region	1133ter-070	Gorgany	753.48	4 637.59
			36 519,00	4 696,00

Another natural World Heritage site in the program area is the „Caves of Aggtelek Karst and Slovak Karst". The Caves of Aggtelek Karst and Slovak Karst are outstanding because of the large number of complex, diverse and relatively intact caves concentrated into a comparatively small area. Located at the north-eastern border of Hungary and the south-eastern border of Slovakia, this exceptional

[25] UNESCO: Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe **http://whc.unesco.org/en/list/1133**

group of 712 caves, recorded at time of inscription, lies under a protected area of 56 650 ha and a larger buffer zone. Today more than 1 400 caves are known.[26] More than 99% of the Caves of Aggtelek Karst and Slovak Karst is preserved in its original natural condition and is well protected. The other 1% has been substantially modified as "show-caves" to allow human use. Current threats to the site's values are relatively low. Potential threats from increasing number of visitors, as well as pollution from different activities in the area, require application of careful management, including development of an integrated management of the entire water catchment.[27]

Table 4: Component areas of the world heritage site „Caves of Aggtelek Karst and Slovak Karst"

County	ID	Name & Location	Property (ha)	Buffer Zone (ha)
Borsod-Abaúj-Zemplén County	725ter-001	Component including Aggtelek	16 365	9 566
	725ter-002	Component of Szendrő-Rudabánya Hill	3 325	9 567
	725ter-003	Component of Esztramos Hill	195	9 567
Košický Region	725ter-005	Component of Plešivec plateau	12 055.19	12 778.11
	725ter-004	Component neighbouring Silica and Jasov	12 055.19	12 778.11
	725ter-006	Component of Koniar plateau (including Ochtinská Aragonite Cave)	12 055.19	12 778.11
	725ter-007	Dobšinská Ice Cave	600	19 763
			56 650.57	**86 797.33**

The **'Man and the Biosphere (MAB) Programme'** – also cordinated by the UNESCO – is an intergovernmental scientific programme that aims to establish a scientific basis for enhancing the relationship between people and their environment. The programme area is affected by the following MAB areas: in Hungary: Aggtelek; in Romania: Pietrosul Mare; in Slovakia: Slovenksy Kras and Tatra, in Ukraine: Carpathian and East Carpathians. Biosphere reserves have three interrelated zones: transition area (socioculturally and ecologically sustainable activities are allowed); buffer zone (activities compatible with sound ecological practices); cores area (strictly protected ecosystem for conserving biological diversity).[28]

Protected areas of European importance include **Natura 2000** sites established by the European Union under the Berne Convention and designated according to two directives. Natura 2000 sites have been designated specifically to protect core areas for a sub-set of species or habitat types listed in the Habitats and Birds Directives. They are deemed to be of European importance because they are endangered, vulnerable, rare, endemic or present outstanding examples of typical characteristics

26 UNESCO: Caves of Aggtelek Karst and Slovak Karst. **http://whc.unesco.org/en/list/725**
ANP: Világörökség. **https://anp.hu/vilagorokseg**

27 IUCN World Heritage Outlook: Caves of Aggtelek Karst and Slovak Karst
https://worldheritageoutlook.iucn.org/explore-sites/wdpaid/93292

28 Biosphere reserves in Europe & North America: **https://en.unesco.org/biosphere/eu-na**

of one or more of Europe's nine biogeographical regions.[29] Most of the programme area's nationally protected sites are also designated as Natura 2000 sites. For each and every Natura 2000 territory a series of aspects has been identified such as thethe designated species and habitats, information on conservation status and the level of the main threats, pressures and activities with impacts on the site.

Within the program area, there are nearly 30 'Special Protection Areas' (SPAs) larger than 100 km^2 and designated under the Birds Directive. The largest of these (grater than 1 000 km^2): Volovske vrchy (SK); Zemplén Mountains with the Szerencs Hills and the Hernád Valley (HU); Laborecka vrchovina (SK). There are 14 of the 'Site of Community Importance' (SCI) designated under the Habitat Directive, reaching 100 km^2, the largest exceeding 200 km^2: Munții Maramureșului (more than 1 000 km^2), Valea Izei și Dealul Solovan, Obcinele Bucovinei, Râul Tur (RO); Tatry, Bukovske vrchy (SK); Upper Tisza, Aggtelek karst and its periphery (HU).The **Emerald Network** is the practical extension of the Natura 2000 Network for non-EU countries based also on the Bern Convention. The two networks are fully compatible with each other and use the same methodology and information tools. As an ecological network, the Emerald Network is a system of coherent interconnected areas that are subject to management, monitoring and reporting measures.[30] Ukraine has more than 350 officially adopted Emerald sites, several of them are located inside the programme area. Several of the sites located within the programme area are considerably large (for example Dolynsko-Rozhniatynskyi 1 064 km^2; Carpathian Biosphere Reserve 576 km^2; Carpathian National Nature Park 500 km^2)[31]. Some sites lie along or touches upon the border, creating cross-border interconnections of ecological networks. Examples include the Natura 2000 (SPA) 'Upper Tisza' along the Hungarian-Ukrainian border and the 'Vynohradivska Tysa' belonging to the Emerald network; along the Slovak-Ukrainian border, Natura 2000 (SCI) 'Stinska' and the 'Uzhanskyi National Nature Park', also part of the Emerald network; Examples of the Romanian-Ukrainian border are the Natura 2000 (SCI) 'Munții Maramureșului' and the 'Marmaroski ta Chyvchyno-Hryniavski Hory' of the Emerald network.

Comparisons between different **nationally protected nature protection categories** are made possible by the so-called IUCN categories. The six categories were differentiated by their managment objectives andby the level of the protection.[32] The figure below shows the distribution of the different categories within the program area by country.

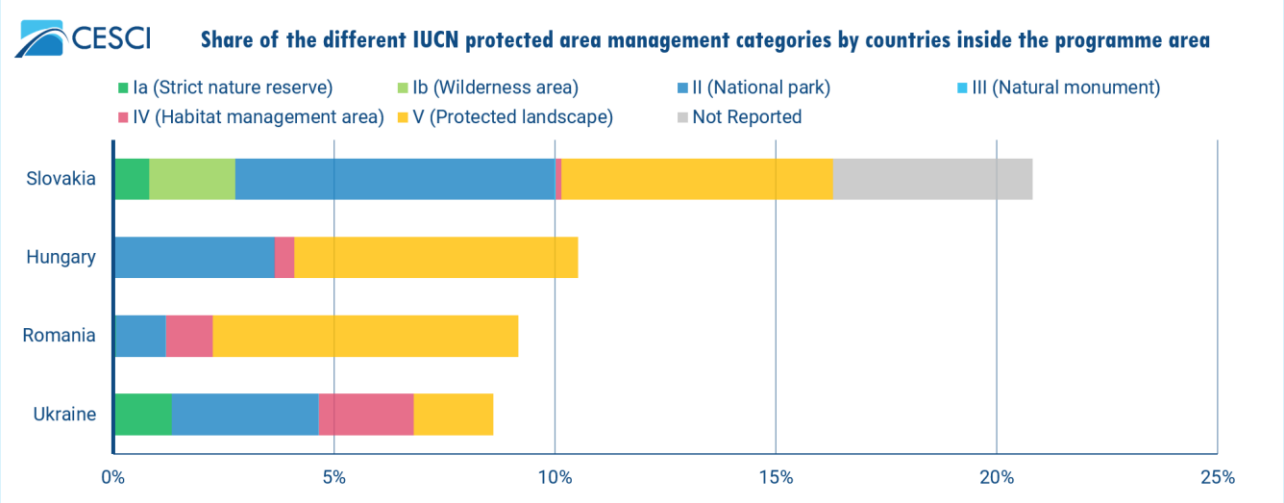
29 Frequently asked questions on Natura 2000: **https://ec.europa.eu/environment/nature/natura2000/faq_en.htm**

30 Emerald Network - General Viewer: **https://emerald.eea.europa.eu/**

31 List of the adopted Emerald Network: **https://rm.coe.int/updated-list-of-officially-adopted-emerald-sites-december-2019-/168098ef51**

32 Nigel Dudley ed. (2013): Guidelines for Applying Protected Area Management Categories. IUCN. **https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf**

Figure 13: Management categories of the protected areas



The highest category, 'Ia: Strict nature reserve', in Ukraine includes two areas with a total area of almost 460 km^2: 'Karpatskiy National' biosphere zapovednik (Zakarpatska Region), 'Gorgany Range' state nature reserve (Ivano-Frankivska Region). In Romania, the area classified as 'Ia' is just over 10 km^2, the 'Piatra Rea' scientific reserve (Maramureş County) and the 'Rezervația Lacul Iezer Din Călimani' nature reserve (Suceava County). In Slovakia, the number of areas in category 'Ia' exceeds 120 in the program area, but their total area is less than 130 km^2, while the total area of 15 areas in category 'Ib: Wilderness area' exceeds 300 km^2. The latter are all located in the 'Tatransky' National Park in the north-western part of the Prešovský Region. There are no 'Ia' or 'Ib' areas in the affected area of Hungary. The total size of the areas classified as 'II: National park' in the program area is almost 3 000 km^2.

Figure 14: National parks within the analysed area

Name of the National park	**Country**	**County**	**Affected area** (km^2)
Aggteleki	Hungary	Borsod-Abaúj-Zemplén County	201.74
Bükki	Hungary	Borsod-Abaúj-Zemplén County	278.37
Parcul Național Călimani	Romania	Suceava County	118.05
Parcul Național Munții Rodnei	Romania	Maramureş County	96.12
Nizke Tatry	Slovakia	Prešovský Region	86.63
Pieninsky	Slovakia	Prešovský Region	37.04
Slovensky kras	Slovakia	Košický Regio	343.70
Slovensky raj	Slovakia	Košický Region, Prešovský Region	188.97
Tatransky	Slovakia	Prešovský Region	479.70
Karpatskiy	Ukraine	Ivano-Frankivska Region	612.63
Synevyr	Ukraine	Zakarpatska Region	462.30
Vyzhnetskiy	Ukraine	Chernivetska Region	81.60
			3 566,00

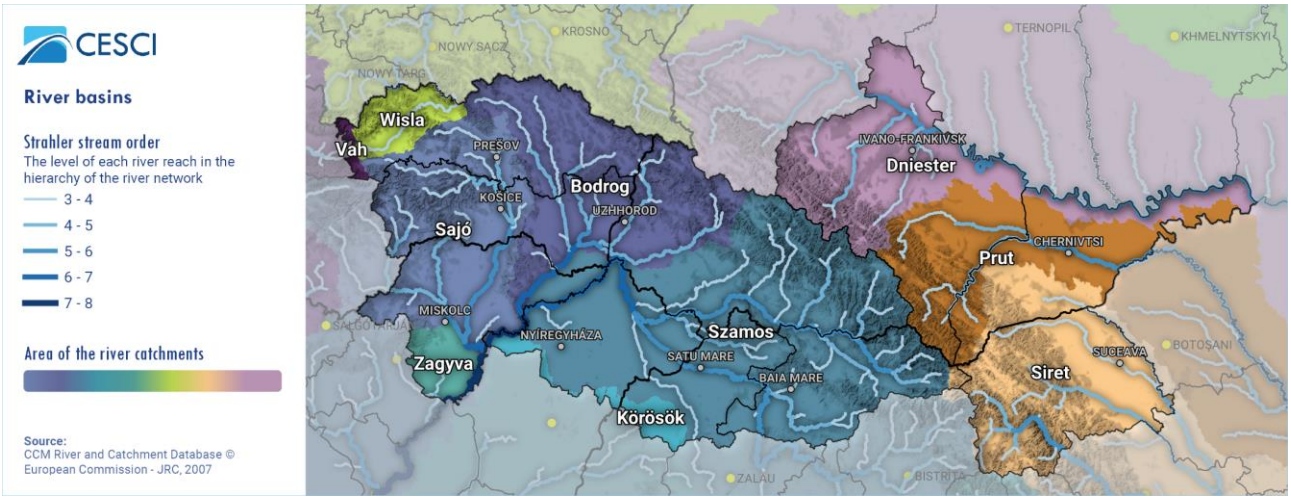
Due to their nature, the spatial extent of the natural values classified in the category 'III: Natural monument' is low (just over 10 km^2 in total), however, their number exceeds 130 within the program area. Compared to this, the area classified as 'IV: Habitat management area' is more significant (1 000 km^2), mainly in Ukraine (nearly 750 km^2). Out of the six categories concerned, most areas (more than 3 700 km^2) are within the 'V: Protected landscape' category. In the case of Hungary, Romania and Slovakia, more than 6% of their program area is under such protection. In the case of Ukraine, this rate is below 2%.

Furthermore, based on the **EU Water Framework Directive**, any area or groundwater designated by legislation for the protection of surface and / or groundwater or for the conservation of habitats and species directly dependent on water is considered to be protected. These include the protective profiles of drinking water withdrawals, respectively the protected areas, nutrient- and nitrate-sensitive areas, natural bathing areas, areas protected due to their natural values and surface waters designated to ensure the living conditions of fish. (More information on the hydrographic features of the area can be found in the next section.)

2.2.1.4 Water resources, river basins

One of the most significant common issues in the program area is water management. From this point of view, it is worth reviewing the **hydrographic system** of the area, which also shows a close connection with its other natural geographical features. The continental-level watershed and topography of the Carpathians have a significant impact on the development of river basins.

Figure 15: Water basins within the programme area



Out of the rivers in the program area, only the Wisla and its tributaries flow into the Baltic Sea, the other watercourses are received by the Black Sea. From the point of view of water management issues within the program area, it is important to emphasize that the three major river basins on the eastern side of the Carpathians, Prut, Siret and Dniester, leave the area on the eastern side of the program area. Watercourses (excluding the Vah) from the western side of the Carpathians are collected and discharged by the Tisza in the southwestern part of the region. The Vah, Tisza, Siret and Prut flow into tributaries of the Danube, while the Dniester flows directly into the Black Sea.

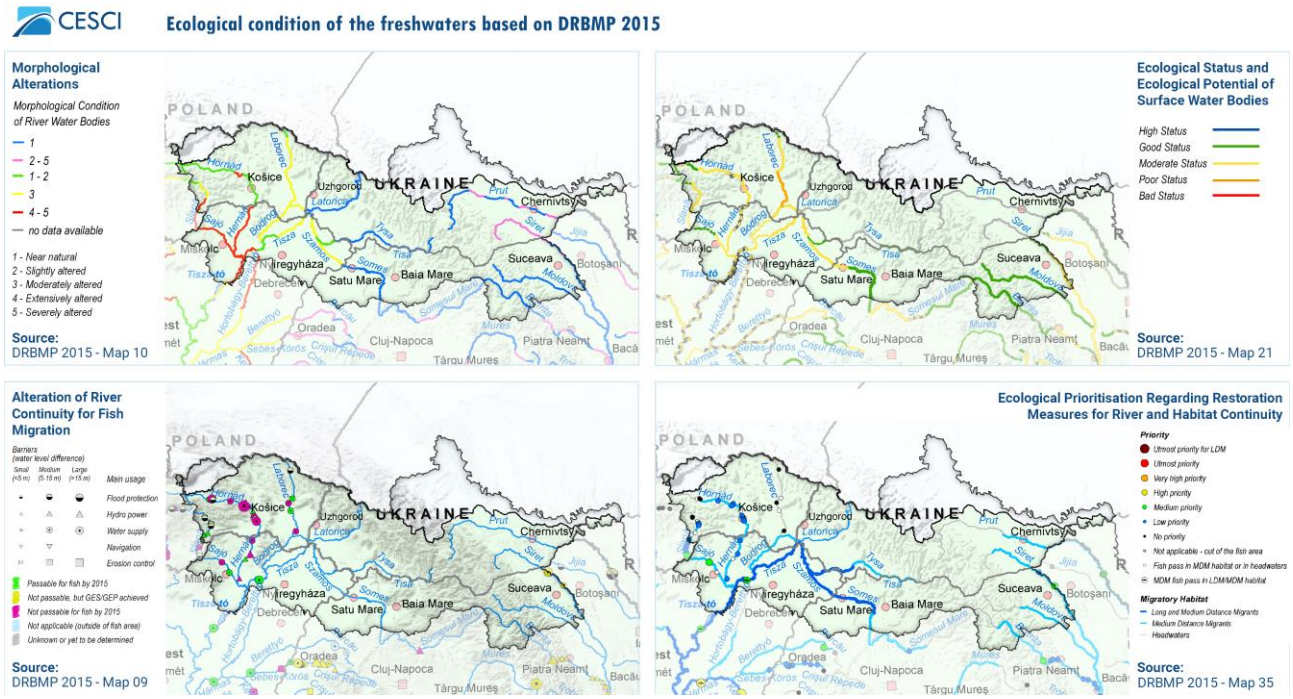
Rivers flow into the Black Sea from nearly 98% of the area. The largest river basin in the area, the Danube with a share of nearly 85%, is followed by the Dniester with a share of nearly 13%. Among the tributaries of the Danube, the Tisza is also the most significant in the program area (60.23%), followed by Siret (13.02%) and Prut (11.26%). There are more than 20 bigger rivers as tributaries of Tisza in the analysed cross-border area (Sajó, Hernád, Bodrog, Ondava, Latorica, Laborec, Uzh, Cirocha, Kraszna, Someș, Tur, Batar, Şugătag, Baia, Şaroş, Săpânţa, Valea Hotarului, Bicu, Sarasău, Valea Iepei, Iza, Vişeu). Among the tributaries of the Tisza, Bodrog (14.30%), Sajó (16.69%) and Szamos (29.71) are the most significant in the programme area.

Table 5: Water basins inside the programme area and their proportions

Basin (Level 4)		**Basin** (Level 3)		**Basin** (Level 2)		**Basin** (Level 1)	
Name	**Rate** (%)	**Name**	**Rate** (%)	**Name**	**Rate** (%)	**Name**	**Rate** (%)
Wisla	02.36	Wisla	2.36	Wisla	02.36	**Baltic Sea**	**02.36**
Vah	00.31	Vah	0.31	Danube	84.82	**Black Sea**	**97.64**
Bodrog	14.30	Tisza	60.23				
Körösök	01.61						
Sajó	16.69						
Szamos	29.71						
Zagyva	01.91						
Siret	13.02	Siret	13.02				
Prut	11.26	Prut	11.26				
Dniester	12.82	Dniester	12.82	Dniester	12.82		

The chemical status of the rivers in the Danube River Basin varies from river section to river section. Transnational intervention would be needed in the case of Tisza/Tisa and many of its transboundary tributaries (Someș, Körös).

Figure 16: Ecological condition of the freshwaters based on DRBMP 2015



The Danube River Basin Management Plan gives a comprehensive picture about the **ecological situation of the affected freshwaters**. The upper parts of the river bodies are mainly in near natural morphological condition. The Danube River Basin Management Plan gives a comprehensive picture about the ecological situation of the affected freshwaters. The upper parts of the river bodies are mainly in near natural morphological condition. However, the river segments in Slovakia and Hungary are from slightly to severely altered. The water bodies mainly have moderate ecological status, and only few of them own good ecological status. The main rivers from those analysed are the most important routes and starting points of fish migration for long and medium distance migratory fish species. The passableness of the water bodies significantly influences the fish migration and it shows a strict correlation with the morphological alteration. The planned measures until 2021 shows those places where the freshwater ecosystem needs joint efforts to enhance its original ecological statues.

In connection with water management and flood management issues, see the relevant sections of the chapter *2.3.1.3 Hydrological and climate-related disasters*.

Transboundary coordination in the field of water supply management in the frames of a river basin management system is required in relation to many water bodies, including **groundwater**. Within the programme area many groundwater bodies exist with a transboundary relevance. There are significant similarities and differences according to the aquifer type, the utilisation and the overlying strata. Based on the available data, the identified groundwater bodies of transboundary importance are situated mainly in the western part of the programme area. The protection and usage of these water bodies are relevant since many of them act as major source for e.g. drinking or agriculture. Nature protection, the decrease of pollution is extremely relevant in relation to these water bodies.

Regarding the available data about the cross-border groundwater bodies, it has to be also pointed that most of the international database (e.g. ICPDR)[33] based on national data does not include all of the existing groundwater bodies in the region, which is probably not for hydrogeographical but for administrative reasons. It would be useful to pursue cross-border cooperation in this area as well. Due to the vulnerability of the groundwater porous water bodies that provide the drinking water supply, it is particularly important to explore the status of the groundwater body intersected by the border and the sources of pollutants.

2.2.1.5 Joint preparation for climate change

Climate change is among the biggest threats for humanity, seriously affecting human health, the natural environment, and security. Global temperature is now around 1°C higher compared to the preindustrial era and if adequate mitigation strategies are not introduced, global warming could reach 3°C or more by the end of this century.[34] These changes will affect also the programme area. In this subchapter, the potential climate change scenarios for the programme area will be briefly presented based on the results of the NAGis project[35]. The overview highlights only the changes which are most relevant for the programme. The climate change has an enormous high impact not only to the environmental conditions of the programme area but also to the frequency of natural disasters. See more information about these risks and vulnerability in the chapter *2.3.1.1 Dimensions of the risk management*.

Based on the available model results, the annual **average temperature** in the Carpathian Basin is expected to increase by 1-2 °C by 2050 and by 2-3 °C by 2100, even under the more favourable scenarios (RCP4.5). The model results show an increased and continuous warming than the annual average in summer, while in winter most of them show a more moderate warming

[33] ICPDR = International Commission for the Protection of the Danube River (ICPDR)

[34] Feyen L., Ciscar J.C., Gosling S., Ibarreta D., Soria A. (editors) (2020): Climate change impacts and adaptation in Europe. JRC PESETA IV final report.: **https://ec.europa.eu/jrc/sites/jrcsh/files/pesetaiv_summary_final_report.pdf**

[35] The National Adaptation Geo-information System (NAGiS) is a multipurpose geo-information system that can facilitate the policy-making, strategy-building and decision-making process related to the impact assessment of climate change and founding necessary adaptation measures in Hungary and in its broader region. The climate change scenarios for the Carpathian-basin region consider projections under a moderate mitigation (RCP4.5) and high emissions (RCP8.5) pathway in order to evaluate impacts both for low and high levels of global warming. The climate models cover the periods 2021-2050 and 2071-2100. More information: **https://nater.mbfsz.gov.hu/**

Figure 17: Different climate change scenarios based on prognosed mean temperature rates

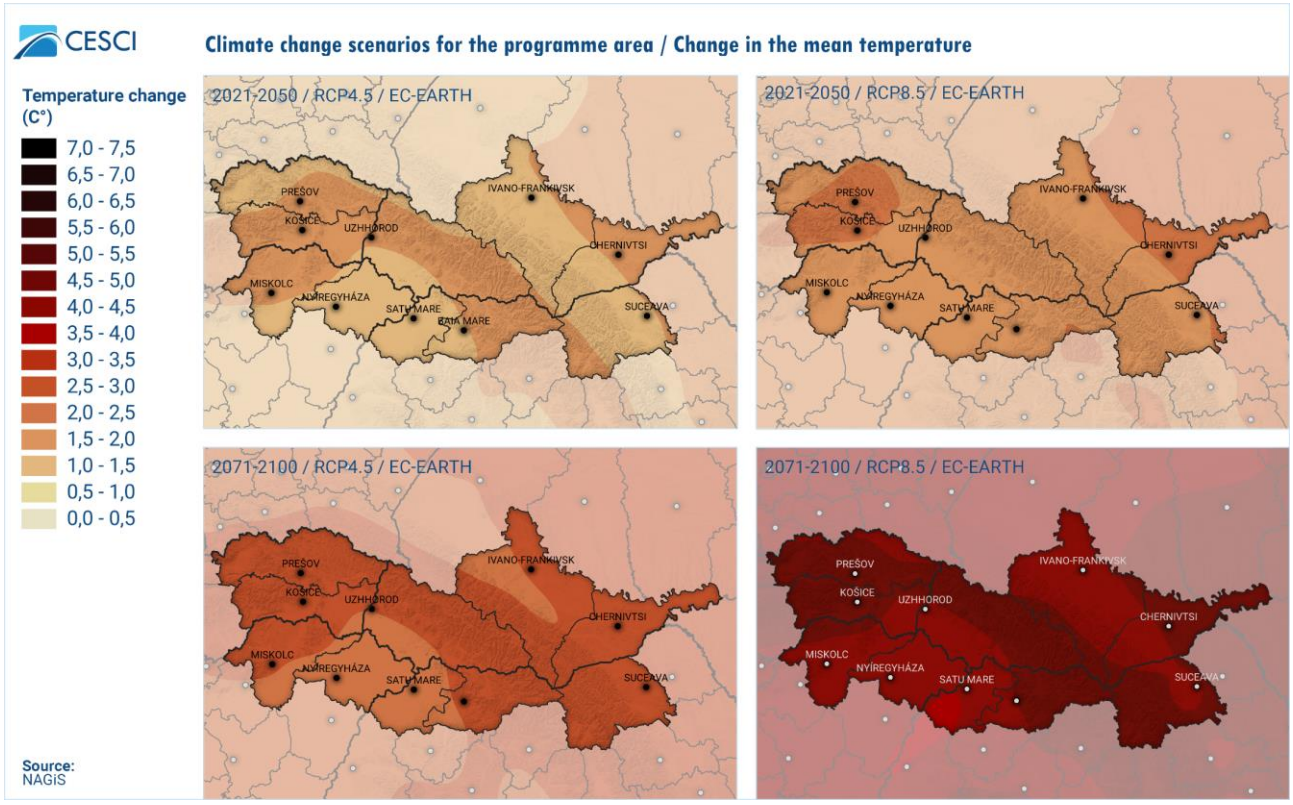
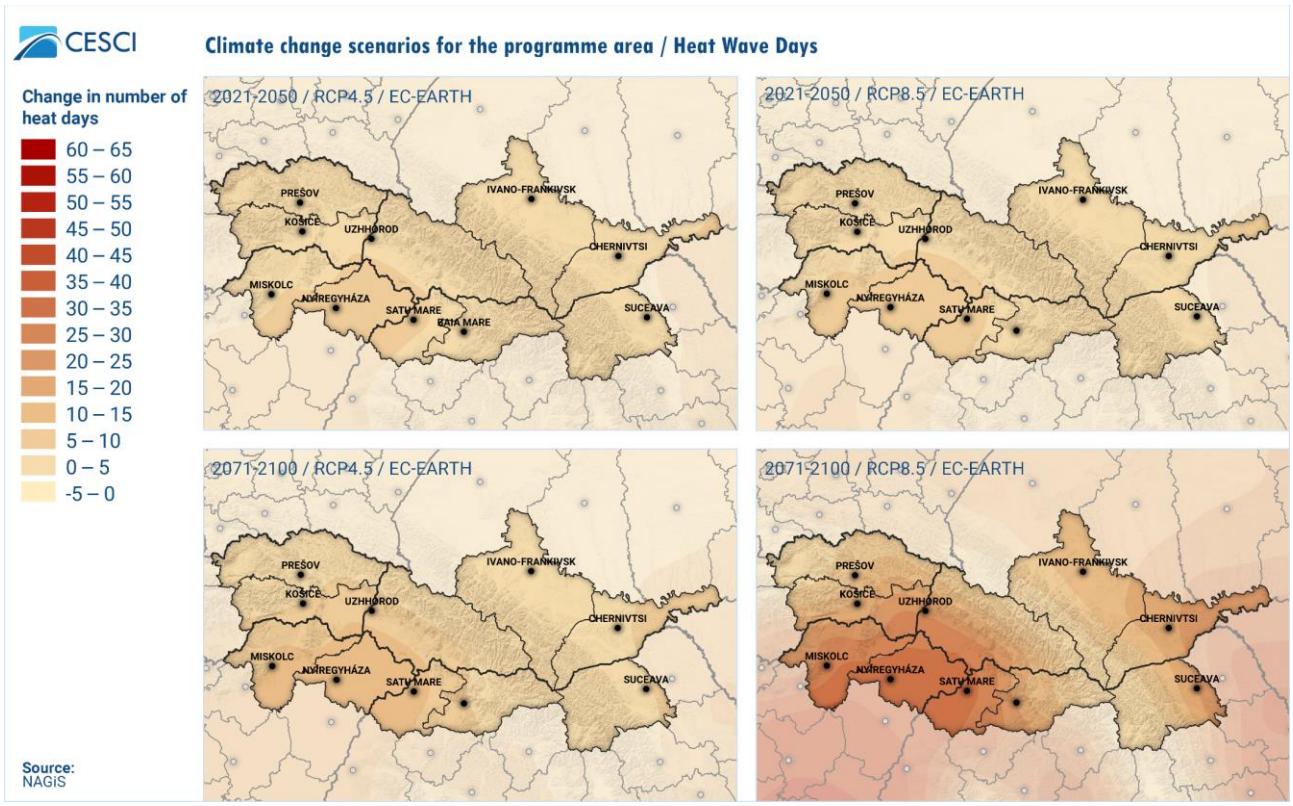
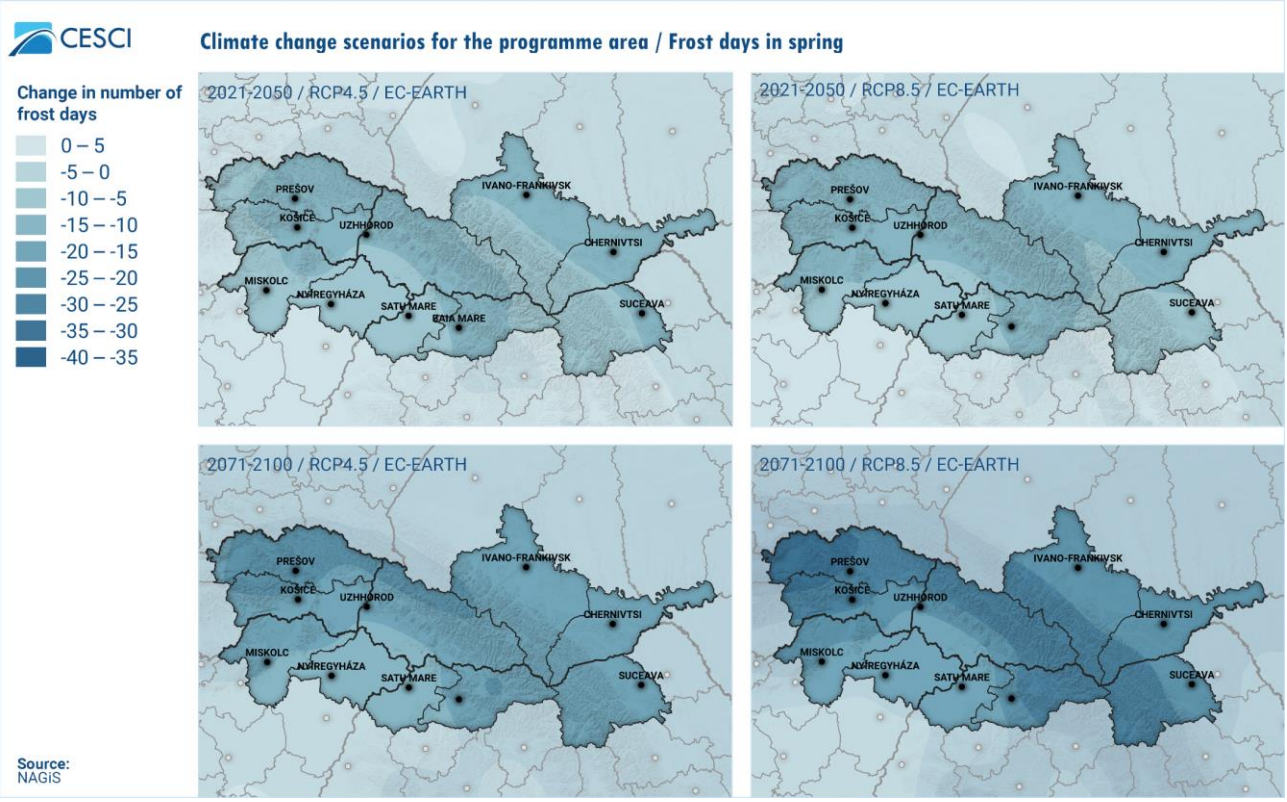


Figure 18: Different climate change scenarios based on extreme temperature events / Heat Wave Days



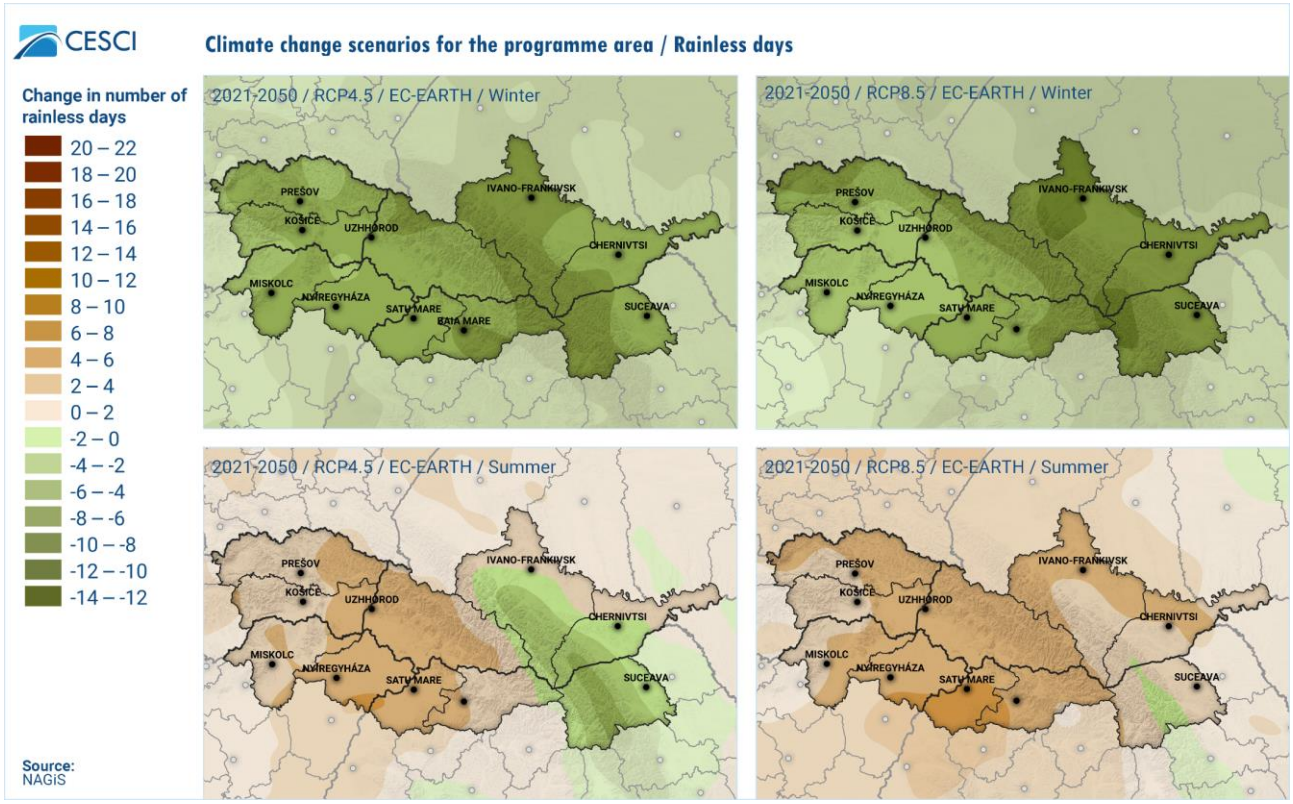
Extremes related to temperature are clearly and significantly moving in the direction of warming: summer days and heatwave days will increase, the number of frosty days will decrease. An increase in the number of heat-induced days, ie. days with an average temperature above 25°C, is expected, mainly in the Pannonia and Continental regions. According to the moderate mitigation (RCP4.5) model, the number of heat days in these areas may increase by 5-10 days by 2050 and by 10-15 days by 2100. According to the high emission (RCP8.5) model, by 2100 in the southwestern parts of the program area this value could be up to 30-35 days. At the same time, according to the moderate mitigation (RCP4.5) model, the number of spring frosty days will decrease significantly in the short term, by 10-15 days. According to the most pessimistic scenario (RCP8.5), by 2100 the number of spring frosty days in the Carpathians could decrease by as much as 25-30 days.

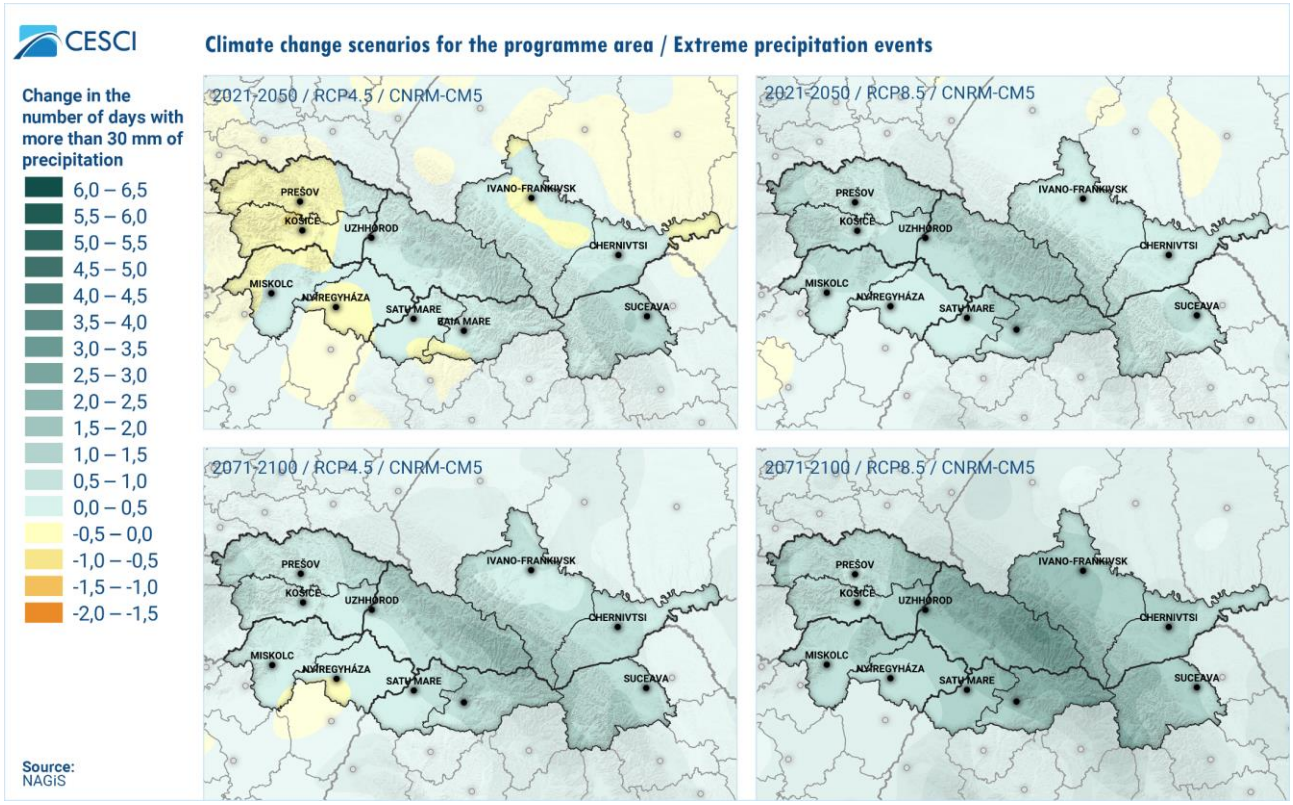
Figure 19: Different climate change scenarios based on extreme temperature events / Frost days in spring



The direction and extent of the expected change in **precipitation** in the future is much less clear than that of temperature. Due to the spatial and temporal variability of precipitation, the model results show a particularly high degree of uncertainty. According to most model simulations, slightly less precipitation can be expected in summer. According to the moderate mitigation (RCP4.5) model, by 2050 there will be 6-4 days more rainy days in most of the program area in winter and 6-8 days more in the Carpathians. In contrast, in summer rainy days are expected to decrease by 2-4 days, except in the Carpathian Mountains. At the same time, however, the number of suddenly occurring precipitation events exceeding 30 mm/day will stagnate according to more favourable models, but will increase in most of the program area. Such heavy rains can cause flash floods under certain conditions.

Figure 20: Different climate change scenarios based on extreme precipitation events





The observed changes in climate are already having wide-ranging impacts on ecosystems, economic sectors and human health and well-being in Europe. Climate change is affecting all regions in Europe, but the impacts are not the same. The indicator-based report of the EEA[36] summarized the key impacts of the climate change for the affected biogeographical regions of the programme area in this way:

Alpine region

- Temperature rise larger than European average
- Fewer and smaller glaciers
- Upward shift of plant and animal species
- High risk of species extinctions
- Increasing risk of forest pests
- Higher risk of rock falls and landslides
- Changes in hydropower potential
- Decrease in ski tourism

Pannonian and Continental regions

- Increase in heat extremes
- Decrease in summer precipitation
- Increasing risk of river floods
- Increasing risk of forest fires
- Decrease in economic value of forests
- More energy needed for cooling

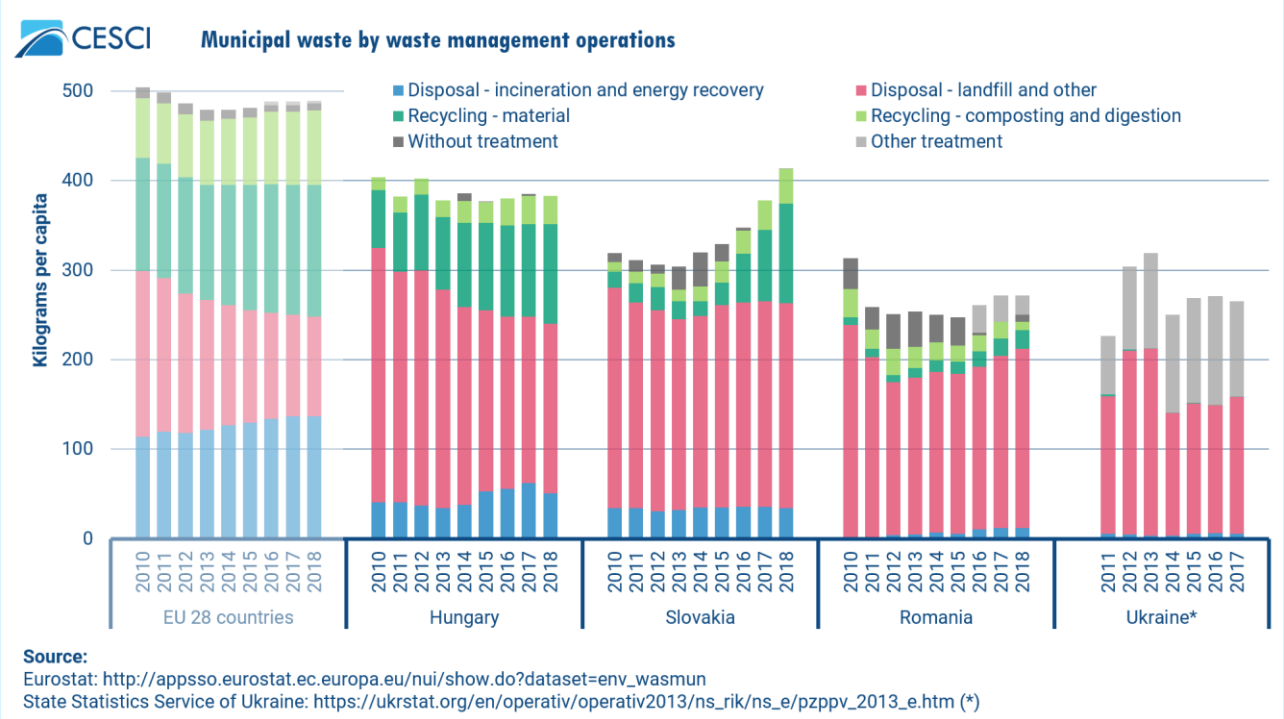
2.2.1.6 Environmental pressures

One of the main environmental issue in the program area is the elimination of the negative environmental impacts that result from the different environmental infrastructure of the affected counties and in many cases also have a cross-border impact. Examples of such areas are waste management, wastewater treatment, and air pollution. Although environmental quality issues have been part of not only national, mainstream programmes but also cross-border cooperation programmes for several cycles, significant work can still be identified in this area. **Waste management** – or in some places its lack of function – creates serious environmental tensions in the border area. The figure below clearly shows that in all four countries, far less municipal waste is generated than the EU-28 average, which is almost completely treated in the EU Member States. It is noteworthy that while the amount of waste per capita is basically stagnant in Hungary and Romania, it has gradually increased in Slovakia in recent years. It is clear that the recycling rate is much higher in the EU-28, while it is almost non-existent in Romania and is basically not perceivable in Ukraine. Another observation is that the amount of waste destined to landfill is declining dynamically almost only in Hungary, it has increased in Romania, and it has stagnated in Slovakia during the years under review.[37]

[36] European Environment Agency (2017): Climate change, impacts and vulnerability in Europe 2016. An indicator-based report. **https://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016/at_download/file**

[37] Eurostat: Municipal waste by waste management operations. **http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wasmun**

Figure 21: Municipal waste management at the analysed area



Due to the different methodologies, it is not possible to compare regional data, only the available county data can be presented.

Compared to Eurostat data, the amount of household waste calculated according to a different methodology was on average 227 Kg/Capita per year in Borsod-Abaúj-Zemplén county between 2008 and 2018, while in Szabolcs-Szatmár-Bereg county this value was 205 Kg/Capita. The values of both counties are lower than the national average (236 Kg/Capita) and show a fundamentally declining trend. The proportion of municipal waste utilized in its material was 24% in Borsod-Abaúj-Zemplén county, 15% in Szabolcs-Szatmár-Bereg county, and the national average was 24% in 2018 (however, these values do not include the utilization of waste for energy purposes, which was in Borsod 17% in 2018).[38]

Within Slovakia, Košický Region and Prešovský Region have the lowest municipal waste per capita value (330 Kg/Capita in 2018), but these values are gradually increasing. According to the statistics, the recycling rate of municipal waste exceeded 35% in Košický Region and 39% in Prešovský Region in 2019, compared to the 40% in Slovakia.[39] Although significant steps still need to be taken in the field of waste management in Hungary and Slovakia too, at the same time the direction of developments is typically to increase efficiency, move towards zero landfill, and develop waste recycling.

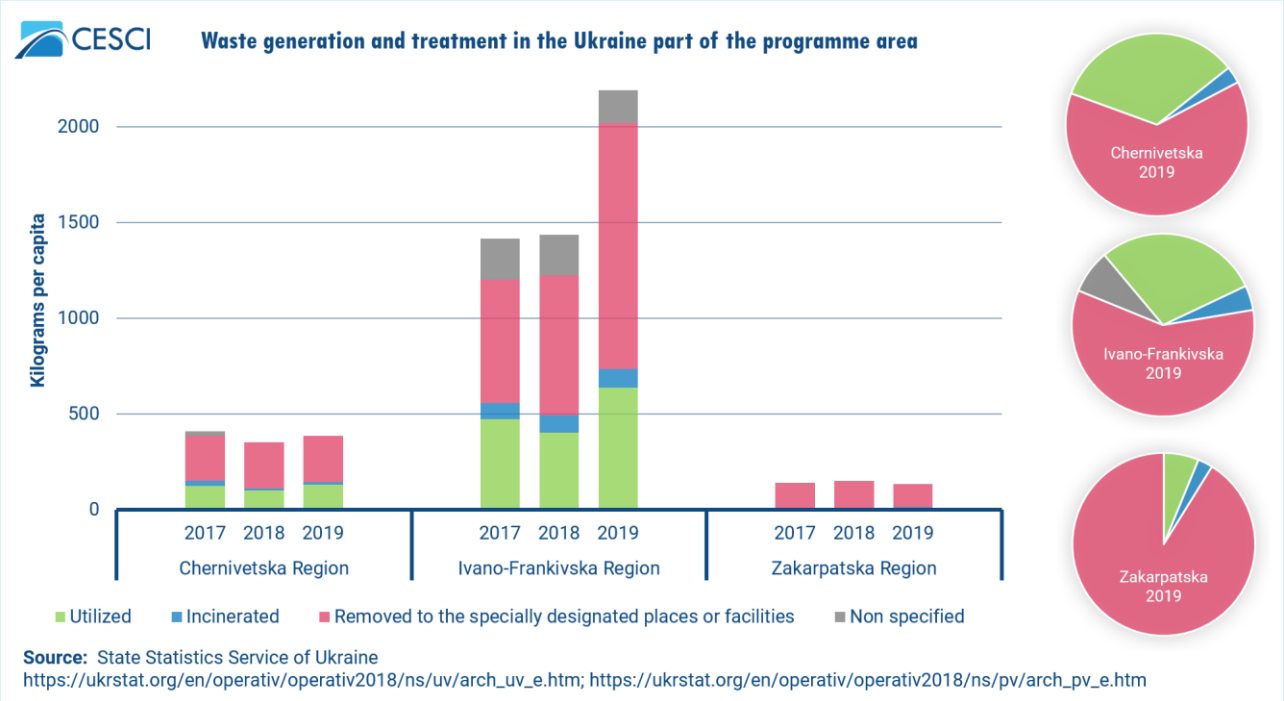
[38] Generation of municipal waste transported in the framework of public services in Hungary (2006–). **https://www.ksh.hu/docs/eng/xstadat/xstadat_annual/i_ur009b.html**

[39] Relative indicators from the area of treatment with municipal waste [zp3002rr]. **http://datacube.statistics.sk/#!/view/en/VBD_SK_WIN/zp3002rr/v_zp3002rr_00_00_00_en**
More information: Taušová, M. et al. (2020): Analysis of Municipal Waste Development and Management in Self-Governing Regions of Slovakia. Sustainability / 12 / 5818. **https://www.mdpi.com/2071-1050/12/14/5818/htm**

In Ukraine there are appalling conditions in the field of waste management. Although thousands of tons of solid waste are generated in every county every year, most of the landfills and repositories in each county are now full. The main concern is the depletion of the capacity of illegal landfills as well as existing landfills. The problem is exacerbated by the fact that in the absence of separate waste collection, no actual processing and recycling takes place.

According to statistical data, in terms of waste per capita, the Zakarpatska Region has a remarkably low per capita waste generation, while the Ivano-Frankivska Region has a remarkably high value. Although the statistics show a very high utilization rate, with the exception of the Zakarpatska Region, the '2030 National Waste Management Strategy' also acknowledges that the reliability of Ukrainian waste management statistical information is not complete. He also notes that about 94% of household waste is landfilled, which is a significant problem simply because experts estimate that more than 99% of existing landfills do not meet European requirements.[40] The main problem in waste management is, on the one hand, transportation – especially in villages that are difficult to access – on the other hand, irregularly operating landfills. From now on, it is a fundamental difficulty that the provision of public services is the responsibility of local governments, which cannot develop and operate in all areas with low waste management fees.[41]

Figure 22: Municipal waste management at the Ukrainian part of the analysed area



Source: State Statistics Service of Ukraine
https://ukrstat.org/en/operativ/operativ2018/ns/uv/arch_uv_e.htm; https://ukrstat.org/en/operativ/operativ2018/ns/pv/arch_pv_e.htm

The cross-border aspect of waste management is provided by the illegal dumping of waste into the floodplain of the Tisza, which it carries on to Hungary when the river floods. Such waste pollution has been regular in the rivers of the Upper Tisza region since the 2000s. These pollutants cause a

40 2030 National Waste Management Strategy Ukraine. **https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80#Text**

41 III. Round table and brainstorming for a clean Tisza (2018) **https://petkupa.hu/hu_HU/dokumentumok/III-KEREKASZTAL-ES-OTLETBORZE-A-TISZTA-TISZAERT.pdf**

significant environmental burden along the river. Although several remediation programs have been launched in recent years, the real solution would be complex prevention (professional waste management; elimination of existing illegal landfills; reduction of the use of plastics (for example through the development of a drinking water network, recovery). In this respect, the effectiveness of the current HUSKROUA ENI Programme ZEROWASTE project (HUSKROUA / 1701 / LIP / 006) is of particular interest. Another important environmental issue for countries along the Tisza upstream is that of **wastewater treatment**, which is also unresolved in many Ukrainian settlements. Consequently, there is a need for infrastructure development and pre-treatment, wastewater treatment plants. Sewage treatment and drainage is an acute problem throughout Ukraine, its infrastructure is underdeveloped and extremely outdated. In 2018, 80.4% of Ukrainian households were connected to the plumbing network. In Transcarpathia, these indicators were slightly above the national average, as 89% of households had drainage, while in the other two counties concerned they were slightly below the Ukrainian average: 75.3% in Ivano-Frankivsk County and 74.7% in Chernivtsi County.[42] Dividing the development of the canal network into settlement types shows that large cities have approximately 98% development while 87% of the urban settlements and only 53% of the villages have a sewerage system. However, this sewer network is largely outdated and in urgent need of renovation. Due to the vulnerability of groundwater bodies providing drinking water supplies, it is particularly important to identify the sources of pollution and to eliminate them.

Air pollution[43] has a significant impact not only on the health of the population, but also on the ecosystem. Air pollution is a major cause of premature death and disease and is the single largest environmental health risk in Europe. Europe's most serious pollutants, in terms of harm to human health, are PM, NO2 and ground-level O3. Estimates of the health impacts attributable to exposure to air pollution indicate that PM2.5 concentrations in 2016 were responsible for about 374 000 premature deaths originating from long-term exposure in the EU-28. The estimated impacts of exposure to NO2 and O3 concentrations on the population in the EU-28 around 68 000 and 14 000 premature deaths per year, respectively. Air pollution also damages vegetation and ecosystems. It leads to several serious environmental impact, which directly affect vegetation and fauna, as well as the quality of water and soil and the ecosystem services they support. The most harmful air pollutants in terms of damage to ecosystems are O3, ammonia and nitrogen oxides (NOX).

Different air quality maps of the European Environment Agency (EEA) and modelled data from the Copernicus Atmospheric Monitoring CAMS Services (CAMS) provide an overview about the main air quality indicators of the analysed area. However, it has to been noted, that the interpolated maps based on observations can be less accurate because of the relatively low number of the validated air quality stations in this region.

The following presentation of the air quality indicators is based on the document 'European air quality in 2019[44]On the figures the seasonal averages can be observed with the following logic: upper

42 Social and Demographic Characteristics of Households of Ukraine. **http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_sdhdu2018pdf.pdf**

43 European Environment Agency (2019): Air quality in Europe 2019 **https://www.eea.europa.eu/publications/air-quality-in-europe-2019**

44 The presentation of the air quality indicators is based on the following document: Copernicus Atmosphere Monitoring Service (2020): European air quality in 2019. Interim Annual Assessment Report for 2019. **https://policy.atmosphere.copernicus.eu/reports/CAMS71_IAR_2019_final.pdf**

left pane is winter; upper right panel is spring; lower left panel is summer and lower right panel is autumn. Nitrogen oxides (NOx) are emitted during fuel combustion (e.g. from industrial facilities and the road transport sector). As can be seen, the nitrogen dioxide level did not reach higher concentration at any season. The average concentrations of the ozone show a strong seasonal determination. The concentrations in spring and summer are enormously high in the whole analysed area. The particulate matter (PM) is emitted from many anthropogenic sources, including both combustion and non-combustion sources. Natural emissions of PM also occur. As it can be observed on the last figure, the PM2.5 concentrations have higher values all around Central-Europe. The values are increasing mainly in winter, and most of the pollution comes from households. In this sense, the low air quality shows a close correlation with the harmful heating methods, but also some bad agricultural practices can play a negative role in this case (e.g. burning agricultural organic waste).

- Based on the Orientations Paper for the next programme, potential joint actions can be, for example, the following ones:Share best practice in monitoring and modelling.
- Actions to improve monitoring and modelling.
- Work on cross border warning mechanisms for pollution peaks.
- Share best practice for selecting and implementing air quality measures and developing Air Quality Plans.

Figure 23: Seasonal averages of background NO2 (nitrogen dioxide) in 2019. Unit: [µg.m-3].

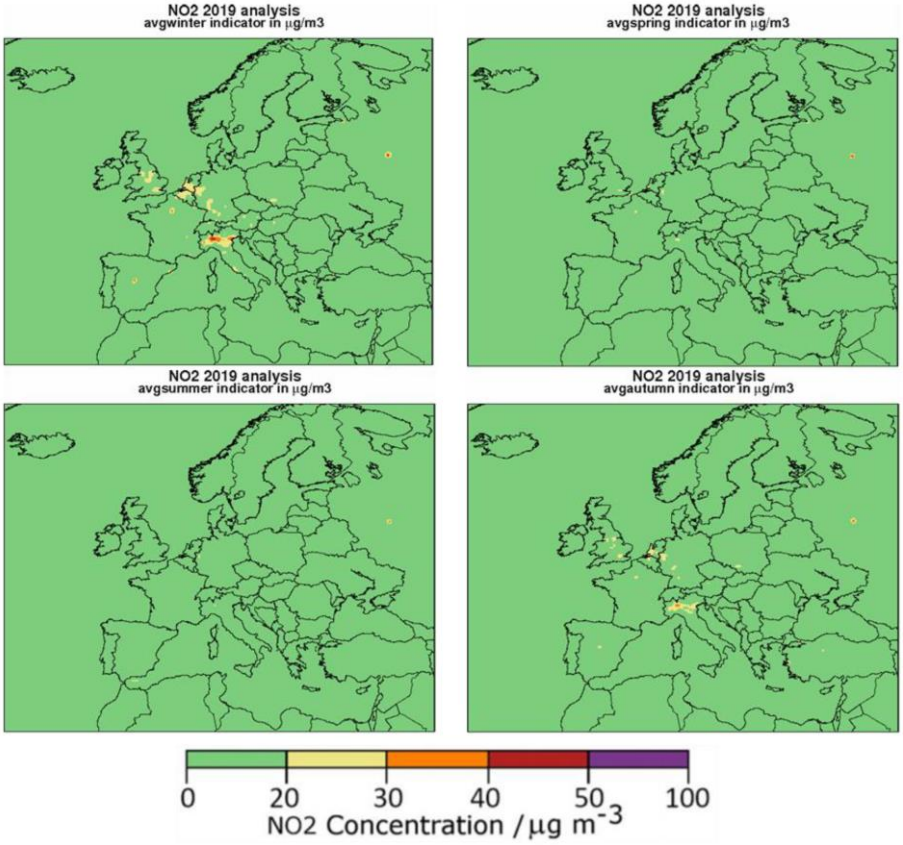


Figure 24: Ozone seasonal average concentrations for 2019. Units: [µg.m-3]

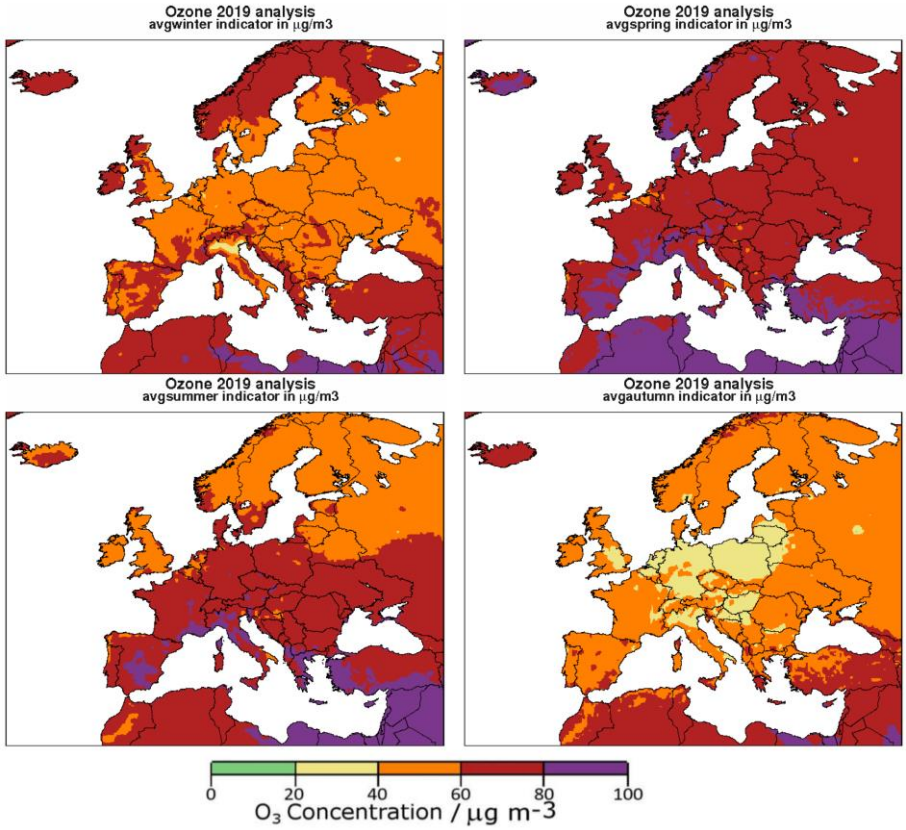
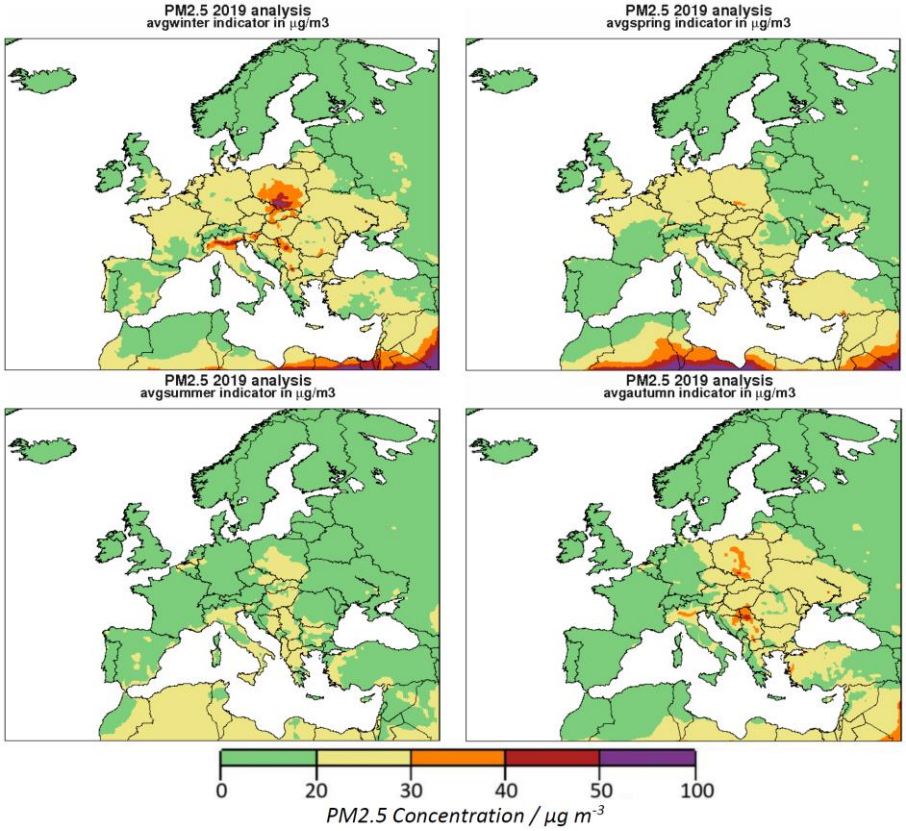


Figure 25: Seasonal averages of background PM2.5 (particulate matter with a diameter of 2.5 µm or less) in 2019



2.2.1.7 Sustainability

The issue of environmental sustainability is not only globally topical, but is also of particular regional importance to the programme area. Hungary and Slovakia have already started to meet the various sustainability requirements of the EU, which Romania joined shortly after. However, significant efforts are still needed in all three Member States in this area. Ukraine has also begun its **European integration**, on 1st September 2017, the EU Ukraine Association Agreement entries fully into force after a long period of ratification.[45] The Agreement has a separate chapter for the Environment issues, where also one of the main cooperation potential within the programme area were stated: 'The Parties shall develop and strengthen their cooperation on environmental issues, thereby contributing to the long-term objective of sustainable development and green economy.' In this sub-chapter some aspects of sustainable development will be analysed, mainly on country level.

Comparing the **Ecological Footprint**[46] of the affected countries, we can see that the higher footprint value is typical in the countries with higher incomes and higher HDI: in 2016, Slovakia had the highest footprint among the affected countries (4.21), followed by Hungary (3.61), then Romania (3.09) and Ukraine (2.91). Out of the 187 countries surveyed, the countries from the programme area are located in the second quarter (ranking positions: SK: 54; HU: 69; RO: 81; UA: 87). Compared to the EU-28, the countries are among the countries with lower footprints. It is an unfortunate fact, however, that all four countries have a larger footprint than their biocapacity. When it comes to the components of the ecological footprint, it has to be concluded that more than half of the footprint derives from carbon in each country. Carbon has a higher share in the footprint in Slovakia and Hungary. Besides carbon the countries have a lot to do in decreasing cropland as well as forest footprint. More eco-friendly agriculture and forestry would be well advised.

The data highlights two important factors, among others: on the one hand, improving resource efficiency in all four countries would be important; on the other hand, less developed countries would have the opportunity to transfer knowledge in order to avoid deadlocks in their development that result in higher footprints in parallel with development (for example use of plastics).

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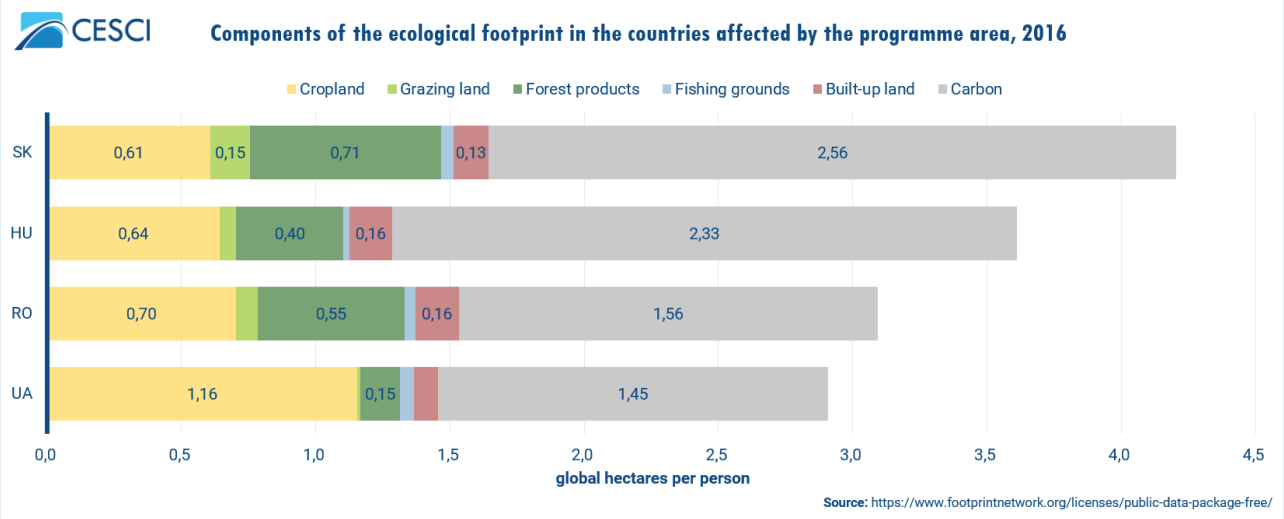
45 Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part. **http://publications.europa.eu/resource/cellar/4589a50c-e6e3-11e3-8cd4-01aa75ed71a1.0006.03/DOC_1**

46 Ecological Footprint generally refers to the Ecological Footprint of consumption. It is a measure of how much area of biologically productive land and water a country requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. The Ecological Footprint is usually measured in global hectares. [Global Footprint Network, D. Lin et al. (2019): Working Guidebook to the National Footprint and Biocapacity Accounts . **https://www.footprintnetwork.org/content/uploads/2019/05/National_Footprint_Accounts_Guidebook_2019.pdf**]

Figure 26: Ecological footprint components of the analysed territory



A prominent issue in terms of resource efficiency is the extent and nature of energy consumption. Based on Eurostat data, it can be seen that since 2015, Slovakia and Hungary, as well as Romania and Ukraine, have been following almost the same trajectory in terms of per capita energy consumption. In Romania, per capita consumption stagnated during the period under review, decreased significantly in the case of Ukraine (but not necessarily for resource management reasons), while increased in Hungary and Slovakia after a temporary decrease.

Within **energy consumption**, all four countries are dominated by various fossil fuels, the total value of which does not exceed 70% in the case of Hungary and Slovakia alone. The share of Nuclear heat is over 20% in Ukraine and Slovakia, 15% in Hungary and below 10% in Romania. According to statistics, the utilization of renewable energy sources is close to 18% in Romania, around 10% in Hungary and Slovakia, and below 5% in Ukraine.

Figure 27: Changes in the energy consumption

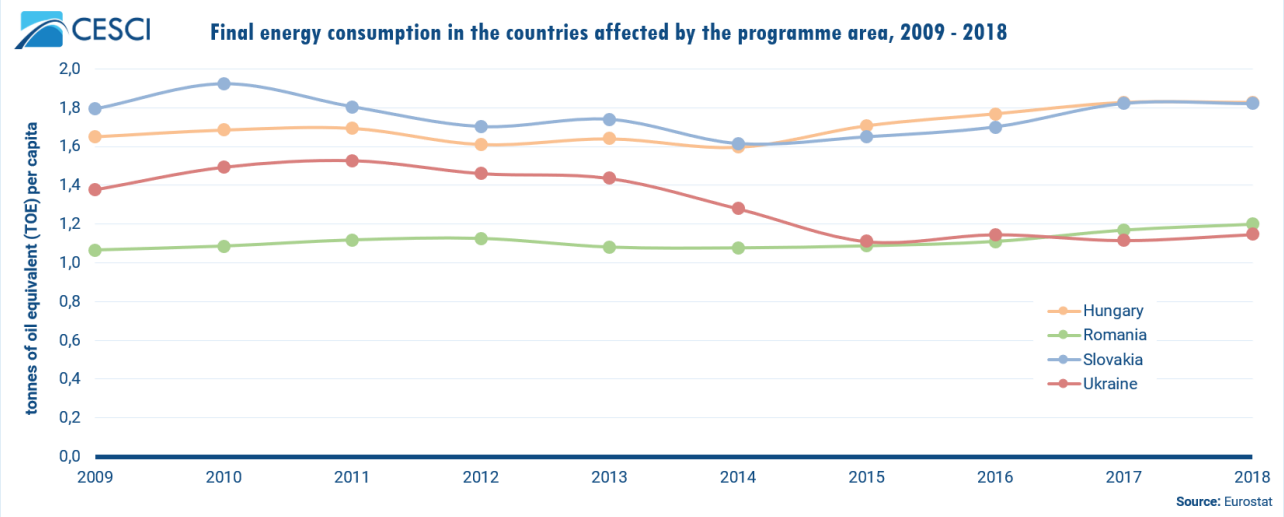


Figure 28: Energy consumption by sources of energy

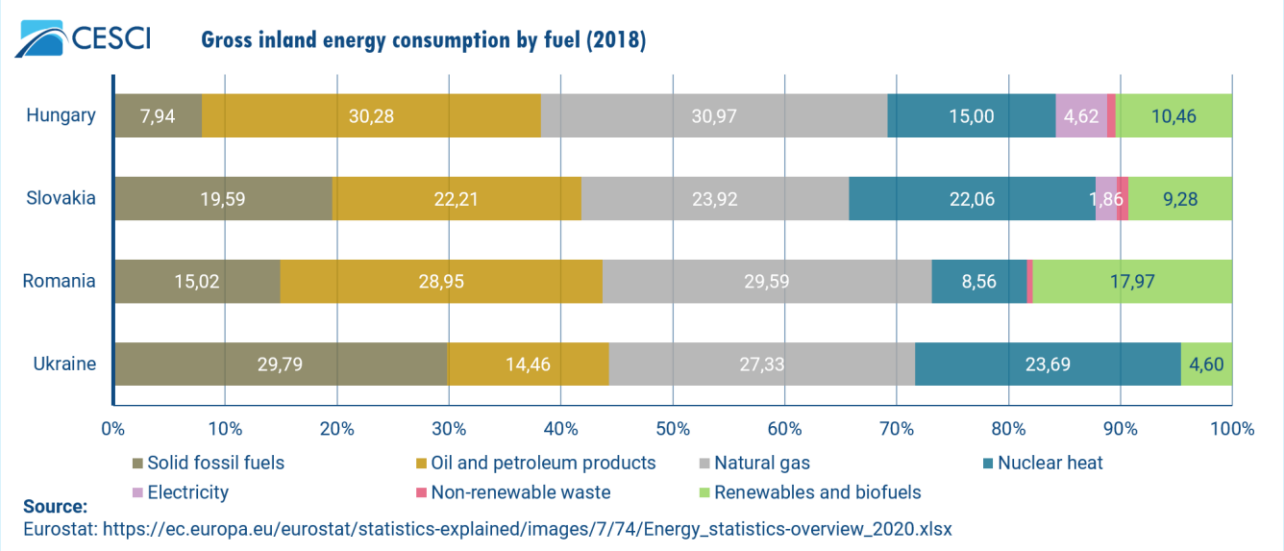
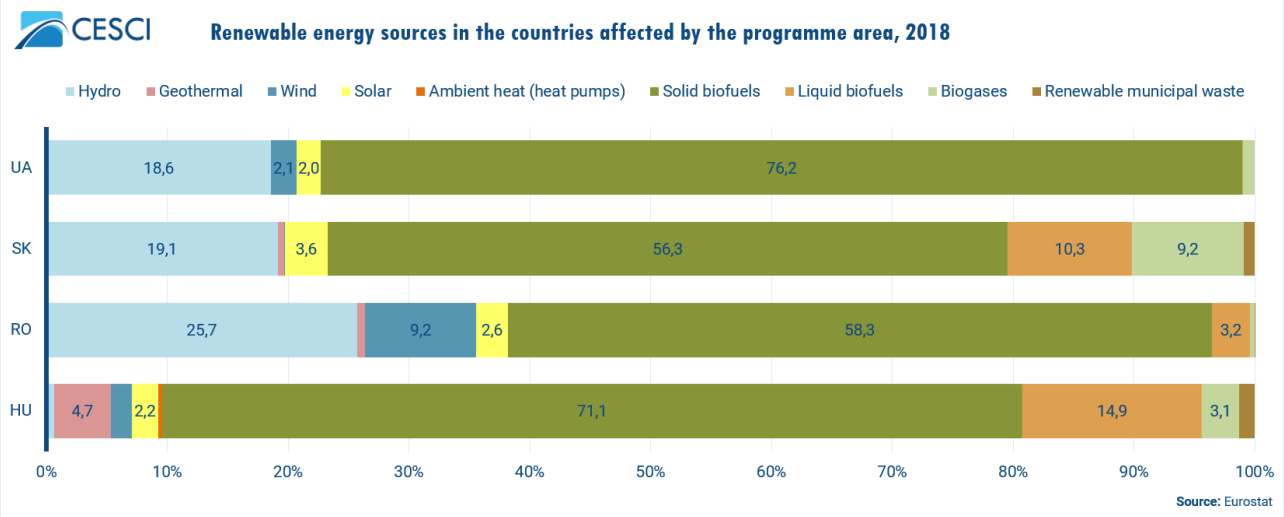
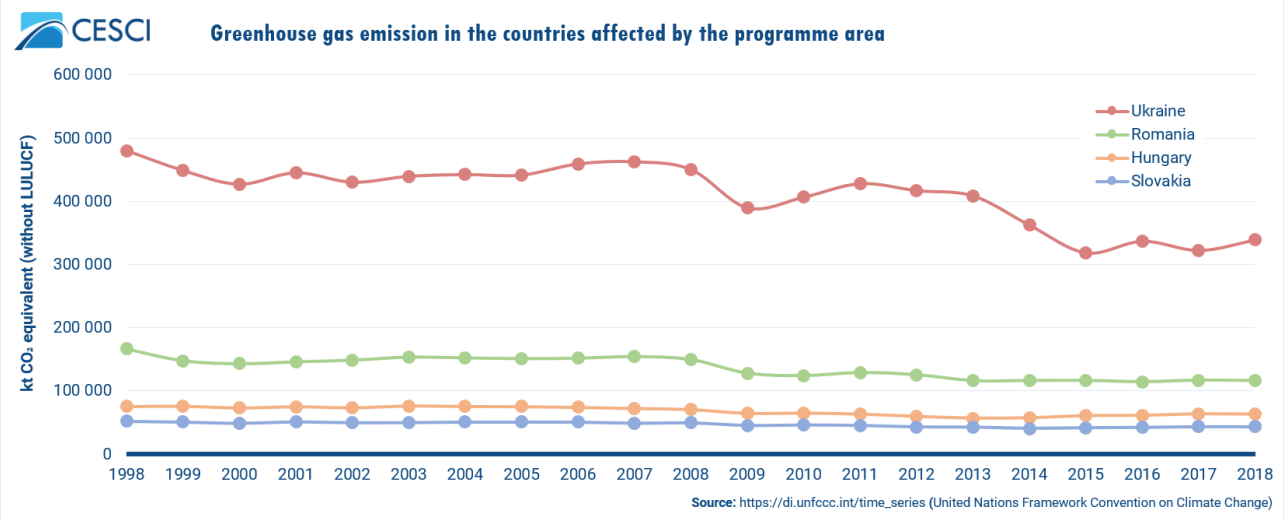


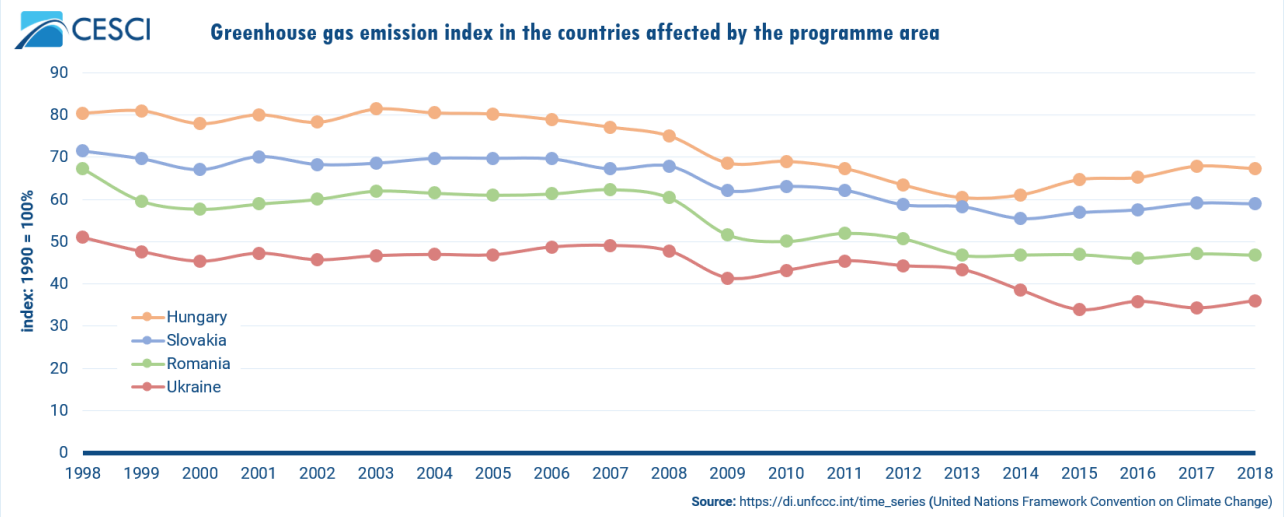
Figure 29: Renewable energy sources



Renewable energy sources are dominated by different biofuels within countries, but hydropower is also significant. In addition to these, the utilization of geothermal energy sources is even more significant in Hungary, and wind energy in Romania. The share of solar energy in all four countries is below 4%. It has to be highlighted that the analysed geographical area is worth further investigation stemming from its geothermal attributes. In order to reach thermal water layers and to be able to sustainably exploit them, a cross-border coordination is essential which is unimaginable without the availability of a common surveying and analysing system based on statistical information and research. Examining **greenhouse gas** data is interesting from two perspectives: on the one hand, they give an idea of the emission and resource efficiency characteristics of a given country, and on the other hand, it should not be forgotten that greenhouse gas emissions are the primary cause of climate change. Based on the statistical data the level of emission has not significantly decreased in the last nearly one decade except for Ukraine. The efficient technologies and the use of alternative energy sources could be further supported in regional economies.

Figure 30: Changes in greenhouse gas emission

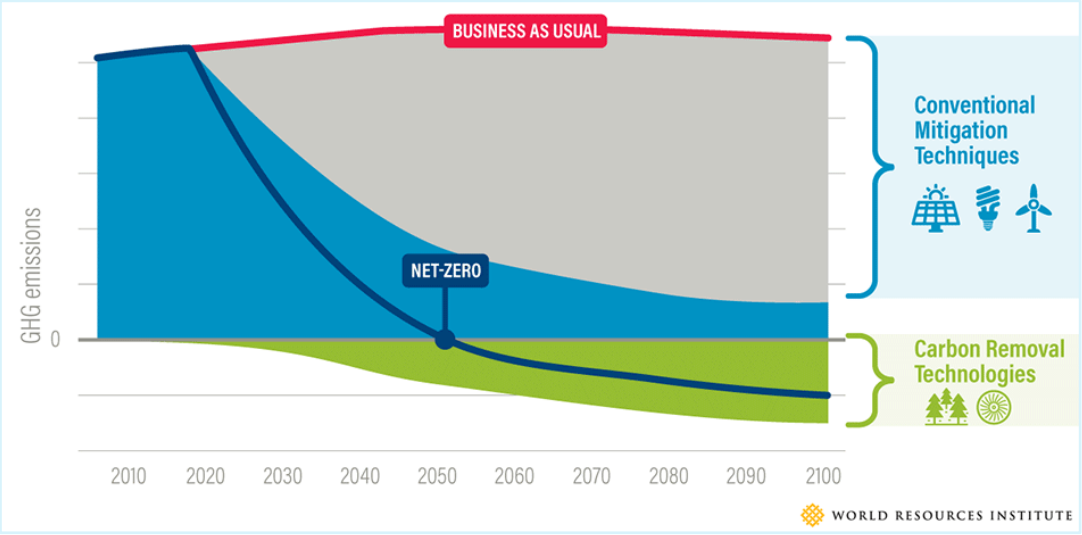




The European Green Deal[47], published in 2019, endorsed the objective of achieving a climate-neutral EU, an economy with net-zero greenhouse gas emissions, by 2050. It means, that not only conventional mitigation techniques have to be implemented, but also carbon removal technologies should be applied, also within the programme area. The lower level of greenhouse emission could be reached through the improvement of energy efficiency, switching to less carbon-intensive fuels, an increase in the use of renewable energy sources, but structural changes in the economy could also play important role in this process.

47 Communication from the Commission: The European Green Deal. **https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1596443911913&uri=CELEX:52019DC0640#document2**

Figure 31: Road to the net-zero greenhouse gas emission status[48]



2.2.1.8 Biodiversity

Biodiversity is one of the crucial topics of modern European environmental strategies. This complex topic is influenced by many green issues, as it is also reflected in the EU Biodiversity Strategy for 2030. In the Strategy, several actions have been formulated to reverse biodiversity loss. Most of these actions' relevance and situation inside the analysed area were presented in the previous subchapters.

Actions of the EU Biodiversity Strategy (Chapter of the Strategy)	**Subchapter of the current Territorial Analysis**
A coherent network of protected areas (2.2)	2.2.1.3 Protected areas
Strengthening the EU legal framework for nature restoration (2.2.1)	Not relevant
Bringing nature back to agricultural land	2.2.1.2 Natural conditions > Arable land
Addressing land take and restoring soil ecosystems	2.2.1.2 Natural conditions > Landcover 2.3.1.4 Geophysical disasters > Landslide
Increasing the quantity of forests and improving their health and resilience	2.2.1.2 Natural conditions > Forest areas 2.3.1.3 Hydrological and climate-related disasters > Forest fires
Win-win solutions for energy generation	2.2.1.7 Sustainability > Energy consumption & Renewable energy sources
Restoring the good environmental status of marine ecosystems	Not relevant

[48] World Resources Institute: What Does "Net-Zero Emissions" Mean? 6 Common Questions, Answered. **https://www.wri.org/blog/2019/09/what-does-net-zero-emissions-mean-6-common-questions-answered**

Actions of the EU Biodiversity Strategy (Chapter of the Strategy)	**Subchapter of the current Territorial Analysis**
Restoring freshwater ecosystems	2.2.1.4 Water resources, river basins > Ecological situation of the affected freshwaters
Greening urban and peri-urban areas	Not relevant (Non-transboundary issue)
Reducing pollution	2.2.1.6 Environmental pressures
Addressing invasive alien species	2.2.1.1 Natural regions

As the results of the territorial analysis show, most of the actions of the EU Biodiversity Strategy are crucial also for the whole analysed area. Not only the handling of the different environmental issues, but also the maintenance and preservation of the main ecological corridors and elements (e.g. protected areas, large forest areas, traditional extensive agricultural lands, Carpathians corridor, freshwater ecosystems, migratory routes of birds etc.) are a joint task of the whole cross-border area. Most of the issues are intrinsically linked and need integrated solutions. Climate change accelerates the destruction of the natural world through droughts, flooding and wildfires, while the loss and unsustainable use of nature are in turn key drivers of climate change.

2.2.2 Functional areas

Functional areas connected to priority "Environmental protection, climate change mitigation and adaptation are closely related in some respect. The key elements in the case of each area are related to the catchment area of the Tisza river and the Carpathian forests. These hydrological and biogeographical features create a common functionality across the analysed area affecting the whole programme area, and are closely interlinked with all the related subtopics. However, certain functional areas can be identified in relation to each subtopic of the priority, therefore such areas are explained below.

In relation to the natural conditions basic similarities can be shown according to biogeographical regions. Out of them the Pannonian and Alpine regions are having the most significant effects owing to their highly cross-border character. Considering natural regions Pannonian Region consists of the southern part of Košický Region, the two Hungarian counties, western territories of Zakarpatska and Satu-Mare, while the Alpine Region stretches across the unifying ranges of the Carpathian Mountains covering the whole of Prešovský Region, the norther part of Košický, the eastern parts of Zakarpatska and Maramureş, furthermore the western areas of Chernivetska, Ivano-Frankivska and Suceava. The Continental Region, on the other hand, is more of a transitional area and does not constitute a cross-border functional area within the programme area. Within these areas, several natural endowments show similar characteristics, thanks to which there are potentials for cross-border cooperation.

Nature conservation areas, ecological networks and identical habitats that meet along the borders have environmental functions that are also suitable for considering them as functional areas. In this respect, the situation of the "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" can be considered special, which, although not physically continuous, has a spatial network in terms of its functionality.

River basins show strong cohesion with regard to cross-border cooperation needs and potentials. River catchment areas are not aligned to state borders but to the continental-level watershed of the Carpathians in particular, which play an important role in the programme area. The functional integration of river basin areas situated west of the Carpathians can be considered much stronger, given that all sub-basins (of the Zagyva, the Sajó/Slaná, the Bodrog, the Someș, the Körösök/Criș) are integral part of the Tisza basin reaching all the related countries. The Tisza basin has an outmost importance within the programme area, more significant than of the river basins east of the Carpathians, which watercourses also flow into the Black Sea, but affect less countries directly in the analysed area.

Due to the complex impact of climate change on the Carpathians (e.g. extreme precipitation events), almost the entire programme area can be considered a functional area, however, certain factors of change (e.g. drought risk) are expected to have different effects within the border area. Thus, the adaptation and mitigation requires cross-border solutions.

The cross-border impact areas of environmental damage in the programme area can also be considered as a special functional area. With regard to this subtopic, waste generated, deposited and carried in the Tisza River Basin is a significant risk of cross-border relevance. Thus, floodplains, riverside areas affected by waste pollution of Ukrainian and Romanian watercourses especially are also decisive functional areas. The challenges in waste management in the case of both upstream and downstream areas unitest extensive areas along rivers flowing through the borders.In connection with the sustanability subtopic, the main climate-influencing element and therefore functional area is the Carpathian mountain range itself, as well as its forests and water-retaining capacity. In addition, its status in this sense affects the entire programme area, both in terms of climate and water management. Consequently, the forested areas (the western part of the Slovak-Hungarian border; the northern part of the Slovak-Ukrainian border; almost the entire Ukrainian-Romanian border area) stretching across borders can also be regarded as functional areas from environmental point of view. In connection with other sustainability issues, it is not possible to delimit spatial functional areas. It can be said that further steps to increase resource efficiency are important for the region as a whole, in which Hungary and Slovakia are ahead of the other two countries.

2.2.3 Opinions

Based on the stakeholder opinions in the conducted survey, TO6-PO1 is valued the highest (3.63) among all priorities of the Programme with regard to how much the given priority meet the territorial needs of the border area.

Taking a closer look at the opinions per country, it can be stated that the average of the opinions are below average in the case of Romania (3.5) and Slovakia (3.6), while stakeholders from Ukraine (3.72) especially perceive that this objective largely meet the territorial needs. Environment is a priority where the smallest differences per countries can be found, thus there is a clear consensus on supporting this TO-P. In addition, the value for the Ukrainian respondents is the highest of all responses to any of the priorities chosen. Along with Ukraine Hungarian stakeholders also consider environmental cooperation the most suitable to meet the needs among all the potential priorities. Furthermore, in the case of Slovakia environment is the second most favoured priority down by only

0.01 compared to TO3-PO1 Heritage. The share of respondents who chose the option "I don't know" is the lowest (1.25%) compared to the rate of the other priorities.

According to the results of the survey, 35.6% of the respondents agree with the respective priority, but do not say any specific comment on the possible important fields of cooperation within the priority. However, before discussing the thematic grouping of the topics within Environment, several stakeholders reflected on the difficulties in making difference between Environment and Disaster.

The most frequently mentioned topic is waste-related (13.75% of all responses). Pollution of rivers by different kind of waste is a major subtopic. Waste management is of out outmost importance, especially in terms of disposal, treatment and elimination. Other relatively important topics are connected to natural values (5%, subtopics of conservation of species and habitats, creation of cross-border protection areas), renewable energy (4.4%, subtopics of supporting alternative energy production and energy efficient technologies) and water management (3.1%, subtopics of protection of ecological status and creation of cross-border water management and related plans).

It has to be noted that there are answers which can be regarded as complex or multiple (11.25%), where distinct topics were discussed with no clear single topic. Many stakeholders expressed the need for an integrated approach meaning that all environmental topics would be well advised to be managed with an integrated approach. Interweaving field of actions according to the respondents cover waste, water and forest management, environmental protection infrastructure, adaptation and mitigation techniques, phenomena of deforestation, river pollution, unsustainable tourism, low share of recycling and treatment level of solid waste and wastewater, as well as climate change.

At last but not least the category "other" (9.38%) should be introduced. Responses here usually made some remarks about the programme itself, or made some reservations. Remarks include the need for a larger budget dedicated for environmental subtopics, underlining of the importance of nature protection and preservation activities, the need for concrete joint development and management projects and plans, the call for the cooperation of authorities and other public bodies, among others.

2.2.4 Project ideas

In the related survey respondents described 26 project ideas in relation to TO6-P1 Environment. The most project ideas were formulated covering the subtopics of waste management (6 project ideas), forests (5), biodiversity and protected areas (4), water supply, wastewater treatment (3) as well as resource efficiency, renewables, low carbon solutions (3). Only a single idea can be categorised as an idea covering rehabilitation, environmental education, climate change or air quality. There is also a multi-thematic idea which summarises coordinated measures in integrated management of natural landscapes, water and forest resources of cross-border regions on the basis of basin/catchment areas with the improvement of relevant infrastructure. Except for biodiversity the majority of ideas, 15 in total, originated from Ukrainian respondents. 6 project ideas were submitted from Slovakia and 4 from Hungary. Only a single project idea arrived from Romania. The project ideas had been categorized according to the level of their cross-border relevance. From this point of view 100% of forest-related ideas, 75% of biodiversity-related ideas, 33.3% of waste as well as resource efficiency-related ideas can be regarded as fully CBC relevant. None of the ideas sent in the frames of water supply, wastewater treatment meet the criteria of cross-border relevance.

Considering project proposals submitted in the frames of waste-related subtopics, different types of measures can be separated from each other. There is a significant need especially with the participation of the Ukrainian regions to invest in infrastructural developments. Construction, and support for different kind of facilities are foreseen here in relation to waste management; waste processing plans involving energy-saving technologies, introduction of solid waste collection system, municipal and industrial waste treatment and sorting. Apart from this specific theme, joint actions in the field of waste prevention and removal can also be listed here. Cleaning the river Tisza from PET bottles and other plastic waste is out outmost importance. Waste reduction in and along the cross-border rivers is of major concern. The reduction of waste is possible also with the help of digital awareness-raising campaigns supported by IT tools across the analysed area.

In the subtopic of forests two fields of actions are the most popular. One is related to forest management i.e. measures for the introduction of technologies in mountain forests on the basis of nature conservation. Forest management has to focus on biodiversity preservation and be in line with the nature protection goals and conventions. Better harmonisation of forest utilisation with the natural resources is important according to the potential applicants. The other type of ideas is about initiatives targeting the restoration and protection of forest ecosystems. Carpathian forests are in the forefront of the ideas concerned.

Project ideas that can be grouped around biodiversity and protected areas consist of measures for better cooperation of organizations dealing with protected areas (authorities, managers, non-governmental organizations) in order to implement joint monitoring and joint protection measures, establishment of a cross-border Ukrainian-Romanian UNESCO Biosphere Reserve in the Maramureș Mountains, monitoring of wetlands and development of management plans, furthermore support of research to conserve biodiversity concerning watercourses.

Considering the water-related subtopic, the project ideas are focused on water supply and water treatment. Thus, along with provision of water supply, sewerage treatment is of great significance. The projects ideas would like to build infrastructure or reconstruct already existing ones. There is a clear need for the introduction of latest technologies and the creation of modern, up-to-date treatment systems in the analysed area. Special emphasis has been put on the involvement of Ukrainian stakeholders and facilities. In treatment sludge processing, disinfection of treated wastewater plays a crucial role.

The subtopic of resource efficiency and renewable energy sources are quite diverse, and include ideas about construction of a regional hydrogen station, environmental management of greenhouse gas emissions and other environmental risks in the process of transportation of energy hydrocarbons (petroleum products) and promotion of low-carbon development in the cross-border area of Ukraine and Romania.

2.3 PO2 Greener / TO8-P1 Disasters

Related thematic field based on the current programme: Thematic Objective 8: Common challenges in the field of safety and security - Priority 1: Support to joint activities for the prevention of natural and man-made disasters as well as joint action during emergency situations

Expected results in the current programme: Expected result: the risk of natural and man-made disasters should be decreased and the handling of such cases should be more effective with the use of new infrastructure elements, common strategies and co-operation platforms created for the programming area.

Short summary of the topic: A common challenge is that this region is one of the most flood-prone regions in Europe with increasing frequency and intensity of floods. In the programme area, the Transcarpathian Region, Maramureş and Suceava County in particular have had a high number of floods, more than 20 since 1998. Several of them were devastating such as the one in 2001. However, in the sense of the HUKSROUA NEXT Programme, only the floods of the Tisza River Basin can be expected as a real cross-border issue. In Borsod-Abaúj-Zemplén county, Szabolcs-Szatmár-Bereg county, and in the Košice region, more than half of all floods could be classified as extreme cases. Weather anomalies intensifying with climate change also affect other areas either by drought, hail, storms or forest fires. Damage prevention and joint risk management have cross-border importance. Pollutants entering rivers, especially the Tisza, remember the cyanide pollution or the extreme salt concentration in Solotvyno / Aknaszlatina, require a rapid response and the sharing of knowledge and capacity. Regarding geophysical risks, there is no high potential of earthquakes, but the increase of landslides' frequency has to be expected.

The cooperation thematically should focus on the joint hazard issues (mainly hydrological and climate-related hazard) and in terms of activities on the joint prevention, preparation and management of the potential disaster situations. Disaster-related cooperation in the border region requires, among others, the following actions: understanding the disaster risk; strengthening disaster risk governance to manage disaster risk; investing in disaster risk reduction for resilience; enhancing disaster preparedness for effective response, recovery, rehabilitation and reconstruction. All this can be achieved, inter alia, through the following types of activities and cooperation: collaboration, engagement and partnerships; data generation, GIS and remote sensing; elaboration of scientific methodologies; assessment and monitoring; innovation and technology improvement; communication, education and training.

2.3.1 Statistical and data-based analysis

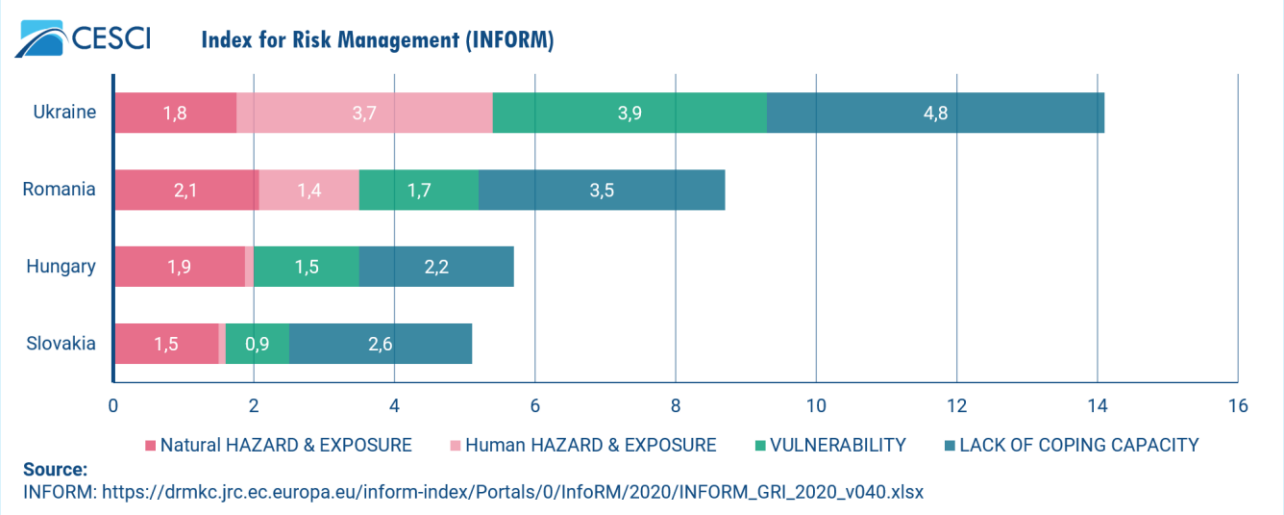
During the statistical analysis of the priority, we review the risk management dimensions (hazard & exposure, vulnerability, coping capacity) of the four countries, then we take into account the registered disaster situations which affected the region during the past 20 years. Based on this, we identify the main risk categories, which are discussed in more detail in the following sections of the chapter. At the end of the chapter, we review the relevant comments and project ideas of the stakeholders.

The natural and environmental factors that generate natural disasters are reviewed in the chapter: *2.2.1.5 Joint preparation for climate change.*

2.3.1.1 Dimensions of the risk management

In the collaboration of the Inter-Agency Standing Committee Task Team for Preparedness and Resilience and the European Commission an objective and transparent tool was elaborated for understanding the risk of humanitarian crises, it is the INFORM.[49] INFORM provides disaster risk profiles of 191 countries, and utilises 50 different indicators related to the conditions that lead to crises and disasters. It includes data on the area's human and natural hazard risks, the vulnerability of the communities faced with hazards, and the coping capacity of local infrastructure and institutions.[50] The INFORM model deals with three dimensions of risk: hazards & exposure, vulnerability and lack of coping capacity dimensions.[51]

Figure 32: Dimensions of the Index for Risk Management



Based on the examined indicators, the tool evaluates the risk dimension of each country. Subsequently, a ranking is made from the individual countries. Ukraine has the highest risk rating from the four countries in the program area, thus it is the most risky country among the 40 European countries registered by the UN. Within the same European comparison, Romania ranks as the 8th, Hungary as the 19th and Slovakia as the 25th country. The following figure illustrates the values of the four countries. It is visible that the four countries have almost the same values for natural hazard & exposure. The value of human hazard & exposure is particularly marginal in the case of Hungary and Slovakia. In the case of Romania, it is the third highest value in Europe, while Ukraine has the highest rate on the continent. In terms of vulnerability, Slovakia has the lowest value. Hungary and Romania have similar values, while Ukraine unfortunately is once again a continent leader in this domain. In

49 EC JRCS, DRMKC – INFORM. About section. **https://drmkc.jrc.ec.europa.eu/inform-index/About**

50 INFORM (Index for Risk Management) **https://www.europe.undp.org/content/geneva/en/home/partnerships/inform--index-for-risk-management-.html**

51 More information about the INFORM methodology: **https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Methodology**

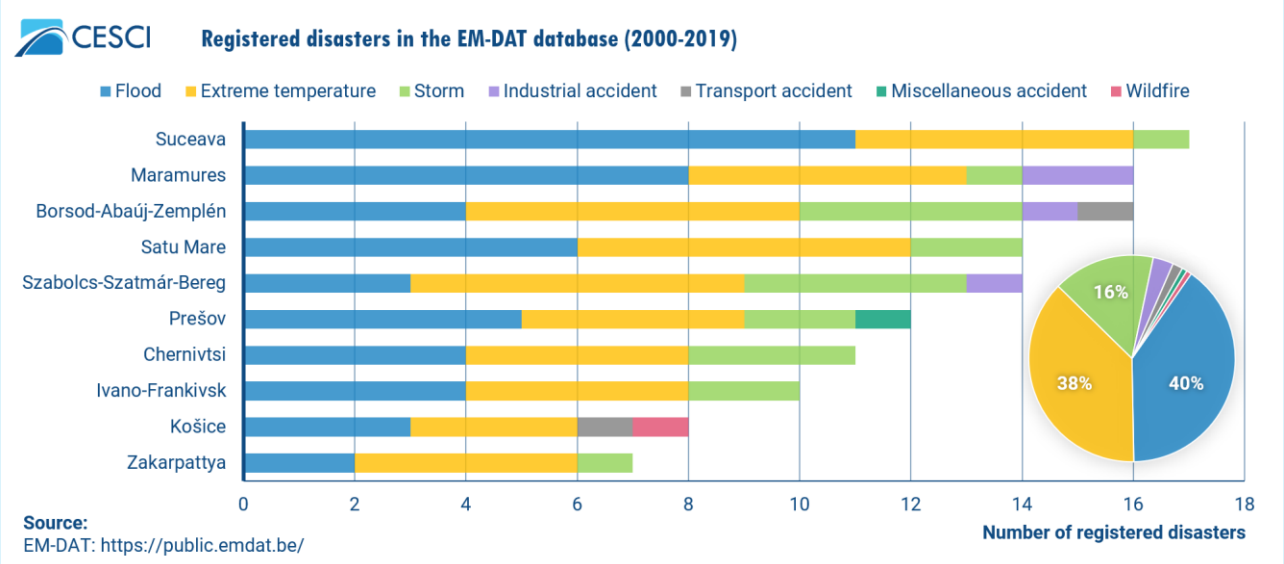
terms of lack of coping capacity, Hungary has the best value, followed by Slovakia, Romania and Ukraine.

In terms of natural hazards & exposure, flood is the main threat for all the four countries. Certain factors stand out in each country (e.g. earthquake in Romania[52], drought in Hungary). Inside the vulnerability, there are two categories aggregated: socio-economic vulnerability and vulnerable groups. Ukraine received a high vulnerability value mainly because the high proportion of the uprooted people. The coping capacity dimension measures the ability of a country to cope with disasters. From this point of view, there is a need to expect governance difficulties. In case of Ukraine and Romania, access to health care is also problematic.

2.3.1.2 Registered disaster events

The EM-DAT database assures an overview of the disaster situations that occurred in the past years. EM-DAT is a global database on natural and technological disasters; the Centre for Research on the Epidemiology of Disasters (CRED) maintains it. The EM-DAT database includes all disasters conforming to at least one of the following criteria: 10 or more people dead / 100 or more people affected / the declaration of a state of emergency / a call for international assistance. The main aim of the database is to help the policymakers to identify the disaster types that are most common in a given country and that have generated significant historical impacts on human populations.[53]

Figure 33: Registered disaster events



A total of 125 disaster events were registered in the database for the past 20 years based on the above criteria, which affected the study area. The number of cases per county are in line with the INFORM natural hazard & exposure values, according to which the areas in Slovakia and Ukraine are less exposed. At the same time, the very low flood value in Zakarpattia suggests that the database might not include all the floods in Ukraine. In this domain, the Slovak counties are in a better position in terms of exposure.

52 Romanian seismic hazard areas are outside of the programme area. See below the relevant subchapter.
53 EM-DAT: The International Disaster Database. **https://www.emdat.be/**

The vast majority of the registered cases (nearly 95%) were of natural origin. Among these, hydrological events (40%; floods) and extreme temperature (38%; cold/heat wave, drought) occurred in almost equal proportions. Significant number of storms also affected the area during the past period (16% of all cases). Among the technological incidents, chemical spill occurred the most, while one and one explosion, aviation accident and traffic bus accident were registered in the database. There are several cases in the database that affected several counties of the program area. Hydrological events and extreme temperature dominate among them, and there was also a chemical spill case (cyanide spill in 2000).

Based on the presented databases, as well as on the basis of the received opinions from the stakeholders, the further subsections work with the following types of disaster situations:

- Hydrological and climate-related disasters: floods, heavy precipitation and windstorms, droughts, forest fires;
- Geophysical disasters: earthquakes, landslide;
- Human-made disasters.

2.3.1.3 Hydrological and climate-related disasters

As it was written in the previous chapter, the programme area suffers high rate of natural disasters, most of them are climate or hydrological related. These two reasons are often interconnected, for example in the case of the floods and the heavy rains, or the long dry (droughts) seasons and the forest fires. The expected climate change were presented in *the 2.2.1.5 Joint preparation for climate change* chapter and their expected disaster consequences are described below.

River floods

Based on the database, maintained by Dartmouth Flood Observatory, the analysed area is heavily exposed to large floods. In the case of 5 counties (Chernivetska, Maramureş, Satu-Mare, Suceva, Zakarpatska), more than 20 flood events were registered since 1998. At the same time, other 5 counties (Borsod-Abaúj-Zemplén, Ivano-Frankivska, Košický, Prešovský, Szabolcs-Szatmár-Bereg) are also parts of Europe that is severely affected by floods. It is considered as an extreme event in more than 40% of cases, thus the probability of its recurrence is greater than 100 years. Based on the database' information, the main reasons of very high floods in the region are heavy, torrential rains (almost 80%) and snow melts (a little bit more than 20%). The human factors might mean the following features, like weak flow regulation, lack of detention reservoirs, low and in some cases illegal forestry activities, over-ploughing of soil, haphazard building, blocking up channels by wood, littered lands, etc.

Figure 34: River floods in Europe

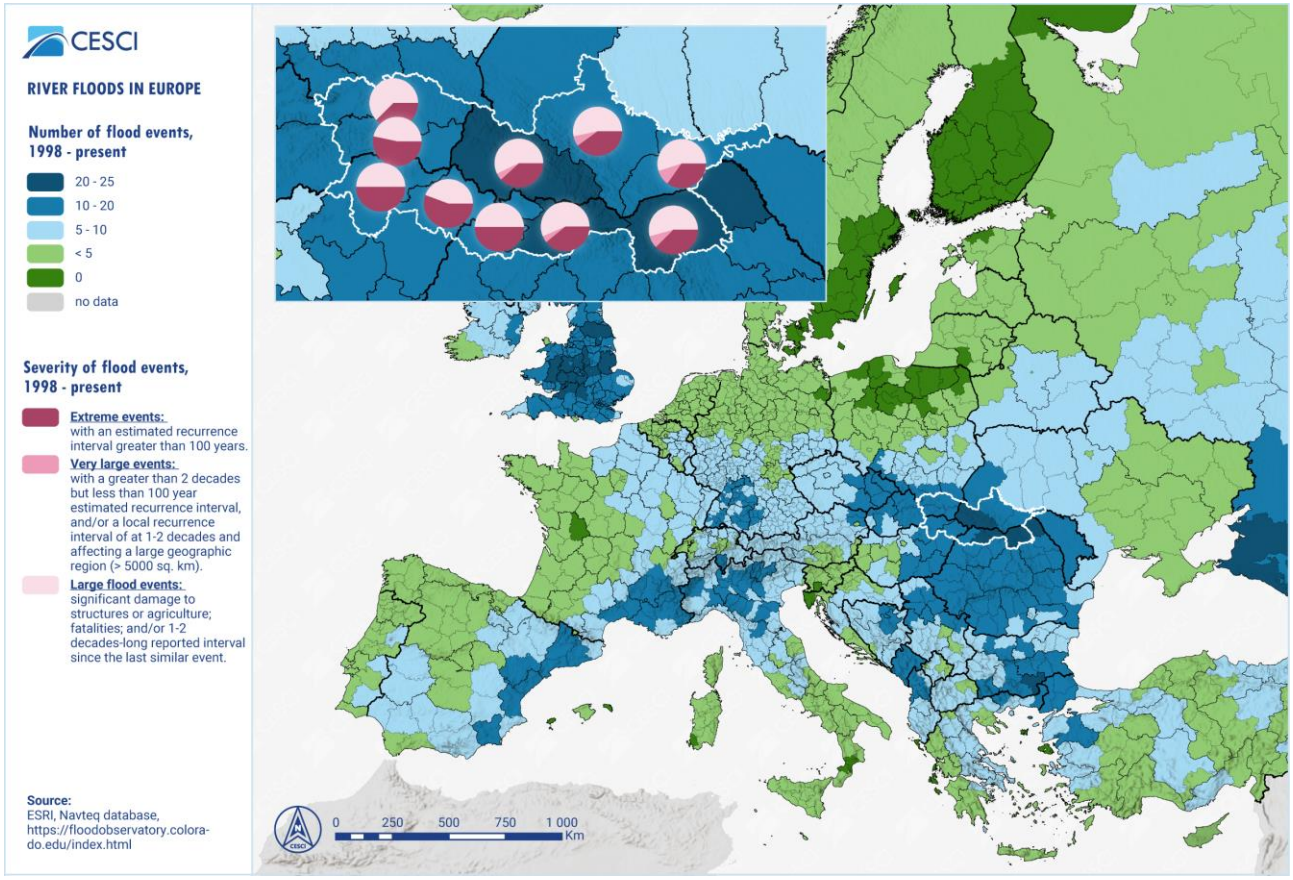
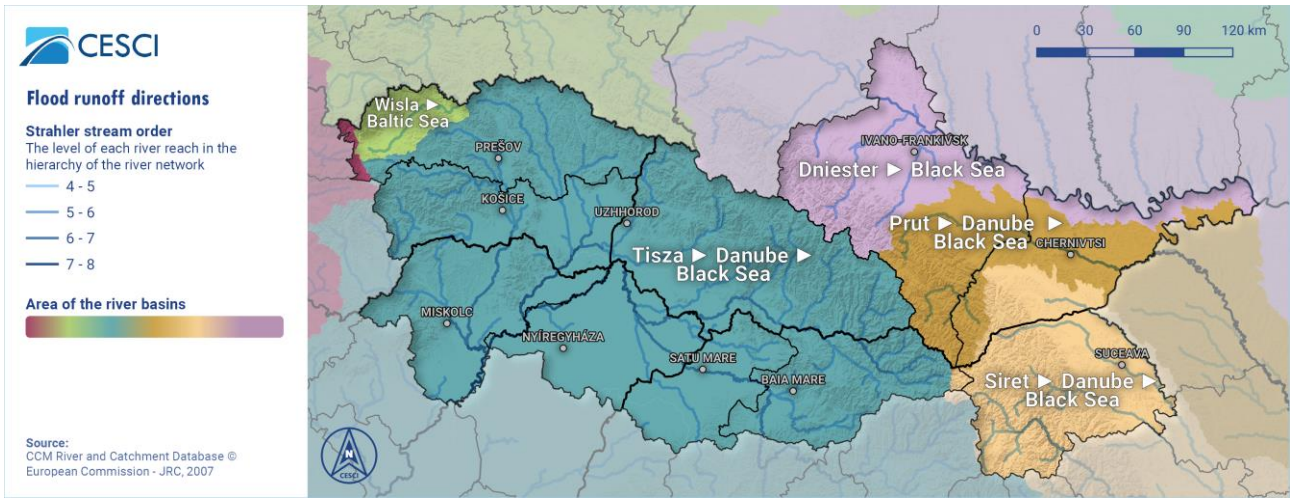


Figure 35: Flood runoff directions



In connection with the analysis of flood conditions, it is necessary to emphasize once again the hydrographic feature[54]. The Carpathian range divides the area into two main parts from the point of view of water structure. The main watercourses (Dniester, Prut, Siret) of the three eastern counties (Chernivetska, Ivano-Frankivska, Suceava) leave the program area in a way that they do not affect other countries and counties from the cooperation area. In sense of the HUSKROUA NEXT

54 See more information in the chapter *2.2.1.4 Water resources, river basins.*

Programme, these floods are not cross-border. On the other side, floods of the watercourses that belong to the Tisza River Basin affect several countries and counties of the program area.

Floods of the Tisza[55]

On the surface of the Tisza River Basin, floods were recorded in all seasons of the year and can be showery, snowy and snow-flurry by origin, but the most significant pressures are formed in the winter, spring and summer season.

The floods generated in Ukraine, Romania and Slovakia are mainly rapid and last from 2-20 days. However, large floods on the Tisza in Hungary can last for as long as 100 days or even more (the flood lasted for 180 days in 1970). This phenomenon is due to the very flat characteristic of the river in this region and multi-peak waves. Moreover, further characteristic of the Middle Tisza region is that the Tisza floods often coincide with floods on the tributaries, which is especially dangerous inside the programme area in the case of the Someş/Szamos River.

In extremely cold situations (as was in 2017), ice drift can appear and aggregate into ice jams. This event highlighted the need for basin-wide development of technical and human resources for sustainable ice-management.

A probable result of climate change is the increasing frequency of high intensity of rainfall events, which increase the local water damage events. If the precipitation of summer decade decrease and precipitation of the wintertime increase we will have to count by decreasing infiltration and increasing runoff. In addition to the usual spring floods, there is a need to prepare for sudden and significant floods during the most unexpected periods.

In all countries, the activity regarding flood risk management is coordinated at national level by a Ministry through a national water management authority which coordinates the institutions with responsibilities in water management at regional level. All countries have signed agreements with the neighbours regarding the water management of the Tisza River. Flood hazard and flood risk maps were elaborated only in Romania, Hungary and Slovakia as a requirement of Floods Directive 2007/60/EC implementation. Ukraine is about to implement the first cycle of Floods Directive 2007/60/EC.

In the last decades, several transboundary projects were implemented on flood risk management in the Tisza River Basin, e.g. JOINTISZA (DTP1-152-2.1); Early warning system UA SK I. and II. (HUSKROUA/0901/136 and HUSKROUA/1101/229); SAFETISZA (HUSKROUA/1701/LIP/003), etc. These initiatives should be continued and new ones should be developed, even based on previous findings. For example, the in the Integrated Report for Tisza River Basin (see the footnote above) it has been stated, that the estimation of the impact of Climate Change on flood risk for Tisza River additional studies were needed, for similar scenarios, in all countries. There are studies on climate change effects at national level, but they are not dedicated to the Tisza River Basin.

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[55] The description based on the following publication: JOINTISZA, D. Rădulescu et al. (2018): Flood issues and climate changes - Integrated Report for Tisza River Basin. More information about the floods on the Tisza can be read in the study. **http://www.interreg-danube.eu/uploads/media/approved_project_output/0001/36/49d50d0b2429884b0a1f2eafc8c158b70bc31679.pdf**

Floods of the Prut and the Siret[56]

The upper part of the Prut and Siret sub-basin is located at Precarpathian Region of Ukraine (Chernivetska and Ivano-Frankivska Region), while the lower part of the Siret is located at Suceava Region. The area is characteristic with high storm activity that generates high risk of floods on different scale and its harmful effects, including underflooding and overwetting of territories, destruction of engineering constructions and communications. Floods are principally caused by fast raising of river water levels. This causes flooding of settlements, industrial facilities and significant economic loses. The destroying floods in the region are caused by many natural and human factors. Excessive atmosphere precipitations (up to 100–300 mm per day) appear as the main factor in comparison with previous floods, e.g. frozen soils, rapid snow melting, deforestation and sand and gravel extraction, etc. We can mention other natural factors, like down-hill gradient, low water permeability of high subalpine meadows (mountain valleys), condition of vegetation and soil cover.

The water protective dikes cannot serve as a safe flood protective complex because they were constructed in different time and different technologies were used with different level. The existing complex of the protective constructions on the rivers and basins are insufficient and need to be reconstructed. Most of them were constructed for solving of local problems, thus these constructions do not form any integrated complex system for safe protection against catastrophic flooding. Taking into account modern tendency in flood protection development, which is directed on flood flow management, the scheme sets the complex approach as a mainstream for solving the problem of flood control: flood flow regulation by constructing special detention reservoirs, polders, constructing regulating hydro-technical constructions, which reduce water flow speed on the tributaries of the major rivers, as well as regulating the river bed, strengthening of a system of flood protective dikes, forest-protection, erosion-preventive and anti-mudflow measures in the mountains, and also protection against the harmful effect of floodwaters during town planning, the question of land exploitation, creation of a road net and building of engineering structures.

The last catastrophic flood on the Prut occurred in June 2020, resulting in fatalities and severe financial and infrastructural damages. The abnormal heavy rains caused flooding in the Carpathians and on the plains along river beds. Another side effect of the flood is that pollutants and toxic substances, especially plastic products, are accumulated in the basin.

It has to be repeated, that the river-basin of the Prut affects only Ukrainian areas. It means that those floods do not have cross-border characteristic in the sense of the HUSKROUA NEXT Programme. The Siret river-basin inside of the programme area extends to the southern part of Ukraine and to the northern part of Romania. Subsequently, floods have cross-border impact also within the analysed area.

[56] The description based on the following publication: ICPDR Flood protection Expert Group (2009?): Flood Action Programme Prut-Siret Sub-basin. More information about the floods on the Prut and the Siret can be read in the study.
https://www.icpdr.org/flowpaper/viewer/default/files/FAP16_Prut-Siret.pdf

Floods of the Dniester[57]

The Dniester has a highly specific flood regime, featuring up to five flood events annually. During these events, river water levels may be increased by 3-4 m, but sometimes the increase is even more. The Dniester river discharges, recorded during the flood, are significantly higher than those occurring during a spring high-water period. The significant rise of water levels in the Carpathians are attributed to the low capacity of river channels. The capacity is limited by steep slopes of the river valley and by narrow floodplain, which is virtually non-existent in some locations.

The main factors determining the flood flow regime of the river valleys in the Pre-Carpathian region and particularly the Dniester River are the following ones: tectonic (endogenous character of orographic and hydrographic pattern, coupled with neo-tectonic movements); climatic (precipitation intensity and river flow pattern); geomorphologic (combination of plain surface runoff, channel flow and river valley runoff); biotic (proportions of forest cover, meadow vegetation and arable land).

The river network in the upper part of the Dniester Basin is asymmetrical, with the majority of Dniester tributaries flowing from the Carpathian Mountains. In the event of heavy rainfalls or intensive snow melting, spontaneous changes in their water levels can significantly affect the water levels in the Dniester itself. Given that the average river channel slope of the Dniester River in this section is about 0.5 m/km, with the channel slopes of its tributaries being 2-3 times steeper, it can be concluded that the tributary flows, discharged into the Dniester, cause a backwater effect upstream of the tributary inflow.

The floods of the Dniester affect only the easternmost Ukrainian region of the programme area and this means that they do not have any cross-border character in the sense of the HUSKROUA NEXT Programme.

Forest fires[58]

The expected increase of forest fires is a problem which is also basically related to climate change. Increasing frequency of droughts, air temperature, relative humidity and rainfall generate an impact on the development of forest fires. Besides of all these factors, the development of forest fires is also influenced by cultural and socio-economic conditions. Although, more than 95% of fire ignitions are caused by humans (either accidently or intentionally). It is well documented that the major determinants of the spread of fire is weather and accumulation of supporting conditions (e.g. litter, needles, mosses, twigs).

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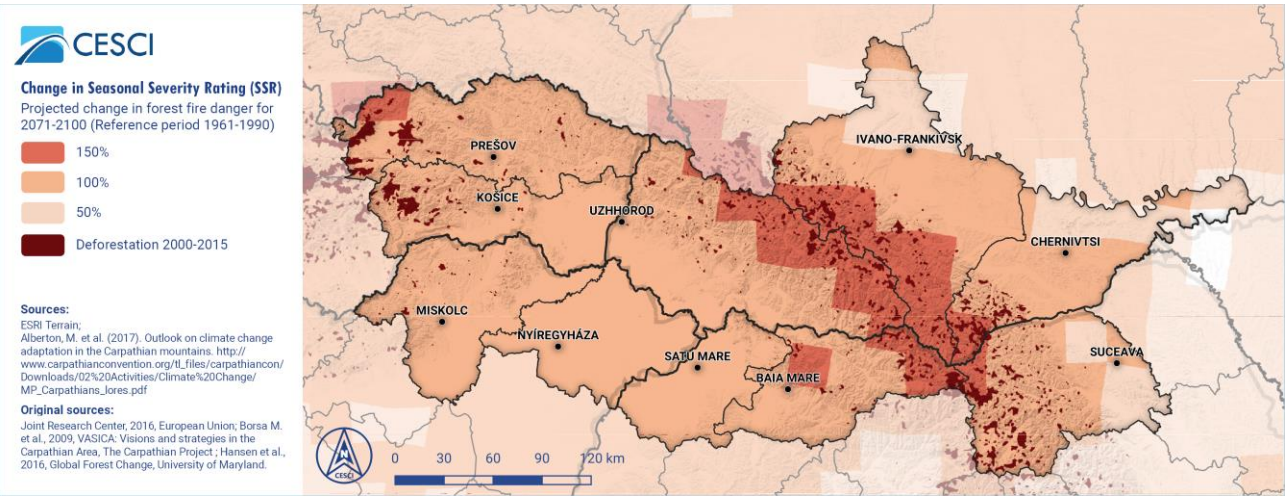
57 The description based on the following publication: UNECE and OSCE (2005): Transboundary Diagnostic Study for the Dniester River Basin. More information about the floods on the Dniester can be read in the study.
https://dniester-commission.com/wp-content/uploads/2019/10/17final_report_eng.pdf

58 The description based on the following publications: H. Costa et al (2020): European wildfire danger and vulnerability in a changing climate: towards integrating risk dimensions . JRC PESETA IV project / Task 9 - Forest fires
https://ec.europa.eu/jrc/sites/jrcsh/files/pesetaiv_task_9_forest_fires_final_report.pdf and
European Environment Agency (2017): Climate change adaptation and disaster risk reduction in Europe. Chapters '3.8 Forest Fires'
https://www.eea.europa.eu/publications/climate-change-adaptation-and-disaster

In the chapter *2.2.1.2 Natural conditions,* the landcover condition of the programme area has been presented. It has been stated that the dominant land cover type of the programme area is various forest areas (57% in total) and these clearly dominate the areas of the Carpathians. On the landcover map, it can be observed that there are several cross-border connections between the forest areas inside the programme area (western part of the Slovak Hungarian border; northern part of the Slovak Ukrainian border; almost the entire Ukrainian Romanian border area). Forest fires in the area typically occur in two periods: during spring (rainless period of the early spring) and during summer (dry, drought period).

The JRC PESETA IV Project has also concluded that the programme area shows a consistent worsening pattern in the sense of wildfire danger. The Pannonian Basin, enclosed by the Carpathians and the Transylvanian Plateau, displays an increasing number of days with high-to-extreme fire danger. The map below shows the projected future change in forest fire danger and areas affected by deforestation between 2000-2015. As it can be seen on the map, the deforestation occurred mainly in the Carpathians, where the projected change of the Seasonal Severity Rating will be potentially the highest.

Figure 36: Forests and climate change



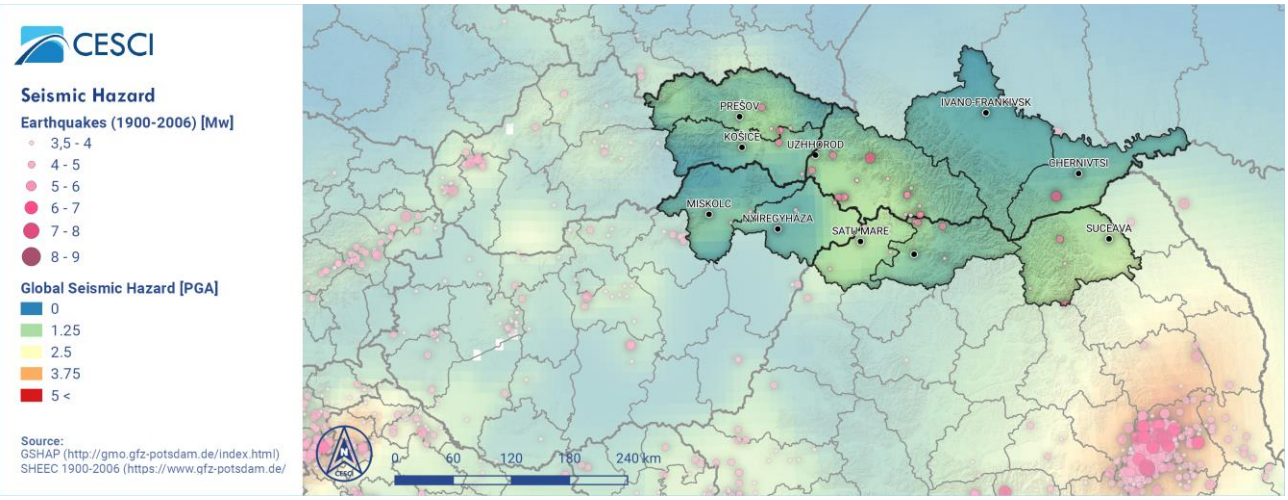
Climate change may affect the forest management of the program area in several ways. The frequency of storm damages may increase. Weather conditions will influence the composition and condition of habitats, and from now on, new biotic pests which are not typical to the area may appear.

2.3.1.4 Geophysical disasters

Seismic hazard

The seismic exposure of the program area is presented through two data: the registered earthquakes in the wider area and their moment magnitude scale, as well as the spatial pattern of the Seismic Hazard Model. Both data - and empirical experience - show that the program area is one of the areas less exposed to seismic hazards.

Figure 37: Seismic hazard



The SHARE European Earthquake Catalogue (SHEEC)[59] covers the 1900-2006 period with earthquake events higher moment magnitude scale than 3.5 Mw. The database contains over 13 600 entries regarding Europe. The number of elements in the program area is only 50, their average moment magnitude scale is 3.98 Mw. There are only 15 cases with a value greater than 4 Mw. In comparison with the Vrancea and Buzău region of Romania, for the same period almost 1,500 cases were registered, including earthquakes above even 6 Mw.

The Global Seismic Hazard Model (GSHAP)[60] is based on latest information about earthquakes, active faults and crustal deformation. The GSHAP depicts the seismic hazard as Peak Ground Acceleration (PGA) with 10% probability of exceedance in 50 years, corresponding to a return period of 475 years. The graduated colors show the range of the hazard level.

The lower the PGA value (blue-green shades), the lower the seismic hazard, the higher the PGA value (orange-red shades), the higher the seismic hazard. The maximum PGA value does not reach 2 PGAs (m/s^2) anywhere within the program area. However, the seismic hazard of Romania is relatively high, mainly due to the intermediate-depth earthquakes located in a confined focal volume at the Eastern Carpathians arc bend, in Vrancea and Buzău region. In this area, the PGA values are mainly higher than 4 m/s^2.

Landslide[61]

Landslides occur as a combination of meteorological, geological, morphological, physical and human factors. Extreme weather- and climate-related events (such as heatwaves, droughts and heavy precipitation) are the most common trigger factors of landslides in Europe.

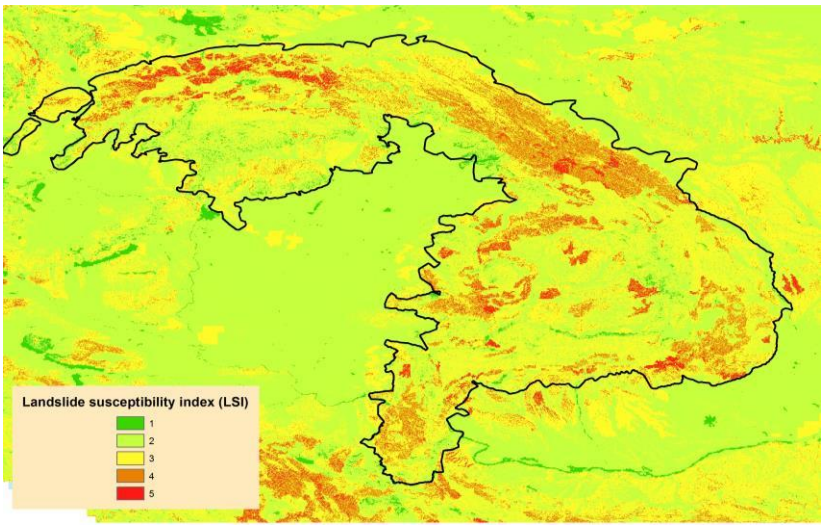
59 The SHARE European Earthquake Catalogue (SHEEC) 1900-2006. **https://www.gfz-potsdam.de/sheec/**

60 The Global Seismic Hazard Map. **http://gmo.gfz-potsdam.de/**

61 The description based on the following publications: European Environment Agency (2017): Climate change adaptation and disaster risk reduction in Europe. Chapters '3.8 Forest Fires' **https://www.eea.europa.eu/publications/climate-change-adaptation-and-disaster** and E. Dobos., A. Hegedűs, J. Vágó (2015): Estimating landslide susceptibility for the Carpathian Region using GIS modeling approach **https://matarka.hu/koz/ISSN_2063-6997/Vol4_No7/ISSN_2063-6997_vol_4_no7_2015_eng45_58.pdf**

Based on the integration of five environmental factors, a landslide hazard map for the wider Carpathian Region was elaborated by the Institute of Geography and Geoinformatics, University of Miskolc. These factors are slope, local relief, land use, lithology and the expected daily maximum precipitation. The research found the most significant factors in the identification of landslide probability, while the local relief factor was found to be less dominant. The model shows the Carpathian region, in general, is severely impacted by landslides. Very high landslide susceptibility index characterises some part of the Carpathians, and high values almost the whole mountain areas. The other, mainly the plain, parts of the programme area differ from medium to low susceptibility.

Figure 38: Landslide susceptibility map for the Carpathians



Source: E. Dobos., A. Hegedűs, J. Vágó (2015)

Several studies have focused on identifying the relationship between frequency in landslides and heavy precipitation. Where the frequency and the intensity of rainstorms will increase, shallow landslides, including rock falls, debris flows and debris avalanches are also expected to increase. See more information about the heavy rains in the chapters *2.2.1.5 Joint preparation for climate change*.

2.3.1.5 Human-made disasters

Human-made disasters are considered those events which are induced entirely or predominantly by human activities and choices. Disasters of human origin are grouped in the literature in different ways, however, as a common denominator of the different classifications, the following events can be included here: chemical/industrial hazards; nuclear and radiological hazards; transport hazards. Some sources also include the societal hazards such as war, terrorism, civil disorder or criminality. There is also a special group distinguished for the so-called extensive disaster risks, which are low-severity, but high-frequency hazards.

Out of all these types, the programme should focus on those human-made disasters which have a cross-border significance at the program level. Human-made disasters of technical origin usually occur locally, in a given location, but their impact may affect several countries, depending on the magnitude of their impact and the nature of the mediating medium. The cross-border nature of a technical disaster for a program may be determined by the following factors:

- Do the effects spread across the border to other countries in the program area?
- Is the type of disaster ranked as a high risk in several countries in the program area?

The first aspect primarily refers to the man-made disasters that occur locally but have cross-border effects. On the one hand, these include pollution affecting transboundary watercourses. For example, the poisoning and pollution of the upper section of the Tisza has a good chance of spreading to the lower sections of the river as well. An extreme example of this was the cyanide spill of industrial origin in 2000, but the example of extensive non-industrial but communal pollution of the river can be cited as an example too. Forest fires can also be considered as man-made disasters, the effects of which can easily be transboundary in the case of forests situated close to the border.

On the other hand, the second group includes disaster situations that affect several areas of the border region, and cooperation would be needed in connection with their management and prevention. An example here is illegal logging as a criminal activity with significant environmental impact, which are also significantly present in the Romanian and Ukrainian counties of Romania.

The adverse effects of certain industrial activities (mining, metallurgy, etc.) can in some cases be classified in both categories. On the one hand, there are industrial and mining areas to be rehabilitated in several places in the region, and on the other hand, their environmental impacts in some cases extend beyond the borders.

2.3.2 Functional areas

From the point of view of disasters, the border region suffers from natural disasters of essentially the same origin and to a similar extent. Wet climatic disasters have a complex mechanism of action in almost the entire program area (heavy rainfall in the Carpathians appears as floods in the lowland areas of the program area). In the case of disasters of dry climatic origin, according to the conditions of the program area, it is basically divided into two main functional areas: the forest-covered Carpathians (forest fires) and the lowland areas (droughts).

With regard to the functional areas related to floods, it is important to emphasize that the Carpathian Range divides the area into two main parts from a water management point of view. Watercourses (Dniester, Prut, Siret) affecting the territory of the three eastern counties (Chernivetska, Ivano-Frankivska, Suceava) leave the program area without affecting other countries and counties within the cooperation area. At the same time, the floods of the watercourses belonging to the Tisza river basin affect several countries and counties within the program area. In this sense, the areas belonging to the Tisza river basin show a stronger functional cohesion. The area of watercourses with the same transboundary river basin district within the border area can also be considered as functional areas because watercourses can also be considered as mediating agent, which not only transmit natural hazards (flood, ice breaking) but also play a role in spreading human-made pollution. All in all, such as it is due to the environmental functional areas, the strongest territorial functionality could be detected along with physical geographic features; mainly the Carpathian mountains and the river basin of Tisza.

2.3.3 Opinions

According to the stakeholder opinions in the conducted survey, TO8-PO1 is valued the second highest (3.53) among all priorities of the Programme concerning how much the given priority meet the territorial needs of the border area.

Taking a closer look at the opinions per country, it can be stated that the average of the opinions are below average in the case of Hungary (3.56), Romania (3.5) and Slovakia (3.33). Only Slovakia forms an exception with a relatively low level of support. Compared to the Slovakian answers, stakeholders from Ukraine (3.67) perceive that this objective primarily meets the territorial needs. Disaster is therefore a priority similarly to Health where notable gap can be found regarding the level of support for the priorities per countries. TO8-P1, along with TO6-P1, is the most supported by the stakeholders. It shows that nature-related topics would enjoy significant support in the upcoming period as well.

The share of respondents who chose the option "I don't know" is 2.5%, which is the second highest after Health, but stay relatively low still.

According to the results of the survey, 43.1% of the respondents simply agree with the TO8-P1, and do not say any specific comment on the possible important fields of cooperation within the priority. However, before discussing the thematic grouping of the topics within Environment, several stakeholders reflected on the difficulties in separating the priorities Disaster and Environment from each other.

Focusing on the thematic breakdown of the answers, water management (18.1%) is a popular topic. Flood management and protection on the Tisza, the Prut and their tributaries is in the centre of many responses. Almost all related regions expressed a strong need for a better coordination and cooperation in this field including Ivano-Frankivska and Chernivetska Regions as well. Creation of monitoring and alert systems, prevention by forestation, knowledge and data exchange are of great importance. Water management and flood risk planning on a cross-border level is a real priority for many stakeholders. The second most popular topic within this priority is centred on climate change (9.4%). Mitigation of the effects of extreme high water levels and droughts enjoys massive support. Risks and disasters caused by floods and droughts, thus rivers, floodplains and soils are in the foreground of suggested interventions. Also, it would be important to empower authorities and civic organisation for more effective natural disaster prevention caused by the effects of climate change.

Special group of answers can be described, which can be regarded as complex or multiple (6.9%), where distinct topics were discussed with no clear single topic. Here stakeholders expressed their opinions on managing environmental topics under a single integrated priority. Subtopics of high support include forecasting, monitoring and early warning, automated information and measurement systems regarding floods in particular, but forest fires and landslides are also mentioned. Deforestation, as well as prevention measures such as decrease of solid waste and chemicals in the river Tisza is also a frequent topic.

Some answers can be named as the "other remark" (5%). Responses in the frames of these other responses usually made some remarks about the programme itself, or made some reservations. Remarks include the low financial support for investments with real transnational impact, thus

preparatory works, knowledge exchange seem to be more adequate for the Programme. Large infrastructural developments cannot really be carried out.

At last but not least the pollution of rivers (3.75%) is also a relevant subtopic within this given priority.

2.3.4 Project ideas

In the related survey respondents described 14 project ideas in relation to TO8-P1 Disasters. The most project ideas were formulated covering the subtopics of flood and water management (5 project ideas), general risk management (4) and weather-related measures (3). Only a single idea per subtopic was submitted in relation to pollution just like in mountain rescue. Taking into account the distribution of ideas by countries, every second idea came from Ukraine based on the country of registration of the particular stakeholders. In descending order by the number of project ideas, Romania leads with 4 ideas after Ukraine, followed by Slovakia with 2 ideas, while just one idea was registered from Hungary. The project ideas had been categorised according to the level of their cross-border relevance. The project ideas had been categorised according to the level of their cross-border relevance. From this point of view 80% of flood and water management related ideas, 66.7% of weather-related ideas and 50% of general risk management ideas can be regarded as fully CBC relevant considering the frequently mentioned ideas.

With regard to flood and water management, one of the main areas of potential intervention is flood protection. Risk management could include the establishment of joint (e.g. Hungarian-Romanian-Ukrainian) disaster prevention and response system. Besides rivers and basins of the Tisza and the Siret in particular, risk management related to inland waters should also be considered. Along with risk-based plans, some project point out the need for sustainable and optimised management of watercourses and riverside landscapes.

Ideas centred on other, general (not water-related) risk management, stakeholders were committed to deal with the establishment of community safety centres and fires stations, the purchase of emergency station equipment and the implementation of a GIS system for emergencies. As it can be seen, the ideas are very much intend to invest in hard infrastructure. Together with the aforementioned stations it was also described to build a regional educational and scientific centre for technological and ecological hazards and concerned management activities.

In relation to weather-related hazards, activities foreseen cover the installation of hail protection systems, a regional Center for Training and Monitoring of Transboundary Precipitation Impacts as well as the creation of a sustainable rainwater management in the cities of the Carpathian region. Consequently, the weather-related ideas have a strong focus on the extreme distribution of rainwater.

At last but not least, a single project ideas deals with the rehabilitation of sites historically polluted with heavy metals, and another one would like to improve the conditions and the cooperation of mountain rescuers.

2.4 PO3 Connected + ISO2 Safer / TO7-P1 Transport

Related thematic field based on the current programme: Thematic Objective 7: Improvement of accessibility to the regions, development of sustainable and climate-proof transport and communication networks and systems – Priority 1: Development of transport infrastructure to improve the mobility of persons and goods

Expected results in the current programme: Labour force and businesses become more mobile in the border region and the economic activities are increasing including the number of visitors of touristic attractions. (Result indicator: Increase of number of vehicles using the built, modernized transport and border management infrastructure (number of vehicles per day). Target value: 1000.)

Short summary of the topic: The lack of transport connectivity is one of the main challenges in the programme area, especially in view of the fact that the region is torn apart by the Schengen external borders. Not only the low number of crossing points but also their distribution and capacity (e.g. weight limitation) and the bottlenecks of the cross-border road and rail networks are a problem. A particular challenge is bridging the gaps in rail track gauges. Waiting times at border crossings often run for several hours, which is not conducive to collaborations in the region requiring physical contact, including economic ones (e.g. labour market commuting) and people-to-people personal meetings.

Transport systems are typically capital-centric and there is a lack of common public transport solutions in the area. Coordination of transport development projects and facilitating border crossing conditions is therefore key features to the region's internal cohesion.

2.4.1 Statistical and data-based analysis

2.4.1.1 Road network

Taking into account **road TEN-T network**, in the Ukrainian-Hungarian border area the section of the Mediterranean corridor and the core element the M3 highway ends at Vásárosnamény, and planned to be constructed to Beregdaróc- Dijda. Also, another four-lane speedway is planned to be constructed from Vásárosnamény to Záhony-Chop as a comprehensive element under the name M34. The planned section of M3 continues in the form of the Astei-Mukacheve road M24. M06 is another road in Ukraine that connects the Záhony-Chop crossing point with Uzhhorod, Mukacheve and Kiev.

Considering the Slovak-Ukrainian connections the first class road I/50 creates link with the Ukrainian M06, which has a junction at Mukacheve with M24. The Slovak road is not even part of the comprehensive network. The planned section of the D1 motorway from Bidovce to Záhor would create a direct link between Košice (and except for very few sections, with Bratislava) and Uzhhorod. With regard to both Ukraine and Hungary the construction and development of R2 speedway (Trenčín-Košice) as part of the comprehensive network would also be an important international and transit route.

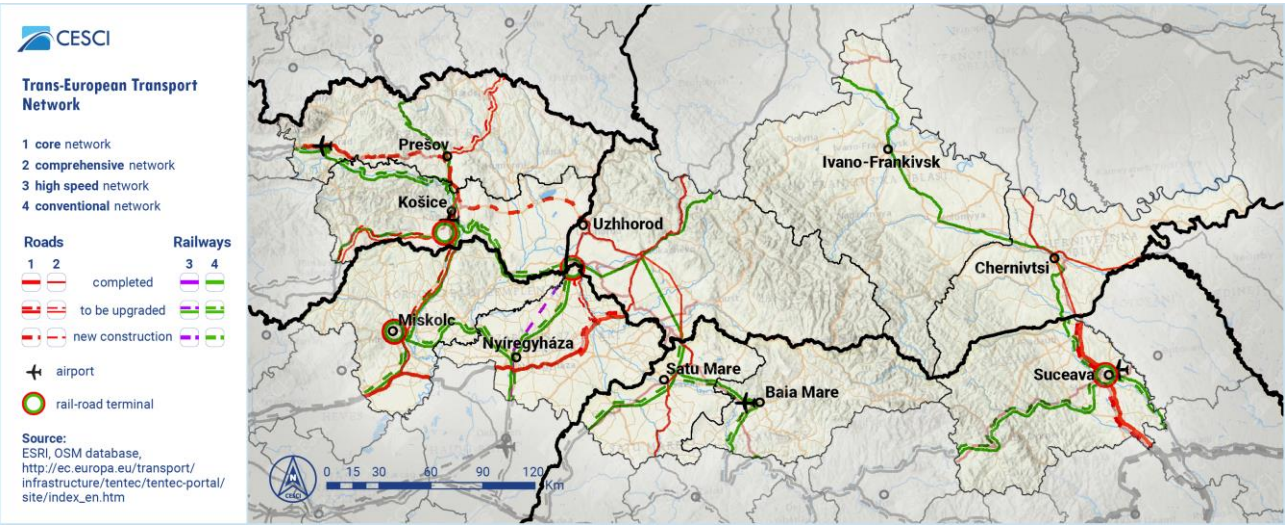
Considering the Romanian-Ukrainian connections, at Halmeu-Nevetlenfolu the Ukrainian M26 that continues towards Mukacheve and the Romanian road 1C that continues towards Baia Mare, meet.

In the form of E81 and M26 the border area is connected to Mukacheve, Ukraine and Satu Mare, Romania as part of comprehensive elements. Another connection as part of the TEN-T network is the link consisted of the Romanian DN2 (linking Ukraine with Suceava, Bacău and Bucharest) and M19 (across Chernivtsi towards Ternopil).

Considering the Hungarian-Romanian border area no TEN-T elements can be mentioned.

Considering the Slovak-Hungarian border area currently there is no direct motorway connection, but the Hungarian M3 and M30 and the Slovakian R4 and D1 are situated close to the borderline. The 56 km long comprehensive section of M30 between Miskolc and Tornyosnémeti is scheduled to open in the first quarter of 2022. As a result an almost continuous speedway connection with the help of M3 (Budapest-Emőd), R4 and D1 (Milhosť-Košice-Prešov) will be available for the traffic.

Figure 39: The Trans-European Transport Network



Considering **road transport network**, one of the main features of the area is the weakly developed and non-harmonised national systems in terms of construction, planning and maintenance as well. As it is apparent on the figure, limited number of any kind of high-level road creates direct connections across the state borders. When it comes to four lane (2x2) highways, in fact there are no real such continuous roads.[62] Almost all such infrastructure end at least 20 km, sometimes 50 km before it reaches the state border (see D1, M3, M30). Except for M30 from Miskolc to Tornyosnémeti and M3 from Vásárosnamény to Beregdaróc there are no cross-border sections to be constructed or finished before 2028-2030, the only other exception could be the Dejda –Berehove and the Mukacheve –Lviv sections in Zakarpatska and Ivano-Frankivska Regions. Since 2014 transnationally relevant speedway sections have been inaugurated mostly in the territory of Slovakia and Hungary. The expressways of M34 Vásárosnamény–Záhony, M49 Mátészalka (Őr)–Csenger, highway from the Hungarian border to the motorway M24, the upgrade of M06 from the Slovak border, the building of a continuous motorway from Mukachevo to Lviv, the D1 from Bidovce to Sobrance-Záhor,

62 There are significant differences in the terminology of public roads in the given countries. This is especially to in the case of Ukraine, where all roads signed with "M" are considered as international highway, even if their width is only two lanes and their technical quality is poor. In Romania all roads marked as a European route with "E" sign are seen as motorways in some categorisation, however on these roads have two lanes in general, and the speed limit is usually 100 km/h.

furthermore the planned expressways of Oar – Satu Mare, Suceava – Siret, Suceava – Botoșani and Baia Mare – Dej – Bistrița – Vatra Dornei – Suceava etc. are all still missing, and expected to be ready on the medium up to long term exclusively. Owing to extensive developments in the last two decades the Slovak and Hungarian side have relatively significant length and thus density of highways and speedways with four lanes (Szabolcs-Szatmár-Bereg: 66 km, 11.1 km/1000 km^2, Borsod-Abaúj-Zemplén: 72.5 km, 10 km/1000 km^2, Prešovský Region: 112 km, 12.5/1000 km^2, Košický Region: 59 km, 8.7/1000 km^2). In many parts of the analysed area there are zones where the closest true motorway is as far as 50-100 km. Due to weakly developed transnational high-speed routes extensive areas with weak interconnectedness and weak accessibility persist. The delay of such infrastructural investments conserves the unfavourable situation of regions lagging behind. Areas with weak accessibility tend to be left of from major trans-European flows of goods, services and people, and have less development potential. Since there is lack of high capacity roads in large parts of the analysed area, the traffic is using lower ranking roads, which tend to create congestions causing longer travel times, road safety problems and quickly deteriorating road quality parameters due to heavy traffic.

The road quality is often poor regarding border sections, e.g. with regard to the connection between Halmeu and Diakove on the Romanian-Ukrainian border. On the Ukrainian side in almost all cases the quality is significantly worse compared to the other side.

Road networks are still capital-centric. Based on the figure on the road network it can be seen that there is a huge lack of motorways/highways across the Carpathian Mountains. While in general the north-south connections are more served by high-level roads, extensive border areas miss high-level east-west road transport corridors despite of this direction's significance in socio-economic relations. One of the most peripheral part of the analysed area stretches on both sides of the Tisa and Siret rivers, in the regions of Maramureș and Bucovina shared by Romania and Ukraine.

Despite of having multimodal transport nodes in the analysed area, there is a persisting lack of well-functioning networks between the regional seats and largest cities across borders. Chernivtsi and Suceava in particular have the most unfavourable location in terms of travel times to the other regional centres. Except for Ivano-Frankivsk and the Chernivtsi/Ivano-Frankivsk, all the listed cities are situated at least 5 hours and 40 min from Chernivtsi and Suceava by car. On the other hand, none of the cities of Prešov, Košice, Miskolc, Nyíregyháza and Uzhhorod can be reached by passenger car in more than 2 hours and 33 min.

The transport geographic situation of the peripheral regions (e.g. the joint Ukrainian-Romanian riverside areas of the Tisa on 62 km where, among others, the Lunca la Tisa–Luh bridge was exploded by Nazi forces, the Teceu Mic–Tiachiv "half-bridge" cannot be used by transport) and a better integration to transnational flows should be better supported. Also, the interconnectedness of the major cities of the cooperation area could be further facilitated creating sustainable network links between cities situated relatively close to each other in terms of travel times (see the attached table). Better interconnectedness and thus accessibility could be reached in relation to the transport nodes of Košice, Miskolc, Nyíregyháza, Uzhhorod and Satu Mare, or between Suceava, Chernivtsi and Ivano-Frankivsk. Coordinating transport developments to support better accessibility within the area is of paramount importance for all related regions and cities, which could include studies of mobility needs, preparatory activities, strategies, feasibility studies, cost-benefit analyses, analyses on the

financial and legal possibilities and obstacles to creating a transport system more tailored to the given area.

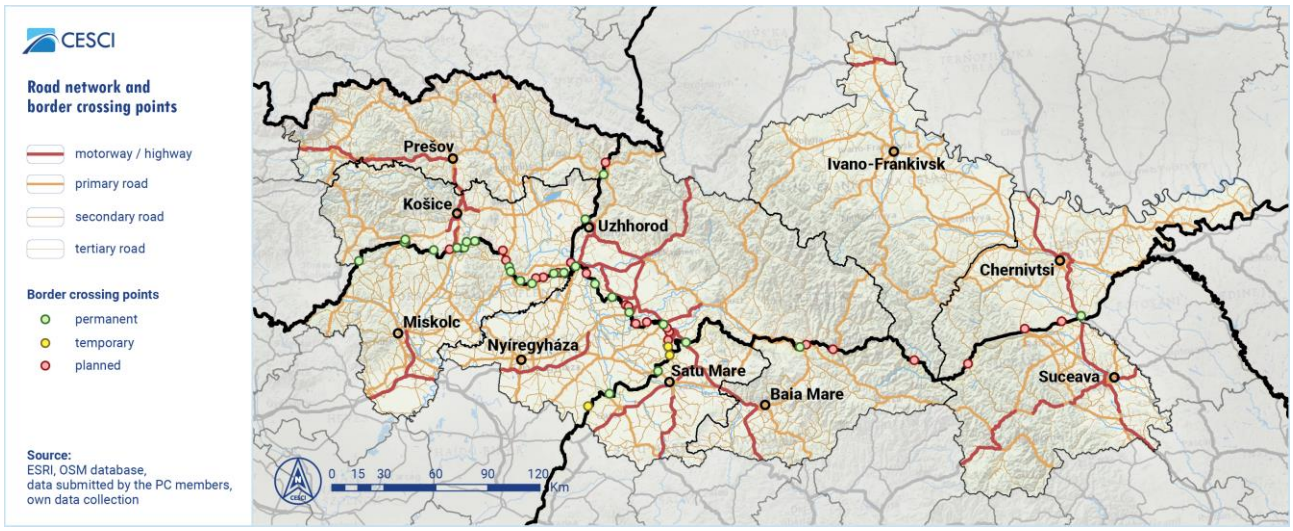
Table 6: Traveling times between the centers of the affected counties

By car (hour:minute)	Prešov	Košice	Miskolc (Borsod-Abaúj-Zemplén)	Nyíregyháza (Szabolcs-Szatmár-Bereg)	Uzhhorod (Zakarpattia)	Ivano-Frankivsk	Chernivtsi	Satu Mare	Baia Mare (Maramureș)	Suceava
Prešov		0:29	1:57	2:32	1:50	6:15	8:07	3:42	4:46	9:10
Košice	0:29		1:30	2:04	1:38	6:02	7:56	3:28	4:31	9:42
Miskolc (Borsod-Abaúj-Zemplén)	1:57	1:30		1:15	2:33	6:37	8:32	2:33	3:36	8:43
Nyíregyháza (Szabolcs-Szatmár-Bereg)	2:32	2:04	1:15		1:32	5:43	7:36	1:37	2:40	7:50
Uzhhorod (Zakarpattia)	1:50	1:38	2:33	1:32		4:35	6:31	2:30	3:10	7:35
Ivano-Frankivsk	6:15	6:02	6:37	5:43	4:35		2:18	5:31	5:00	3:53
Chernivtsi	8:07	7:56	8:32	7:36	6:31	2:18		6:25	5:54	1:36
Satu Mare	3:42	3:28	2:33	1:37	2:30	5:31	6:25		1:09	6:27
Baia Mare (Maramureș)	4:46	4:31	3:36	2:40	3:10	5:00	5:54	1:09		5:40
Suceava	9:10	9:42	8:43	7:50	7:35	3:53	1:36	6:27	5:40	
	14:48	**13:20**	**13:16**	**8:49**	**7:54**	**21:54**	**6:55**	**9:22**	**12:26**	**12:36**

Data source: Google route planner, 08.25.2020, 11:30-12:00

Bottlenecks on road infrastructure of trans-European relevance are severe factors hindering stronger cohesion across borders. Bottlenecks are especially apparent and concentrated at border crossings. Freight traffic has strong limitations since trucks with an axle load exceeding 7.5 tonnes are allowed to enter only at Uzhhorod – Vyšné Nemecké on the Slovak-Ukrainian, at Záhony –Chop on the Hungarian-Ukrainian, at Halmeu – Diakove/Nevetlenfolu and Siret–Porubne/Terebleche on the Romanian-Ukrainian, furthermore at Tornyosnémeti – Milhosť and Sátoraljaújhely – Slovenské Nové Mesto (and if crossings towards Banskobystrický Region counts, Bánréve – Kráľ) border crossings. The elimination of the identified bottleneck is of great significance in increasing the permeability of borders, and consequently the level of integration across borders.

Figure 40: Road network and border crossing points of the analysed territory



Another aspect of road network concerns safe and preferably separate roads for non-motorized road users. Despite of the fact that cycling can be one of the main possible type of sustainable transport that can also contribute to the decrease of bottlenecks at border crossings, for geographical, social

and attitude reasons cycling is still regarded more as a hobby or sport activity and less so as a valid means of transportation for cross-border commuting workers. However, the future program could also encourage developments in this direction by supporting new or already started initiatives of this kind. At the same time the problematic border crossing process renders also this difficult and experience with current projects shows that such cycling developments in the border area require extra attention and dedication.

2.4.1.2 Railway network

Regarding the TEN-T **railway connections** between Ukraine and Romania as few as two crossings can be mentioned far away from each other, on the two edges of the analysed area. The western one is the branch line between Halmeu and Korolevo, which is a non-electrified line out of operation. Due to the lack of service the railway lines no. 400 (towards Baia Mare and Jibou) and 402 (Satu Mare-Oradea) cannot have connections with Zakarpatska Region. The eastern one is the non-electrified railway line from Lviv across Ivano-Frankivsk and Chernivtsi that creates a direct link at Vadul-Siret– Dornești with the Romanian network. Except for the border section from Dornești and Suceava the Romanian continuation of the line is non-electrified, while from Suceava to Ploiești the main line no. 500 is electrified. On both sides the tracks are part of the TEN-T core network. On the Romanian side the tracks are to be upgraded all directions.

Regarding Hungary and Ukraine, the significance of the Pan-European Corridor V has to be underlined. Also, the Mediterranean Freight Corridor from the Iberian Peninsula (Almería – Valencia / Madrid – Zaragoza / Barcelona – Marseille – Lyon – Turin – Milan – Verona – Padua / Venice – Trieste / Koper – Ljubljana – Budapest – Záhony) ends at the Ukrainian-Hungarian border, located at Záhony – Chop. The countries are connected by the Venice-Trieste / Rijeka-Ljubljana-Maribor-Budapest-Uzhhorod-Lviv-Kiev railway route. In the analysed area the Hungarian section is the electrified double-track line no. 100 Szolnok – Debrecen – Nyíregyháza – Záhony, which creates direct link with Ukraine. On the Ukrainian side the electrified Chop-Bat'ovo-Mukacheve-Lviv main line can be found, which has double track between Chop and Bat'ovo (gauges of 1520 mm and 1435 mm) and a wide gauge (1520 mm) from Bat'ovo. This line is also part of the extended core network.

Regarding Hungary and Slovakia, single-tracked but electrified Miskolc-Hidasnémeti line 90 runs on the Hungarian side, which comprehensive element continues in line no. 169 between Hidasnémeti and Košice. From Košice in the form of line no. 180 (towards Žilina, core) and 188 (towards Prešov, comprehensive section) the line created connection with further destinations too.

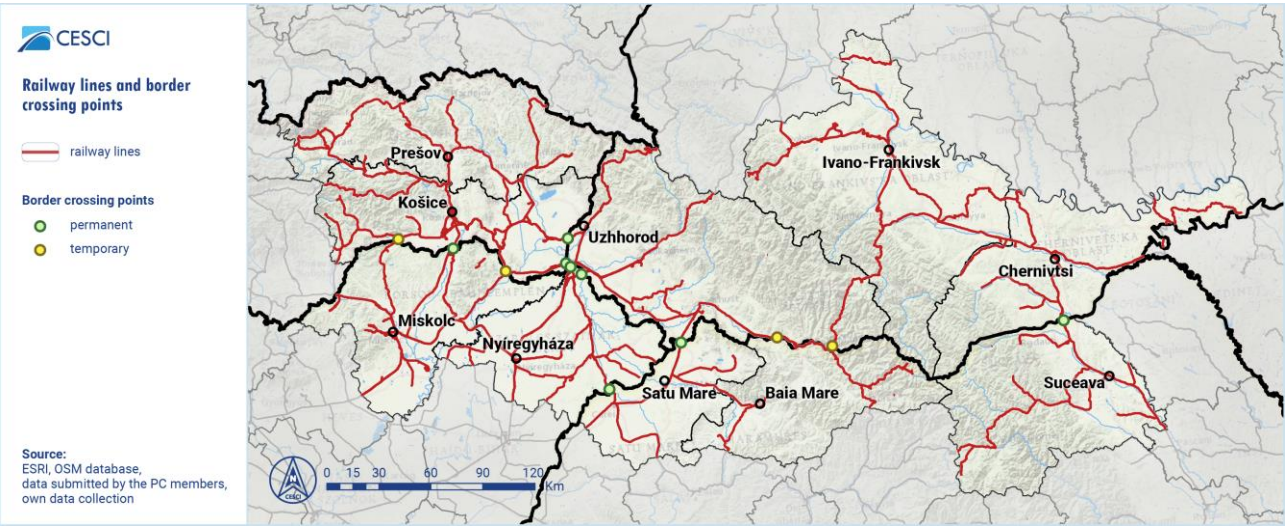
Regarding Slovakia and Ukraine, the wide-gauge, single-track Uzhhorod-Košice railway line, which is of key importance for freight transport and to be upgraded, can be listed. The short Chop – Čierna nad Tisou railway line plays a decisive role in cross-border Slovak-Ukrainian transit traffic, where Čierna nad Tisou is one of the core network border crossings. This section along with the aforementioned line 180 towards Bratislava and Western Europe across Žilina is part of the Rhine – Danube TEN-T corridor.

Considering TEN-T there is no direct connection between Hungary and Romania.

Considering the **railway network** of the analysed area it can be said that despite of a rather dense existing network regarding the regions between Prešov, Košice, Miskolc, Nyíregyháza, Uzhhorod and

Satu Mare the network suffers from many unfavourable parameters. Many lines and sections have been suspended and out of operation for either public or freight transport, or both (e.g. Borşa –Vişeu de Sus, Kazincbarcika–Rudabánya, Trebišov–Vranov nad Topl'ou, Solotvyno–Velykyi Bychkiv). Therefore, even if there are (almost) continuous lines across borders, it does not mean any transport service is carried out using those specific railway tracks. One of the weakest permeability and harmonisation can be found in relation to the former Batiovo–Korolevo–Tiachiv–Solotvyno–Sighetu Marmației–Dilove railway line, which crosses the border twice, and is in a deteriorated condition, and not used for cross-border public transport purposes. In recent years one of the most significant improvements was the opening of the new Beskyd tunnel between Zakarpatska and Ivano-Frankivska Regions, which increases the former capacity from 12 trains per day to 46 along the pan-European corridor between Lviv and Chop station on the border with Slovakia and Hungary. The construction of the second tunnel was started in 2012, and this is the biggest railway project in the country since Ukraine gained independence.[63] Other significant developments with cross-border relevance took place only at some points (e.g. Záhony–Chop–Mukacheve where no axle conversion/bogie replacement is required for passenger trains anymore). However, other bottlenecks and 68nharmonized infrastructures persist including technical differences in gauge parameters (e.g. wide versus normal width between Ukraine and the rest of the cooperation area), electrification (electrified versus non-electrified, or electrified but with differences in AC/DC and kV) and number of tracks. Gauge changes and track switches are of major hindering factors of quick railway transport.

Figure 41: Railway lines and border crossing points of the analysed territory



The **logistical potential of the trinational border region around Záhony, Čierna nad Tisou and Chop** is highlighted by that it is that part of Hungary, Slovakia and Ukraine where the European standard gauge (1435 mm) and the Russian-type wide gauge (1520 mm) track network meet. This shared cross-border logistics zone is of European potential as a railway freight gateway along the Mediterranean TEN-T and Pan-European Corridor V, which creates links between Mediterranean ports and the capital of Ukraine. This is an international transit area for the trade and flow of goods

63 Ivan G. SAVCHUK: Ukraine's window to the West: The role of international railway connection in Transcarpathia (Zakarpattia). In: Hungarian Geographical Bulletin 63 (2) (2014) 159–175. DOI: 10.15201/hungeobull.63.2.3

between Central and Eastern Europe and Central Asia including Slovakia, Hungary, Ukraine and Russia as well. Taking into account rail freight, 55% of all the imported goods on trains from Ukraine are imported across the three related Slovakian-Ukrainian and Hungarian-Ukrainian border stations. The most significant role of the tri-national area is in the loading, sorting, storage, transport and loading of products, especially different bulk products and chemical industry products such as iron ore and other ores, oil products, and fertilizers as well as food. The bulk of foreign trade between Ukraine and the Central European countries is carried out by railway. Cargo dispatched from Ukraine strongly exceeds cargo dispatched from Hungary, Romania and Slovakia towards Ukraine. The existing transfer and trans-shipping capacities are sufficient for further growth of the volumes of commercial freight traffic at the freight stations.[64]

The cross-border zone consists of Záhony transhipment area, the eastern Slovakian transhipment area and the infrastructure in Zakarpatska Region. The Hungarian one is a 84 km^2 land transhipment complex. It includes eight railway stations and related infrastructure in and around Záhony, its rail-road terminal, covering the territory of about 11 settlements. The normal track network of the area is 260 km and the wide track network is 140 km long. Together with the area of Čierna nad Tisou, Maťovce forms the eastern Slovakian transhipment area in the vicinity of the Ukrainian border. It includes 200 km of railway network, 20 transhipment platforms, a number of transhipment facilities and complexes, as well as 88 km of wide-gauge railway tracks connecting Uzhhorod with the rail-road terminal of Košice (Uzhhorod–Maťovce–Haniska pri Košiciach), and Chop with Čierna nad Tisou. On the Ukrainian side the capacities of Chop, Uzhhorod and Batyovo can be highlighted, where railways connect Mukacheve, Chop, Batyovo with the Slovak and Hungarian standard and wide gauge networks. The joint and complementary assets give space to further logistics-industrial cooperation and harmonisation of infrastructure in the light of the European (economic) integration as well.

2.4.1.3 Border crossing points

One of the main obstacles to any type of cross-border cooperation requiring frequent movements and flows across state borders is the unfavourable quantity and quality of **border crossing points**. There are extensive border regions with no or limited number of road or railway crossings. Along the 531 km long Ukrainian-Romanian border there are only 3 road border stations (Halmeu–Diakove/Nevetlenfolu, Sighetu Marmației–Solotvyno, Siret–Porubne/Terebleche).[65] The average distance between these points is as much as 177 km. Out of the four railway connections two of them (Câmpulung la Tisa–Teresva and Valea Vişeului–Dilove) are out of service, the latter one due to serious technical damage caused by the flood of 2006 on the Tisa.

On the 97 km long Slovak-Ukrainian joint border section three road crossings (Vyšné Nemecké–Uzhhorod: passenger and weight traffic; Veľké Slemence-Malyi Selmenci: foot traffic and cyclists; Ubľa–Malyi Bereznyi: passenger traffic and weight traffic with a weight limit of 3,5 t) are established resulting in an average distance of 32.5 km. Two railway connections are deserving cross-border

64 Ivan G. SAVCHUK: Ukraine's window to the West: The role of international railway connection in Transcarpathia (Zakarpattia). In: Hungarian Geographical Bulletin 63 (2) (2014) 159–175. DOI: 10.15201/hungeobull.63.2.3

65 **https://dpsu.gov.ua/en/AT-THE-BORDER-WITH-ROMANIA/**

good transport (at Maťovské Vojkovce-Pavlovo and Čierna nad Tisou-Čop – at the latter one also passenger traffic is allowed).

On the 133 km long Ukrainian-Hungarian border section, a total of 5 existing road crossings (Barabás–Koson', Beregsurány–Luzhanka/Astei, Lónya–Dzinkove/Horonhlab, Tiszabecs–Vilok, Záhony–Chop) follow each other with an average of 27 kilometres, with a relatively balanced territorial distribution and similar capacity. The crossing density of 4 crossing points/100 km can be considered a medium value in Central Europe, so it is not the rarity of border crossings per se, but rather the strict border regime that makes mobility difficult.

On the 92 km long joint border section of Szabolcs-Szatmár-Bereg and Satu-Mare two road crossings are operating, namely Csengersima–Petea and Vállaj–Urziceni. Two other connections have been established (2013: Garbolc–Bercu, 2014: Ömböly–Sanislău) but because of the delay of Romania's accession to the Schengen Zone none of them have been opened to international traffic. There is a single railway crossing operating between Tiborszállás and Carei.

The density of border crossings is outstanding regarding the analysed area when it comes to the Slovakian-Hungarian joint border section between Slovakia and Borsod-Abaúj-Zemplén megye (295 km), or the joint section of Košický Region and Borsod-Abaúj-Zemplén in particular (226 km). The number of paved road crossings is high, 17 of which 15 ensures connection within the analysed area (Bánréve–Lenartovce, Bánréve–Kráľ, Aggtelek–Kečovo/Domica, Tornanádaska–Hosťovce, Hidvégardó–Hosťovce, Büttös–Buzica, Tornyosnémeti–Milhosť speedway connection, Tornyosnémeti–Milhosť public road connection, Abaújvár–Kechnec, Kéked–Trstené pri Hornáde, Hollóháza–Skároš, Sátoraljaújhely–Slovenské Nové Mesto (2 crossings), Karos–Streda nad Bodrogom, Pácin–Strážne, Lácacséke–Pribeník, Zemplénagárd–Veľké Trakany). The average distance between the aforementioned points regarding the joint section of Borsod-Abaúj-Zemplén and Košický Region is 15 km only. This border section is known for significant development in the permeability of the border owing to the opening of new crossings in the past few years (2013: Kéked–Trstené pri Hornáde, 2015: Abaújvár–Kechnec, 2016: Hollóháza–Skároš, 2018: Tornyosnémeti–Milhosť speedway connection). Concerning railway connections, despite of the existence of the Bánréve–Lenartovce (on which cross-border transport was suspended in 2009), Tornanádaska–Turňa nad Bodvou, Sátoraljaújhely–Slovensé Nové Mesto crossing points, passenger traffic is suspended on each of them. There are also technical parameters that harden the cross-border traffic: apart from a nearly one kilometre long section of missing electricity overhead line at the Sátoraljaújhely crossing, it is possible to cross the border only with diesel engines due to the difference between the voltage system of Hungary (25 kV AC) and Slovakia (3 kV DC).

Along with the already operating ones it is worth mentioning the **planned crossings**. The largest number of new crossings is planned in relation to the Hungarian-Slovak (Ózd-Susa–Janice, Alsóregmec-Čerhov, Felsőregmec–Michal'any, Dámóc–Biel, Gömörszőlős–Neporadza, Hidasnémeti–Perín, Hídvégardó–Chorváty, Nagyrozvágy–Vel'ký Horeš, Pácin–Strážne) as well as the Hungarian-Ukrainian border (Záhony–Chop, Tiszakóród–Vary, Beregsurány–Astei, Tiszaszentmárton–Solovka, Beregdaróc–Dyida, Magosliget–Tysobyken, Szatmárcseke–Badalovo, Kispalád–Velika Palad,

Beregdaróc–Berehove, Uszka–Tysobyken). Feasibility studies and action plan have also been elaborated to support the final designation and construction of new points.[66]

There are border crossings which are long awaited such as the border crossing on the Hungarian-Ukrainian border at Nagyhódos–Velika Palad. The infrastructure, including the border guard building, is completed on the Hungarian side, but due to administrative and infrastructural delay this is not the case on the Ukrainian side making the crossing dysfunctional since 2016. The opening of the border crossing around Chop, Ukraine and Čierna nad Tisou, Slovakia is designed since 2010. On this border two crossings are to be built (Čierna nad Tisou–Solomonovo, Ulič–Zabrid).

The set-up of new crossings is planned especially along the Tisa and the mountainous landscapes cut by the joint state border between Romania and Ukraine. At those Carpathian landscapes also several development ideas appeared. Regarding the Ukrainian and Romanian joint border, new checkpoints are in the process of opening in the short or medium term, namely Krasnoilsk–Vicovu de Sus between Chernivetska Region and Suceava County, Dyakivtsi–Racovăț between Chernivetska Region and Botoșani County, while others are under construction, namely Bila Tserkva–Sighetu Marmației between Zakarpatska Region and Maramureș County, Shepit– Izvoarele Sucevei and Bila Krynytsya–Climăuți between Chernivetska Region and Suceava County.[67]

One of the biggest investments promoted by Maramureș County is a new border crossing point between Sighetu Marmației and Bila Tserkva with a road bridge across the River Tisa designed for freight traffic with 4 lanes per direction. Further need is to restore the bridge between the villages of Khmeliv, Ukraine and Valea Vișeului, Romania. Furthermore, Ivano-Frankivsk Region would support the creation of a crossing across the mountainous areas at Sibene–Poienile de sub Munte. The connection between Verkhovyna and Băile Borșa is supported by the Zakarpatska Region.

There is a need for pedestrian crossings to be authorised at existing border stations and also to create dedicated cross-border pathways to support regional tourism purposes in mountainous areas in particular. Such development needs are articulated especially between Ukraine and Romania (since e.g. at Sighetu every third person crossing the border is a pedestrian).

Traffic at the border section between Hungary and Ukraine significantly grew in the analysed decade, including both passenger and vehicle transport. Passenger traffic to Hungary increased from 2 089 147 to 3 951 233 by 189%, while to Ukraine from 1 757 719 to 3 787 626 by 215%. The number

66 KÖZOP-hoz illeszkedő projektek határmetszési szakaszainak megvalósíthatósági tanulmány szintű feltárása, azok hálózati hatásainak vizsgálata a magyar-ukrán határszakaszon. Átfogó megvalósíthatósági tanulmány és Cselekvési terv. KÖZOP-hoz illeszkedő projektek határmetszési szakaszainak megvalósíthatósági tanulmány szintű feltárása, azok hálózati hatásainak vizsgálata a magyar-szlovák határszakaszon. CESCI (2015): Functional analysis and evaluation of the cross-border road infrastructure development planned in the Hungarian-Slovak border region.

67 Olga Brusylovska, Iryna Maksymenko (2019): In: Old Borders - New Challenges, New Borders - Old Challenges: De-bordering and Re-bordering in Contemporary Europe (Thematicon). Logos Verlag Berlin. pp. 45-74.
https://books.google.hu/books?id=rnGrDwAAQBAJ&pg=PA62&lpg=PA62&dq=new+bridge+sighetu+marmatiei+bila+tserkva&source=bl&ots=sd0BBT4z4T&sig=ACfU3U29-Z4ZAID1rADrpN45kgSrA60blg&hl=hu&sa=X&ved=2ahUKEwjOrYCU8JrrAhVHxosKHVKZAV0Q6AEwCnoECAoQAQ#v=onepage&q=new%20bridge%20sighetu%20marmatiei%20bila%20tserkva&f=false

of vehicles in total also increased from 2 056 115 to 2 306 005 by 12%. The most frequently used border station is at Záhony in terms of road and rail traffic too. Other station worth highlighting is the Beregsurány road crossing. The Záhony crossings are of transnational relevance with their outstanding flows of people and goods.

Table 7: Traffic volumes at the border stations between Hungary and Ukraine

		Passenger				Vehicles	
		To Hungary		To Ukraine		all	
Border station	**Type**	**2008**	**2018**	**2008**	**2018**	**2008**	**2018**
Eperjeske	rail	6 795	5 732	6 688	5 661	164 814	121 597
Záhony	road	865 402	1 319 736	679 660	1 403 267	914 333	899 692
Záhony	rail	80 274	128 829	71 101	107 113	47 079	25 622
Barabás	road	166 374	308 073	150 045	260 854	131 429	156 141
Beregsurány	road	522 619	1 083 953	457 227	1 034 479	418 988	628 274
Lónya	road	49 082	126 875	36 433	66 703	39 844	72 431
Tiszabecs	road	398 601	978 035	356 565	909 549	339 628	402 248

Passenger traffic at the Ukraine- Romania border was between 1 176 848 and 1 324 079 persons in the years of 2008 and 2018. The inward and outward passenger traffic decreased to 90-91% of 2008 during the analysed decade. The decrease of vehicles crossing the border was 2%, from 683 470 to 674 142. The traffic around the crossing of (Vadul) Siret road and railway crossings exceeds all related crossing within the analysed area. From Ukraine to Romania the freight traffic calculated in vehicles increased by 215% from 29 261 to 62 970, and from Romania to Ukraine from 39 236 to 75 711, by 193% at the Siret–Prubne road border station. Based on information received following individual data request from the General Inspectorate of Border Police in Romania, the Siret road border station receives the highest traffic by far, followed by Sighetu Marmației, while Halmeu road station is a less frequently used one.

Table 8: Traffic volumes at the Romanian border crossings

	Persons (all)		Vehicles (all)	
Border station	14-15 August 2019	14-15 August 2020	14-15 August 2019	14-15 August 2020
Halmeu	3000	3800	1500	800
Sighetu Marmației	6700	600	1300	170
Siret	22000	8000	5400	2500

Source: Inspectoratul General al Poliției de Frontieră (the General Inspectorate of Border Police, Romania)

Considering the Slovak-Hungarian section the most frequently used crossings are by far the Tornyosnémeti–Milhosť speedway (average daily traffic was 4752 vehicles in 2018) and main road (3119 vehicles) connections. Other main crossings include Sátoraljaújhely–Slovenské Nové Mesto

(1942 vehicles) and Bánréve–Kráľ (1258 vehicles). Large number of crossings can be considered less frequently used also owing to their capacity (e.g. no freight traffic over 3.5 tonnes is permitted) and location (e.g. rural areas). Such examples can be found in relation to the Slovak-Hungarian border, e.g. in relation to Büttös–Buzica (an average number of 412 vehicles a day in 2018), Hídvégardó–Hosťovce (374), Pácin–Veľký Kamenec (348), Hollóháza–Skároš (323), Aggtelek–Kečovo (303), Kéked–Trstené pri Hornáde (223), or Zemplénagárd–Veľké Trakany (140).

Regarding the Hungarian-Romanian border crossings the Csengersima–Petea road crossing represents the largest traffic volumes. The passenger numbers towards Hungary increased by 290% from 744 879 to 2 163 398, while the vehicle numbers increased by 268% from 644 295 to 1 724 357 comparing annual data of 2008 and 2018. The Vállaj–Urziceni road crossing is much less important (438 490 passengers and 310 726 vehicles in 2018). The railway crossing within the analysed area was stagnating, and was of less importance compared to road traffic (1 395 in 2008, 1 460 vehicles in 2018, both directions, and 1 657 passengers to Hungary , 1 666 passengers to Romania in 2018).

Based on the previously shown data on growing mobility needs in the form of increasing number of persons and vehicles crossing the international borders, cross-border flow of people, goods, services and labour should be eased. Owing to the often strict border regimes, the limited capacity of border crossing infrastructure, the international traffic tend to concentrate on few points causing congestions at crossings with severe bottlenecks especially. The capacity of existing crossings and related transport infrastructure across borders need to be developed in order to create faster crossings. This is especially true in the case of border stations, roads and railways of transnational importance such as along TEN-T corridors.

Apart from the number and territorial distribution of border crossing points, the **border regime** is similarly relevant including control rules and procedures. The border regime and its characteristics greatly contribute to the highly closed nature of the border, negatively affecting many areas of socio-economic life. Ukraine is not a Member State of either the Schengen Area or the European Union, which causes fundamental difficulties in cross-border mobility. It is also problematic that Romania has not yet entered the Schengen Zone causing permeability problems at its borders with Hungary (e.g. border infrastructure with predefined technical background and paid officer staff is needed at all crossing points).

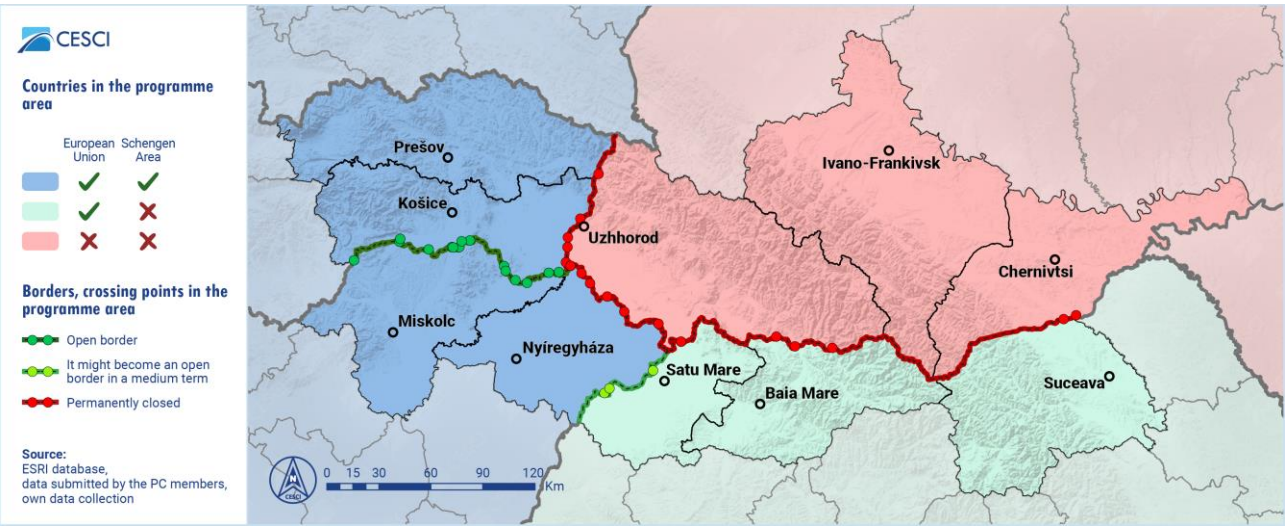
As the Ukrainian border is an external border of the EU, it is subject to the Schengen Agreement and the Schengen Borders Code. It means that in contrast to internal borders, the movement of Ukrainian citizens is obviously much more limited than the EU citizens', border crossing is allowed only at official border crossing stations, during the specified opening hours, and the green border is considered closed. During the recent years, three improvements have been made facilitating cross-border mobility: the Association Agreement with Ukraine[68], the introduction of small border traffic regimes (e.g. since 2007 between (Hungary and Ukraine), and the visa-free travel for Ukrainian nationals approved by the EU in May 2017.

[68] Association Agreement with Ukraine: **https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=LEGISSUM:280101_1**

The movement of Ukrainian citizens is surveyed via the second generation of the Schengen Information System (SIS II) and by 2022 onwards it will be controlled via the Entry/Exit System (EES)[69] and the European Travel Information and Authorisation System (ETIAS). The above systems of so-called Smart Borders policy are managed by the European Agency for the operational management of large-scale IT-systems in the area of freedom, security and justice (eu-LISA).

Joint actions made by the EU member states' border control authorities are coordinated based on the Stockholm Programme adopted in 2010 which promotes police, justice, border control and civic protection cooperation as well as collaboration in the field of cross-border crime such as human trafficking, sexual exploitation of children and child pornography, cyber crime, economic crime and corruption, drugs and terrorism.

Figure 42: Types of border crossing points in the analysed territory



Based on some Hungarian and Slovak stakeholders' opinion the number of border crossings is less of a problem than the permeability of the Ukrainian border. The key problem in relation to the border sections of Ukraine is often the weak interoperability and the long waiting times which can be up to even several hours especially with regard to entering to an EU country for trucks. The long waiting times are major obstacles to any kind of cross-border flows, and harden all types of cross-border cooperation that would require frequent and quick personal interactions (such as just-in-time logistics systems, value chains of perishable products, visiting cultural events etc.). Cross-border commuters, both in terms of employment and education, have to face the same problems. Daily migration has become largely impossible due to increased congestion and long control mechanisms.

69 The EES will be installed at the external border crossing points of the Schengen Area in the near future (the first operation of the EES is expected from 2022). The (EES) will be an automated IT system for registering travellers from third-countries, both short-stay visa holders and visa-exempt travellers, each time they cross an EU external border. EES will replace the current system of manual stamping of passports, which is time-consuming, does not provide reliable data on border crossings and does not allow a systematic detection of over-stayers. The Entry/Exit System will modernise external border management by improving the quality and efficiency of controls as well as the detection of document and identity fraud. The financial sources for the instalment of the EES are provided; however, there are some additional development needs (e.g. development of service facilities, car parks, truck terminals), which could be financed by the next cooperation programme.

In practice if someone intend to use a service on the other side (e.g. studying, going to the doctor) or work abroad, they have to wake up around 3-4 a.m. and are expected to return at the end of the day, around 8-9 p.m. What is more, there is no differentiation between the categories of entrants and by the reason for travel.

Consequently, the deficient operation of the existing crossings needs to be improved. It means that increasing the number of crossings at the external borders is not sufficient. The development of the capacity of existing border crossings should also be supported. The number of (green, EU citizen, small border traffic) lanes toward the territory of the EU in particular is very low (1 to 2). Thus, comprehensive cooperation and development are required in the field of bringing ministries and regional stakeholders together to mitigate congestions and support capacity increase, improving technical conditions, sharing know-how and training border guards and custom officers, unifying and simplifying the systems of customs and border control.

In addition, one of the most relevant fields of cooperation in the field of border management is that of organised crime having different aspects. In general, where a border is closed, the emergence of illegal migration and smuggling is inevitable. Unlike the internal EU borders, the external ones are prominent places of law enforcement against foreigners.

Right after the system transformation within the post-communist countries, networks supporting and operating **illegal migration** started developing. This phenomenon represents a major problem in itself but it has further negative effects. On the one hand, illegal migrants cannot be fully integrated in the job market due to the lack of official documents. Consequently, the share of people making their living from illegal activities is high among them. At the beginning of the 2000s the number of Ukrainian citizens employed in Hungary in the black market was estimated equal with those legally employed (around 10 thousand people). On the other hand, based on the highly organised networks, serious crimes appear related to human trafficking across the border, like (child) prostitution and drug trade. Since the second half of the 1990s, these activities have been coordinated in Central Europe mainly by Russian and Ukrainian groups[70]. While in general, the Central European EU member states are not destination but transit countries of illegal migration, they are much more active players in cross-border prostitution activities.

Smuggling is typical implication of closed and strictly guarder borders. Per definitionem, smugglers are those people who hides goods extending the allowed quantity to transport or makes an invalid announcement thereon. At the beginning of the 1990s, cross-border individual trade had a great wave: people exchanged goods across the border. These activities was banned from the second half of the decade due to the stricter customs rules taking effect, Since then the volume of contraband goods has been increasing. In the 1990s petrol was the main good, more recently, especially tobacco plays a definitive role. In 2019 in Romania, 65% of total quantity of smuggled cigarettes were

[70] Between 2007 and 2009, one quarter of the cases of human trafficking was carried out by Ukrainian citizens. See: Imre, G. (2013) *A Kárpátalján eszközölt magyar tőkebefektetések sajátosságai a magyar-ukrán határtérség társadalmi-gazdasági folyamatainak tükrében*. Doktori értekezés. Széchenyi István Egyetem Regionális és Gazdaságtudományi Doktori Iskola, Győr, 147.

confiscated in the northern regions of the country.[71] According to the data of the State Border Guard Service of Ukraine, between May 2019 and April 2020, the biggest quantity of contraband cigarettes were seized along the Romanian border (1.5 million packs). 315 thousand packs were confiscated along the Hungarian border while the Slovak border is not indicated in the list[72]. In Slovakia, "there is no free, publicly available database containing criminological information regarding illicit trade in tobacco products." However, in 2014, the total volume of smuggled cigarettes seized by the Slovak authorities amounted to 19,481,493.[73] It has to be highlighted that the major destination countries of tobacco smuggling are not the three EU member states of the programme area but France, the UK, Poland and Germany[74]. Accordingly, the Ukrainian criminals need the assistance of their Slovak, Hungarian and Romanian counterparts to deliver the goods.

Further goods which are frequently confiscated along the Ukrainian border are: alcohol, gold, jewels, amber, clothing, underwear, cosmetics, footwear. The quantity of smuggled weapons, stolen cars, pyrotechnic materials and drug should not be forgotten from the list.[75]

Illegal trade has further effects on the border regime. E.g. the authorities had to close the Sighetu Marmaţiei–Câmpulung la Tisa–Teresva railway connection and passenger traffic due to the uncontrollable smuggling. Similarly, the phenomenon results in stricter and long-lasting controlling measures which hinders legally allowed forms of cooperation and cross-border mobility.

Smugglers are using very "innovative" solutions for bringing the goods to the goal which requires preparedness and close cooperation of the customs and police authorities of the four countries. Cooperation activities can include: exchange of information and experiences; disposition of joint measures and development of joint capacities of surveillance and control; implementation of integrated actions.

Similarly, tackling uncertain situation caused by the COVID-19 pandemic requires stronger cooperation between states and their authorities. In the upcoming years the permeability of borders will heavily depend on how the different measures are harmonised and put into practice. Topics such as self-isolation or official quarantine, mandatory medical examination at the border, closure and opening of border stations, travel restrictions will heavily define the future of cooperation and the cohesion of the analysed area.

71 Over 4.4 million packages of smuggled cigarettes seized by border guards in 11 months of 2019: **https://www.politiadefrontiera.ro/en/main/i-over-44-million-packages-of-smuggled-cigarettes-seized-by-border-guards-in-11-months-of-2019----7538.html**

72 **https://dpsu.gov.ua/upload/news/news_20200505_092803_1588660083.jpeg**

73 Klimek, L. (2021): Prevention and Repression of Illicit Trade in Tobacco Products: Experience of Slovakia. In Nowak, C. (2021) (ed.) *Combatting Illicit Trade on the EU Border. A Comparative Perspective.* Springer: Cham, 253-273, p. 267.

74 KPMG (2020): *Illicit cigarette consumption in teh EU, UK, Norway and Switzerland.* 2019 results.KPMG LLP.

75 See the annual reports of the Romanian Border Police: **https://www.politiadefrontiera.ro**

2.4.1.4 Public transport

Cross-border **public transport** is weakly developed in the analysed region. A single such direct connections are operating between Ukraine and Romania (Dorneşti/Vicşani –Vadul Siret) despite of three existing and a potential crossing point for public transport vehicles. Until 2007, a pair of local border trains ran between Teresva and Sighetu Marmației across Câmpulung la Tisa three times a week, but this ceased after the opening of the Tisa bridge at Sighetu Marmației-Solotvyno for international traffic after its reconstruction for single-lane road traffic in 2001-2002. The railway bridge was used for daily border crossing for commercial purposes. It involved the sale of coffee, cigarettes and food from Ukraine into Romania and porcelain, glassware and industrial products from Romania into Ukraine. The same bridge was also used for cultural exchanges, visiting relatives and student migration purposes for people who want to learn in their mother tongue.[76] The former strong seasonal labour migration depending on agricultural and weather conditions across the shared Ukrainian-Romanian Maramuresh region has decreased greatly.

There is also a single border crossing with cross-border passenger service, between Záhony and Chop in the whole Ukrainian-Hungarian border section. The Hungarian State Railways opened a direct connection between Mukachevo and Budapest in 2018. One of the technical conditions for this was that the Ukrainian railway company should make the standard gauge wing line branching towards Mukacheve suitable for the scheduled transport of Hungarian locomotives and wagons. This allows trains to run without axle retrofitting, thus the waiting time at the border reduced to almost zero.[77] The Latorca IC trains operate twice a day each direction with a travelling time of 7 hours. Within the analysed area it has stops in Nyíregyháza, Kisvárda, Záhony and Chop. Hortobágy EuroCity trains were extended in 2017 with direct sleeping wagons from Záhony towards Kiev, Ukraine, from Vienna across Budapest, Nyíregyháza, Záhony, Chop and Mukacheve. In addition, a local border traffic train operates 7-8 times a day each direction between Záhony and Mukacheve with a stop in Chop.[78] Presumably, the express train functions in part as a commuting train, and those arriving from Ukraine arrive in Záhony in the morning or in the afternoon shift and return home to Zakarpatska Region according to the work schedule. Based on a study, together with the former Tisza IC trains, 49% of those traveling on the IC and the local train are active workers. In addition to employment, student migration (16% of passengers are students) on the fixed-track means of transport is also worth mentioning, but it is very far behind the reasons for travel (3%). Overall, however, the railway is mainly used for long-distance tourism and visiting friends and relatives (59%), followed by personal administration (12%) and shopping (11%).[79]

Zakarpatski Region, Mukacheve in particular improved its international connections towards Slovakia, Hungary and the Czech Republic. In relation to Slovakia and Ukraine on the European-gauge railway between Košice and Mukacheve passenger service was launched by the Slovak

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76 Nicolae Boar: Changes in the human migration patterns in the Maramures region (Romania - Ukraine). In: Belgian Journal of Geography. 1-2/ 2005. p. 185-198. Source: **https://journals.openedition.org/belgeo/12492**

77 **https://www.mavcsoport.hu/mav-start/nemzetkozi-utazas/vasarnap-reggel-elindult-elso-budapest-munkacs-kozvetlen-jarat**

78 **https://www.mavcsoport.hu/sites/default/files/upload/page/mnr_nemzetkozi-2020_teljes_6_0.pdf**

79 Záhony (HU) – Chop (Csap) (UA) határátkelőhely rész-megvalósíthatósági tanulmánya

operator in 2019 with stops in Čierna nad Tisou and Chop on the way. The service is provided twice a day in each direction with 4 hours of travelling time. In addition, there are trains that run only between Čierna nad Tisou and Chop. Czech open-access rail operators Leo Express and RegioJet provide bus service between Mukachevo and Košice with a stop in Uzhhorod to link Zakarpatska Region with their trains to Prague via Košice, usually once a day.[80]

Currently, the only border crossing where international trains between Romania and Ukraine run is situated at Suceava (Dorneşti)–Vadul Siret. There are two services offered; one of which runs on a daily basis from Bucharest to Vadul Siret, while the other serve between Bucharest and Kiyev once a week. At Vadul Siret gauge changing facilities are operating to reach Chernivtsi for example.

Across the joint border of Szabolcs-Szatmár-Bereg and Satu-Mare Counties the local border traffic is carried out by two trains a day each direction between Mátészalka and Carei.

On the Hungarian-Slovakian border despite of having numerous existing and potential railway crossings, cross-border passenger transport is limited to a single point, namely to Hidasnémeti–Kechnec. The crossing is characterised by the daily passenger trains of Rákóczi IC and Hernád/Hornád IC, both having the same route from Budapest to Košice with stops in Miskolc and Hidasnémeti in the joint border area. Almost every second passenger (46%) is an employed person. The purpose of travel from Miskolc to Košice includes returning to home (48%), visiting (22%), leisure (13%), personal affairs (11%), working (5%) and shopping (1%). In the other direction leisure has higher share (33%) compared to the opposite direction, while returning home (38%) visiting (11%) has lower share, furthermore shopping and personal affairs are not among the reasons. Student migration and health care (both with 2%) appears among the main reasons for travel along with business affairs (4%). Cross-border labour migration is also relevant since 10% of the passengers cross the border by train in order to work abroad.

Bus service has been operating between Košice and Hidasnémeti since October 2019. The public transport service, which has stops in Hidasnémeti, Tornyosnémeti from Hungary and Haniska, Belža, Seňa, Kechnec and Milhosť from Slovakia, mainly used by Slovakian citizens who had immigrated to Hidasnémeti as a suburbanisation of Košice requested to launch. The line serves the needs of cross-border labour migration.

To conclude, the current public transport services are rather uncoordinated on the level of the related four countries involved. The services, either bus or train, are generally creating connections between two countries only. More international services are needed which would connect at least three countries, while multimodality and real-time passenger information apart from the required infrastructural developments would also be provided and guaranteed based on real mobility needs.

2.4.2 Functional areas

One of the most adequate functional areas is the transport network of international relevance. These are either core or comprehensive elements of the pan-European and TEN-T corridors crossing the analysed area, which create direct links between at least three of the four related countries. The

80 **https://www.railtech.com/policy/2019/06/10/slovakia-launches-new-train-to-ukraine/?gdpr=accept**

developments centred on the creation of better east-west relations linking Ukraine and Central Asia with Western Europe across the four countries can create new impetus for forming functional areas in the frames of EU integration. The most apparent place for capitalising from such flows is the transhipment-logistics zone around Čierna nad Tisou, Chop and Záhony. The identification and elimination of bottlenecks, better coordination of management and development of such infrastructure of large traffic is of great importance. Strong interconnections, with regard to intermodality and interoperability, could be created including the transport axes and services within the area defined by the nodes of Miskolc, Košice, Uzhhorod, Mukacheve, Satu Mare and Nyíregyháza in particular.

Other types of functional areas can be outlined in relation to border crossing points. The spatial distribution, number, capacity, technical parameters and personnel define the status of and potentials to all types of cross-border cooperation to a large extent. The permeability of crossings affects the functional relations including health care, education, labour market etc. Thus, transport infrastructure and services via such crossing points are crucial for creating well-functioning cross-border hinterlands, and supporting cross-border mobility (for instance labour and student migration, tourism, business travels).

Special types of functional areas can be identified in relation to areas with weak transport accessibility (e.g. along the joint section of the river Tisa on the Ukrainian-Romanian border, or in mountainous areas of the Carpathians). These areas are often situated on the periphery along state borders, and characterised by unfavourable transport network, low number of border crossings, weak economic performance. Such areas are often also rural areas lacking urban functions largely because of weak permeability of borders and dysfunctional cross-border transport infrastructure and service provision.

2.4.3 Opinions

The priority meet the territorial needs of the border area given the relatively high average (3.45) based on the stakeholder opinions. However, this value is the lowest considering the opinions given in relation to the other Pos and Tos. It also has to be noted there are slight differences in opinions if favour of the other objectives and topics. Compared to the second least preferred the gap is only 0.01, while compared to the most supported one the difference is 0.18.

Taking a closer look at the opinions per country, it can be stated that the average of the opinions are under average in the case of Slovakia (3.33) and Hungary (3.34), while stakeholders from Ukraine (3.48) and Romania (3.69) especially perceive that this objective largely meet the territorial needs. In addition, the value for Romanian answers is the highest regarding all topics and country answers, thus for Romanian stakeholders this objective is of outstanding relevance.

According to the results of the survey only a single person (0.5% of all opinions) disagreed about the content of the short analysis that had been given about the topic. Only 7.5% thought transport is either not a priority or the given person do not know what to answer. Without any further comments 36.6% of all answers express agreement upon the discussed situation analysis.

Based on the majority of opinions (29.6%), people are most preoccupied with thoughts related to border crossings, their quantity and quality-related characteristics. There are two types of answers:

1. The ones grouped around the number of (and the lack of) border crossings (14.5% of all related answers); 2. The others grouped around border control, capacity and waiting times (15.1%). Including answers having a clear opinion on certain subtopics exclusively, the share of crossings reach as high as 53.4% of the related answers (thus disagreeing answers, answers with no further comments or explanations are excluded this way). Apart from these public roads and their quality measures can also be considered as an important and frequent topic (10.2%). Other topics worth mentioning are related to railway transport (public railway transport: 7%; rail freight traffic: 1.1%), coordination of transport developments, network development (5.9%), and at last but not least bicycle traffic (1.6%).

2.4.4 Project ideas

A total number of 14 project ideas were formulated in the frames of TO7-PO1. The most supported topics include logistics, cross-border transport system and network development, sustainable mobility as well as increasing the number and permeability of border crossings. With less intensity railway infrastructure, pedestrian safety, and aviation is also mentioned. In addition, studies on current cross-border migration and transport needs are also advised by the potential project partners.

Regarding border crossing points construction of new ones, the training of customs and police officers, sharing of border control know-how, road and bicycle infrastructure developments to and from the crossing points, introduction of automatic weight control systems to reduce congestions caused by freight carrier vehicles, logistics developments, purchase of up-to-date technologies and equipment to speed up border control procedures are named as required activities. The density of crossings, the interconnectedness of bordering regions, and the border management schemes should be improved. In the field of logistics, ideas are centred on cross-border and transnationally harmonised capacities, e.g. joint creation of (multimodal) logistics centres. In relation to cross-border transport and network development different preparatory and construction documents would be supported such as support for feasibility study, strategic environmental assessment, and construction plan. Apart from these modern information databases and analytical tools, geoinformation systems for road management are advised by regional stakeholders. Furthermore, as part of sustainable mobility e-mobility solutions can be found among the project ideas, which cover charging stations and the unification of the distinct charging and payment systems, intelligent parking as well as railway transport with regard to modernisation of wagons and gauge change.

2.5 PO4 Social / TO8-P2 Health

Related thematic field based on the current programme: Thematic Objective 8: Common challenges in the field of safety and security – Priority 2: Support to the development of health

Expected results in the current programme: joint prevention programmes, improved healthcare infrastructure and cross border institutional co-operations are foreseen to improve health conditions of citizens and reduce the risk of human epidemiology hazards crossing the border. Result indicator: Medical equipment density (total density per million population, simple average of all measured equipment types in the four countries – HU, SK, RO, UA)

Short summary of the topic: The situation of the healthcare in the programme area causes a concern at a different level, which cannot be fully addressed by the programme, but progress can be made in some sub-areas. Cardiovascular diseases are among the leading causes of death in each region, so the need for cooperation in this area is the most clear. There are a number of legal-administrative obstacles to the joint organization of healthcare, cross-border patient care and emergency rescue, which need to be resolved and need international agreements, bilateral or multilateral agreements in many cases. This is especially true for the non-EU member Ukraine. The programme can help identify barriers, build partnerships for care organization, develop prevention activities, and develop health-related social programs (e.g. elderly care, health promotion campaigns) with the involvement of the local population.

2.5.1 Statistical and data-based analysis

According to the Inception Report, the success of cross-border cooperation is fundamentally determined by how local actors are involved in its implementation and how that changes the narrative which might once have been unfavourable. With a view to describing issues connected to social cohesion of a border area, health related issues and healthcare cooperation deserves special attention as the perseverance of good health as well as the efficient treatment of the diseases is vital for maintaining a well-functioning society in the border region. This is why cross-border healthcare cooperation is essential through the exchange of knowledge, joint trainings, publishing bilingual dictionaries, investments in telemedicine etc. But in order to create cooperation, first it is important to see what the current situation is concerning the programme area.

2.5.1.1 Mortality and natality rates

The mortality and natality rates have been analysed for every region of the programme area between 2013 and 2018. From these indicators the natural increase or decrease of the population has been calculated. Based on this, six regions have had a natural decrease continuously since 2014, meaning that more people deceased than were born. In these regions for the most recent year for which comparable data is available (2018) the rate of population decrease shows differences; the highest being in Ivano-Frankivsk (-3.51), Borsod-Abaúj-Zemplén (-3.00), Chernivtsi (-2.83), Satu Mare (-2.32), Szabolcs-Szatmár-Bereg (-1.96) and Maramureș (-1.58).

In Zakarpattia a significant change was observable during the past years since between 2013 and 2016 the rate was positive and the natural population growth gradually decreased from +2.94 to

+0.48, and then in 2017 tipped over to population decrease, reaching a -1.15 rate by 2018. Suceava, on the other hand had a somewhat inverse process, its rate was below 0 in 2013 and 2015, but managed to stay on the positive side until 2018 (albeit the natural population growth rate is only 0.51 which puts the county into a precarious situation).

Both Slovakian regions affected by the programme territory have positive and high natural population growth rates. In 2018 Košice county had a 2.07 rate and Prešov an even higher 3.22 rate. Even though there are some fluctuations (and also consecutive a decrease in Prešov) it still seems like the natural population rate will not turn into decrease in these regions.

2.5.1.2 Life expectancy at birth

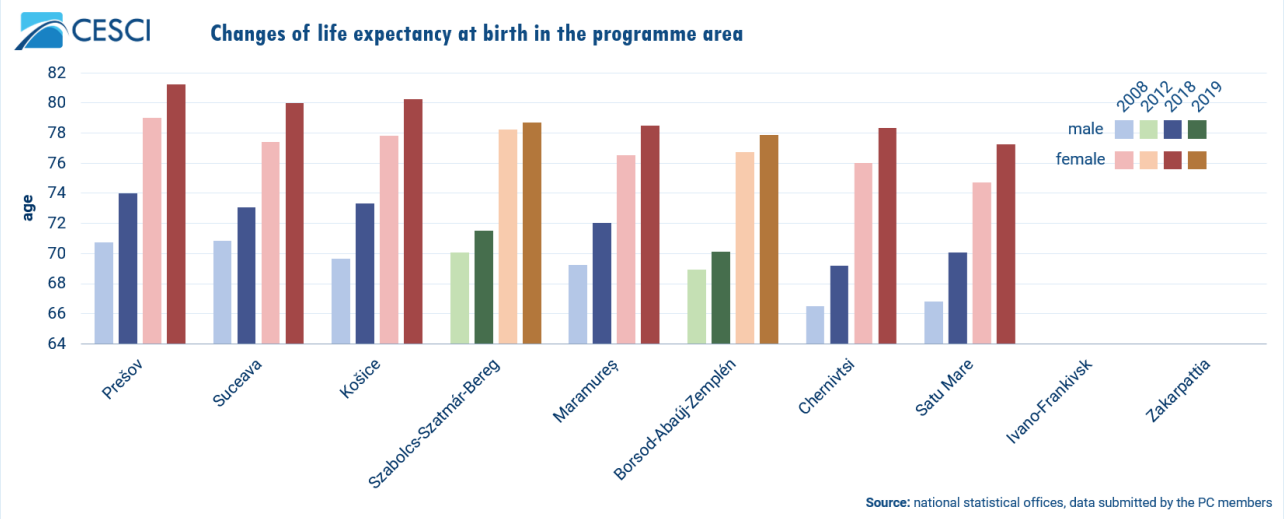
Looking at the aggregated data[81] of life expectancy at birth in Europe it shows that the affected countries by the programme largely fall into the same categories (between 75.3 and 77.4) which is lower than the Western (around 81), Northern (between 81.8 and 82.8) and Southern European (between 78.9 and 83.5) averages.

Zooming closer to the programme territory the data[82] shows that even though these regions bear similar characteristics when it comes to life expectancy at birth, still there are important regional differences. The male life expectancy is the lowest in Chernivtsi, the only region of the program where it stays below 70, then follows Satu Mare (70), Borsod-Abaúj-Zemplén (70.1) and Szabolcs-Szatmár-Bereg (71.5). The highest is in Prešov (73.9) and Košice (73.3). The tendency on the higher end of the scale is similar for females, in Prešov (81.2) it is the highest, followed by Košice (80.2), whereas the shortest lives of females are expected in Satu Mare (77.2), Borsod-Abaúj-Zemplén (77.8) and Chernivtsi (78.3).

81 Source: Eurostat. (2018). Life expectancy at birth by sex. online data code: SDG_03_10. **https://ec.europa.eu/eurostat/databrowser/view/sdg_03_10/default/map?lang=en**

82 Sources:
- Hungary: Hungarian Central Statistical Office: Life expectancy at birth, average age. 2012, 2019. **http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_wdsd008.html**
- Romania: National Institute of Statistics, TEMPO - POP217A - Life expectancy by urban, rural area, sex, macroregions, development regions and counties. 2008, 2018. **http://statistici.insse.ro/shop/?page=tempo2&lang=en&context=11**
- Slovakia: Data provided by the counties.
- Ukraine: Data provided by the counties.

Figure 43: Life expectancy at birth in the programme area



The data also complies with general global trends, namely that in every region for both sexes the life expectancy at birth grew in the past ten years. However, the rate of this growth is different according to the genders and geographical locations. Albeit women tend to live longer than men, the growth of their life expectancy is more modest (on average 1.96 years) than it was for men (on average the life expectancy for men grew from 2008 to 2018 with 2.56 in the programme territory). The biggest growth for males has been registered in Košice region (3.64 years) and the lowest in Borsod-Abaúj-Zemplén county (1.16 year). For women, the biggest growth was registered in Suceava where from 77.3 the life expectancy increased to 80 years. In the case of Szabolcs-Szatmár-Bereg county this increase was the lowest, not reaching 1 year.

2.5.1.3 Distribution of deaths by major death causes

The observation of the leading causes of death is always important when assessing the health level of a society as it not only shows the biggest threats and dangers that should be immediately tackled but also allows to draw more general conclusions about the people's lifestyles, challenges and problems which again calls for attention.

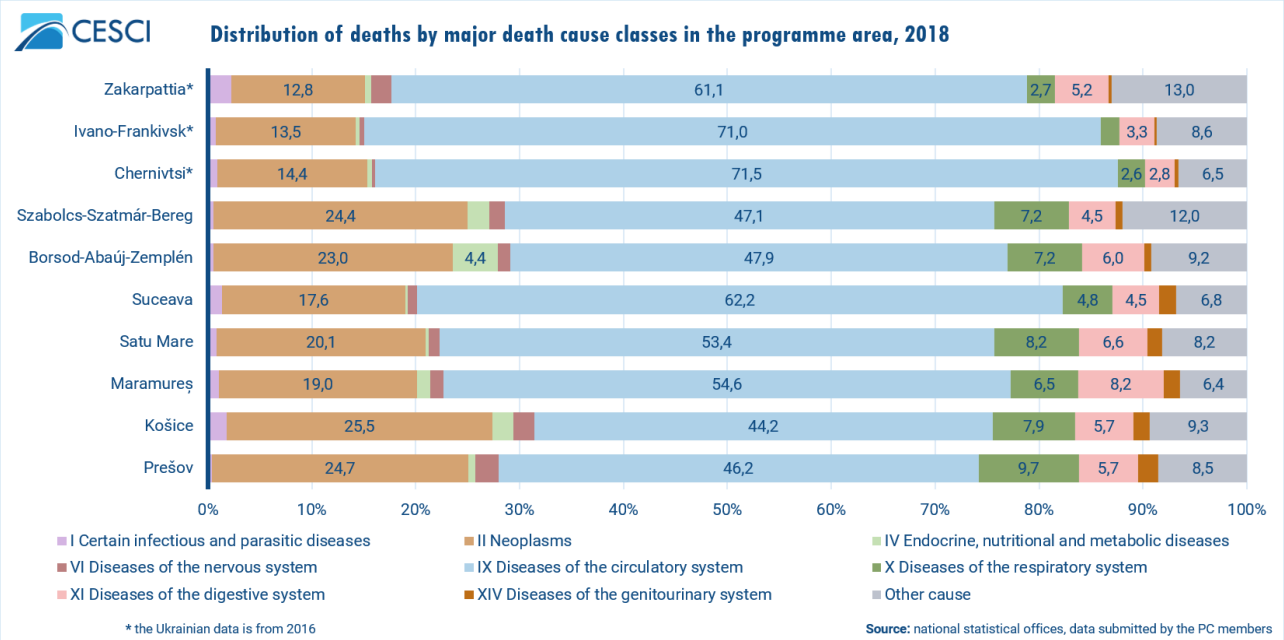
The diagram below represents the statistical data[83] of the leading causes of death in the 10 regions of the programme area. The data for Hungary, Slovakia and Romania is from 2018, while from Ukraine only data from 2016 was available.

[83] Sources of data:

- Hungary: Hungarian Central Statistical Office: Population and social statistics. Mortality by districts from 2015, **http://statinfo.ksh.hu/Statinfo/index.jsp**
- Slovakia: Data cubes. Deaths by Causes of Death, Sex and Permanent Residence. **http://datacube.statistics.sk/#!/view/en/VBD_DEM/om7035rr/v_om7035rr_00_00_00_en**
- Romania: National Institute of Statistics, TEMPO, POP206I – Deaths having their usual residence in Romania by causes of death, macroregions, development regions and counties **http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=en&ind=POP206I**.
- Ukraine: Ukrstat: Publications: Regional Statistics. Statistical publication Regions of Ukraine 2017. **https://ukrstat.org/en/druk/publicat/kat_e/publ2_e.htm**

The data shows that by far the group of diseases resulting in the highest proportion of death attacks the **circulatory system**. There are regions such as Ivano-Frankivsk (70.9%) and Chernivtsi (71.4%) where nearly three quarters of the deaths are due to one form of circulatory disease. These types of diseases are often linked to poor life circumstances and habits such as smoking, higher alcohol consumption, reduced physical activity, obesity, diet rich in saturated fats and insufficient fresh vegetable and fruit intake. From this point of view, considerable differences are observable between the regions, while those in Ukraine seems to have a much higher risk of developing a lethal circulatory illness, in Slovakia these rates are much better (in Prešov 46.2% and in Košice 44.15%). Hungary falls closer to these rates, in Borsod-Abaúj-Zemplén county 47.8% of deaths are attributed to this category, while in Szabolcs-Szatmár-Bereg county 47.1%. The Romanian rates are in between the two end of the scale, with Suceava having a higher (62.1%) rate while in Maramureş (54.5%) and Satu Mare (53%) more than every second death is attributed to some form of circulatory disease.

Figure 44: Leading causes of death in the programme area

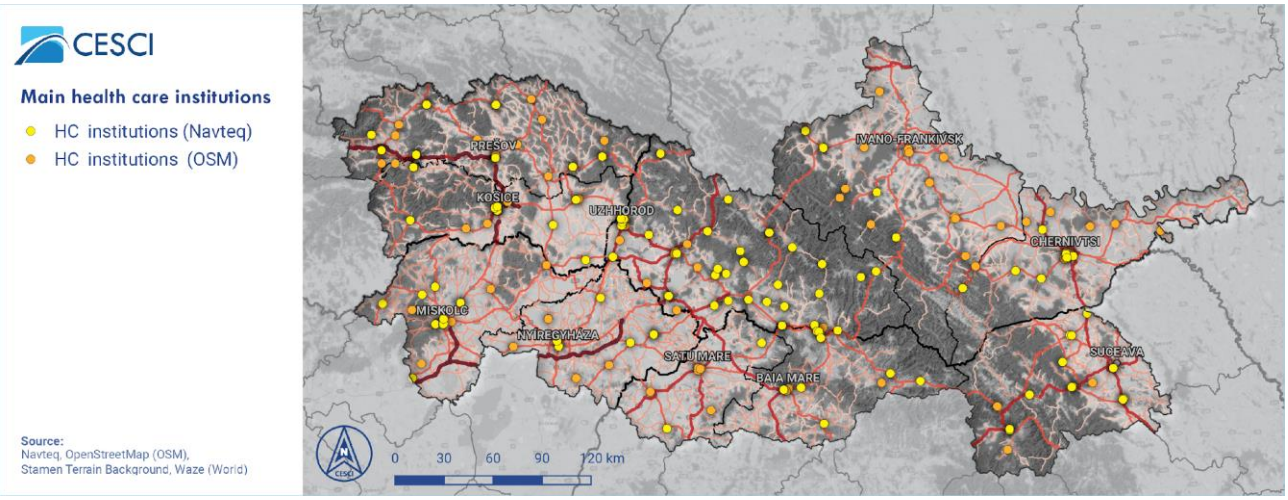


The second most dangerous type of disease in the programme area is the **neoplasms**. Here the territorial differences are much less marked as it varies from 12.8 % in Zakarpattia to 25.5% in Košice. **Diseases of the respiratory system** as well as the **digestive system** are also among the leading cause of death, the first appearing to be a bigger problem in the Slovakian part of the programme territory (Prešov 9.6% and Košice 7.9%) and less big of a concern in the Ukrainian regions (Chernivtsi 2.6%, Ivano-Frankivsk 1.7% and Zakarpattia 2.6%), while the second results in a – relatively – strikingly high number of casualties in Maramureş (8.2%) and Satu Mare (6.6%), but otherwise stay lower than 5% everywhere in the programme territory.

2.5.1.4 Health services and infrastructures

The database[84] of the main healthcare institutions has been visualised in the map below. This shows that the main healthcare institutions tend to follow the natural and socio-geographical features of the area by being located in bigger cities and settlements with satisfactory road accessibility.

Figure 45: Main healthcare institutions in the programme area



Even though the database has its own flaws stemming from its open-source nature, general tendencies are still visible: first of all, the fact that all in all at least 150 different healthcare institutions are registered in the cross-border programme's territory. First of all, it seems that in the Ukrainian regions there are a strikingly high number of healthcare institutions, more than half as many as in the affected parts of Slovakia and Romania. The two Hungarian counties integrated in the programme area have a comparably much lower amount of healthcare institutions. Having said that, it is important to keep in mind that this observation refers to the numeral values and are not adjusted to population or territory size.

Secondly, an important assessment is that the distribution of the healthcare institutions is uneven within the regions. There are counties – such as Chernivtsi or Satu Mare – where the majority of these institutions are located in the central, bigger cities. However, in the majority of regions, the healthcare providing points are much more spread out among the settlements, for example in Prešov nearly 20, in Ivano-Frankivsk more than 10 different settlements are registered to give home to a healthcare institution, predominantly this being a hospital.

To measure the level of health services and infrastructure a good indicator can be the number of hospital beds per ten thousand inhabitants. The data[85] shows that the highest number and ratio of

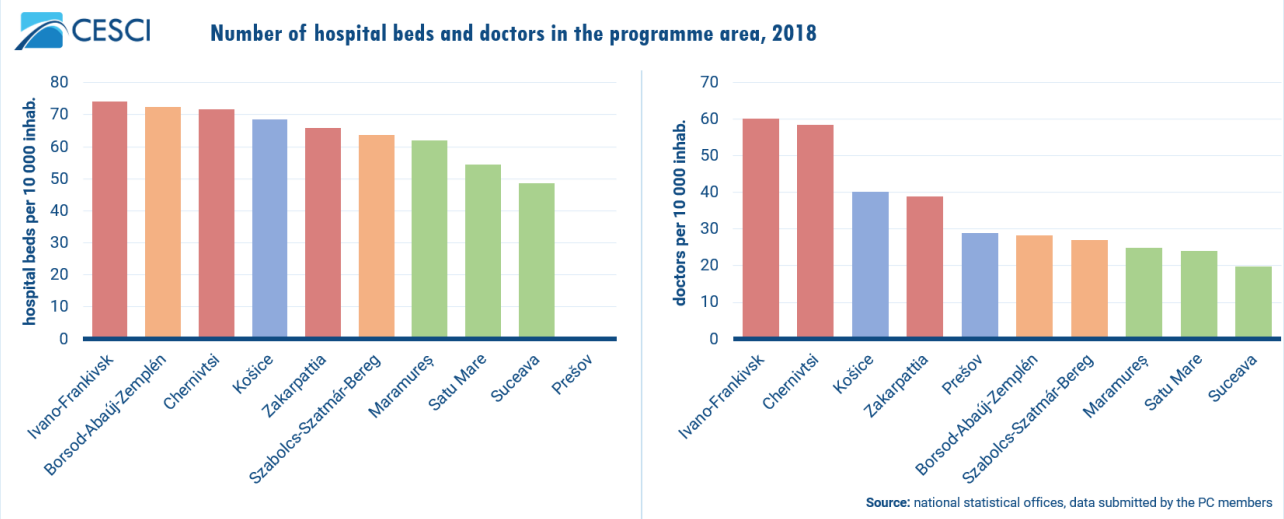
[84] Source: Map data is collected from OpenStreetMap contributors and available at **https://www.openstreetmap.org and Navteq https://www.here.com/navteq**

[85] Sources:

- Hungary: Hungarian Central Statistical Office. Hospital care. 2018. **http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_fek006b.html**
- Slovakia: The regions sent the data.
- Romania: National Institute of Statistics. TEMPO: SAN102C - Number of the beds from sanitary units, by specialities, ownerships, counties and localities. 2018. **http://statistici.insse.ro/shop/index.jsp?page=tempo2&lang=en&context=30**

hospital beds are found in Ivano-Frankivsk where 10 200 beds are available for a population of 1 377 500 meaning that 74 beds are maintained for 10 000 people. The second best ratio is that of Borsod-Abaúj-Zemplén (72 beds) and Chernivtsi (71 beds). For Prešov there is no data available, but the Košice rate (68 beds) shows a middle ratio. The bottom end of the scale are the three Romanian counties, out of which in Suceava the situation is the worst, as there are only 48 beds for 10 000 people.

Figure 46: The number of hospital beds and doctors per ten thousand inhabitants in the programme area



2.5.1.5 Medical employees

The density of medical employees is also indicative of a region's healthcare status. Here the collected data[86] on the number of working doctors per ten thousand inhabitants shows an unbalanced image regarding the programme territory. If the official data is to be believed, then in the case of two of the three Ukrainian regions, namely Ivano-Frankivsk (60 doctors) and Chernivtsi (58 doctors), the numbers are considerably higher than in the rest of the regions. In Košice (40 doctors) and Zakarpattya (38 doctors) the rates are in the middle among the programme territory's ratios, however, in the Romanian counties – similarly to the hospital beds – the situation is somewhat worse. In Suceava for instance only 19 doctors were registered for 10 000 people in 2018.

- Ukraine: State Statistics Service of Ukraine. Statistical Yearbook of Ukraine for 2018. pg. 135. **https://ukrstat.org/en/druk/publicat/kat_u/2019/zb/11/zb_yearbook_2018_e.pdf**

[86] Sources:

- Hungary: Hungarian Central Statistical Office. Working doctors. 2018. **https://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_fer001b.html**
- Slovakia: The counties provided the data.
- Romania: National Institute of Statistics. TEMPO - SAN104B - Medical-sanitary staff, by categories, ownerships, counties and localities. 2018. **http://statistici.insse.ro/shop/index.jsp?page=tempo2&lang=en&context=30**
- Ukraine: The counties provided the data.

To put these data into a wider context, the WHO's 2020 data[87] was used where the countries are ranked according to the number of doctors available for 10 000 people. In this database the country averages do not correlate for every case with the averages of the programme area for the given country. For instance, while the Slovakian average is 34.1 doctors for 10 000 inhabitants in 2017, the average for the two analysed Slovakian region falls closely with 34.6 doctors, in Hungary and Romania the country averages are more favourable then only for the affected territories (the Hungarian average is 34 doctors, while the average for Borsod-Abaúj-Zemplén and Szabolcs-Szatmár-Bereg counties is 27 doctors, similarly the Romanian average is 29, while the three affected regions' average is only 23 doctors). However, this is not true for Ukraine, where it seems that a strikingly higher amount of doctors concentrate in the three affected regions (with an average of 52 doctors per 10 000 inhabitants) while the country's average is only 29 doctors. Globally, available statistics show that over 40% of WHO Member States report to have less than 10 medical doctors per 10 000 population, however, regarding the European Union's average which is 37 doctors per 10 000 population, only the three Ukrainian regions and Košice region reaches above this value, showing an understaffing of doctors in all other regions of the cross-border programme.

2.5.1.6 Emigration of medical personnel

The emigration of medical personnel from the programme territory is a problem often cited in professional platforms and stakeholders exchanges as it is identified as a main obstacle even though the collection of comparable data on NUTS3 level is incomplete. However, there are ample studies and indications that show the magnitude of this phenomenon. For instance, in 2018 only in the United Kingdom 184 Slovakian, 330 Ukrainian, 531 Hungarian and 1 129 Romanian doctors worked and in Germany 1 036 Slovakian, 1 443 Hungarian and 3 978 Romanian doctors have been registered[88]. This only offers a glance at the issue, but if it is compared to the yearly average number of 1 500 graduated doctors in Hungary it allows to conclude that a staggeringly high number of graduates leave these four countries. This affects the programme territory both directly and indirectly as people born and raised in the analysed counties are not living and producing value in these areas as well as the practices of these territories tend to stay vacant in the absence of doctors from the same country but different county willing to fill these positions.

This high level of emigration of medical personnel is not restricted to doctors, but also applies to the nurses. Again, in the lack of comparable and comprehensive data only an illustration is offered here to grasp the size of the problem. The figure below shows the inflow of nurses trained in Hungary, Slovakia, Romania and Ukraine to Germany between 2012 and 2018. It is visible that apart from some minor fluctuation, the number of emigrating trained nurses are consecutively high and persistent in all four countries but especially in the case of Romania, from where in the peak year (2016) a little more than 800 nurses got moved to Germany.

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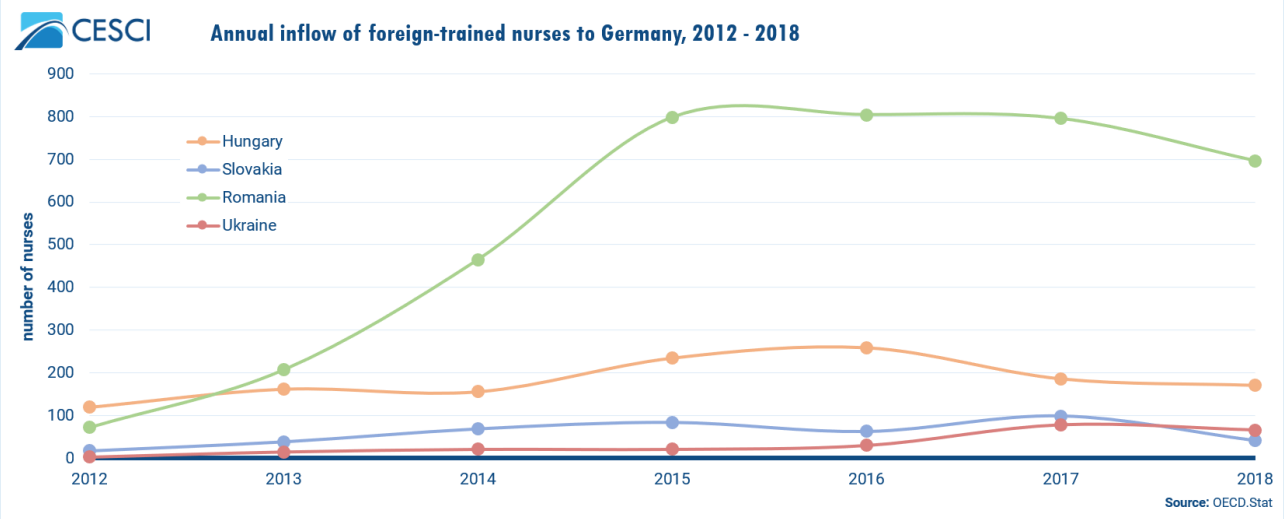
87 World Health Organization. Medical doctors per 10 000 population. 2020. https://www.who.int/data/gho/data/indicators/indicator-details/GHO/medical-doctors-(per-10-000-population). In each case the most recent published data was used: for Hungary 2018, Slovakia and Romania 2017 and Ukraine 2014.

88 Source: OECD. Health Workforce Migration: Foreign-trained doctors by country of origin. 2018. https://stats.oecd.org/Index.aspx?QueryId=68336

Figure 47: Annual inflow of foreign-trained nurses to Germany



2.5.1.7 Cross-border rescue procedures

Cross-border rescue and the free movement of the ambulances is an often discussed issue with paramount importance. Despite the fact that there is an unquestionable need for it – especially in territories where a hospital is considerably closer on the other side of the border – currently, ambulances are only allowed to drive within the Schengen area without control, however, in the case of non-Schengen borders (with Romania and Ukraine) there is an obligatory control, which significantly slows down the rescue. In addition, border controls are not the only obstacle in smooth cross-border rescue, but a lack of harmonized legal and administrative procedures also blocked so far the realisation of this initiative. However, the future cross-border programme could tackle this issue as there are definitely a need for it at several border sections such as in the case of Hungary, in the area of Rajka, the cooperation is becoming more and more necessary, as a significant number of patients living on the Hungarian side of the border but having insurance in Slovakia often call the Slovak emergency services[89]. Also, the question of cooperation is also often raised in relation to rescue with helicopters as currently, the helicopters meet at the border and hand over the patient to one another, a practice whose efficiency is questionable.

2.5.1.8 Medical tourism

Even though medical tourism lies on the border of health care and tourism, it was thought to be important to briefly consider for the benefit of the future cross-border programme since if developments are carried out for the sake of inviting more medical tourists in the region that will undoubtedly have a spill-over effect and raise the quantity and quality of healthcare provision for the locals too. Furthermore, this aspect is also important as it was shown above, some of the leading causes of death are due to unhealthy lifestyles, within the offer of medical tourism those preventive

89 Source: Central European Service for Cross-border Initiatives. 2018. Cross-border rescue. Summary report about the harmonisation of the cross-border ambulance services. **http://legalaccess.cesci-net.eu/wp-content/uploads/2019/03/JOGa3_Rescue_EN_2.1.pdf**

and health preservative activities are also included (such as wellnesses, massages, retreats etc.) that can have an attitude-forming effect.

As a study[90] based on a research among the preferences of British and German respondents with experiences or interest in medical tourism pointed out that there is a pronounced demand for certain medical procedures carried out in the Central and Eastern European countries such as dental services, in vitro services, ophthalmological services and body sculpting (liposuction), aesthetic medicine and plastic surgery. While the study found that Poland is the primary preferred destination, interest was also perceivable for Hungary and Ukraine. Another study[91] names Hungary, Slovakia and Romania as a potential contender for medical travellers as these countries are continuously improving their cross-border mergers and acquisitions.

One potential angle for the medical and health tourism could be centred around water as the analysed cross-border region is famous for having an abundance of varied and valuable mineral resources. One third of Europe's thermal and mineral springs are located in Romania[92], many of which in the affected counties (for example around Băile Borșa in Maramureş county there are 20 springs with carbonated-ironed water which has several healing effects), but also on the Hungarian side there are several with such characteristics (for instance in Miskolctapolca, Mezőkövesd or Sárospatak). Similarly, Slovakia has a large number of mineral and thermal healing springs, extensive deposits of high-quality healing peat and mud, and also climatic conditions, suitable for the treatment and protection of the respiratory tract for instance in Hromoš or Plavnica. Furthermore, in Ukraine there is a real political support for developing medical tourism which according to the Ukrainian Association of Medical Tourism already invited 60 000 foreign patients to the country in 2018 alone as President Volodymyr Zelensky suggested to abolish visas for citizens of those countries from where a larger number of tourists arrive for various treatments such as plastic surgery, dentistry, rehabilitation treatment, ophthalmology and reproductive health services. Consequently, there is ample potential for cooperation and joint initiatives around capitalizing these natural resources. However, from the point of view of thermal water resource management and environmental impact, it is absolutely necessary to examine the quality and quantity of the thermal water bodies covering the entire project area due to the significant number of thermal and spas operating on both sides of the border. The issue of thermal water extraction and the disposal of used water is of particular importance from the point of view of nature conservation and water management, as the increasing use of thermal water endangers small watercourses. These analyses could be done in the framework of a separate project.

90 Source: Adrian Lubowiecki-Vikuk & Diana Dryglas (2019) Medical tourism services and medical tourism destinations in Central and Eastern Europe - the opinion of Britons and Germans, Economic Research-Ekonomska Istraživanja, 32:1, 1256-1274, DOI: 10.1080/1331677X.2019.1627892. **https://www.tandfonline.com/doi/full/10.1080/1331677X.2019.1627892**

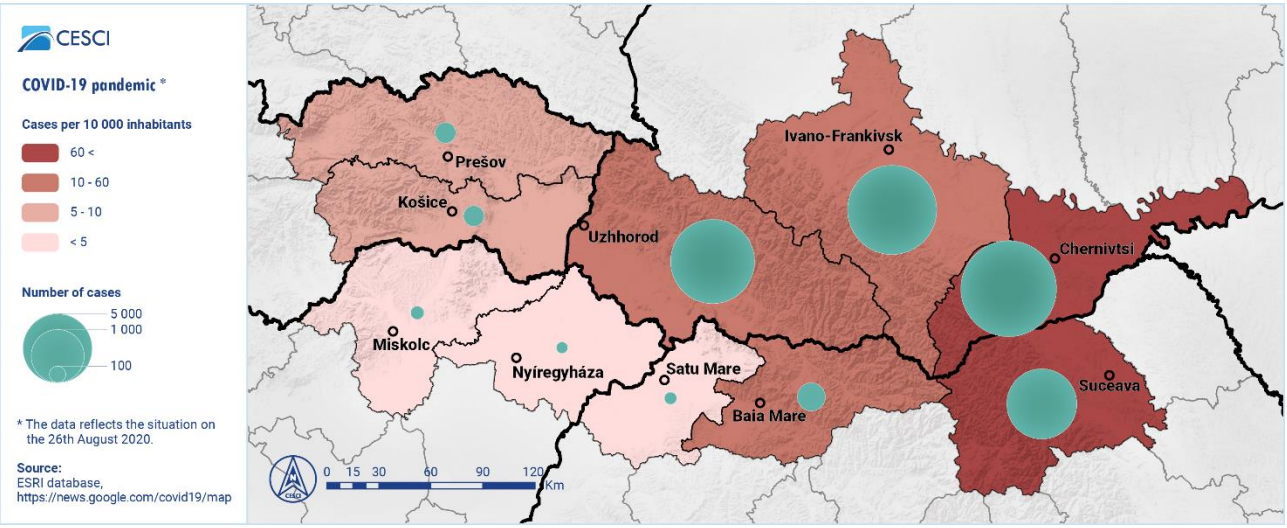
91 ource: Eilert Hinrichs and Michael Wisniewski. 2019. International Medical Travel Journal. Central and Eastern Europe - Medical Tourism Attractiveness. **https://www.imtj.com/articles/central-and-eastern-europe-medical-tourism-attractiveness/**

92 Source: European Spas Association. 2020. Section on Romania. **https://www.europeanspas.eu/en/members/romania**

2.5.1.9 COVID-19 health indicators

For obvious reasons it is nearly impossible to give an assessment of the COVID-19 pandemic which would not lose its accuracy as the data is constantly changing with every hour. However, to give an indication of the magnitude of the problem, here a snap picture is offered as of the available data[93] just before the submission of this document.

Figure 48: COVID-19 confirmed cases (number and ratio per 10 000 inhabitants)



As the map above shows, the different regions are affected very differently. Numerically the most cases have been confirmed in Chernivtsi (9 167) and the least number in Szabolcs-Szatmár-Bereg county (139). However, what is more telling is the ratio of the number of confirmed cases per 10 000 people as it would be logical to have more cases in more populous regions. However, the most cases (102 confirmed cases per 10 000 person, meaning 9 167 cases) have been registered in Chernivtsi which is only the third most populous region among the analysed counties of the programme area. Suceava is the second most affected by the COVID-19 virus (63 cases per 10 000 person) which in fact is the 4th smallest county out of the 10.

Ukraine in general seems to be much more severely affected as the other two programme regions also have relatively high number of cases (Ivano-Frankivsk 58 and Zakarpattia 53 per 10 000 people, meaning 7 975 and 7 026 confirmed cases respectively). The other end of the scale are the two Hungarian counties, both having 2.4 cases per 10 000 people. The Romanian results show no correlation with each other, Satu Mare having a considerably lower (3.9 rate, meaning 150 cases) amount, Maramureş a mid-rate (14.8 per 10 000) and Suceava a high number of cases (63.6 per 10 000, meaning 4 862 confirmed cases). This also shows that it might be more efficient if the coordination of the handling of the pandemic would not exclusively be organised on a national level, but rather on a cross-border way with regions bearing similarities working more closely together.

93 The data reflects the situation on the 26th August 2020 as captured by the joint data provision initiative of Wikipedia and The New York Times (based on governmental data). https://www.google.com/search?q=presov+region+confirmed+cases+covid&rlz=1C1GCEA_enHU818HU818&oq=presov+region+confirmed+cases+covid&aqs=chrome..69i57j33.6455j0j4&sourceid=chrome&ie=UTF-8

2.5.2 Functional areas

In the case of healthcare provision, the possibilities of functional areas are heavily defined by the diverging border regimes. The analysed territory comprises Schengen, non-Schengen and non-EU borders as well, not to mention the different legislation and administrative pathways connected to every type of healthcare services.

Nevertheless, this does not mean that there are no functional areas already in the region or there is no potential for their developments. First of all, the universities of medicine (such as the Faculties of Medicine at the Uzhhorod National University, the Debrecen University and the Pavol Jozef Šafárik University) create a knowledge triangle in which joint research and dissemination of information could take place. Similarly, the hospitals located in the region can cooperate with each other and with the universities as well and also strive to enlarge their range of activities to territories which are more function deficient.

Partly in connection with this, telemedicine and remote diagnostics are issues that call for joint cooperation. As the analysis above showed, in the Ukrainian regions – compared to the other regions of the programme – there are a relatively higher number of medical personnel which could be employed to cover a larger, cross-border area through technologies of telemedicine. Furthermore, with the cooperation of universities and larger hospitals, certain diagnostic centres could be established specialised for those illnesses that are the most prevalent in the region; here the collected samples could be sent and subsequently analysed this way providing a higher quality of healthcare service for patients living in more remote areas. This in some sense would break with the idea of functional areas strictly linked to geographical closeness which especially benefits the mountainous territories that are less accessible. All in all, at the current stage of cross-border integration of the programme area, the functional region of health care could be only defined by the related institutions, so it could be understood as a network of interoperable spots.

Finally, it is also visible that from the collected project ideas (presented below) no clear synergies can be distilled, meaning that even though there are several shared health care related challenges in the region, the stakeholders might not yet found each other and connected in a way to think in systematic, joint solutions along functional areas and thus it would be highly beneficial if the programme would support this process through different consultation activities.

2.5.3 Opinions

In the online survey the local stakeholders were provided with a short analysis regarding the programme area's health characteristics and asked to express their opinions with their own words on the specificities they perceive regarding the topic. These insights then had been thematically grouped in the following 5 categories.

In general, the vast majority of the respondents claimed that they agree with the observations and underlines the importance of the cross-border healthcare projects. However, there was one respondent who mentioned that they disagree as the organization of healthcare is the responsibility and competence of the nation states and not something that should be managed on the European Union's level. The respondent underpin this opinion by claiming that the diversity of the health

insurance systems and the lack of interoperability between them cannot be resolved at the local level as they are state competencies. While this point is valid, from the other opinions it seems that there are still an abundance of aspects of the healthcare systems that indeed can be ameliorated by joint initiatives. Partly underlying this opinion another was also submitted that actually calls for joint projects that would aim to remove the legal-administrative barriers in the field of health to pave the way for even more joint projects.

Secondly, several opinions pointed out that it is necessary to distribute and share certain key medical infrastructural devices as well as knowledge as well. Concrete examples were also mentioned as areas for cooperation such as the development of oncology, paediatric neurosurgery and modern diagnostic equipment as well as the treatment of rare diseases. One respondent said that curing rare diseases are "still on the fringes of interest of health systems in individual countries worldwide and Europe-wide, and this is particularly in Eastern Europe." The opinion also reflected on the fact that these interventions often require wider international programme support and cooperation in all areas, because these treatments require equipment and specialised knowledge that is more reimbursable if it is allocated to one specialised site that is able to cater for everyone in need from the programme area. Within this category belongs also the training of specialists which again can be done in a cross-border manner.

Thirdly, an important raised aspect was one that not only affects the healthcare system but the labour market in general in the programme area and that is the very intense brain drain. Keeping the highly qualified medical professionals in the programme area is a key factor for sustaining a functional healthcare system. It was pointed out that from Ukraine many intellectual potential moves primarily to Slovakia and Hungary, in turn from Slovakia, Hungary and Romania doctors, nurses and healthcare specialists move to Western Europe or the United States of America. Therefore, it is essential to on the one hand, improve the financial and social status of these employees and introduce reforms in the field of medicine that ameliorate their working conditions and on the other hand to improve the skills of the existing professionals.

Furthermore, the recent COVID-19 pandemic shed light on the importance of international cooperation in solving emergency care. This was also reflected in the opinions; several respondents highlighted the need for jointly preparing for similar situations and institutionalised exchange of experiences in handling a regional or global pandemic or other mass health hazard situation that might happen in the region.

Finally, a bigger group of observations concerned in one way or another the question of prevention and health preservation activities and services. A considerable number of respondents said that different prevention programmes and campaigns would be helpful in increasing the knowledge and responsibility of the individuals to take care of their own health. Involving the people in healthier lifestyles including the participation in regular screening programmes could ameliorate the devastating statistics regarding cardiovascular diseases among others. That is why a much stronger emphasis on social information and awareness-raising programs would be needed. The respondents claimed that it would be essential to monitor the effectiveness and measurability of the projects, and rather professional planning is needed during their development to ensure that real progress would be attained. This also relieves the burden on the supply system as from a socio-economic point of view, maintaining a healthy society is much more cost-effective than reducing the burden of the

diseases. Another aspect of the same topic could be – as suggested by a respondent – that the programme would also consider supporting the large-scale cultivation, collection, post-harvest treatment and use of medicinal, aromatic and spice plants as disease preventive methods. Also, since the programme area is rich in mountainous territories with clean air, developing medical tourism is an aspect that can both serve this priority's goals and that of tourism.

2.5.4 Project ideas

All in all, 22 project ideas had been submitted by the local stakeholders in the online survey; 3 from Hungary, 4 from Slovakia, 4 from Romania and 11 from Ukraine showing a moderate interest. These project ideas had been categorized according to the level of their cross-border relevance. The analysis showed that nearly half had an especially strong cross-border aspect, while only 5 projects lacked any real cross-border character; these later were subsequently excluded from the detailed analysis.

The submitted project ideas had been analysed in detail also from the point of view of their content. It was found that almost in an equal number of cases the project ideas focused more on the soft elements (in 5 cases) then on the infrastructural investments (in 4 cases). However, a higher number of projects (8 cases) handled a problem from a more complex approach, mixing the infrastructural and the soft elements. It was also noticeable that in the case of these complex projects, the level of preparedness is also higher, the project proposals are less in the idea level and more equipped with an elaborated project proposal or even feasibility studies are prepared which is not the case for the more one-sided project proposals.

Probably due to the known restricted financial means, the purely infrastructural projects in general do not focus on building new hospitals or wards, but rather on diversifying and improving the medical equipment of the existing healthcare service points. It was characteristic of all of these so-called hard projects that they targeted a specific problem or field. For instance one of the project ideas undertakes to establish a centre for medical and diagnostic angiography for patients with acute stroke or myocardial infarction which would involve the creation of a material and technical base, the purchase of medical equipment (operating angiograph, ultrasound scanner), the arrangement of the operating room for surgical interventions, the training of medical staff. Another project focuses on prevention by acquiring and operating testing mobile stations (in the form of filtering buses) as well as analysing the samples they collect. In a somewhat similar logic, another project in the idea level wishes to improve the provision of medical care for children living in the mountainous remote areas of the programme territory through purchasing the necessary equipment and creating the frameworks for helicopter transport of sick children in emergency situations. Another project idea in turn seeks to ameliorate the mental health protection as well as the spreading of the use of natural therapies by building and strengthening the functions of therapeutic and climatic gardens.

Among the soft projects several centres around joint education and the exchange of know-how, such as in the case of the project idea about the prevention of tuberculosis or the cystic fibrosis among the population of the border regions. Even though these project ideas also contained the need for material support, they placed the emphasis on dissemination of information, on publications, lobbying activities, regular exchange trainings for young medical staff as well as the establishment

of skill laboratories etc. The large-scale cultivation of medicinal plants and their use for public health has been also categorized as rather a soft project since here also the emphasis is placed on education, share of tillage, collection, conservation, extraction and distillation techniques of those plants that are either native of the border region or the climate and the circumstances are suitable for their farming. Finally, the submitted project proposals also reflected the most current health related problems that the border regions' society also experiences, that of the covid-19 virus and the pandemic it has caused. Even though the project proposal is only at the idea level, it already found its focal point which would be the formation of a cluster platform to support the relatives of the people infected with this virus. Thus, the project would have the following activities: the development of a step-by-step algorithm to help families of infected people and those who have lost their relatives due to this illness, the arrangement of material and technical functioning of the platform, the formation of a community of specialists of the required profile (psychologists, lawyers, economists, rehabilitation specialists etc.) who would support the activities of the platform and provide targeted consulting support.

The mixed group of project ideas contained several infrastructural elements and also soft elements which in general is a beneficial set-up for the cross-border projects as these pillars mutually strengthen each other. The project which is in a most advanced stage (having a feasibility study carried out already) aims to support a cystic fibrosis centre and medical care for sick children with respiratory diseases and in order to do so it would purchase specific equipment and would also engage in training the experts and establish the channels for disseminating the information and experiences. A somewhat similar project idea was submitted focusing on the development of oncology services where again the point would be to acquire equipment, transfer the knowledge both on a theoretical and practical level in the field of radiotherapy of tumour patients. The introduction of innovative technologies in the treatment of burns had a similar project idea, as well as the patient-oriented hospital care for the elderly people; both projects envisage the purchase of modern equipment, implementation of IT solutions, education, staff training and exchange visits.

There were also project ideas proposing the construction of a continuous hospitalization department for medical recovery (in general but also for chronic psychiatric patients). The project would not stop at the building and equipping of the new wards with medical recovery machinery, but it would also create an educational and telemedicine platform available in 5 languages (the 4 of the partnership and English) to support the relatives of the treated patients to help them along the medical recovery process at home. Finally, these projects would also develop a Joint Program for Occupational Therapy for chronic psychiatric patients as well as encourage the exchange of experiences for the development of the knowledge of the medical staff in the field of medical recovery. A complex project idea targeted the cooperation for the diagnosis of well-being. This project would have five key steps: it would purchase medical equipment, then it would organise a respiratory system screening which would be followed by an anti-smoking campaign among young people; it would also conduct a public survey on the local health policy and then partly based on this it aims to create a common local strategy on public health policy.

2.6 PO5 Citizens + PO4 Social + PO1 Smarter / TO3-P1 Heritage

Related thematic field based on the current programme: Thematic Objective 3: Promotion of local culture and preservation of historical heritage – Priority 1: Promoting local culture and historical heritage along with tourism functions.

Expected results in the current programme: Network of renewed cultural and historic sites (buildings and their environment and infrastructure) which forms the bases of touristic products of the programming region (thematic routes crossing the border, cultural programmes with cross border effect) with which the number of visitors can be increased in the area.

Joint orientation paper: Tourism has grown significantly across the majority of the area. Given the presence of UNESCO heritage sites and a number of sites of outstanding natural beauty, sustainable tourism has the potential to contribute significantly the cluster area's economy. […] Cooperation between tourism stakeholders can further improve the area's sustainable tourism offer and generate greater visibility.

Short summary of the topic: The main points of this analysis stated that the extent of utilization of cultural heritage can be partially measured through the number of guest nights which shows that in 2011, the visitor intensity was moderate in most regions with only the Slovak program area standing out from the average. Compared to 2011, by 2016 the number of guest nights per thousand inhabitants increased significantly. Visitor traffic has increased significantly in most regions, with the exceptions of Košice Region, Satu Mare County and Chernivtsi Region. There was a general tendency to increase the number of tourism visitors, which was accompanied by the spread of traffic and the decrease of territorial inequalities. Significant regional differences still exist mainly between Prešov Region and Chernivtsi Region. The spatial pattern of tourist traffic has changed: the western, Slovak-Hungarian areas are very attractive, while, except for Suceava County, the eastern regions receive less from tourism revenues. Furthermore, in addition to the Slovak regions, Suceava and Satu Mare County have the most developed tourist infrastructure, while in the Ukrainian regions as a whole there is a rather insufficient supply, partly due to low demand. The biggest challenge is how to integrate the Ukrainian regions into international tourism flows so as to increase the number of stays there.

2.6.1 Statistical analysis

2.6.1.1 Description of the key cultural and natural assets of the cooperation area

The analysed area is rich in cultural and natural assets which can provide a strong basis for the smart and sustainable capitalization of the region's endogenous heritage. As it was shown on the Figure 12 *(Figure 12: Nature protected areas in the programme area)* the distribution of nature protected areas and the cultural sites belonging to World Heritage Sites nicely cover almost the whole border region. This is especially advantageous when assembling and offering tour packages for visitors. For instance when visiting the areas under regional, national and international protection at the border

section between Maramureș and Ivano-Frankivsk one can also easily tour the Wooden Churches of Maramureș and the Churches of Moldavia thus linking the religious tourism with active tourism.

The more the observer zooms in the different regions, the more varied heritage elements become visible. In Borsod-Abaúj-Zemplén county there are two UNESCO World Heritage Sites, namely the Tokaj Wine Region Historic Cultural Landscape and the Caves of Aggtelek Karst and Slovak Karst. The county can also build its tourism offer on its numerous castles (such as Boldogkő, Cserépvár, Dédes, Diósgyőr, Füzér, Sárospatak and Szerencs) completed with various cultural and historical sites and services. For those who are more interested in nature, the county can offer the Dripstone cave of Aggtelek, Bükk National Park and Lillafüred as places of recreation.

The neighbouring Szabolc–Szatmár-Bereg county excels in folk architecture, folk art, music and dance traditions. Here the main attractions are the wooden bell towers, the 13th century church and the coffered ceiling of the Reformed Church in Mátészalka, the Andrássy castle in Tiszadob as well as the Gencsy castle in Balkány. The Salt Lake offers a prime location for its famous spa, whose main competitors are the spas in Nyíregyháza and Fehérgyarmat. Furthermore, there are three famous historical sites in the county worth visiting, these being Máriapócs as a natural shrine, Nyírbátor with its reformed church and the Castle of the Báthory family, as well as the Castle of Kisvárda.

Moving north from the Hungarian counties the observer finds itself on the Slovak territory of the programme area. These regions are characterised by breathtaking mountainous areas as well as attractive towns as Levoča, Prešov, Bardejov, Poprad and Kežmarok with many cultural and historical monuments. In the Prešov region as part of the Tatran National Park (TANAP) the High Tatras is one of the country's most beautiful and spectacular natural sites as well as a prime space for observing several rare species of flora and fauna.

Košice region already from its size and importance within the Slovak Republic deserves the special attention of tourists. In the southern and south-eastern part of the region stretches the Slovak Karst National Park with its number of caves and pits classified as UNESCO heritage sites. The Caves of Aggtelek Karst and Slovak Karst and Primeval Beech Forests of the Carpathians are both analysed in detail in the chapter dedicated to nature. However, the region also has to offer a series of historical monuments especially castles or their ruins and many churches. For instance Spis Castle and its surroundings is the largest medieval castle complex in Central Europe and a UNESCO cultural world heritage site.

In the Romanian territory of the programme area, Satu Mare county disposes an array of historical, cultural and recreational heritage. The main tourist attractions in the county are: the "Oaș Country", with its strong Romanian folk traditions, on the North Eastern side of the county, the Oaș Mountains, the cities of Satu Mare and Carei, Tășnad Resort, the fortresses of Ardudand Medieșu Aurit. Furthermore, here there are also an abundance of cultural and historical elements which belong to the category of shared intellectual and material value (such as the house of Endre Ady, one of the most prominent Hungarian poet) that can be utilized in a way to attract more visitors from within the programme area.

Maramureş county is home to many villages where the main attraction for foreign visitors could be that century-old traditions are still part of daily life. Furthermore, these villages are also a unique sight as they are distinguished by their unique wooden churches with tall spires and shingled roofs.

Architectural sights are not finished here, but the monumental Maramureş gates, guarding the entry to the houses, are also something worth to be noted. Some of the prime examples are found in the villages of VaduIzei, Desesti, Giulesti, Budesti, Sarbi, Barsana and Oncesti. The Wooden Churches of Maramureş – in Surdesti, Plopis, Rogoz, Ieud, Poeinile Izei, Barsana, Budesti and Desesti – have been recognized by UNESCO as some of the most important sites of world heritage. The location of the county is also perfect for trekking as the landscape of mountains, rolling valleys, waterfalls, caves and passes filled with a rich diversity of flora and fauna leave the visitors breathless.

On the Ukrainian side, the Ivano Frankivska region is home for numerous natural and architectural sites that are dispersed throughout the region. Out of the many monuments of architectural heritage the most prominents are the city of Halych (national preserve), the Church of the Holy Spirit located in the city of Rohatyn as well as the Manyava Skete near the village of Manyava in Bohorodchany Raion. The oblast also accounts for some number of various wooden churches of Boykos and Hutsuls traditional architecture. For those more interested in exploring beautiful landscapes the tallest mountain in the country (Hoverla Mountain), the highest waterfall in Ukraine (Manyava waterfall), and a local mud volcano near the village of Starunia are all available for visiting.

Zakarpatska Region is interesting from several points of view, for instance it is the only Ukrainian administrative division which borders upon four countries: Poland, Slovakia, Hungary, and Romania. The cultural and historical diversity is reflected upon the several castles and ruins waiting for visitors to bring closer bygone times. The most notable is the castles of Uzhgorod and Mukachevo, the castles of Khust, Vynohradiv, Korolevo, Nevytske, Serednie, and Kvasovo also serve as a popular attraction. Many of these, however, could provide opportunities for renovation and redevelopment. The region is also famous for its wooden churches in Srednie Vodyane, Verkhnye Vodyane, Danylovo, Kolodne, Krainykovo, Nyzhnie Selyshche, Olexandrivka and Sokyrnytsia.

In Chernivetska region the most famous attractions are the Residence of Bukovinian and Dalmatian Metropolitans, UNESCO World Heritage Site as pointed out on the relevant map of this document, Khotyn Fortress State historical-architectural preserve, and Kozmodemyanivska church (church of Cosmas and Damian). Further points of interest are the medieval castles situated in Nevytske, Serednie, Vynohradiv and Khust, however they are not in satisfactory condition as the refurbishment of these sites has not been a national priority. The region could also attract more tourists if the accounting, the protection, the preservation and the use of cultural heritage would be carried out in a more professional manner.

The completion of a proper statistical data collection analysis of the natural and cultural sites of the programme area is highly difficult due to the non-consecutive data collection manners which often use different methodologies. Consequently, the brief assessment described below should be read with keeping in mind that it was made to reflect on the general perceivable trends and not to be a full inventory of every heritage element.

According to the data provided by the counties, the largest number of theaters (9) are located in Košice county and Borsod-Abaúj-Zemplén county (6), while the least, 2, in Chernivtsi and Prešov. Since in the other two Ukrainian counties both 5-5 theaters are found, it seems that the dividing lines in the number of theaters are not drawn according to nationality or population size of the given

counties. Museums are much more numerous in every county of the analysed area. Numerically[94], in Chernivtsi are the most museums located (149) which is also the best museum to population ratio. In Borsod-Abaúj-Zemplén county there are also a considerable number (61) of museums. Then a significant drop follows, the third best museum to population ratio is in Szabolcs-Szatmár-Bereg with 25 museums, followed by Satu Mare with 16 museums to a much smaller population. The number of museums and theaters are not only interesting from the point of view of these being directly able to attract visitors, but also they are institutions that can be interested in enlarging and diversifying the cross-border tourism offer.

2.6.1.2 Potentials for religious tourism

Religious tourism has always been a key point of the analysed area. Today, it overgrew the face value of organised pilgrimages and church visits and religious tourism expresses the connection of cultural and heritage tourism with sacred sites, churches, monasteries and abbeys but not only due to their spiritual value but also because they are important monuments and ecclesiastical buildings. A prime example is the Via Maria Pilgrimage Route in Hungary which goes through Borsod-Abaúj-Zemplén county and Szabolcs-Szatmár-Bereg county and becomes more and more popular as its organisational background also expands. Nowadays, the pilgrimage is branded as the "Pilgrimage of Central Europe" and several services, accommodations and programmes are tailored to the specific needs of the pilgrims along its way. Another such example is the pilgrimage of Monok (Borsod-Abaúj-Zemplén) where a celebration of the Holy Cross in the calvary hill takes place every third Sunday of September. Sajópálfala is also a visited pilgrimage destination in Borsod-Abaúj-Zemplén. The St. Elizabeth Road Pilgrimage passes Northern Hungary and connects Sárospatak (Borsod-Abaúj-Zemplén) and Košice (Košický region) rendering it a truly cross-border pilgrim route. Máriapócs (Szabolcs-Szatmár-Bereg County) is one of the most famous places of Greek Catholic pilgrimage.

Pilgrim routes are also to be found in the Slovak border region. The St. Anne pilgrimage site in Rudnik (Košice region) along the Hungarian-Slovak border is one of the largest shrines of the middle Highlands. In the Prešov region, Cervený kláštor is a unique cultural and historical relic of an ancient Camaldolese monastery, which was successfully restored in the years 1956-1966. Moreover, numerous Orthodox and Greek Catholic wooden temples of high cultural and historic value pattern the region of Upper Zemplín.

Furthermore, there is also a religious pilgrimage route that affects three countries belonging in the programme area. The Saint Ladislaus' route cuts across Hungary, Romania and Slovakia which through 49 locations showcases the various valuable examples of built heritage, the beautiful natural landmarks as well as the locations connected to the Saint Ladislaus legends. The pilgrim route also has a website[95] that promotes the sites and offers useful information about them.

One of the most famous religious sites in the whole country of Romania are the painted monasteries of Bukovina which is located exactly in the programme area (currently Chernivetska and Suceava). The best-preserved monasteries are the monasteries in Humor, Moldovita, Patrauti, Probota, Suceava, Sucevita, and Voronet. Another famous site is a small church, located in the village of

94 The number of museums was missing for Ivano-Frankivsk and Zakarpattya regions.
95 See: **https://knightking.org/** (Last Accessed: 01. 12. 2020.)

Arbore. Seven of these churches were placed on UNESCO's World Heritage list in 1993. Considered masterpieces of Byzantine art, these churches are one-of-a-kind architectural sites in Europe. Far from being merely wall decorations, the murals represent complete cycles of religious murals.

Religion has always played a central role also in Ukraine which is also reflected on the many religious sites. The most famous religious site in the border region is the Uzhgorod Synagogue. Since World War II, the Jewish synagogue has been neglected as a religious institute with all related symbols removed. Instead it has been refurbished and currently used as 'Uzhgorod Concert hall'. Uzhgorod Synagogue was adopted as a concert hall due to its amazing acoustics. The Ukrainian concert hall is home to the talented Regional Philharmonic Society and the Folk Choir of Zakarpatska. Most famous and visited places of worship in Zakarpatska are the Nisnie Bolotne, Boronyavo, Nankovo, Korolevo, Mukachevo, Uzhgorod, Uzhgorod-Gerény, in Ivano-Frankivska: The Church of the Holy Spirit, built in 1598, is located in the north of the Oblast in the small city of Rohatyn, in Chernivetska: Kozmodemyanivska church (church of Cosmas and Damian).

The project called "The Route of Medieval Churches"[96] is an initiative that strives to capitalise on the religious past and its architectural heritage in the region. The project has been carried out throughout several cross-border programmes starting from 2009. Ever since its activities and the covered territory is continuously growing, now conducting research projects and heritages tours in the Hungarian, Romanian and Ukrainian parts of the current programme area. However, further developments – such as the inclusion of the Slovakian territories – are also needed as well as similar new initiatives which could be supported in the next cycle.

2.6.1.3 Cultural events, festivals

It is true for all the affected regions that it gives home for many festivals and cultural events. In order to assess the attractiveness of these events – in the lack of hard data such as visitor numbers – an empirical desk research has been carried out enlisting those festivals that are visible for foreigners. The underlying assumption is that if a foreigner tourist is planning a visit to a region from the programme area then most likely they will search for events and festivals on the internet in English (even though there are tourists within the regions who are bilingual, considering that four official languages are at play, it is probably safe the assume that the majority do not speak simultaneously Hungarian, Romanian, Slovakian and Ukrainian and thus falls back to English). Consequently, those festivals that are not popping up in a quick English internet search basically cannot be regarded as a real tourist attraction with international or cross-border appeal.

Subsequently, the table below must be read with caution, it does not enlist all the cultural events and festivals of the programme area but only those, which are advertised on the internet in English. From the list it is visible that despite of the natural yearly cyclicity, there are cases where synergies could be found and capitalised on should the organisers of these events invest in enlarging their activities in a cross-border manner. For example in Suceava every January the Winter Sports Festival is organised which could be visited before the Slovak Winter Food Festival in Košice and thus would prolong the nights spent in the region. Also, where cultural events with similar thematics and target groups are organised in two regions at the same time (or close to each other) such as in the case of

[96] The webpage of the project: **http://www.temple-tour.eu/uk**

the Chess Festivals in Prešov and Satu Mare, a close cooperation could be achieved by distributing certain organisational burdens (for example shared marketing) and making the most of the partnership through various joint activities.

Table 9: Calendar of festivals and cultural events that have an efficient online marketing in English

2019	Prešov	Košice	Szabolcs-Szatmár-Bereg	Borsod-Abaúj-Zemplén	Satu Mare	Suceava	Maramureş	Ivano-Frankivsk	Zakarpattia	Chernivtsi
January		Slovak Winter Food Festival				Winter Sports Festival		Kolyada on Mayzli	Winter Romantic Festival Chervene Wine Festest	Malanka-fest
February	International Guitar Festival								Bukovel Music Festival	
March		Febio Fest		Miskolc International Mineral Show			Celebration of the Snow			
April		Zing Festival		Horizont – International Contemporary Dance Festival				Drinkable Honeys	International Festival of Contemporary Sacred Music	Linoleum Animation Fest
May		Košice Music Spring Festival	City Day Events		Science Festival in Satu-Mare		Spring Harmonies	Burak Fest	Search Results Web results International Wine Festival	International Festival of Traditional Arts
June	Dobrý Festival	Use The City Festival		Bartók Plus Operafestival	Samfest Jazz Festival	Suceava Blues Festival	Festival of the Goulash		Tvoia Kraina Fest	

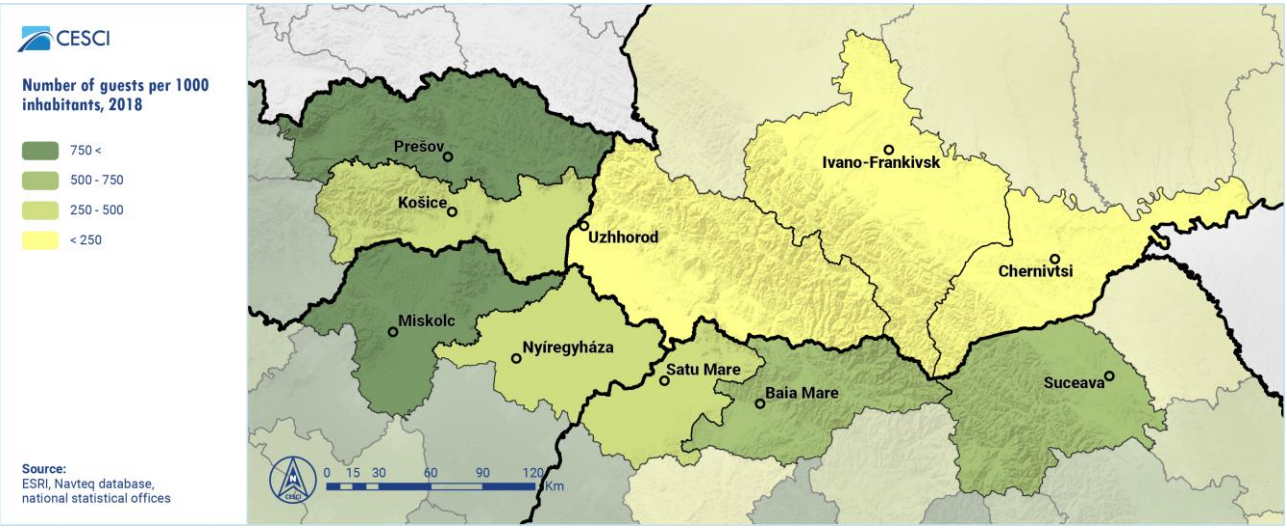
2019	Prešov	Košice	Szabolcs-Szatmár-Bereg	Borsod-Abaúj-Zemplén	Satu Mare	Suceava	Maramureş	Ivano-Frankivsk	Zakarpattia	Chernivtsi
July	Bon Apetite Festival				StreetMusic Festival Satu Mare	The Hutsul Festival	Day of Dragomireşti Monastery's Patron Saint	Prykarpattya Honey Fest		Bukovynian Gatherings
August	Chess Festival		Nyírség International Folk Dance Festival Color Festival		Satu Mare International Chess Festival	Stephen the Great Medieval Festival Suceava Days	Hora de la Prislop Festival of the Beekeepers	Holiday of Grapes and Wine		Obnovafest
September		Košice Wine Festival	Regnum Fest Tirpak Festival, Pálinka Day	Miskolc International Film Festival		Bucovina Rock Castle Festival	Chestnuts Festival Harvest Day	Precarpathian Vernisage Stanislavska Marmulada		Chervona Ruta
October		The Soup Festival					Europe km 0 – International Poetry Festival	Night Ivano-Frankivsk	Carpathian Mountain International Film Festival	Bikers Festival
November		Art & Tech Days	Feast of St. Martin Retro Festival				Song and Dance in Ancient Land		Transcarpathian Beaujolais	

2019	Prešov	Košice	Szabolcs-Szatmár-Bereg	Borsod-Abaúj-Zemplén	Satu Mare	Suceava	Maramureş	Ivano-Frankivsk	Zakarpattia	Chernivtsi
December		Vibe Fest					The Festival of Ukrainian Carols, Winter Customs and Traditions	New Year's Vytrebenky	International Roma Jazz Festival	

2.6.1.4 Data, information on tourist arrivals and tourism facilities

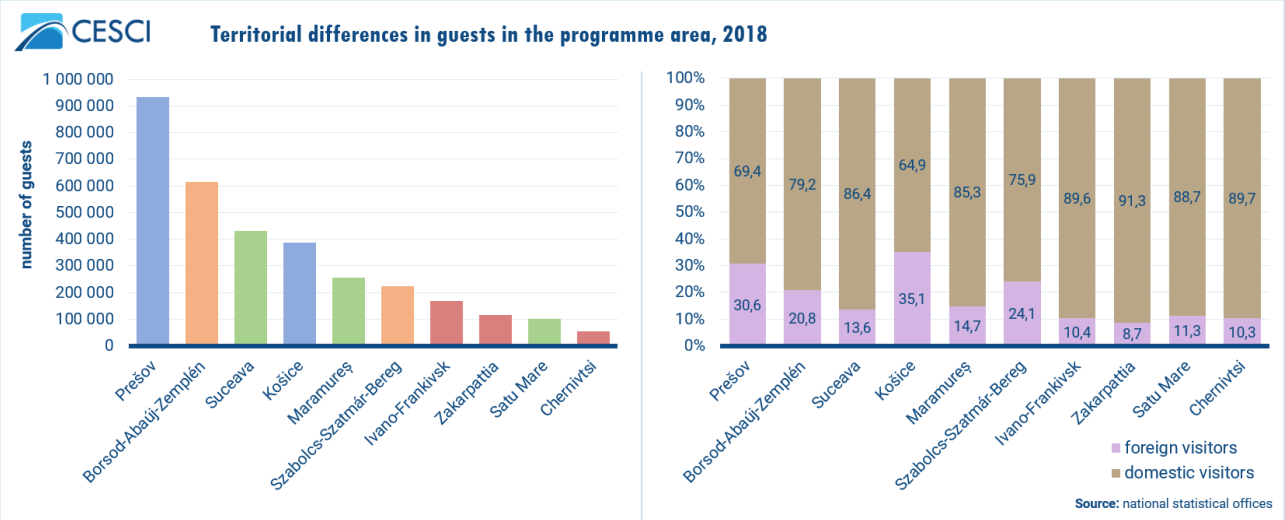
As pointed out above, the statistical in-depth analysis of tourism in the cross-border region is considerably difficult due to the lack of recent data collected according to similar methodologies. However, based on the data that is available it seems that the most attractive regions for tourists are Prešov and Borsod-Abaúj-Zemplén county where the number of guests per 1 000 inhabitants were 1 132 and 947 respectively. Szabolcs-Szatmár-Bereg county and its neighbour, Satu Mare county fall in the same category attracting 250-500 guests (per 1 000 inhabitants), while Maramureș and Suceava are reaching a better rate (500-750). The three Ukrainian regions can also be listed in the same cluster, having the least visitors.

Figure 49: Number of guests per 1 000 inhabitants



The ratio of foreign guests compared to domestic was almost the highest (30.6%) in Prešov region, this was only overpassed by Košice region, where the guests' number per 1 000 inhabitants were lower (483 which is a middle-rate in the programme region), but out of these guests 35.1% were foreigners. The three Ukrainain regions are those which attracted the least number of guests, in Zakarpattya and Chernivtsi regions their ratio per 1 000 inhabitants have not even reached 100.

Figure 50: Territorial differences in guests in the programme area

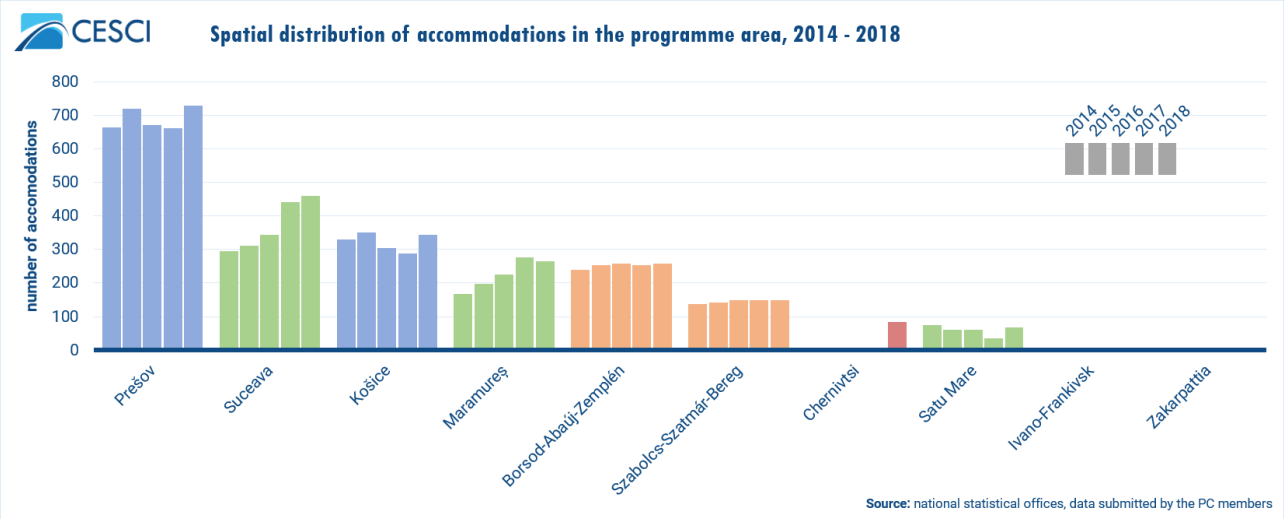


Whereas at the moment it can only be guessed what the COVID-19 pandemic and the subsequent national and international restrictions will do to tourism, it is most likely safe to assume that it will drastically change the travelling habits at least on the short-term. While up until now, it was considered as a good strategy to attract as many foreign visitors as possible due to their higher purchasing power, if the borders will stay closed, they will suddenly disappear from the equation. In this case, most likely every region will see a higher rate of domestic guests, however, those, which are already relatively more popular among their own citizens might do better. These are the Zakarpattya region (91%), Chernivetski region (90%), Ivano-Frankivsk region (90%), Satu Mare county (89%) and Suceava county (86%).

In connection with the number of guests what is also indicative of the size of tourism and the capitalisation of the cultural and natural heritage is the number of nights the guests spend in the given region. Unfortunately, for this data for the Ukrainian regions were not available, so only the other 7 regions could be analysed. This analysis shows that Prešov has by far the highest number of guest nights in 2019 (4 091 nights), which cannot be compared to the other counties: Borsod-Abaúj-Zemplén 1 622, Suceava 1 328, Košice 1 317, Maramureș 996, Szabolcs-Szatmár-Bereg 675 and Satu Mare 386.

Another interesting observation can be that if this indicator is compared between 2013 and 2019, different types of changes can be detected. In every region the number of guest nights in 2019 are higher than in 2013, except of Satu Mare where after some fluctuations it declined from 410 to 386. However, this is not the usual pattern, in all other cases an increase is observable with different speed. Four out of the seven analysed regions (not counting the Ukrainian regions due to lack of data) have a relatively similar growth rate, however, there is one county on each end of the scale which diverge from these tendencies. Szabolcs-Szatmár-Bereg county – albeit increased its guest night – it did so in a much smaller pace (almost one fourth of magnitude) than the other counties. On the other end of the scale is Prešov county which nearly doubled its guest nights of 2013 by 2019, although it is true that this growth was not continuous, for example it fell back in 2014 and the majority of the increase was achieved in 2019.

Figure 51: Spatial distribution of accommodations in the programme area



The data on the accommodations in the programme area is also non-conclusive as there are shortcomings in the input. However, based on what is available it is clear that the patterns are similar to that of the guest nights spent in the region. Prešov (728) has the highest number of accommodations by far and here the number increased significantly from 2008 to 2018. Suceava also has 460 accommodations while Košice 340. The end of the scale is Szabolcs-Szatmár-Bereg county with only 148 registered accommodations. Košice region is the only from the analysed territory where a decrease in the number of accommodation is observable between 2008 and 2018.

In general, accommodations can fall into many categories, they can be hotels, hostels, motels, touristic villas, bungalows, holiday villages, campings, boarding houses etc. attracting different target groups and working with profoundly diverging profit margins. From the available data it seems that out of the seven analysed regions (the Ukrainian regions not having data were disregarded from this comparison), the highest ratio of hotels among the total accommodation types is registered in Satu Mare region where 25% of the facilities are hotels. Borsod-Abaúj-Zemplén county comes as a close second with 23% and Szabolcs-Szatmár-Bereg county as a third with 20%. In the Slovak regions this rate falls between 14-16%, while the other Romanian counties have a 10-13% of hotel ratios.

2.6.2 Functional areas

Deriving from the analysis above – and taking into consideration the opinions of the local stakeholders as well as the submitted projects ideas detailed below – three main functional areas can be dissected for the Hungary-Slovakia-Romania-Ukraine cross-border territory.

Firstly, a functional area appears through the network of cultural heritage. A network of joint and complementary built heritage, cultural heritage sites such as historical monuments, castles, palaces, art nouveau buildings or folk art/rural architectural form a colourful but coherent territory that could be positioned and advertised for tourists. Also the tourism built on the religious sites and heritage belongs here together with the network of churches belonging to different denominations.

Secondly, the network of natural heritage forms an excellent functional area for the analysed territory. The network of sites rich in natural values such as different nature protection areas are and could be the prime locations for thematic routes such as cross-border routes with a network approach which thematically connect and territorially integrate different points of interest, attractions, infrastructure, products, services and stakeholders from both sides of the border in relation to at least a single tourism branch/sector. This could be for instance the active tourism with different hiking, cycling, kayaking etc. options.

Finally, the cross-border territory's inherent characteristics also makes it possible to create a spa and health tourism functional area (as briefly also mentioned in the chapter dedicated to healthcare). The abundance of thermal and mineral water sources scattered around the programme area can act as a real connecting power if these are correctly capitalised on through a cooperative and not competitive approach. Also, there are synergies between the spa and medical tourism offers between the different regions that could be tied in to a more comprehensive network of preventive and recovery services.

2.6.3 Opinions

The respondents of the survey had been asked to express their opinion about the short assessment of the programme area's characteristics connected to heritage management (as described at the beginning of this chapter).

Even though there were a minority (about 6% of the respondents) who claimed that this territory falls outside of their expertise and thus wish to refrain from giving an opinion about it, the vast majority of the respondents agreed with the assessment above and did not feel the need to add any further comments. However, there were also a considerable number of valuable and informative opinions which completed the brief assessment with insights that shed light on important aspects of the topic.

First, several respondents raised awareness on the issues connected to data collection and the selection of used indicators. It is highly important to use the most recent data, since as one of the respondents stated 'The information below shows statistical information for 2016. Currently Ivano-Frankivsk region demonstrates significant progress in the development of tourism.' However, finding the most recent data is not enough as their method of collection also must be compatible. As one respondent pointed out, the method of calculating the number of overnight stays in the EU and in Ukraine differs, so the comparison of data obtained by different methods can be erroneous, especially that the reliability of information of the number of tourist nights in Ukraine is questionable as the information from the private sectors is not taken into account. In contrast to this, several respondents required the diversification of data in a way that a number of indicators would appear in the analysis (such as the number of cultural events or the initiatives with cross-border involvement). Finally, someone suggested the use of smaller units as for instance in the case of Prešov district the nuances between the eastern and western parts are lost if the data is aggregated. While all these remarks are completely valid, in the document the conclusions are exclusively built on officially available data. More specific and specialised data collection on heritage management in the programme area nevertheless could be the objective of a project in the future programme.

Another group of received opinions emphasized the abundance of assets and attractions of the programme territory. Some simply named a few such as the High Tatras, the Cocosului ridge, or the sites in eastern Slovakia included on the UNESCO World Heritage List. Others focused on the ways to utilise the existing assets in a way to generate more tourism revenues, these mostly being the organisation of more cultural programs, guided tours, visits to folk craftsmen, tastings of local traditional products, thematic excursions and ecotourism. From the point of view of cross-border developments probably the most important angle in the opinions had been the one where a respondent suggested to integrate the Ukrainian regions into the international tourist flows through capitalizing on the shared historical past; their example was the HUSKROUA / 1001/046 project which linked together Ukrainian, Slovak and Hungarian museums to promote the historical role of the Rákóczi family which makes part of the common historical past.

Furthermore, there was a group of respondents who approached the topic from a more critical standpoint, highlighting the challenges that are perceivable in the heritage management. Both from a theoretical and practical point of one, one big challenge is to find the right balance between the development of tourism and the protection of natural values and habitats. It is often experienced –

especially in less developed areas – that the improvement of tourism happens at the cost of natural assets, which is an unsought adverse effect. However, this is not the only challenge that needs to be overcome; the differences in legal regulation of cultural and historical heritage preservation can also cause tension between the regions of the programme areas. Continuing the line of administrative barriers there is the very serious problem with the border permeability; without the simplification and acceleration of border crossing (probably through the creation of additional crossing points and simplified border crossing procedures), the number of tourists will not grow that significantly. Of course, the current times burdened with the global pandemic and the responses the nation states applied to control its spread goes against these trends and objectives. This has been already reflected on by the respondents who drew the attention on the current uncertain status of tourism.

When analysing the submitted opinions, the largest group turned out to be those that mentioned different development needs that are considered vital to flourish the programme area's heritage management and tourism. The clearest and loudest voice that was provided by a significant number of respondents stated that the highly precarious road infrastructure of the Ukrainian regions paired with the lengthy and complicated border crossing procedures are the biggest obstacle in the development of tourism based on cultural and natural heritage and therefore it is a territory that needs to be urgently developed (however, some respondents questioned whether the amelioration of the road infrastructure falls in the competencies of the cross-border programme or rather it is a state level responsibility). Secondly, the lack of quality accommodation, restaurant and program offerings (especially services linked to active tourism such as cycle paths and repair points, trekking routes, ski resorts etc.) are another huge territory that needs to be developed and also diversified within each region (as one of the opinions depicted in Szabolcs-Szatmár-Bereg county the ceilinging of the tourist nights are due to the fact that the Nyíregyháza-Sóstó axis is maxed out, but the other parts of the county are not exploited enough). Furthermore, the strengthening of marketing and information providing activities were also listed as a huge development need; new tourist directions, recreational, historical, cultural and natural resources need to be popularized, published on printed and online maps and made accessible in five languages. Concrete development ideas had been raised as well such as the organisation of summer and winter camps, community events or – the field analysed more in depth in the health care services chapter – the medical tourism as for instance sanatorium treatments would lengthen the tourist stays by 21-28 days as pointed out by a respondent.

2.6.4 Project ideas

The survey also asked the responding local stakeholders to list project ideas that they are aware of which are relevant to the promotion of cross-border local culture and historical heritage along with tourism functions. All in all, 41 such projects have been submitted which then were analysed from the point of view of their cross-border relevance and their thematic content (their analysis from the point of view of preparedness and project partners are carried out in detail in the chapter discussing the survey itself, but where important specific connections are also made here).

The submitted project ideas has been classified into three categories according to the level of their cross-border character: 0 was given to those ideas that have no cross-border angle, 1 for those which are somewhat relevant in a cross-border context and 2 for those project ideas that reflect on the true

purpose of the cross-border programme. Out of the 41 projects 34 projects were found to have some kind of cross-border relevance, meaning that the 7 which are not were excluded from the thematic analysis. It is a promising fact that the majority (24) of the projects were categorised in the highest rank showing that the responding local stakeholders are aware of the importance of thinking according to transboundary logic when planning their projects.

The submitted project ideas also went through a thematic scrutiny. During the analysis six different subcategories had been isolated encompassing all the project ideas, these being infrastructural project ideas (9), project ideas based on shared history (9), complex project ideas combining infrastructural and soft elements (8), agroturism & water tourism (6), marketing and institutional background ideas (5) as well as P2P initiatives (4). Having in mind that the submitted project ideas are only a snapshot of the respondents' ideas and not necessarily reflect on the regions' long-term developmental plans, still the analysis of the country patterns can be informative. According to this infrastructural projects seems to be more or less equally important in all four countries' affected territories (with Hungary and Romania gradually less so), it also seems like the projects building on the shared past are more popular in Ukraine (4 ideas) than in Slovakia (1 idea). But the most striking difference manifests in connection with agritourism and water tourism which are overrepresented in Ukraine and Slovakia (3 ideas respectively) but are entirely missing from the submitted project ideas from Hungary and Romania.

Not forgetting the findings of the statistical analysis and the general opinions of the respondents, it is not surprising that the infrastructural project ideas were the most numerous. The respondents considered that the cross-border programme offers an excellent opportunity to fill the shortcomings of the tourism infrastructure of the programme area. Concrete mentioned ideas considered small-scale infrastructure developments required for the development of the Upper Tisza rural heritage tour, the establishment and equipment of campsites in border regions with sophisticated comfort elements for caravans (service stands enabling the caravans to access water, electricity, sewage, internet etc.), establishment of a joint infrastructure center for tourism development, building of bicycle routes and trekking routes, development of accommodation sites as well as monitoring the condition and reconstruction of the access roads to increase the safety of visitors in the Tatras.

The project ideas based on shared history mostly focus on the preservation and development of architectural assets, be that monuments, castles, churches or museums. However, the majority of these project ideas go beyond mere restoration activities and they also include soft elements such as the organisation of workshops and sessions to discover further possibilities of usage such as what kind of activities could be organised within the walls of an eco-museum. Also, several projects focus on ethnographic research, exchange of experiences, building of databases and the production of various informative materials such as multilingual catalogues, brochures, maps, website, mobile applications or even documentary movies depicting not only the previous ways of life but also the current activities and experiences a tourist can benefit from upon visiting the cross-border region.

Complex project ideas are usually more successful in sustaining their achievements as it combines infrastructural developments with soft project elements. The submitted project ideas that were classified in this group usually targeted to identify a niche (such as the creation of new tourist routes), then after creating the necessary infrastructure for it, continue the work with training guides, developing a website and/or mobile application, printing informative materials about it etc. Then

there are those project ideas that also intend to organize events around these infrastructural investments such as workshops with folk craftsmen, folk dance classes, exhibition of gastronomic products, fairs for handicrafts etc.

Marketing and institutional background ideas also markedly appeared among the project proposals. Although in the case of the above mentioned complex projects also the necessity to disseminate information about the sights and points of interest were mentioned as part of the projects, in the case of certain projects the entire attention is devoted to the marketing of either the whole cross-border area or a certain specific product. In order to do this, one project idea for instance suggests to carry out a series of surveys and data collection activities (which reflects also to the above described needs for accurate and up-to-date data) about the natural and cultural resources that can be used for tourism, about the visitors' habits and preferences to outline development needs and also a survey for tourism service providers to facilitate their cross-border cooperation and the development of joint tourism program packages. Another form of marketing that was proposed is the creation of an online television channel where the programme area would be presented, informing the potential tourists about the events and attractions of the region. Furthermore, some project ideas also supported the development of the operational capacities of non-governmental organization dealing with tourism and heritage protection operating in the border area.

Agrotourism and water tourism were grouped under the same category not necessarily because they are interlinked but because these two areas had been identified within the submitted project ideas as separate, concrete areas in need of development. Here the project proposals tended to describe quite general ideas such as the production and distribution of local products or the improvement of the professional competences of producers. Water tourism is based on the endogenous resources of the programme area, and albeit it carries a lot of potential, the described project ideas were again quite underdeveloped (such as 'to create tourist zones and thermal waters of historical heritage').

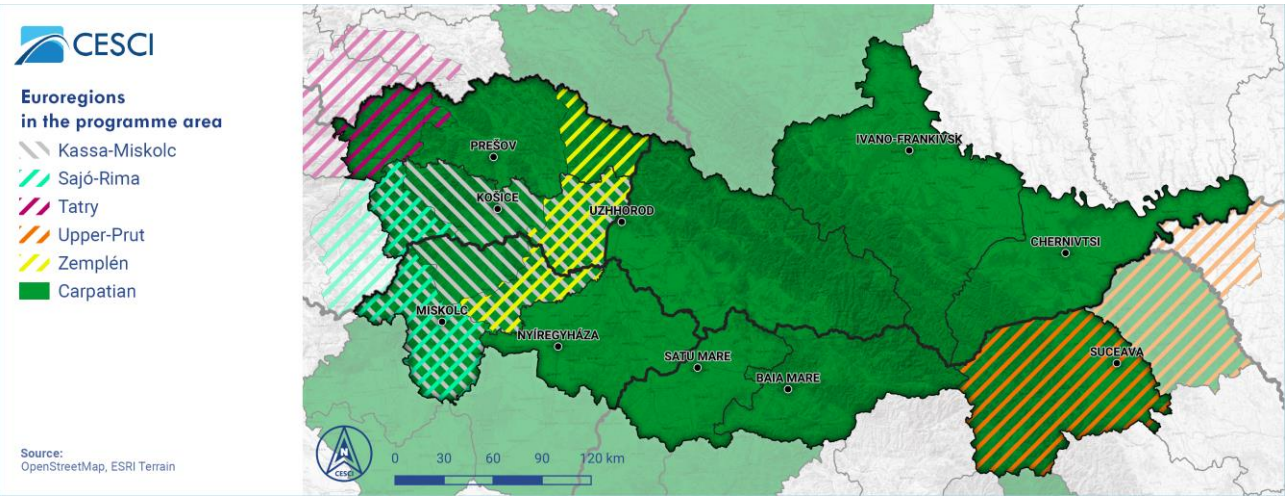
Finally, there were project proposals which placed their focus on the people-to-people cooperation aspect within heritage management and tourism. For instance, one suggested to organize fishing camps for children which would include attitude-forming activities, excursions and knowledge sharing about the programme area to familiarize the children with each other's culture and history. In a similar manner but for adults the organization of different festivals were also proposed; the main idea of the 'Festival of Four Cultures' is to get acquainted with the authenticity of cultures, traditions, languages and lifestyles of different nationalities.

2.7 ISO1 Main characteristics of the governance of the area

2.7.1 Public administration of the area

All the related four countries are unitary states according to the degree of self-governance of the regions. It means there is limited authority enjoyed by the regional governance units, and most of the competences lie with the central government. The largest tiers of sub-national government are the same in all four states considering their PC and MC member roles in the Programme: the NUTSIII regions in the EU member states (județ in Romania, kraj in Slovakia and megye in Hungary) and the oblasts is Ukraine. However, apart from the surface area and population, there are some differences in their roles and responsibilities, competences, budget, personnel etc. among the related regional public bodies. The regional administration has the most extensive power in Slovakia, where the counties extend their powers to several educational, health care, transport, cultural, social policy-related etc. fields, and has significant budget to dispose of as well. On the other hand, in Hungary counties are rather weak, since in the latest years they lost their hospitals, schools, museums and many other institutions as owners, and their main tasks have been reduced to regional planning and development basically. However, all regions discussed are responsible for the coordination of territorial development within their respective territories.

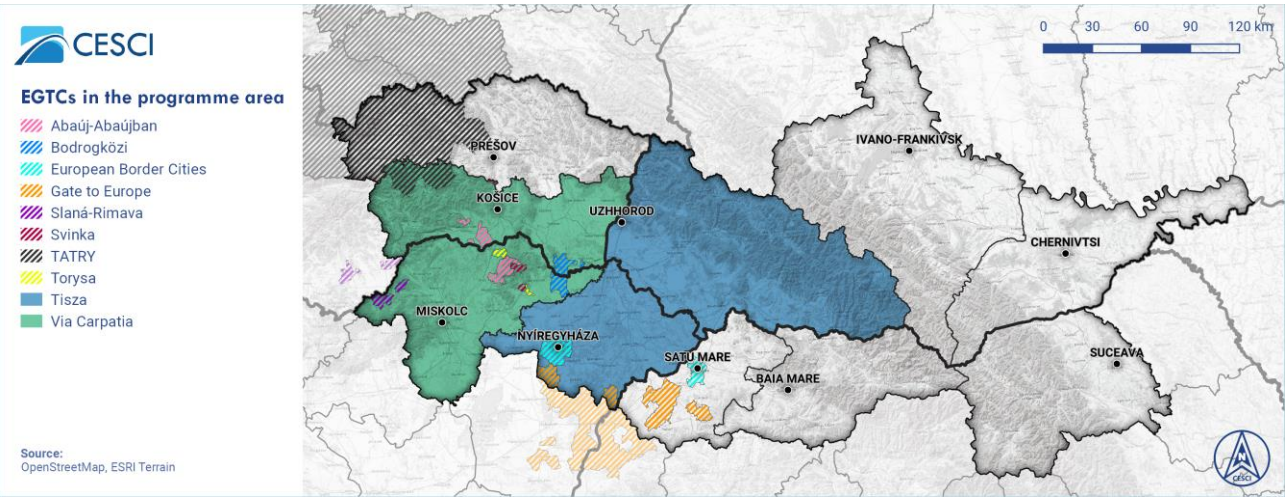
Figure 52: Euroregions in the programme area



Along with the actual regions, cross-border bodies have also been formed in the analysed area including Euroregions and European Groupings of Territorial Cooperation (EGTC), which consist of regional and local governments, municipalities. There are six **Euroregions** operating in the analysed area: Košice-Miskolc Euroregion, Kassa-Miskolc Euroregion, Sajó-Rima Euroregion, Tatry Euroregion, Upper Prut Euroregion, Zemplén Euroregion. Out of these Carpathian Euroregion is the largest, which builds up of all the analysed regions, and additional Hungarian, Ukrainian and Polish regions. This incorporates all the related regions, while the rest of the Euroregions have been established between two countries' border areas as members (between Slovakia and Hungary: Košice-Miskolc Euroregion, Sajó-Rima Euroregion, Zemplén Euroregion, between Slovakia and Poland: Tatry Euroregion, between Romania and Moldova: Upper Prut Euroregion). The largest number of Euroregions is functioning in the Slovakian and Hungarian analysed area, only Upper-Prut Euroregion has a

completely different territorial focus. On the other hand, low number of such bodies operates with the participation of Ukraine, i.e. there is a certain lack of them. Regarding the size and shape of the cooperation areas and memberships, Upper Prut, Košice-Miskolc and Carpathian are adjusted to NUTSIII type of regions.

Figure 53: EGTCs in the programme area



There are ten **EGTCs** operating in the analysed area. None of them covers all the analysed regions from the four countries, and all of them have members from two countries exclusively. Except for Tatry EGTC, all try to create stronger cohesion within the analysed area. The largest number of EGTCs is having members from Slovakia and Hungary (Abaúj-Abaújban, Bodrogközi, Slaná-Rimava, Svinka, Torysa, Via Carpatia). There are two which are focused on the Romanian-Hungarian border areas (Gate to Europe and European Border Cities). There is only a single EGTC (Tisza) that is a body with a Ukrainian member. No such body has been established with the participation of Slovak-Ukrainian or Romanian-Ukrainian members along the related borders. Via Carpatia and Tisza are EGTCs with regional governments (kraj, county, oblast) as members, while the others can be regarded as cooperation bodies of local governments and municipalities, therefore the area of the latter is generally smaller.

2.7.2 Main experiences in the cooperation of the cross-border bodies

The most active applicants regarding project development and realisation during the 2014-2020 Programme were the EGTCs among the cross-border bodies. The Ukrainian-Hungarian Tisza EGTC participates in six projects, three times as Lead Applicant. Tisza EGTC put TO3 Promotion of local culture and preservation of historical heritage into the heart of its Lead Applicant activities. One project was called Augmented Reality in Tourism – Tourism development with advanced IT technologies with an ENI contribution of 148 578.3 and a total cost of 165 087 EUR, while the other is titled Augmented Reality Solutions in Tourism to Promote Culture and History in the 4 Borders Region with an ENI contribution of 125 261.1 and a total cost of 139 179 EUR. The third project as a Lead Partner is titled Select2Select: establishment of selective waste management in the joint cross-border area with an ENI contribution of 61 712.55 and a total cost of 68 569.5 EUR. Other projects, where the EGTC participates as a project partner included ClimateGuard – Planning the Cross-Border

Anti-Hail System of the Frontier Regions of Hungary, Romania and Ukraine, Environmental Assessment for Natural Resources Revitalization in Solotvyno to prevent the further pollution of the Upper-Tisza Basin through the preparation of a complex monitoring system, and Zero Waste: Theory for Everybody, Practice for Everyone in the Cross-Border Region.

Via Carpatia EGTC has a total of three projects as a project partner in each case. Two are titled Tradition Renaissance Factory in the frames of TO3 Promotion of local culture and preservation of historical heritage (ENI contributions of 105 182.6 and 117740.84 EUR, total costs of 116 869.56 and 130 823.16 EUR). The third project is titled ICT-based Clusters in border regions in relation to TO7 Improvement of accessibility to the regions, development of sustainable and climate-proof transport and communication networks and systems (ENI contribution: 104 596.92, total contribution: 116 218.8 EUR).

Significant project activity can also be detected in relation to the area and the body of the Carpathian Euroregion. The Regional Development Association for the Carpathian Euroregion participates in two projects as a project partner. One is a project titled Carpathian Small Aviation – new approaches for mobility of persons and goods in Carpathian region ENI contribution: 498 205.94, total cost: 553 562.16 EUR) in the frames of TO7, while the other is called Establishment of the International Museum of Transborder Cooperation (ENI contribution: 95 648.04, total cost: 106 275.6 EUR) in relation to TO3. Projects can be related to the Carpathian Euroregion in the case of three more projects: Promotion of crafts and gastronomy, as relevant components of the cultural heritage of the Carpathian Euroregion; Promoting the immaterial wooden heritage of the Carpathian Euroregion, a technical handbook for traditional woodworking. However, these are not carried out by the Euroregion itself.

The other cross-border cooperation organisations have not won any projects from the HUSKROUA CBC Programme.

Based on the experiences of Tisa, Via Carpatia and European Border Cities EGTCs that filled the survey (for further analysis, please check Chapter *3.1 Results* of the online survey), the most frequent difficulties the EGTCs encounter when participating in a CBC programme are the lack of capacity (lack of language skills) in the organization and the lack of partner(s). Except for Via Carpatia the other two EGTCs said the priorities identified in the Programme largely met the territorial needs of the border area. Via Carpatia expressed that TO8-P1 and TO8-P2 met the needs to a small extent. Other topics that EGTCs consider important to present in the next Programme include cross-border inter-municipal cooperation, creation of products with high added-value, cooperation of entrepreneurs, educational cooperation, cultural cooperation and citizens' cooperation (P2P).

The EGTCs find themselves capable of using innovative application, tender tools, especially Small Project Fund. It is worth noting that Via Carpatia EGTC has gained experience and primary role in the Small Project Fund of the Interreg V- A SK-HU Cooperation Programme as it manages SpF for Borsod-Abaúj-Zemplén County and Košický Region.

2.7.3 Synergic connections with the EU related macro-regional strategy

The current HUSKROUA CBC Programme area is territorially fully covered by one of the four macro-regional strategies of the European Union, namely the EU Strategy for the Danube Region (EUSDR).

The analysis of the connection between the NEXT CBC Programme and the EUSDR, is based on the document named *"Embedding EUSDR into EU funds. A comprehensive tool."* This tool was developed in the context of the embedding of the EUSDR into EU funds. It also emphasizes that the preparation phase of the post-2020 programming offers an opportunity to funds such as IPA and NEXT (former called NDICI) to address territorial challenges more strategically, through more coordinated and synergized actions stressing European added value. The table attached below is based on the overview of all strategic topics as submitted by Priority Area Coordinators (PACs) in May 2020, which have been allocated to the NEXT fund. The direct and indirect synergies in the following table are checked between the Thematic Objectives of the NEXT Programme and the shortlist of up to three strategic topics per Priority Area to be included in the relevant operational programmes proposed by the PACs, i.e. the related Working Group's shortlisted actions from EUSDR Action Plan. In the upcoming NEXT CBC Programme according to the decision made by the PC the current priorities will be kept. Thus, the table deals with objectives and priorities already known in comparing them to the EUSDR actions. The table shows if there are connections between the Pas and the Tos, and if so, what strength the respective relation is. Direct connections were marked by 1, while indirect connections by ½.

Strong direct connections between the actions of the EUSDR Action Plan and the Thematic Objectives and priorities of the NEXT Programme can be detected between "PA 3 Culture and Tourism, People to People" and "TO3-P1 Heritage", since only two actions have indirect connection, and the other four is in a close synergy with to the related TO-P. The actions of "PA 4 Water quality" and "PA 5 Environmental" risks are by supported by either "TO6-1 Environment" or "TO8-P1" to a large extent directly. In relation to "PA 1b Rail-Road-Air Mobility" there is only a single action which is not in a direct connection with "TO7-P1 Transport", and the same is valid regarding the connection between "PA 6 Biodiversity and landscapes, quality of air and soils" and "TO6-P1 Environment".

In contrast, Pas connected to economic cohesion in particular ("PA 7 Knowledge Society", "PA 8 Competitiveness of enterprises" and "PA 9 People and skills") are very weakly assessed with regard to the designated Tos of the Programme. This is especially true comparing to the strong interrelations in the case of environmental and touristic actions. Partly owing to the navigability problems in the related Tisza river sections, "PA 1a Water Mobility" and "TOP7-P1" have low level of synergies. "PA 10 Institutional Capacity and Cooperation", and partly "PA 11 Security" as well have rather weak direct connections with the chosen TO-Ps of the Programme.

Table 10: Synergic relations between the Shortlisted Actions of the EUSDR Priority Areas and the Thematic Objectives of the HUSKROUA CBC Programme

Priority Area	Shortlisted Actions from EUSDR Action Plan (Final SWD of EC as of 4/2020)	TO3-P1 Heritage	TO6-P1 Environment	TO7-P1 Transport	TO8-P1 Disaster	TO8-P2 Health
PA 1a Water Mobility	ACTION 1: Contribute to improve waterway and port infrastructure & management			½		
	ACTION 3: Facilitate fleet modernization					
	ACTION 5: Contribute to the enhanced quality of education and jobs			½		
PA 1b Rail-Road-Air Mobility	ACTION 3: To enhance cooperation between air traffic stakeholders in order to improve regional connectivity and prepare a plan to implement shorter plane routes					
	ACTION 5: To improve the regional/ local cross-border infrastructure and the access to rural areas by facilitating secondary and tertiary transport infrastructure			1		
	ACTION 6: To develop further nodal planning for multimodality			1		
PA 2 Sustainable Energy	ACTION 1: To further explore the sustainable use of clean biomass, solar energy, geothermal, hydropower and wind power to increase the energy independency and to promote and support multipurpose cross border RES utilisation projects.		1			
	ACTION 2: To promote energy efficiency and use of renewable energy in buildings and heating systems including district heating and cooling and combined heat and power facilities		½			
	ACTION 7: To explore new and innovative solutions of (subsurface) energy storage					
PA 3 Culture and Tourism, People to People	ACTION 1: Promote sustainable tourism in the Danube Region and capitalise on EUSDR projects in the areas of culture, nature and tourism	1				
	ACTION 2: Support and promote cultural tourism in the Danube Region	1				
	ACTION 3: Invest in sustainable quality products, services, innovative forms and infrastructure in the fields of tourism and culture, promote skills, education and creating jobs in the related areas	1				
	ACTION 4: Develop a "Smart Destination Danube"	½				
	ACTION 5: Promote and encourage the development of the cultural activities and creative sectors	½				
	ACTION 6: Promote cultural heritage in the Danube Region	1				
PA 4 Water quality	ACTION 1: HAZARDOUS & EMERGING SUBSTANCES: Promote monitoring, prevention and reduction of water pollution deriving from hazardous and emerging substances (EU priority substances and watch list candidates as well as Danube basin specific pollutants candidates and others e.g. micro plastics-plastics, pharmaceuticals, PFOS)		1		1	

Priority Area	Shortlisted Actions from EUSDR Action Plan (Final SWD of EC as of 4/2020)	TO3-P1 Heritage	TO6-P1 Environment	TO7-P1 Transport	TO8-P1 Disaster	TO8-P2 Health
	ACTION 2: WASTE WATER: Continue boosting major investments in building, upgrading, maintaining and rehabilitating urban wastewater treatment facilities and promote alternative collection and treatment of wastewater in small rural settlements, including measures to build capacity at the regional and local level across the Danube basin		**1**		**1**	
	ACTION 3: WATER & AGRICULTURE: Promote prevention and reduction of diffuse pollution, promote nutrient retention, smart irrigation and water reuse, foster and develop an active process of dialogue and cooperation between authorities responsible for agriculture and environment to ensure that measures are taken to address diffuse pollution and ensure smart water use		**1**			
	ACTION 6: CLIMATE CHANGE: Promote measures to adapt to climate change impacts in relation to water quality and quantity		**1**			
PA 5 Environmental risks	ACTION 1: Provide sufficient support for development and execution of risk management plans for different hazards				**1**	
	ACTION 3: Strengthen disaster prevention and preparedness among governmental and non-governmental organizations				**1**	
	ACTION 5: Anticipate regional and local impacts of climate change		**1**			
PA 6 Biodiversity and landscapes, quality of air and soils	ACTION 3: Develop and/or implement conservation action plans and/or management plans for endangered umbrella species of the Danube Region		**1**			
	ACTION 5: Anchoring the concept of EU green infrastructure in the Danube region		**1**			
	ACTION 7: Enhance and/or maintain soil-related ecosystem services (ES)		**½**			
PA 7 Knowledge Society	ACTION 1: To promote coordination of national, regional and EU funds to stimulate excellence in R&D&I, in research areas specific for Danube Region					
	ACTION 2: To promote participation of Danube countries in EU R&I Programmes, in particular in Horizon Europe					
	ACTION 3: To strengthen cooperation among universities, research organisations and SMEs in the Danube Region					
	ACTION 4: To increase awareness and visibility of science and innovation in the Danube Region					
	ACTION 5: To support exchange of information and experience sharing for the purpose of preparation of future strategic R&I documents applicable in the new programming period					

Priority Area	Shortlisted Actions from EUSDR Action Plan (Final SWD of EC as of 4/2020)	TO3-P1 Heritage	TO6-P1 Environment	TO7-P1 Transport	TO8-P1 Disaster	TO8-P2 Health
PA 8 Competitiveness of enterprises	ACTION 3: Improvement of framework conditions, support programs and capacity building of stakeholders, to enhance the collaboration between cluster initiatives and regional innovation strategies, with an accent on the rural areas					
	ACTION 4: To improve business support to strengthen the innovative and digital capacities of female-led-SMEs					
	ACTION 5: Enhance the application of Artificial Intelligence (AI) technologies in the Danube Region SMEs					
PA 9 People and skills	ACTION 1: Intensify Cooperation in Labour Market Policies					
	ACTION 2: Digitalization and Innovation in the World of Work					
	ACTION 3: Integration of Vulnerable Groups into the Labour Market					
	ACTION 4: Fighting Poverty and Promoting Social Inclusion for All					
	ACTION 5: Quality and Efficiency of Education and Training Systems					
	ACTION 6: Relevant and High-Quality Knowledge, Skills and Competences					
	ACTION 8: Inclusive Education, Equity, Common Values and Sustainable Development					
PA 10 Institutional Capacity and Cooperation	ACTION 1: To improve institutional capacities in order to provide high-quality public services			**½**		**1**
	ACTION 6: To foster cooperation built on mutual trust between state and non-state actors to enhance well-being for the inhabitants of the Danube Region					
	ACTION 7: To strengthen the involvement of civil society and local actors in the Danube Region					
	ACTION 8: To enhance capacities of cities and municipalities to facilitate local and regional development					
PA 11 Security	ACTION 1: Security offensive – Enhancing police cooperation with the aim of improving security and tackling serious and organised crime in the EUSDR countries and strengthening the efforts against terrorism threats			**½**		
	ACTION 3: Improving the systems of border control, document inspection management and cooperation on consular related issues in the Danube region			**1**		
	ACTION 4: Promoting the rule of law and the fight corruption					

2.7.4 Synergic connections with relevant national and regional strategies

A total number of 65 distinct national and regional development plans from the participating four countries were collected and reviewed in order to find out the connections between the suggested developments and the Tos and their priorities. Those documents were checked which have a strong relevance to the Programme; their timeframe does not terminate before 2021, and their topics correspond to the Tos of the NEXT CBC Programme.

Out of the selected documents 21 has a suggestion or development idea with CBC relevance. The majority focuses on few certain topics, namely on transport as being the most favourable thematic field, as well as on environment. Other relatively frequently discusses topics include tourism and cultural heritage, often in connection with each other. There is very limited number of documents which would deal with the whole analysed area. The highest share of documents with clear suggestions on cross-border cooperation is from Hungary. The proportion of documents from Slovakia and Hungary regarding TO6-PO1 and TO8-PO1 is high, and the same is valid for Hungary in the case of TO7-PO1. Considering TO3-PO1 the picture is more heterogeneous by countries, but Romania and Ukraine have higher shares than in other Tos in general.

In relation to **transport**, the most comprehensive suggestions for cross-border relations in the programme area can be found in the National Transport Infrastructure Development Strategy of Hungary[97]. It discusses the completion of domestic sections of motorways in the direction of national borders to enhance accessibility, the development of cross-border transport network connections. The document also identifies threats. It says if resources are not concentrated on the development of cross-border infrastructures where the creation of a new connection or the increase of capacity can induce real cross-border development effects, both in economic and social terms, and based on better exploitation of existing territorial potential, serious territorial competitiveness disadvantages some border regions would suffer from, while the spatial focus of developments would be lacking. If cross-border integrated industrial-logistics zones cannot be established, Hungary will only benefit from the damaging effects of transit traffic on the road network and the environment, according to the document. National Development and Territorial Development Concept of Hungary[98] suggests that there is an incomplete transport infrastructure, while the east-west traffic relations are strong. Strategic plan for the development of transport in the Slovak Republic until 2030[99] explains that ensuring the cross-border character of transport is a main challenge. State Programme for Development of Ukrainian Carpathian Region for 2020-2022[100] deals with the need for construction of new Ukrainian-Romanian road border crossings, and the improvement of transport infrastructure of the Ukrainian-Romanian, Ukrainian-Slovak and Ukrainian-Hungarian border crossings and the logistics bases near them. Strategy of regional development of the Chernivetska Region for the

97 National Transport Infrastructure Development Strategy of Hungary: **https://www.kormany.hu/download/b/84/10000/Nemzeti%20K%C3%B6zleked%C3%A9si%20Infrastrukt%C3%BAra-fejleszt%C3%A9si%20Strat%C3%A9gia.pdf**

98 National Development and Territorial Development Concept of Hungary: **https://regionalispolitika.kormany.hu/download/a/c9/e0000/MK14001.pdf**

99 Strategic plan for the development of transport in the Slovak Republic until 2030: **https://www.mindop.sk/ministerstvo-1/doprava-3/strategia/strategicky-plan-rozvoja-dopravy-sr-do-roku-2030/strategicky-plan-rozvoja-dopravy-sr-do-roku-2030**

100 State Programme for Development of Ukrainian Carpathian Region for 2020-2022: **https://www.kmu.gov.ua/npas/pro-zatverdzhennya-derzhavnoyi-programi-rozvitku-regionu-ukrayinskih-karpat-na-20202022-roki-i201019**

period until 2027[101] envisages the maintenance and development of transit routes through the region; the development of border infrastructure and the modernization of border crossings. National Tourism Development Strategy 2030 of Hungary[102] supports the development of service infrastructure at border crossings.

Regarding suggestions for cross-border relations in the field of **environmental issues**, Romania's National Strategy for Sustainable Development 2030[103] can be mentioned, among others. It calls for creating coherence between national policies and support for international partnerships. In Greener Slovakia – Strategy of the Environmental Policy of the Slovak Republic until 2030[104] the notion of cross-border frame appears in the goal of Better Data for Better Decision Making. Specifically, it underlines the public availability of data, open access and high-quality and up-to-date data will ensure better and more reliable fulfilment of cross-border and international legislative commitments and expectations of the Slovak Republic in several areas. According to the Strategy for the adaptation of the Slovak Republic to the adverse effects of climate change[105], the change and its consequences go beyond national borders, thus cross-border, collaborative and coordinated approach is needed for the adopted measures. The strategy mentions the priorities of efficient water management, climate change and circular management; sustainable agriculture, food and forestry in the context of climate change. Furthermore, the Strategy underlines that Slovakia is member of the Carpathian Convention and of the Carpathian Wetland Initiative. Strategy of regional development of the Chernivetska Region for the period until 2027 suggest the examination of establishing three Ukrainian-Romanian cross-border nature reserves on the basis of existing protection areas. Also, it envisages the improvement of the ecological status of Prut and Siret by modernizing and building new treatment plants on the rivers. National Water Strategy (Kvassay Jenő Plan) of Hungary[106] describes that in sustainable river basin management, cross-border cooperation is needed to address the risk of floods, droughts and water pollution. In all transboundary water relations of Hungary, the coordination of cross-border monitoring systems, the regulated and regular provision of data between countries, and the knowledge of the operating rules of water facilities are a priority. The extension of the river assessment model to the river basin has already begun with the two countries with the most important border conditions, Ukraine and Serbia. The goal is to expand it with the five Tisza countries. Main problems in cross-border relations in general are as follows: there is no mature

101 Strategy of regional development of the Chernivetska Region for the period until 2027: **https://bukoda.gov.ua/uploads/editor/bukoda.gov.ua/%D1%81%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D1%96%D1%8F%202027/Strategia-Chernivetska-2027.pdf**

102 National Tourism Development Strategy 2030 of Hungary: **https://www.kormany.hu/download/8/19/31000/mtu_kiadvany_EPUB_297x210mm%20-%20preview.pdf**

103 Romania's National Strategy for Sustainable Development 2030: **https://www.edu.ro/sites/default/files/Strategia-nationala-pentru-dezvoltarea-durabila-a-Rom%C3%A2niei-2030.pdf**

104 Greener Slovakia - Strategy of the Environmental Policy of the Slovak Republic until 2030: **https://www.minzp.sk/files/iep/greener_slovakia-strategy_of_the_environmental_policy_of_the_slovak_republic_until_2030.pdf**

105 Greener Slovakia - Strategy of the Environmental Policy of the Slovak Republic until 2030: **https://www.minzp.sk/files/odbor-politiky-zmeny-klimy/strategia-adaptacie-sr-zmenu-klimy-aktualizacia.pdf**

106 National Water Strategy (Kvassay Jenő Plan) of Hungary: **https://www.vizugy.hu/vizstrategia/documents/997966DE-9F6F-4624-91C5-3336153778D9/Nemzeti-Vizstrategia.pdf**

coordination mechanism for river basin management and flood risk management plans for cross-border river basins; not all existing Border Conventions apply EU legislation in the meantime; international data exchange is not sufficient to implement the expected quality of flood forecasting; there is a lack of joint remediation plans for watercourses forming a state border. According to the National Framework Strategy on Sustainable Development of Hungary[107] the creation of conditions for sustainability is not only a task within the country, it requires cooperation with the neighbouring countries, it is of special importance. It highlights the water quality problems related to hazardous substances. Water quality is affected by heavy metal pollution from across the country, typically from the rivers entering Ukraine and Romania, the Tisza, the Someș, the Crasna, the Tur. National Landscape Strategy of Hungary[108] describes that there is a chance for cooperation on the basis of landscape units across borders. Two opportunities for international cooperation is mentioned: expanding existing bilateral cooperation with neighbouring countries in the planning, protection, management and development of border landscapes; encouraging cooperation between local governments and regional actors in cross-border landscapes (e.g. broadening cooperation between national park directorates, local action groups, social organizations). National Development and Territorial Development Concept of Hungary[109] underlines the backwardness of environmental infrastructure in relation to the Hungarian-Ukrainian border areas.

Tourism and culture, topics often go hand in hand in the development plans, are also having CBC relevance in the documents. However, compared to transport and environment, natural heritage much less information on how to manage the topics in a cross-border context can be found. Rather broad ideas have been formulated. Some plans tell more about cross-border cooperation, e.g. the National Tourism Development Strategy 2019-2030 of Romania.[110] It supports activities in the frames of the HUSKROUA Programme such as preservation and enhancement of cultural heritage, monuments and buildings, and promotion and development of intangible cultural heritage. Concept of the development of culture in the Košice self-governing region 2020-2025 (2030)[111] also deals with the HUSKROUA. But, as described above, in many plans like in the case of the Development strategy of the Ivano-Frankivsk region for the period until 2027[112] the suggestions remain broad (here: support for the implementation of cross-border projects in the field of tourism).

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107 National Framework Strategy on Sustainable Development of Hungary: **http://sdgtoolkit.org/wp-content/uploads/2017/02/National-Framework-Strategy-on-Sustainable-Development-of-Hungary.pdf**

108 National Landscape Strategy of Hungary: https://www.kormany.hu/download/8/ff/f0000/Nemzeti%20T%C3%A1jstrat%C3%A9gia_2017-2026.pdf

109 National Development and Territorial Development Concept of Hungary: **https://regionalispolitika.kormany.hu/download/b/c9/e0000/OFTK_vegleges_EN.pdf**

110 National Tourism Development Strategy 2019-2030 of Romania: **http://b2b-strategy.ro/b2b/wp-content/uploads/Strategia-na%C8%9Bional%C4%83-a-Rom%C3%A2niei-pentru-dezvoltarea-turismului-Volumul-1.pdf**

111 Concept of the development of culture in the Košice self-governing region 2020-2025 (2030): **https://web.vucke.sk/files/sk/kompetencie/kultura/koncepcne-materialy/koncepcia_rozvoja_kultury_2019.pd**

112 Development strategy of the Ivano-Frankivsk region for the period until 2027: **http://www.if.gov.ua/files/uploads/%D0%A1%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D1%96%D1%8F%20%D1%80%D0%BE%D0%B7%D0%B2%D0%B8%D1%82%D0%BA%D1%83%20%D0%86%D0%B2%D0%B0%D0%BD%D0%BE**

2.8 Orientations from previous reports

In this chapter those main documents are reviewed that have been prepared over the past two years with the aim to provide input and guidance for the next program from the experiences of the current program as well as from the evolving territorial needs. In the following, a short summary will be provided on the main findings of these studied documents, highlighting the proposals that can inform the thematic scope of the next program.

2.8.1 First Phase Evaluation of the HUSKROUA ENI CBC Programme 2014-2020

Cut-off date of data processing: 30/09/2018. Elaborated by CESCI.

The Managing Authority of the Programme as the institution responsible for the coordination of the on-going (mid-term) evaluation, invited originally in February 2018 the Central European Service for Cross-Border Initiatives (CESCI) originally to deliver a report on the then-status of the Programme. The cut-off date of data processing was 30 September 2018. Due to the fact that the evaluation was made at an early stage of the programme implementation, the real impacts could not yet be detected. However, based on the available information and previous experiences, some predictions were still made.

The mid-term evaluation has been made several recommendations, which do not necessarily concentrate on the thematic scope:

1. Programme procedures

1.1 Compensation of the delay

R_1.1 Speed up the processes
R_1.2 Train the beneficiaries on the use of the IMIS
R_1.3 Improve internal communication

1.2 Better performance

R_1.4 Ensure stricter monitoring over the projects
R_1.5 Monitor the implementation of the LIP projects with special attention
R_1.6 Enhance the branch offices
R_1.7 Facilitate better-based partnerships through a partner evaluation system
R_1.8 Improve the beneficiaries' communication capacities
R_1.9 Improve the cross-border character of the projects
R_1.10 Promote the best practice examples
R_1.11 Follow up the level of contribution to EUSDR

2. Lessons-to-go for the design of the next programme

2.1 Strategic framework

R_2.1 Ensure a more balanced geographic coverage in the programme
R_2.2 Ensure untroubled transition to the next programme
R_2.3 Re-consider the current set of the priorities
R_2.4 Improve the permeability of the border through cross-border infrastructural developments
R_2.5 Involve the selected beneficiaries in the designing of the next programme

2.2 Tools

R_2.6 Keep the practice of advance payment

R_2.7 Plan the TA budget with special concern
R_2.8 Keep the tool of the strategic projects
R_2.9 Apply the tool of small project fund

Most of the suggestions relate to the program procedures and implementation. However, proposals R_2.3 and R_2.4 contain information relevant to the thematic scope. In order to provide more information on these, the relevant sections of the report have been included below.

R_2.3 Re-consider the current set of the priorities

The interviewees' general opinion is that the situation analysis of the current programme is a well-based study which justifies the selected priority areas. None of the interviewees questioned the legitimacy of the selected priorities which are considered being in harmony with the needs of the territorial actors. The relevance of the selection is further underlined by the high number of applications.

However, also some critical remarks have been stated. On the one hand, the number of priorities seems to be too high compared to the small budget of the programme. The high variety of the priorities thins out the financial resources. On the other hand, there are some further aspects which are not reflected by the selected priorities. Some interviewees think that the Programme should give more emphasis on (i) the catching up of the Ukrainian borderland in terms of economic performance and European standardisation, as well as on (ii) labour migration. Taking into account the biggest challenges of the border area, the programme really does not tackle the issues of outmigration, cross-border labour mobility and development of skills. Furthermore, the high poverty rate is a common characteristic of the eligible area, too. Therefore, it is worth re-considering the priorities when designing the next programme and giving more focus to those challenges influencing the Euro-Atlantic integration of Ukraine.

R_2.4 Improve the permeability of the border through cross-border infrastructural developments

Obviously, the cooperation programme itself lacks the appropriate financial background for significantly improving the permeability of the borders. However, if every JOP does not contribute but to the construction of 2-3 new border crossings, it will give the perspective of a more integrated borderland and can intensify cross-border relations. Especially, the Ukrainian-Romanian border suffers from the lack of border crossing possibilities. There are only 4 road border crossings along the 531 km long border, which means an extremely low permeability (the average distance is 133 km). Without increasing the permeability, the borders will keep representing a hard barrier preventing lively cross-border cooperation. All this means that the selection of infrastructure development as a priority was well-founded and it should be kept in the next programme as well.

In addition, the Programme itself is the most relevant platform which can represent and popularise the interests of the border area as a whole. Beside the potential construction projects, the CP should encourage the political level to be more committed to the further opening of the borders; and it can support the preparation of relevant studies and the technical plans of the future infrastructure. Regardless of the failure of the previous programme regarding the planned 9 new and renewed

border crossings, with stricter monitoring the number of border crossings should be increased systematically. It is a key factor of Ukraine's Euro-Atlantic integration.

2.8.2 Report of the 2019 Result Oriented Monitoring of the Hungary-Slovakia-Romania-Ukraine ENI CBC Programme 2014-2020

Report date: 30/04/2019. Elaborated by DG Near.

The report of the Result Oriented Monitoring (ROM) summarized the findings in 4 points: 1. Relevance, 2. Efficiency, 3. Effectiveness, 4. Sustainability. Based on these, it made the following 9 suggestions:

Table 11: Recommendations of the ROM

Recommendations	
R1	Directorate-General for Neighbourhood and Enlargement Negotiations (DG Near)/European Commission (EC): should consider how the many good practices of this programme can be captured and disseminated to help management of other cross- border programmes.
R2	MA and JTS should urgently undertake (i) development of detailed methodological guidance for all the indicators, including explanation of the content, sources, collection, calculation storage and dissemination (ii) surveys for setting the baseline and target values for two indicators based on this method for data collection.
R3	MA and JTS should urgently address the capacity issues by: (i) accelerating recruitment processes, (ii) and as long as HUSKROUA 2007-2013 continues to require efforts, ensuring adequate staff in JTS, (iii) urgently ensuring the full functionality and effective use of Branches Offices.
R4	The MA should convoke the JMC more regularly and more often than currently and work in a more effective, collegial manner using the JMC as required. Nas and other members of the JMC should use a more proactive approach in requiring meetings, joint efforts to harmonise the agenda, enquire when problems become manifest, and anticipate and support prevention of problems.
R5	MA should fully and realistically revise the work plan for the remaining period of the programme, from the date of designation, and the JMC should meet to discuss and approve this revision.
R6	JTS should plan effective measures to improve the capacity of the project applicants (for the third CfP) and beneficiaries, with a focus on the use of output and result indicators and identification and monitoring of risks in project design and implementation.
R7	JMC should make a decision regarding the project "CBContent First" (i) consistent with the principles of relevance to the programme, cost-effectiveness and value for money, and (ii) taking account of time required to address the project's problems, the respect of rules governing the call relating to revision and re-assessment and the real risk of losing programme funds.

Recommendations	
R8	JTS should continue and intensify pre-contracting discussions with LIP beneficiaries with a view in helping project beneficiaries to ensure projects are revised according to the new programme calendar and budgets are accordingly adjusted.
R9	MA/JTS should analyse the nature and level of on-going costs that condition the access of the users to the project benefits and ensure they are transposed into sustainability and maintenance plans.

As it can be seen, the proposals are basically concentrating on the implementation of the program. In this respect, further thematic findings can be found in the sections on relevance (1) and effectiveness (3), as shown in the following excerpts:

- Strategically the four thematic objectives are well adapted to the prevailing policies and strategies of the participating countries (cfr. Joint Operational Programme (JOP) pp 43 -49). The interviewees in the regions expressed their satisfaction with the priorities of the programme, while the demand in terms of project applications confirm the selection of the Tos, except for TO7, which might be less relevant for this CBC programme than initially foreseen.
- The representatives of all Nas, regional authorities and beneficiaries including most partners of LIPs provide convincing evidence and arguments as to how the programme in general and certain types of project can enable them to achieve their objectives:
    - The programme contributes to the strategic objectives complementary to other programmes, due to its unique opportunities to resolve common problems across borders. It is indisputable that for the "regional administration" beneficiaries (mainly local or regional public authorities or bodies) in water, transport or forestry, CBC programmes are essential funding sources to implement their long-term plans.
    - Projects proposed by municipalities contribute to their strategies and plans, mainly in transport, disaster management, environment and tourism.
    - Other beneficiaries such as universities and NGOs find HUSKROUA a great opportunity to support projects with few other funding opportunities, sharing experience with others or, in Ukraine, learning and implementing practices from EU Member States.
    - As for universities, projects essentially enable them to develop and transfer knowledge and methods and technology to other relevant stakeholders. This is the case of projects related to the environment and risk management.

2.8.3 Joint paper on Interreg NEXT Strategic Programming 2021 – 2027 / Orientations for the Interreg NEXT cooperation between Hungary, Romania, Slovakia, Republic of Moldova and Ukraine

Report date: 20/01/2020. Elaborated by DG REGIO and the EEAS, in close cooperation with DG NEAR.

The paper aims at launching a discussion on the 2021-2027 cross-border cooperation in the geographic cluster on the external borders both with partner countries (Republic of Moldova and

Ukraine) and with EU Member States (Hungary, Slovakia and Romania). The document presents a brief overview of the socio-economic and territorial characteristics of the cluster area, currently covered by three ENI CBC Programmes[113].

The 69th point of the Orientation Paper stated, that based on guiding principles and the analysis of the cluster area, the principle of thematic concentration and the added value which could in particular be provided by the future Interreg NEXT, the following policy objectives are considered to be the most relevant for support through programmes in this cluster area (highlighted the objectives relevant for the HUSKROUA border area):

1. **Policy Objective 4 (focusing on unemployment, education, health and social inclusion)** in the whole cluster area.
2. **Policy Objective 2 (focusing on climate change, natural risks, biodiversity and natural resources, air quality)** for the Hungarian, Slovakian, Romanian and Ukrainian border areas.
3. Policy Objective 3 (focusing on sustainable, intelligent and intermodal infrastructure and digital connectivity) for the Romanian, Ukrainian and Moldovan border areas.
4. **Interreg Specific Objective 1 (focusing on institutional capacity, civil society, minorities, small project fund) and Interreg Specific Objective 2 (focusing on border crossings management)**, for the whole cluster area.

The following table summarizes the relation between the Orientation Paper's recommendations and the current analysis' chapters. Pos that the orientation paper considers relevant to the HUSKROUA program are highlighted in dark green. Light green marks the PO that the orientation paper mentions but does not name the HUSKROUA border region within the cluster. As can be seen, PO1 as well as PO5 were not named in the Orientation Paper and thus are marked light grey. In the table it is also indicated which PO is analysed and presented in which chapter and in connection with which TO. Furthermore, the document also outlines potential cooperation actions for each sub-topic.

Table 12: Relation between the Orientation Paper's recommendations and the current analysis' chapters

Policy Objectives	**PO1 Smarter**	**PO2 Greener**	**PO3 Connected**	**PO4 Social**	**PO5 Citizens**	**ISO1 Better**	**ISO2 Safer**
Subtopics	-	climate change, natural risks, biodiversity and natural resources, air quality	sustainable, intelligent and intermodal infrastructure and digital connectivity	unemployment, education, health and social inclusion	-	-	-
TO6-P1 Environment		**2.2**					
TO8-P1 Disasters		**2.3**					
TO7-P1 Transport			**2.4**				**2.4**
TO8-P2 Health				**2.5**			
TO3-P1 Heritage	**2.1**			**2.1**	**2.6**		
ISO1 Governance						**2.7+2.8**	

[113] Hungary-Slovakia-Romania-Ukraine ENI CBC 2014-2020; ENI Romania-Ukraine ENI CBC 2014-2020; ENI Romania-Republic of Moldova ENI CBC 2014-2020.

Subsequently, the territorial analysis addresses each of the topics directly concerned. However, with regard to the recommendations of the Orientation Paper, it should be noted that there are areas that are not fully in line with local needs. This is illustrated, for example, by the written opinion of the Self-government of Szabolcs-Szatmár-Bereg County: *"We noted disappointedly that according to the conclusion of the text PO5 is not relevant for our program area. We would like to emphasize that both the preservation of historical heritage and tourism development are crucial topics for the sake of economic development of the county."*

3 Results of the stakeholder consultation

3.1 Results of the online survey

As outlined in the inception report, an online survey has been compiled to gather information from the local stakeholders on their preferences, potential project ideas and their opinion on the tools and solutions which can be applied by the programme. As a result of the survey, the programmers and the PC members are provided with a comprehensive picture on the ideas and intentions of the potential beneficiaries of the future programme. Beside the creation of a project database, the respondents also expressed their interest in different themes considered as important for their future cross-border activities, and shared their views on the socio-economic situation of the border area, based on the maps plotted specifically for this process by external experts[114].

This chapter is dedicated to present the information and the conclusions that can be drawn from the received responses. Experts exercised cautious analysing techniques when structuring the gathered information by double-checking certain provided information, however, the content of this chapter mirrors the opinion of the respondents and not experts's. Even though the provided information is primarily published unchanged, in a low number of cases 127nharmonized127ion was needed (for example in classifying the organizations or the project ideas according to different priority areas).

3.1.1 Overview

3.1.1.1 Type of organization

All in all 160 responses have been received, however, in 5 cases a double submission was detected, meaning that 155 unique institutions responded. The responses from the 5 organizations from which two representatives answered were also taken into consideration as they might have different expertise and overview on the cited issues depending on their position. The respondents were asked to categorize their organizations to one of the pre-defined categories according to the type of their organization. Here, some minor modifications have been made by external experts afterwards to offer an as clear and informative picture as possible.

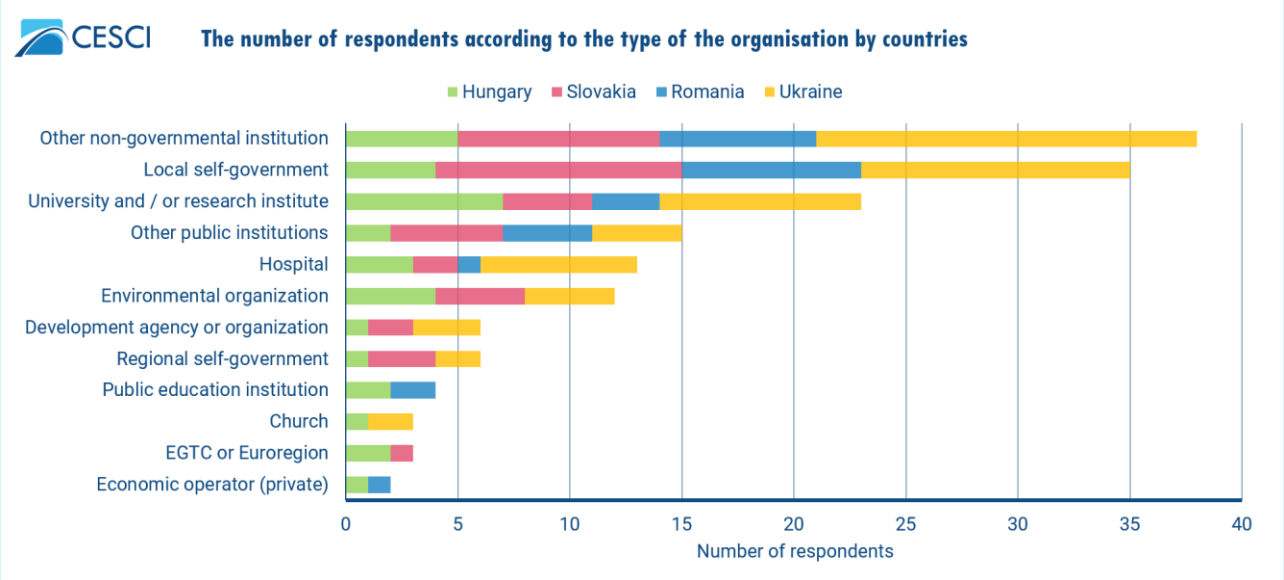
Out of the 160 respondents, the majority belonged to the other non-governmental institution (38 all in all). Since the number of the Ukrainian responses are the highest, it is represented also in this category as more than three times as many Ukrainian (17) other non-governmental organizations filled out the questionnaire as Hungarian did (5), with Romanian (7) and (9) Slovakian assuming a middle rate.

Local self-government institutions (in total 35) have been separated from the regional self-governments (in total 6) in order to clearly see which counties filled out the survey. It was interesting to see that from Slovakia 3 answers have been submitted (2 from Košice region and 1 from Prešov

[114] The process was managed by the Central European Service for Cross-Border Initiatives (CESCI). Further on in this document: external experts or experts.

region), from Ukraine 2 (Ivano-Frankivsk and Zakarpattia regions), while from Hungary only Szabolcs-Szatmár-Bereg county represented itself, from Romania no regional self-government filled out the questionnaire. The tendencies are somewhat similar in the case of the local self-governments too, where 12 Ukrainian, 11 Slovakian, 8 Romanian (showing a bigger interest than in the case of the self-governments) and 4 Hungarian local self-government institutions responding.

Figure 54: Types of organizations filling out the survey from the affected countries



Universities and research institutions showed an outstanding activity in voicing their opinion in connection with the programme. All in all 23 responses have been received from them, 9 from Ukraine, 7 from Hungary, 4 from Slovakia and 3 from Romania. This strong representativeness is important to be kept in mind during the assessments below as it might explain some tendencies.

Other public institutions, hospitals and environmental institutions were represented almost equally across the programme area with 15, 13 and 12 received answers respectively. Looking at the country representativeness within these categories a certain balance can be observed, with the exception of the relatively higher number of Ukrainian hospitals and the total lack of Romanian environmental organizations.

In the case of the bottom five types of the organizations it can be observed that in none were every member country represented. However, it is important that institutions with more specific characteristics (such as EGTCs or churches) are also included in the sample.

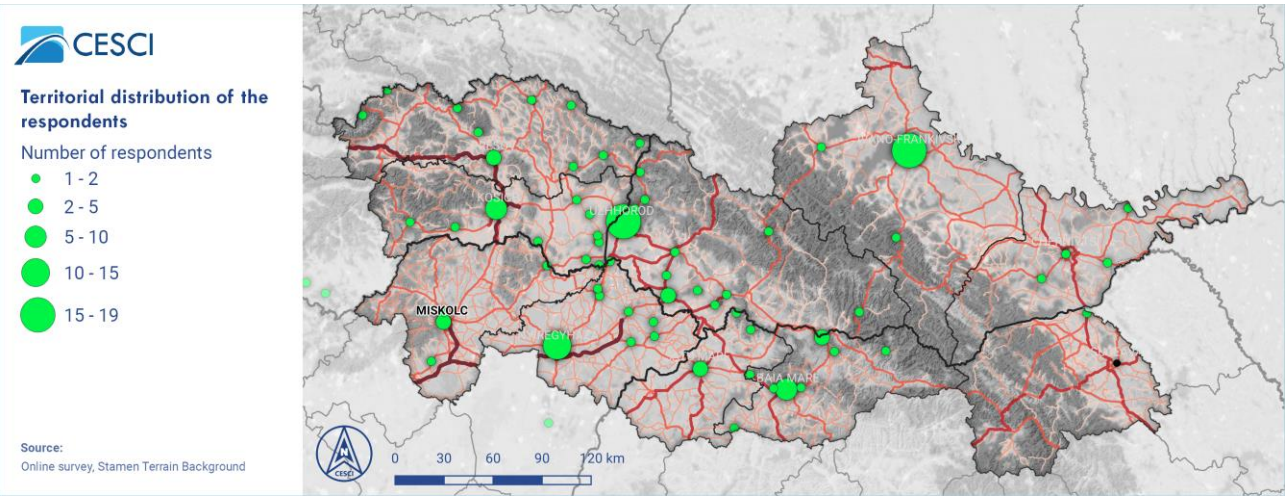
3.1.1.2 Territorial distribution

The territorial distribution of the received and analysed answers is illustrated on the map below. This also shows that answers have been received from all four countries (33 from Hungary, 41 from Slovakia, 26 from Romania and 60 from Ukraine), but with a varying intensity. The map also reflects on the fact that the majority of the answers have been submitted from settlements with a close proximity to the borders.

Looking at the more detailed dataset, it can be seen that the highest number of answers has been registered from Ivano-Frankivsk (19), Uzhhorod (18), Nyíregyháza (14), Košice (9) and Baia Mare (8)

most likely due to the fact that the majority of the relevant institutions are located in these regionally central bigger cities. At the same time, capital cities such as Budapest or Bucharest which lie farther from the affected borders are also represented but with only one responding institutions each.

Figure 55: Territorial distribution of the organizations responding to the survey



3.1.2 Past experience

The past experiences of the responding institutions is important to be taken into account as it reflects on the position and depth they are able to define and assess the previous as well as the next programme. Out of the 160 respondents only 14 claimed to have no experience with cross-border programmes (Hungary: 4, Slovakia: 2, Romania: 4, Ukraine: 4; with hospitals and other public institutions in majority) indicating a remarkable level of possible insight and legitimacy in forming their opinions.

Moreover, 30 respondents claimed that they have already applied successfully once in a cross-border programme and 62 stated that they successfully went through the application process more than twice. Currently 42 respondents have an on-going application, while 13 respondents have at least one unsuccessful application history which is important to shed light on the difficulties potential beneficiaries face during participating in a cross-border programme. Several respondents have experiences also in the programme implementation of the ENI programme.[115]

3.1.3 Difficulties

The analysis of the difficulties that the stakeholders perceive is highly informative in the drafting of the news programme. Looking at the aggregated data of all the respondents it is visible that the two biggest difficulties were mostly structural: the unavailability of the required own contribution (gaining 51 votes) and the experienced delay in the application procedures (50 votes). Then the lack of partners (36), inappropriate scope of supported actions (31) and lack of capacity (mostly lack of language skills) in the organization (31) were considered as the primary problem points. The lack of

[115] Important methodological note: this was a multiple choice question, where respondents could simultaneously select more than one answer.

eligibility was marked at a rather low rate (15) which could also be attributed to the self-selection bias as mostly those stakeholders opted for filling out the survey who felt that they are directly interested in the programme being potential beneficiaries in the past or future. Since one respondent could mark more than one type of difficulty, the sum of the votes exceeded 160. At the same time 19 respondents considered that there were no considerable difficulties with the programme.

Zooming in to the country level, certain divides are perceivable. First of all, in the two most problematic aspects (lack of own contribution and delay in the application procedures), it seems that the different countries are affected in different levels. While for the Slovakian (37%) and Hungarian (36%) respondents, the lack of own funds seemed to be a serious difficulty, it is less emphasized for Romanian respondents (19%). At the same time the delay in the application procedures was ranked the most problematic for the Hungarian (48%), then the Romanian (35%), then the Slovakian (27%) and less so for the Ukrainian (23%) respondents.

There are also topics which divide the countries in an even deeper degree. One such case is the lack of partners, which seems to be the biggest problem for the Ukrainian organizations (33%) and the Romanian (23%) organizations and appears as almost a half a challenge for Hungarian (15%) and Slovakian (12%) organizations. A mentionable outlier case is connected to the scope of supported actions: no Romanian respondents felt that it would be inappropriate, while apart from the Slovakian respondents (22%), the majority perceived that the lack of eligibility is not a problem of big scale (Hungary 3%, Romania 4% and Ukraine 7%).

The respondents also had a chance to express in their own words the biggest difficulties they experienced. Analysing more than 100 received inputs; it mostly boils down to several different difficulties. Firstly, the border crossings is problematic, especially towards Ukraine, it can be highly time consuming. Secondly, several respondents felt that the administration is overcomplicated and thus the preparation of the projects are too time consuming and requiring too much human resources which is paired with a lengthy approval process in turn resulting in outdated budgets and time schedules. Somewhat in connection with this it was identified as a serious problem that the reporting rate is fixed for the month of reporting which causes a threat to several organizations as the exchange rates change during the periods which might incur serious losses. Furthermore, it was mentioned as a difficulty that during the application process there is no possibility to consult with professional reviewers to channel in their insights which negatively affects the assessment of the application. Finally, a less widely mentioned but still relevant observation was that the regional competition block cooperating parties and in general it is difficult to find enthusiastic and competent partners.

The inquiry about the difficulties also included the identification of potential types of assistance that would make it possible for the stakeholders to submit a successful cross-border project proposal. Even though there were some who stated that they received the help they needed, for this specific question 117 answers were received based on which three main categories were distinguished. First of all, many respondents called for administrative measures to handle the difficulties. They named changes such as eradicating the unnecessary administrative steps, introducing more feasible accounting rules or shortening the process as ideas that would make it easier for the stakeholders to successfully apply. The second group of answers concentrated on the financial aspect of the projects. Here suggestions such as reducing the proportion of own-fund, timely allocation of the financial

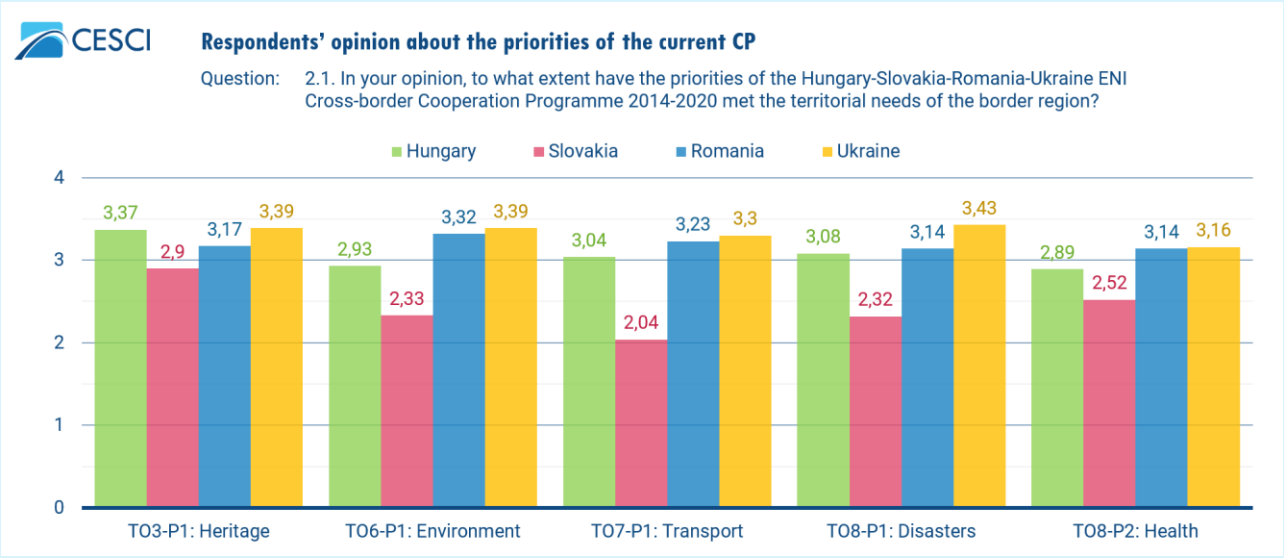
assistance were made as well as calling for a change when accounting for costs that the exchange rates of the month of their occurrence should be authoritative. The third type of identified support focused on the dissemination of information and technical support. Many respondents felt that if they would have a coordinator that is in constant contact with all the involved parties that would be a real help. Also, the organization of more information sessions, seminars, conferences and partner finding events were mentioned as tools to facilitate the process. Similarly to counteracting the low permeability of the borders by providing extraordinary crossing possibilities to facilitate the border crossing for the participants of the projects.

3.1.4 Priorities

3.1.4.1 ENI Priorities

The survey intended to shed light on the extent the respondents felt that the priorities of the Hungary-Slovakia-Romania-Ukraine ENI CBC Programme 2014-2020 corresponded with the programme area's territorial needs. They were offered a 1 to 4 scale to rate each priority and an option to indicate whether they are not familiar enough with the given priority to give an informed assessment. It was the "TO7-P1: Development of transport infrastructure to improve the mobility of persons and goods" that received the highest number of "I don't know" answers (21%), whereas the "TO8-P1: Support to joint activities for the prevention of natural and man-made disasters as well as joint action during emergency situations" and "TO8-P2: Support to the development of health" equally received 18%, meaning that in these three priorities about one fifth of the respondents felt not competent enough. At the other end of the scale the "TO6-P1: Sustainable use of the environment in the cross border area – preservation of natural resources, actions to reduce GHG emission and pollution of rivers" (13%) is positioned, it seemed that the respondents were the most sure about this priority area.

Figure 56: Respondents' opinion about the priorities of the current CP



However, this does not necessarily correlate with the actual assessments. According to the aggregated results, the "TO3-P1: Promoting local culture and historical heritage along with tourism

functions" is the priority that reflects the best the local needs as it received a somewhat outstanding 3.24 mark. The other priorities fell closer to each other, the second best was the TO8-P1 with 3.08, the third the TO6-P1 with 3,05 and the third is the TO7-P1 with 3,00 mark. The lowest mark was awarded to the TO8-P2 which was rated at 2.97.

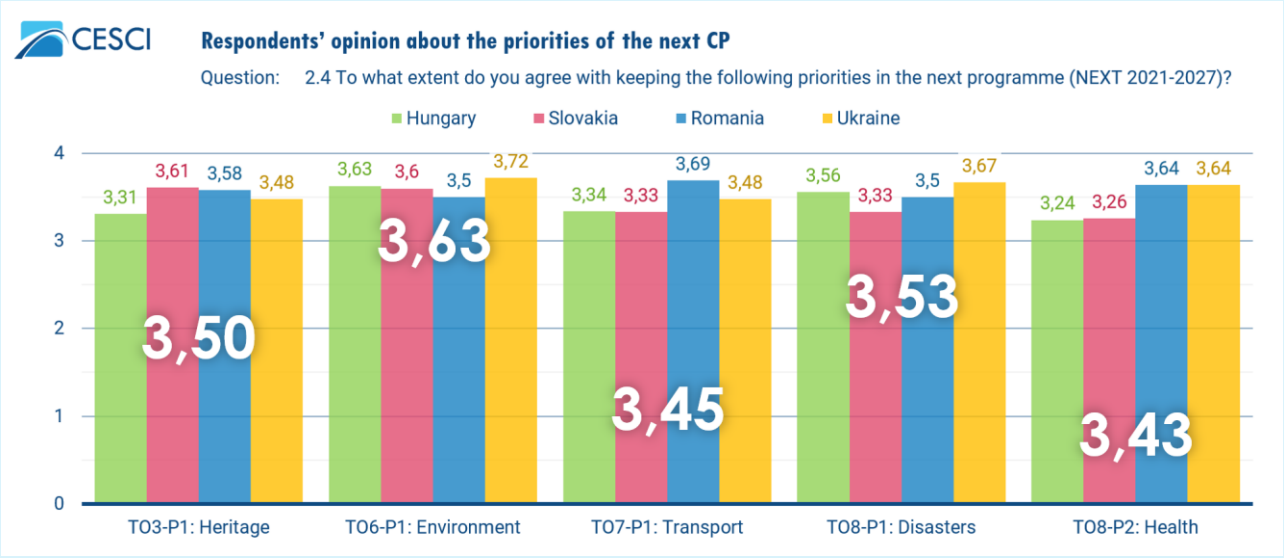
Looking at the country level, it can be seen that in general the respondents from Ukraine were more satisfied with the priority areas, as their average fluctuated between 3.16 and 3.43 which were the highest across the scale. The least satisfied appeared to be the Slovakian respondents, their averages varied considerably lower, between 2.04 and 2.90 points.

The survey also inquired for the reasons why the respondents gave the answer they did. The most frequent answer to this was that they based their score on the developments implemented in the region and their usefulness. Some criticised that they do not see enough of the concrete realizations of the projects, while others pointed out that the touristic utilization of local cultural, historical and natural heritage and cross-border environmental and disaster protection are the topics that can be really developed within the financial frameworks of the programme as transport and health improvements require a higher volume of support. At the same time there were also voices which expressed a worry about these priorities being too specific for broader and more diverse needs of the programme area; these opinions usually asked for a wider and more inclusive set of areas.

3.1.4.2 NEXT Priorities

Focusing on the future programme, the respondents have been asked to rate the extent they agree to keep these priority areas for the future programme on a 1 to 4 scale. Again, they had a chance to opt out from the question in case they did not feel competent enough in the given field by selecting the "I don't know" option. However, in this case, the rate of those who lived with this possibility was significantly lower, only 4% for the TO8-P2, 3% for TO7-P1, 2.5% for TO8-P1, 1.2% for TO6-P1 and 0.6% for TO3-P1. This might also indicate a strong intention to thematically shape the next programme.

Figure 57: Respondents' opinion about the priorities of the next CP



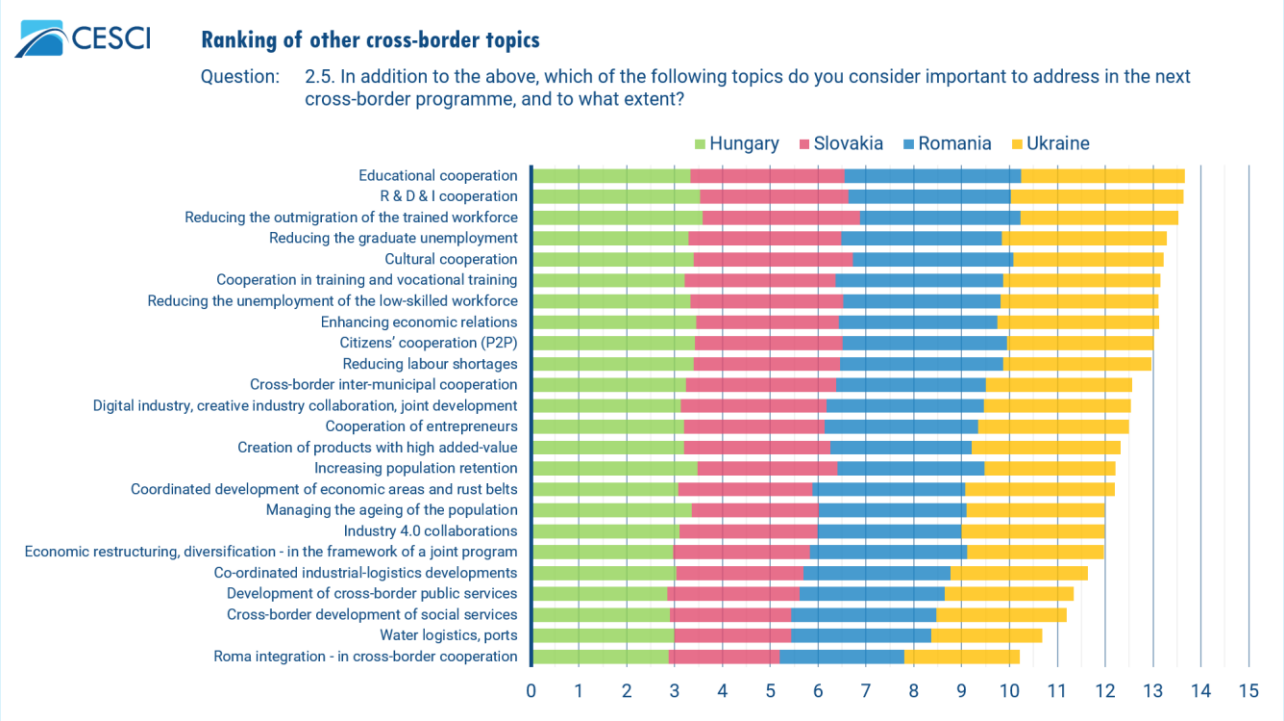
Looking at the different priority areas, it can be observed that their support is generally high and balanced without extremities. Out of the five priority areas, the most widely supported was the "TO6-P1: Sustainable use of the environment in the cross border area – preservation of natural resources, actions to reduce GHG emission and pollution of rivers" achieving a 3.63 score. Not much less – 3.53 – was awarded to "TO8-P1: Support to joint activities for the prevention of natural and man-made disasters as well as joint action during emergency situations" priority. The third most supported was the "TO3-P1: Promoting local culture and historical heritage along with tourism functions" with 3.50 score, which was followed almost in tie by the "TO8-P2: Support to the development of health" with 3.46 and "TO7-P1: Development of transport infrastructure to improve the mobility of persons and goods" with 3.45 score.

Countrywise some minor divergences can be observed, such as in the case of the Hungarian and Slovakian respondents there is a tendency to rate with less enthusiasm (in 2-3 out of 5 cases they offered the lowest score each). For the Hungarian respondents the TO3-P1, the TO7-P1 and the TO8-P2 seemed less important, while for the Slovakians the same but instead of the TO3-P1 the TO7-P1 were neglected. The Ukrainian and Romanian respondents were rather at the other end of the scale considering the topics as better serving the territory's needs. For the Romanian respondents especially important appeared the TO7-P1 priority (3.69), while for the Ukrainians the TO6-P1 was in a featured position (3,72).

3.1.4.3 Other cross-border topics

The respondents were offered the chance to assess the relevance of a list of other topics for the programme area according to the same methodology. Based on the average of the four countries' respondents, out of the 24 topics, the two most important have been the educational cooperation (3.42) and the R&D&I cooperation (3.41). However, when dealing with this result, it is important to keep in mind the above presented ratio of participating organizations; the fact that a relatively large number of universities and research institutions filled out the survey can cause correlations with this result somewhat distorting the actual emphasis of these two topics.

Figure 58: Ranking of other cross-border topics



The next two highest ranking topics were connected to the labour market, more precisely the reduction of the outmigration of the trained workforce (3.38) and the reduction of the graduate unemployment (3.32). Cultural cooperation (3.30) was ranked the fifth most important, cooperation and training and vocational training (3.29), enhancing economic relations (3.28) and reducing the unemployment of the low-skilled workforce (3.28) as well as the citizen's cooperation (3.26) closely following. The least supported topics were the roma integration in cross-border cooperation (2.56) and the water logistics, ports (2.67) stemming potentially partly from the endogenous characteristics of the programme area as well as the framework and scope of the programme's tools.

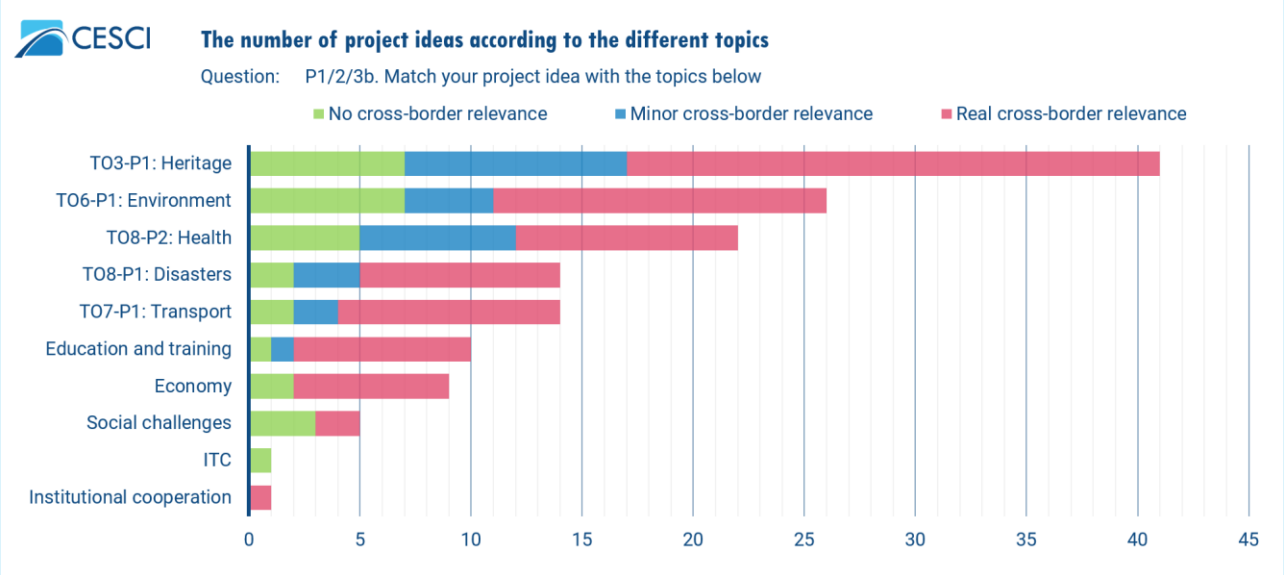
It can also be informative that even though countrywise no unbridgeable incompatibilities surfaced, some minor differences did appear. For instance, the average level of importance assigned to these topics were much higher in some countries than in others; in Hungary the average score was 3.22, in Romania 3.21, while in Ukraine only 3.05 and in Slovakia 2.94. In Hungary the most important topic seemed to be the reduction of the outmigration of the trained workforce (3.58), in Romania the education cooperation (3.69), in Slovakia the cultural cooperation (3.34) and in Ukraine the R&D&I cooperation (3.61).

3.1.5 Projects

3.1.5.1 Project topics

The survey had a dedicated section to build a project inventory based on the forming project ideas of the respondents. Each respondent had a chance to share a maximum number of three project ideas. All in all, 145 project ideas had been registered, 30 from Hungary, 29 from Slovakia, 22 from Romania and a staggeringly high number, 64, from Ukraine.

Figure 59: The number of project ideas according to the different topics



Each project had been classified by the respondents to one of the 5 priority areas, however, in certain cases ulterior adjustments were judged to be necessary by CESCI to better match the described project ideas to the priority areas. Based on this classification, the largest number of project ideas have been submitted to TO3-P1, almost half as much were registered for TO6-P1, then TO8-P2 followed and for TO7-P1 and TO8-P1 equal number of projects were sent in.

An additional assessment from CESCI's part had been also made to see the cross-border relevance of these project ideas. This analysis showed that out of the 145 project ideas 29 did not have any cross-border relevance, and 27 only had minor or indirect cross-border relevance. Since 3 additional project ideas proved to be mistaken (with no disclosed content), only 86 of the submitted project ideas have a real cross-border nature.

3.1.5.2 Level of the ideas

The status of a given project idea is also informative, the more prepared it is, the more likely it can become an application in the future programming period. Out of the 145 received project ideas, however, 63 is still in the earliest stage of the project development, namely, only the idea is formed. In an equal number of cases an elaborated project proposal has also been prepared. Feasibility study was carried out in 12 cases, while in 7 instances respondents claimed that there are technical plans and permits already prepared. This shows that only 4% of the project ideas are in an advanced stage. Countrywise differences are not perceivable, apart from the fact that a considerably higher number of Ukrainian project ideas had been submitted than from the other countries, the patterns are similar across the spectrum.

The planned total budget of the project ideas show that the bigger proportion of the project ideas would cost from 200 thousand € to 1 million €, more precisely 41 was priced between 200-500 thousand € and 40 between 500 thousand € and 1 millon €. All in all 19 projects were submitted with a larger budget request, exceeding 2 million €, while only 6 forecasted a more modest budget not exceeding 50 thousand €.

Proportionately analysing the project ideas' budget needs according to the countries, it shows that in Hungary the lowest budget range is missing from the database, meaning that no project had been assigned with a budget below 50 thousand €, but in this price bracket, the other three countries were equally represented.

3.1.5.3 Partnership – Composition

The respondents of the survey were asked to indicate towards each partner country whether they plan to recruit a lead partner and/or a partner organization from it. One somewhat obvious observation was that usually the lead partner is planned to come from the country from where the project idea was submitted: the Hungarian respondents registered 24 project ideas with Hungarian lead partner and only 1 with Slovakian, Ukrainian and Romanian respectively. Similarly, the Romanian answers indicated that 19 projects would be led by a Romanian organization and only 1 by a Hungarian, 1 by a Ukrainian and none by a Slovakian organization. Among the Slovakian responses a bit more balance image is visible: 18 projects would have a Slovakian lead partner, 8 Hungarian, 6 Ukrainian and no Romanian lead partners are indicated. The Ukrainian respondents shared the details of 38 project ideas with Ukrainian lead partner, 13 with Slovak lead partner, 8 with Hungarian and 9 with Romanian which is a much more balanced picture than in the case of the other countries.

3.1.5.4 Partnership – Preparation

The final question regarding the project ideas concerned the actual – and not envisaged – preparedness of the necessary project partnership. The respondents had to rate this level on a 1 to 4 scale and it turned out that only a fragment (11%) of the project ideas have a fully prepared partnership. The partnership is partially prepared for an additional 30%, and the potential partners are claimed to be known in the case of the 34% of the submitted project ideas. The partnership is not even known yet by 26% of the proposed projects. Within the countries no major divergences were detected.

3.1.6 Tools

3.1.6.1 LIP

The respondents were asked to rate on a 1 to 4 scale the extent the Large Infrastructure Projects (LIP) within the Hungary-Slovakia-Romania-Ukraine ENI Cross-border Cooperation Programme 2014-2020 could respond to the needs of the region. In 9 cases the respondent chose not to answer the question ("I don't know"). On average it seems that the respondents were satisfied with this tool as they rated its adequacy at 3.26.

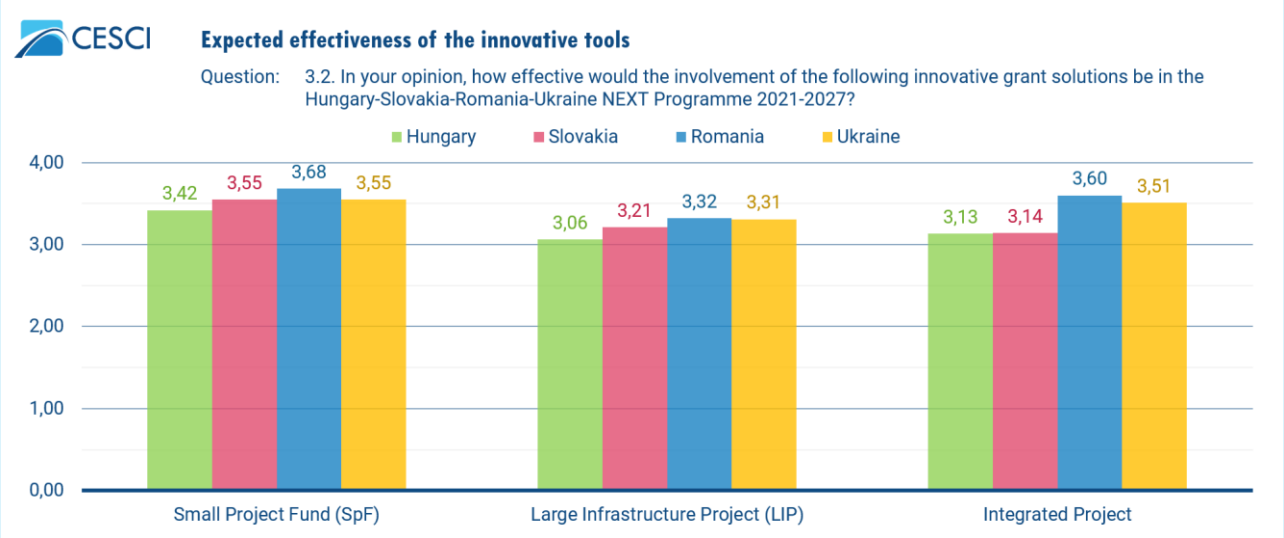
Out of the four countries, in the case of three it seems that the respondents are more or less on the same opinion and more on the satisfied side. The highest rate was awarded by the Romanian respondents (3.36), but the Ukrainian (3.32) and Slovakian (3.29) rates are also relatively high. Compared to this, the Hungarian 3.07 score is somewhat lower.

3.1.6.2 Other tools

A forward-looking question targeted to assess the general opinion of the respondents on the effectiveness of the application of three innovative tools in the Hungary-Slovakia-Romania-Ukraine NEXT Programme from 2021 to 2027, namely the Small Project Fund (SpF), the Large Infrastructural Project (LIP) and the Integrated Project. On an aggregated level, the most supported tool was the SpF (3.55), then the integrated project (3.34), finally the LIP received only 3.22 points on average.

The country level responses show that the SpF is almost equally popular in all four countries, having the most support among the Romanian respondents and the least among the Hungarian responding stakeholders. The Integrated projects were less supported by the Hungarian and the Slovak respondents, maybe because they might have some previous experiences with this tool, but at the same time this solution was considerably less known by the respondents than the others (11 claimed to now being familiar with it, while with LIP only 5 and SpF only 4 said the same). In the additional comment section the respondent explained their scoring by claiming that they would support the introduction of the SpF but only with a pre-financing option. Finally, LIP is supported the most in Romania (3.32) and the least in Hungary (3.06).

Figure 60: Expected effectiveness of the innovative tools



3.2 Results of the online webinars

The online webinars played a significant role in validating the results stemming from the territorial analysis' varied methods such as data analysis, document analysis, online questionnaire etc. because it invited the local stakeholders and the experts of different sectors to express their opinions on the findings in a quantifiable and qualifiable way. Through voting on the importance and relevance of each subtopic discussed by the territorial analysis, the participants had a chance to directly influence the programming process and underline those areas that need the most attention according to their experiences. Furthermore, the online webinars also offered a convenient platform for the local stakeholders and experts to enter into a meaningful dialogue with the strategic planners writing the territorial analysis and call their attention on any points that might need modifications or certain aspects that might be missing from the analysis. This way it is ensured that the territorial analysis truly mirrors the local needs.

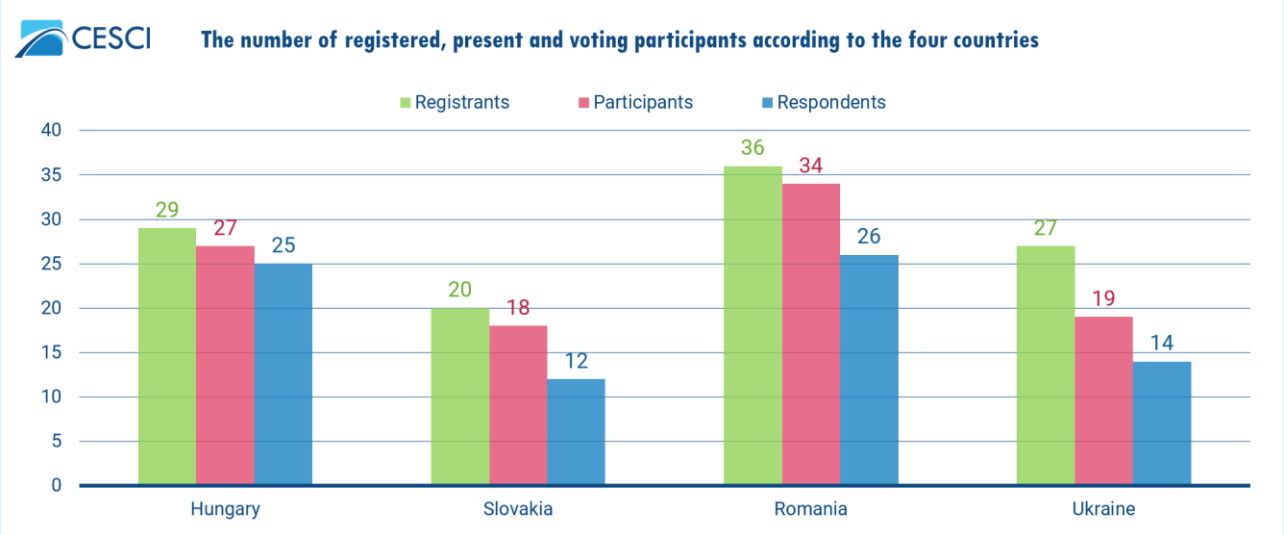
In order for this dialogue to work in practice and have enough time and space for all the local stakeholders and experts, four webinars had been organised in the span of a week. Each webinar was dedicated to a participating country and was held in English with interpretation to the given national language to ensure that potential language barriers are eliminated. In the summary below for the sake of using concise language sometimes the opinions stated are referred to as coming from Hungary or the Hungarian, Romania or the Romanian, Slovakia or the Slovak or Ukraine or the Ukrainian webinar, however, it is important to keep in mind throughout reading the whole chapter that its content reflects on the views of the participants which might differ from other stakeholders' opinions.

The lists of participants were primarily compiled by the Managing Authority with the involvement of participating counties and with the help of the JTS focusing on the affected counties, municipalities, water directorates, development agencies, hospitals, universities, NGOs among others. The open invitation was also published on the website of the programme[116].

The highest number of registered (36 person) and actively present participants (34 person) were logged for the Romanian webinar which was also reflected in the number of votes (26 votes) which is close to the number of votes (25 votes) cast in the case of the Hungarian webinar, where comparatively less people registered (29 person) and participated (27 person). The highest discrepancy between the number of registered and logged in person appeared in the case of the Ukrainian webinar, where initially 27 representatives of different organisations indicated their interest, but only 19 participated in the webinar out of which 14 decided to cast their votes. The least number of votes (12 votes) were collected during the Slovakian webinar where 18 participants showed up.

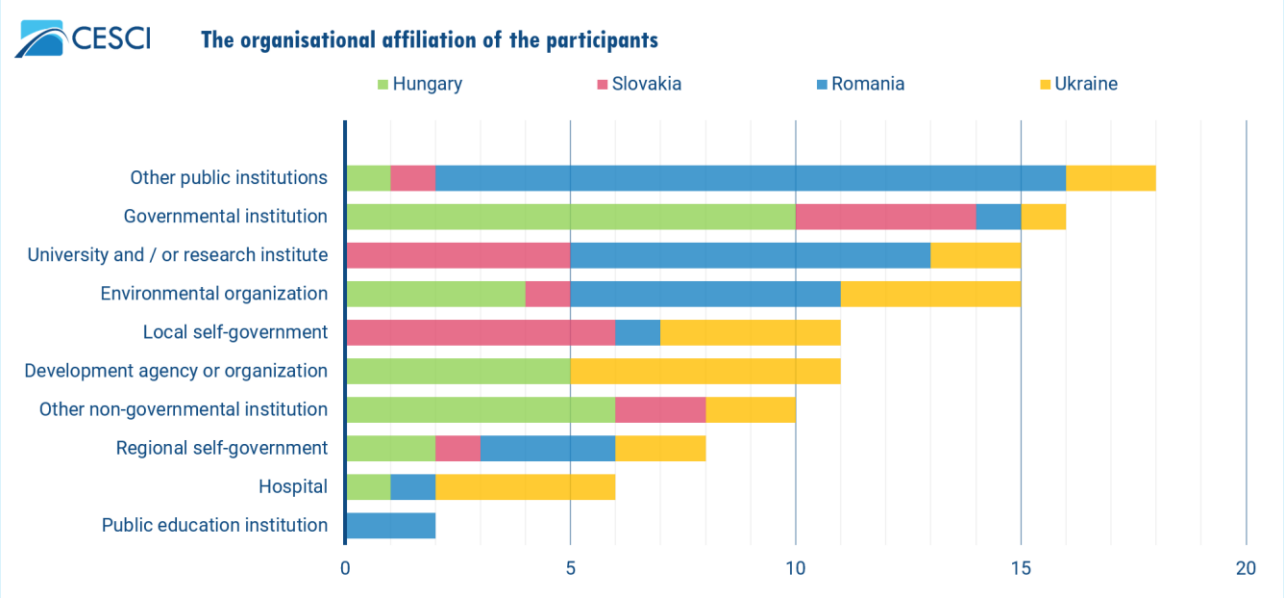
[116] Link to the invitation: **https://huskroua-cbc.eu/news/programme-news/webinar-for-discussion-of-the-territorial-analysis-for-the-future-interreg-next-hungary-slovakia-romania-ukraine-programme-2021-2027** (Last accessed: 2020. 11. 27.)

Figure 61: The number of registered, present and voting participants according to the four countries



In order to offer a frame of reference for the interpretation of the results of the online webinars, the distribution of the organisational affiliation of the participants had been assessed. The largest groups (18 person) of the participants represented public institutions that fall outside of the specified categories. This was especially the case for the Romanian webinar, where 14 participants were representing institutions such as museums, schools or inspectorates. Governmental institutions where also well represented (16 person), especially in the Hungarian case. Apart from Slovakia where only one person was representing environmental organizations, in the other cases this category was the third most populous tied with universities and/or research institutes, however, this category was left unrepresented in the case of the Hungarian webinar. Only the Hungarian and the Ukrainian webinars had representatives of development agencies, while the Romanian event was the only one where public education institutions also appeared. This indicates that even though the webinars were published and promoted the same way in the four cases, the audiences gathered at the end are not entirely homogenous or identical.

Figure 62: The ratio of organisational affiliation of the participants



3.2.1 Structure of the webinars

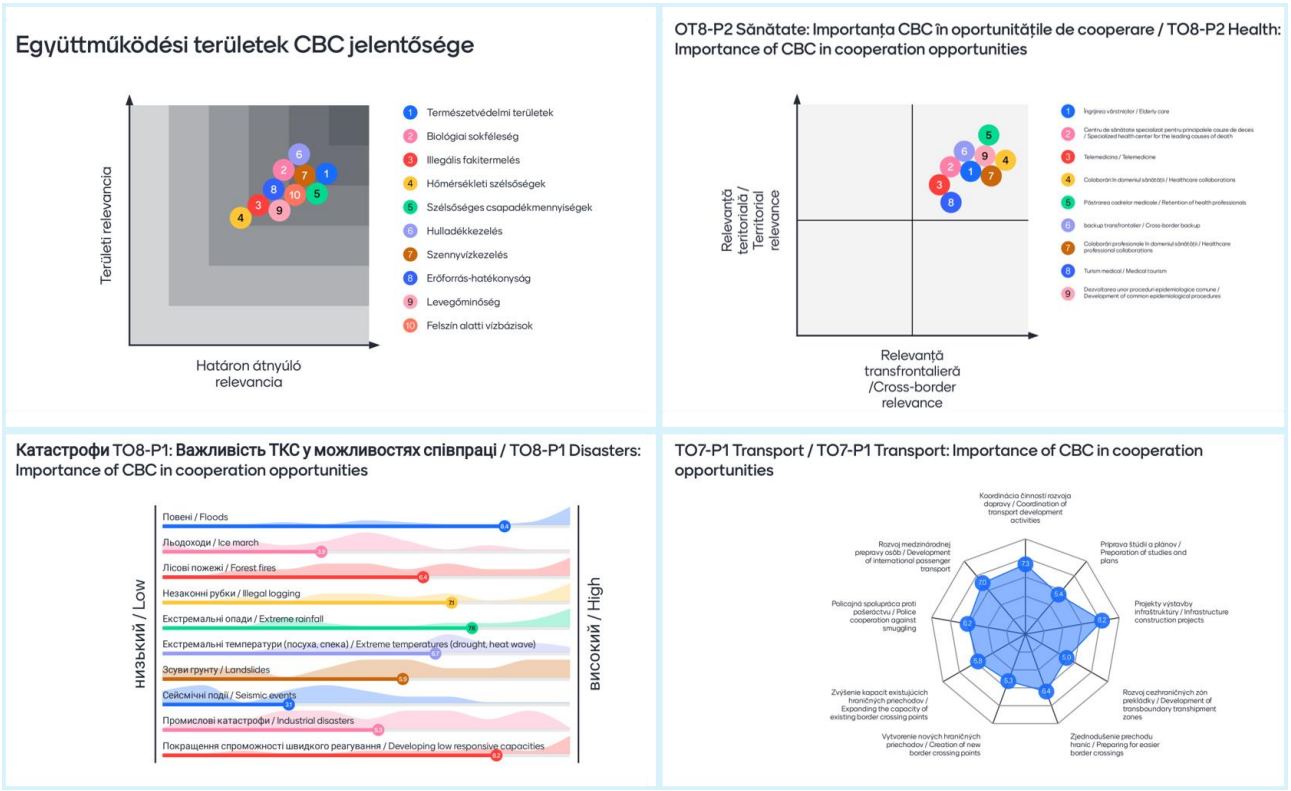
The four webinars were held according to the same logic and the same powerpoint presentation. First, briefly the task had been presented and the process of the preparation of the territorial analysis had been explained. Then those documents and orientation papers had been presented which were used in creating the frameworks of the territorial analysis pointing out the synergies with the thematic objectives. A separate section had been dedicated to showcasing the results of the online surveys where with the help of diagrams and maps the planners explained the respondents' opinion about the priorities of the next CP as well as the number and type of project ideas submitted to the different topics.

During the webinars most attention had been paid to presenting the findings of each topic the methodology of which was explained at the beginning. In the case of the topic of heritage the description of the key cultural and natural assets of the cooperation area, the potentials of religious tourism, cultural events, festivals as well as the data, information on tourist arrivals and tourism facilities were presented in detail. In the environment chapter the natural regions and conditions, the protected areas, the water resources and river basins, the joint preparation for climate change, environmental pressures and sustainability issues were unfolded. The topic disaster management received special attention through presenting the findings of the territorial analysis referring to the dimensions of the risk management, the registered disaster events, the hydrological and climate-related disaster (floods, forest fires), geophysical disasters and human-made disasters. The health topic has been explored through showcasing the findings relating to mortality and natality rates, life expectancy at birth, distribution of deaths by major death causes, health services and infrastructure, medical employees, emigration of medical personnel, cross-border rescue procedures, medical tourism and COVID-19 health indicators. Finally, the topic of transport was approached through the examination of road networks, railway networks, border crossing points and public transport.

The description of each topic finished with the presentation of the relevant section of the special SWOT table and conclusion prepared for the given topic after which the participants had been asked to vote on each subtopic in terms of their importance and relevance of cross-border cooperation. The voting had been taking place through an additional online tool (Mentimeter) where the participants could cast their vote anonymously and where upon the closure of the voting, the presenters could immediately share the results with the participants. The local stakeholders and experts then were asked and encouraged to share any comments or remarks they might have on each of the topics. They could do so either in writing through the chat function or orally (in English or in their national language). They were also prompted if they find a relevant aspect or subtopic missing from the discussions.

In general, the participants proved to be reasonably active when it came to vote. The majority of the participants cast their vote for every question, however, it needs to be mentioned that the planners had to respect if someone wished to refrain from voting in a certain question and thus it is possible that the number of responses is not equal for every question. When it came to formulating remarks the activity of the participants was significantly reduced, very few opinions were voiced; these will be detailed below.

Figure 63: Examples on how the results had been shown to the participants



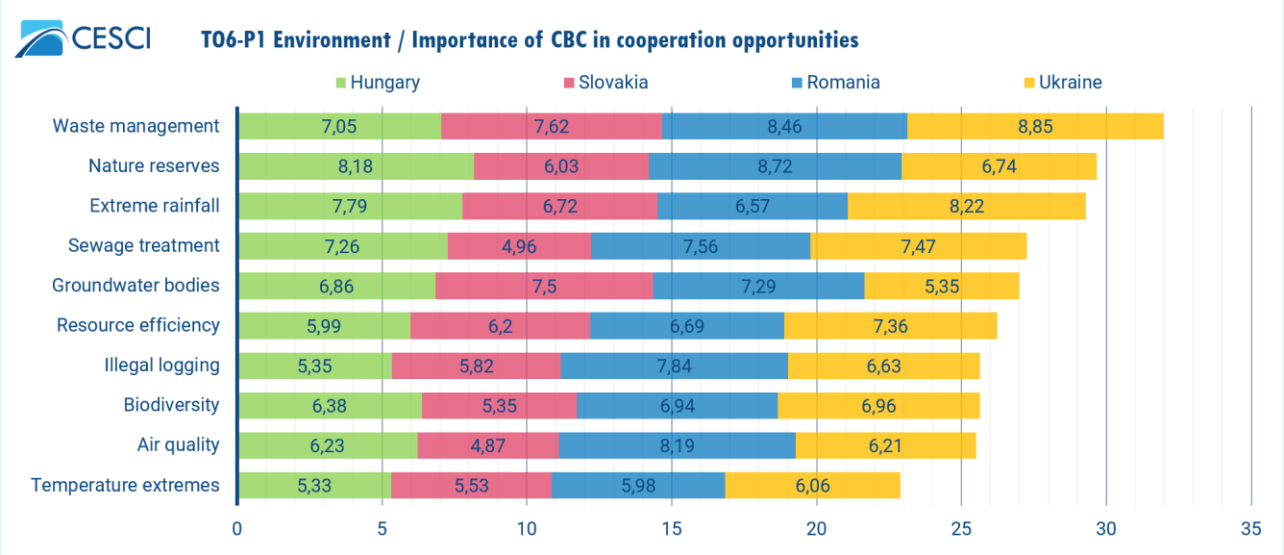
3.2.2 Summary of the results by the topics

In order to be able to offer a full picture as well as compare and contrast the different needs and opinions of the local stakeholders and experts of the four participating countries, the results of the webinars will not be presented in a way to group around the online events but it will be centred around the topics. This reflects also the logic of the webinars described above. Subsequently, in this section the results of the votes of the five distinctive topics will be summarized as well as the received comments and remarks pointed out.

TO6-P1 Environment

According to the participants of the four webinars, the "nature reserves" is the most important subtopic of the environment chapter to be handled on a cross-border level, especially according to the Romanian participants (8,7) and the Hungarian participants (8,1). Similarly, the extreme rainfall is a topic that is considered as primarily important for cross-border cooperation, mostly by the Ukrainian (8,2) and the Hungarian (7,7) participants which is interesting as when the participants were prompted to rate the importance of the same subtopic for their own territorial level than the Hungarian value was much lower (6,3). Sewage treatment and groundwater bodies are two topics that are also on the top of the list when it comes to cross-border environmental cooperation, while it seems from the votes of the participants of the webinars that extreme temperatures is a topic that is less important to be handled that efficiently in cross-border manner.

Figure 64: TO6-P1 Environment / Importance of CBC in cooperation opportunities



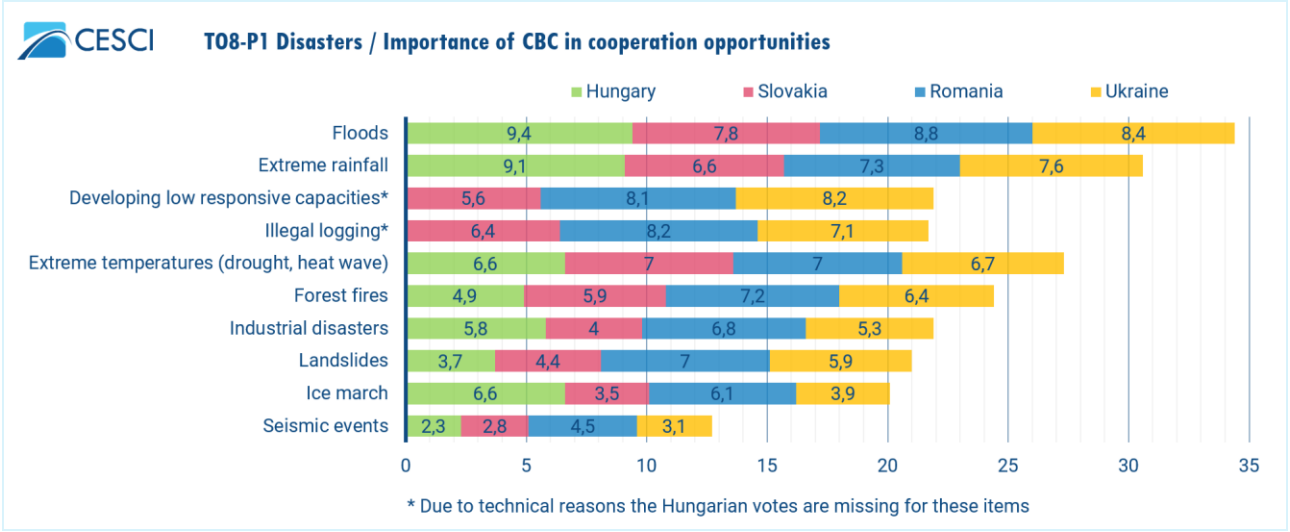
Analytically the difference between cross-border and territorial relevance was also computed for each topic. In some cases, such as waste management (both 7,9) or temperature extremes (CBC: 5,7 and territorial: 5,6) the two values were identical or close to each other meaning that these topics are equally important on a local and on a cross-border level. In other cases, the local aspect was much more pronounced, this was for instance in the case of illegal logging and resource efficiency. Yet in other cases it was the other way around and the cross-border aspect was deemed more important such as in the case of air quality, extreme rainfalls or nature reserves.

The environmental topic prompted a livelier discussion in some of the webinars. On the Hungarian event participants emphasized the importance of dealing with the challenges and opportunities linked to groundwater bases and geothermal assets. On the Slovak webinar a suggestion was raised according to which attention should be also paid on the cross-border monitoring of protected species as well as on the question of light pollution (within probably air quality) especially within the national parks.

TO8-P1 Disasters

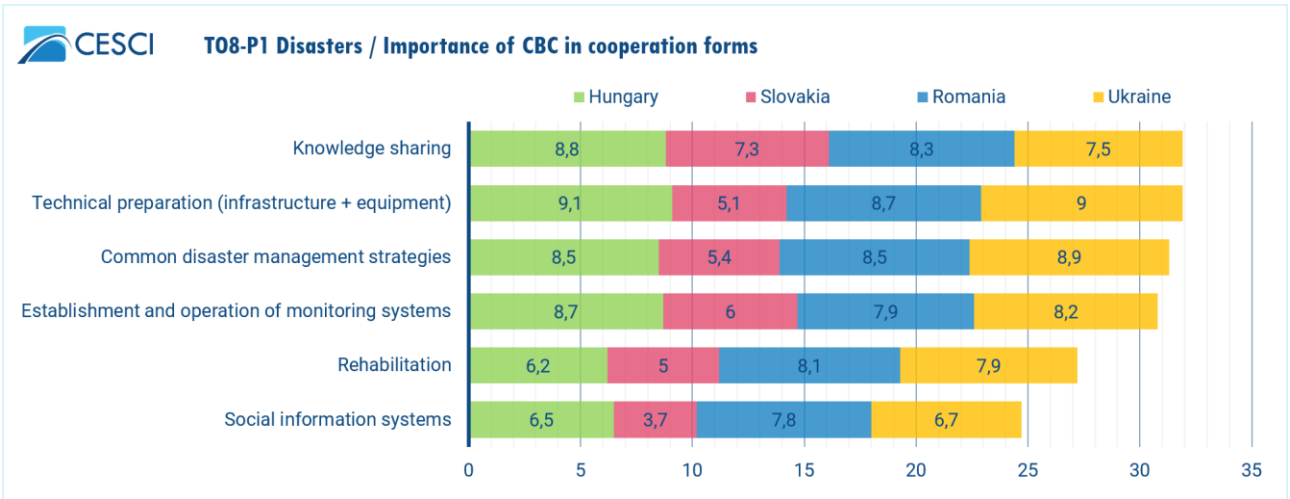
The topic of disasters was divided into ten subtopics each of which was rated by the participants of the four webinars according to their importance of cross-border cooperation opportunities. According to the congruous opinion of the participants floods and extreme rainfall are two types of – somewhat interlinked – disaster that needs to be focused on within these frameworks. Extreme temperatures, forest fires and industrial disasters are also topics with relatively high ratings, though while the first appears to be an equal threat for all the countries, forest fires are more feared by the Romanian and Ukrainian participants and the industrial disasters by the Romanian and Hungarian participants. Illegal logging and the development of low responsive capacities where both more or less considered moderately important on the Hungarian, Romanian and Slovak webinars, but not voted for in the Hungarian which might indicate a technical or linguistical confusion. Seismic events are visibly deemed the least important at all webinars.

Figure 65: TO8-P1 Disasters / Importance of CBC in cooperation opportunities



The participants were also offered six different types of answers for the challenges in connection with disaster management. Here the knowledge sharing was found the most important, mostly at the Hungarian webinar (8,8) and the Romanian webinar (8,3). The technical preparation including both infrastructure and equipment was also voted as very important by the Hungarian participants (9,1) and the Ukrainian participants (9), but because the Slovakian counterpart's aggregated opinion widely differed (5,1), on average it barely surpassed the accorded importance of common disaster management strategies. The rehabilitation and the social or public information systems took the other end of the scale. In the case of this question the results of the four webinars do not differ widely.

Figure 66: TO8-P1 Disasters / Importance of CBC in cooperation forms

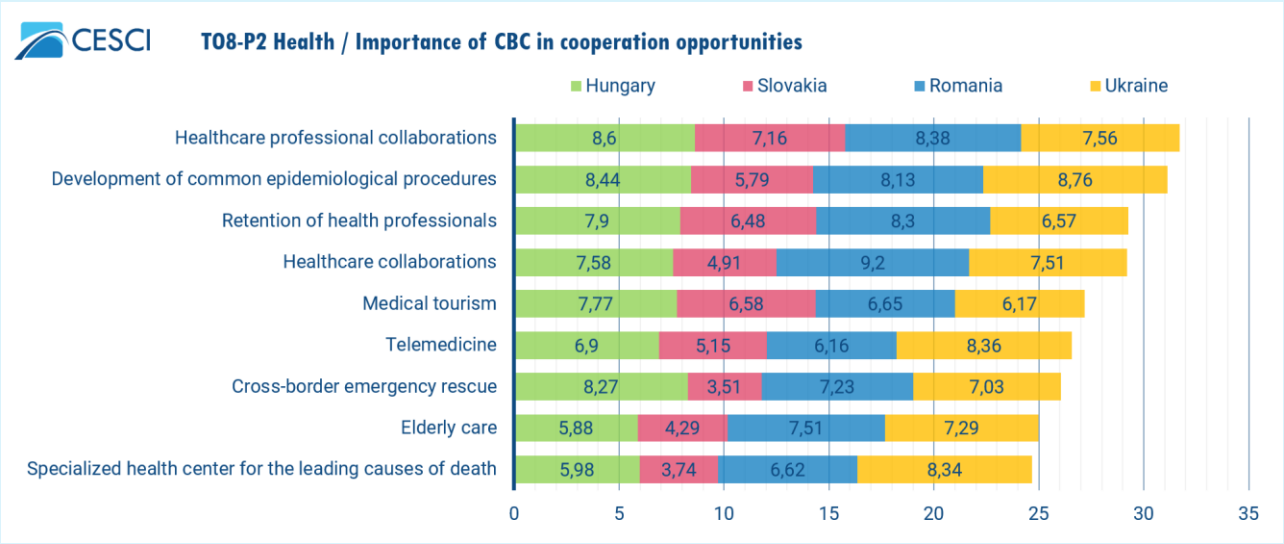


During the discussion no participant has raised any missing aspects or points that need to be modified. Only a question was formulated asking whether in the topic of disaster management large infrastructural projects will be allowed as well. The planners answered that the conclusions of the territorial analysis suggest that it would be beneficial for the programme to support such initiatives.

TO8-P2 Health

In the case of the subtopics related to health the participants of the four webinars were asked not only to rate the importance of the given aspect in terms of its cross-border relevance but also in terms of its territorial relevance. The point of this exercise was to separate those topics that are very important, albeit could and should be treated on a local or national level from those topics that need large-scale cross-border cooperation. According to the responses, the healthcare professional collaborations were rated as the most important topic in terms of cross-border relevance, surprisingly surpassing even the development of common epidemiological processes. While the first seems to be more important for the Hungarian and Romanian participants, the second one is rated more essential according to the Ukrainian and Hungarian counterparts. The final result was struck by the Slovak participants who marked it with a low value the development of common epidemiological processes.

Figure 67: TO8-P2 Health / Importance of CBC in cooperation opportunities



The retention of health professionals and the healthcare collaborations finished almost with the same values, the main difference being that the previous was rated more important in a cross-border context by the Slovak participants, while the second by the Romanian participants. Despite of the programme area's recent demographic trends resulting in the ageing of the society, the elderly care and the establishment of specialised health centers for the leading causes of death are at the bottom of the list suggesting that these are not the subtopics that need the most attention in a cross-border programme.

When it comes to the territorial relevance, however, the picture is slightly different, the retention of health professionals becomes the most important topic, followed by the development of common epidemiological processes and healthcare collaborations. Telemedicine and cross-border backup/rescue finished in both cases in the middle, however, this can be due to comprehension troubles too.

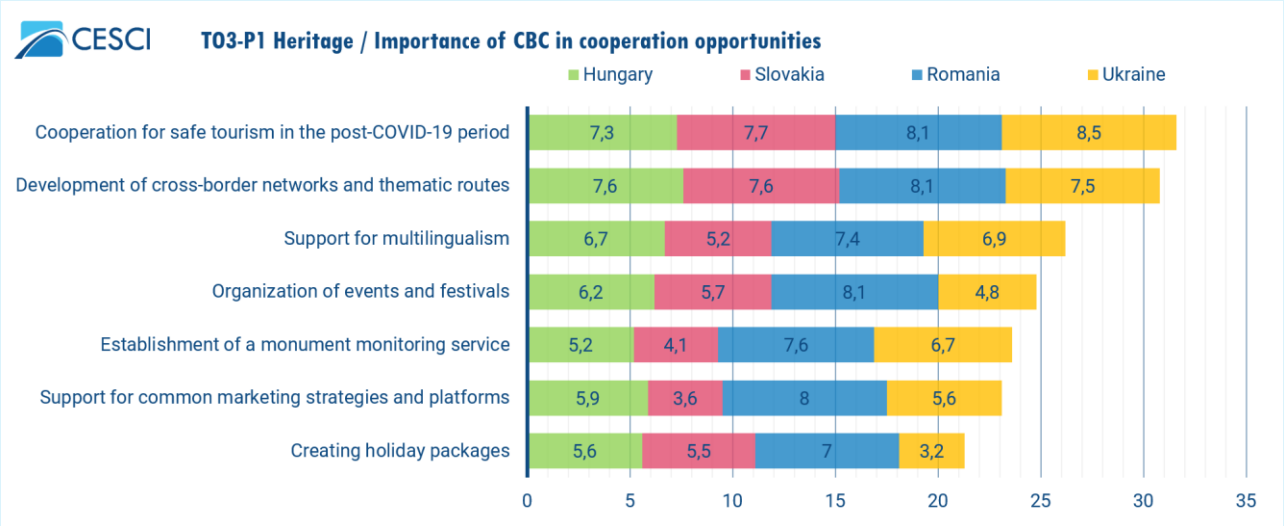
Comparing the answers for the two questions results in showing which topics are more relevant in a cross-border context and which are more important in a local or regional context. According to the

participants of the four webinars, the healthcare professional collaborations, medical tourism and telemedicine are the fields with the most cross-border cooperation opportunities.

TO3-P1 Heritage

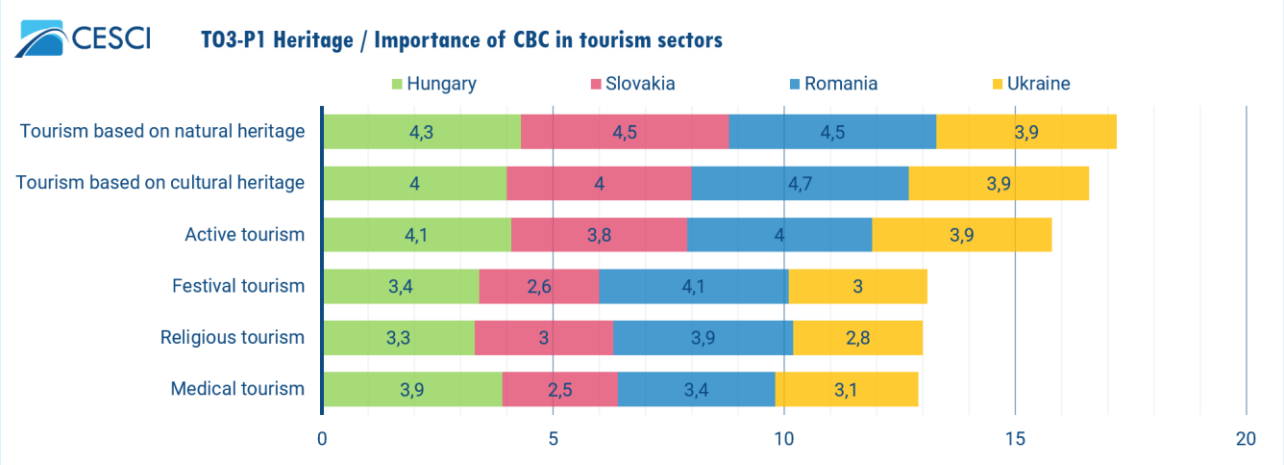
According to the aggregated votes of the four webinars, within the heritage topic the cooperation for safe tourism in the post-COVID-19 period was ranked as the most important among the cross-border cooperation opportunities, which seems to be equally important for all four participating countries, with Ukraine giving a slightly bigger (8,5) and Hungary a slightly smaller (7,3) weight. The participants ranked the development of cross-border networks and thematic routes as the second most important, where again the countries seem to be in balanced agreement. However, this cannot be said for the other topics. Supporting multilingualism finished as the third most important topic with Romania (7,4), Ukraine (6,9) and Hungary (6,7) giving a relatively high value, but Slovakia awarding a relatively lower (5,2) value. On the other hand, organizing events and festivals seem to be the most important to Romania (8,1 this being the highest value in tie with the first two topics) and nearly half as important for Ukraine (4,8). The establishment of a monument monitoring service and supporting the common marketing strategies and platforms managed to attract less interest especially from the Slovak participants. Creating holiday packages finished at the bottom of the list (which might be the result of the current travel ban due to the global pandemic).

Figure 68: TO3-P1 Heritage / Importance of CBC in cooperation opportunities



When comparing the answers of the different country-webinars, it can be said that in general the Romanian values tend to be much higher (7,7) than the other countries (Hungary: 6,3; Ukraine: 6,1; Slovakia: 5,6), which might be indicative in the general commitment or enthusiasm towards the whole topic. The voting also showed where the members from each country placed their focus: in Hungary on the development of cross-border networks and thematic routes, in Slovakia and Ukraine on the cooperation for safe tourism in the post-COVID-19 period, while in Romania both of these and on the organisation of events and festivals.

Figure 69: TO3-P1 Heritage / Importance of CBC in tourism sectors



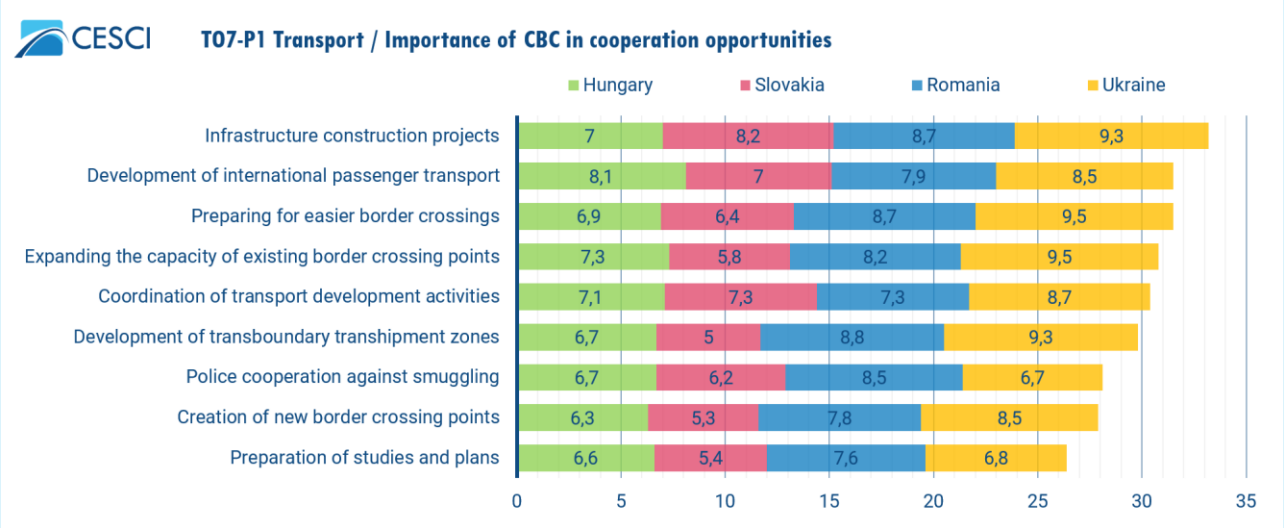
Within this topic there was a second question inquiring about the importance of cross-border cooperation in different tourism sectors. Here the results show that tourism based on natural heritage seemed to be the most important for the participants, especially in Slovakia (4,5) and Romania (4,5), but also in Hungary (4,3) and Ukraine (3,9 which is the highest value the Ukrainian participants awarded for this question). Tourism based on cultural heritage was not far behind, in the Ukrainian webinar it seemed to be equally (3,9), for the Romanian webinar more (4,7) and for the other two slightly less (4 for both Hungary and Slovakia) important. Active tourism finished at the third place in case of which the participating counties accorded a relatively similar level of importance. Festival, religious and medical tourism, however, lagged behind and showed more colourful regional interests. Whereas Hungary and Ukraine are more interested in medical tourism, Romania sees more cross-border cooperation opportunities in festival tourism and Slovakia in religious tourism.

During the webinars no comments or remarks had been made by the participants regarding this topic.

TO7-P1 Transport

In connection with transport nine different subtopics were prompted. Out of which the topic of infrastructure construction projects was voted the most important in cross-border context, especially on the Ukrainian (9,3) and Romanian (8,7) webinars. Preparing for easier border crossings was a topic to be voted as the second most important, though with huge country differences, while the Ukrainian participants rated it to be as important as 9,5, the Slovak participants only awarded a 6,4 value. The development of international passenger transport got the same amount of points as the previous subtopic, but with a much more harmonious distribution of points among the four webinars, meaning that this subtopic might enjoy a broader support among the stakeholders. At the bottom of the list the creation of new border crossing points and the preparation of studies and plans were.

Figure 70: TO7-P1 Transport / Importance of CBC in cooperation opportunities



Most univocally the coordination of transport development activities was supported by the participants as well as the police cooperation against smuggling, while the largest differences between the votes were to be found for the topics of development of transboundary transhipment zones and creation of new border crossing points.

During the conversation, a smaller debate unfolded between the participants whether the construction of bicycle paths should or should not be included in the transport chapter as according to some it can be regarded as a means of transportation and not only dealt with as a subtype of tourism, however, the scale of actual cross-border usage of bicycle as means of transportation are yet to be decided. Furthermore, another received remark in connection with the transport topic was that taking into account the low number of submitted applications for Priority 7 it is believed that this priority should be more promoted and opened to more innovative solutions and not lower the number of possible solutions applicants can use to solve recognized problems.

4 Conclusions

This chapter is dedicated to summarizing the detailed territorial analysis in order to further help the decision-making process. The backbone of the chapter constitutes a special, extended SWOT table, which at the same time serves as the extract of the territorial analysis completed with potential CBC response for each item. Furthermore, an overview is also included on the main conclusions and decision points regarding the POs as well as horizontal issues and other cross-border topics are briefly discussed.

4.1 SWOT table of the conclusions

The territorial analysis has been completed with a SWOT analysis to identify those strengths, weaknesses, opportunities, and threats that are prevalent in the programme area. The matrix is intended to specify the potential objectives of the programme area by naming those internal and external factors that are favourable and unfavourable to the successful development of the programme territory.

The table below slightly diverges from the classic SWOT in the sense that instead of presenting the information in a four-division table, it enlists all the strengths, weaknesses, opportunities and threats according to the logic of the territorial analysis and in the order of its chapters dedicated to the different TO-s. The table is further enriched by a column that offers a CBC-response to each of the findings. Consequently, the table can be also read as a brief but comprehensive conclusion of the territorial analysis.

Table 13: SWOT table of the conclusions

SWOT Items[117]	Chapter	CBC Response
S1. Similarities within joint cross-border biogeographical regions.	2.2.1.1 Natural regions	Joint environmental actions.
S2. Special habitat types across the programme area (e.g. virgin beech forest in the Carpathians; steppic grasslands; wetlands)	2.2.1.1 Natural regions 2.2.1.2 Natural conditions 2.2.1.3 Protected areas	Cooperation to maintain biodiversity and protected areas.

[117] At the beginning of the items' description the letters mean the followings: S = Strengths (green); W = Weaknesses (orange); O = Opportunities (blue); T = Threats (red). The table's rows were colourised based on this system.

SWOT Items[117]	Chapter	CBC Response
T1. High pressure on the different natural habitats (e.g. uncontrolled tourism and fishing; intensification of forestry and eutrophication; spreading of invasive species of flora; pollution from wastewater and domestic waste; inadequate thermal water management; heavy metal pollution; etc.)	2.2.1.1 Natural regions 2.2.1.2 Natural conditions 2.2.1.3 Protected areas 2.5.1.8 Medical tourism	Joint environmental actions.
S3. Extensive forested areas, particularly in the territory of the Carpathian mountain range stretching across state borders	2.2.1.2 Natural conditions	Joint environmental actions.
T2. Intensification of forestry, especially, illegal logging.	2.2.1.2 Natural conditions 2.2.1.3 Protected areas	Joint environmental actions.
S4. Cross-border nature areas of different level of protection stretching within the analysed area	2.2.1.3 Protected areas	Cooperation to maintain biodiversity and protected areas.
S5. Border areas and natural values under protection (e.g. Caves of Aggtelek Karst and Slovak Karst; Natura 2000 and Emerald sites)	2.2.1.3 Protected areas	Cooperation to maintain biodiversity and protected areas.
W1. Less advanced management of the ecological network in Ukraine than of the EU Member States.	2.2.1.3 Protected areas	Cooperation to maintain biodiversity and protected areas.
T3. Surface pollution and contamination reduction is of great significance in terms of transboundary groundwater bodies.	2.2.1.4 Water resources, river basins	Monitoring of the transboundary groundwater bodies. Joint environmental actions.
W2. Tisza and many of its transboundary tributaries have poor chemical status.	2.2.1.4 Water resources, river basins 2.2.1.6 Environmental pressures	Joint environmental actions.
T4. Extremes related to temperature are clearly and significantly moving in the direction of warming	2.2.1.5 Joint preparation for climate change	Joint preparation for climate-related hazards and changes related to drought.
T5. Extreme precipitation events will increase in the future	2.2.1.5 Joint preparation for climate change	Joint preparation for climatic hazards and changes associated with extreme rainfall.
T6. Waste pollution has been regular in the rivers of the Upper Tisza region since the 2000s	2.2.1.6 Environmental pressures	Joint environmental actions.

SWOT Items[117]	Chapter	CBC Response
W3. Waste management and wastewater treatment face significant difficulties in the Ukrainian regions of the program area	2.2.1.6 Environmental pressures	Joint environmental actions.
W4. Resource efficiency needs to be further developed in all four countries	2.2.1.7 Sustainability	Regional cooperation to increase resource efficiency (including utilization of renewable energy sources).
W5. Share of fossil fuels is dominant in the energy consumption off all the countries	2.2.1.7 Sustainability	Regional cooperation to increase resource efficiency (including utilization of renewable energy sources).
T7. All four countries in the program area are highly exposed to natural hazards	2.3.1.1 Dimensions of the risk management	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
W6. The coping capacity is very low in the Ukrainian and Romanian areas of the program area	2.3.1.1 Dimensions of the risk management	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T8. The registered natural disaster cases were caused mostly by hydrological events (40%; floods) or extreme temperature (38%; cold/heat wave, drought)	2.3.1.2 Registered disaster events	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T9. The programme area is heavily exposed to large floods	2.3.1.3 Hydrological and climate-related disasters	Joint preparation for climatic hazards and changes associated with extreme rainfall.
T10. In extremely cold situations, ice drift can appear and aggregate into ice jams	2.3.1.3 Hydrological and climate-related disasters	Joint preparation for climatic hazards and changes associated with extreme rainfall.
T11. In addition to natural factors, human factors also play a role in the development of catastrophic flood situations (e.g. lack of detention reservoirs, illegal forestry, etc.).	2.3.1.3 Hydrological and climate-related disasters	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T12. The programme area shows a consistent worsening pattern in the sense of wildfire danger	2.3.1.3 Hydrological and climate-related disasters	Joint preparation for climate-related hazards and changes related to drought.
S6. The program area is one of the areas less exposed to seismic hazards	2.3.1.4 Geophysical disasters	[No significant cooperative activity is required in this area.]

SWOT Items[117]	Chapter	CBC Response
T13. The Carpathian region, in general, is severely impacted by landslides	2.3.1.4 Geophysical disasters	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T14. There are many human-made disasters on the programme area that occur locally but have cross-border effects (e.g. communal pollution of the rivers)	2.3.1.5 Human-made disasters	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T15. There are plenty of disaster situations that affect several areas of the border region (e.g. illegal logging as a criminal activity)	2.3.1.5 Human-made disasters	Joint knowledge sharing, prevention, preparation and management of the potential disaster situations
T16. The delay of large infrastructural investments supporting interconnectedness conserves the unfavourable accessibility of regions lagging behind	2.4.1.1. Road network	Preparatory activities and coordination for large infrastructural projects of cross-border impact (e.g. feasibility studies, cost-benefit analyses)
W7. Limited number of high-level roads create direct connections across the state borders	2.4.1.1. Road network	Support for better coordination of regional and national road transport policies, planning and construction activities
W8. Persisting lack of well-functioning transport networks and rail border control systems between the regional seats and largest cities across borders	2.4.1.1. Road network, 2.4.1.2 Railway network, 2.4.1.4 Public transport	Support for studies, planning and construction to enhance multimodality, intermodality and interoperability transport nodes
O1. The existing freight transhipment zones' transfer and trans-shipping capacities are sufficient, and further growth of the volumes of commercial freight traffic can be reached as EU integration intensifies	2.4.1.2. Railway network	Territorially integrated economic developments within the cross-border transhipment zones based on joint activities in loading, sorting, storage, processing and transport of transported products
S7. Logistical potential of the trinational border region around the Záhony, Čierna nad Tisou and Chop, the shared cross-border logistics zone is of European potential as a railway freight gateway along the Mediterranean TEN-T and Pan-European Corridor V	2.4.1.2. Railway network	Development of joint and harmonisation of complementary infrastructures and services supporting industrial-logistics cooperation

SWOT Items[117]	Chapter	CBC Response
W9. Bottlenecks and 152nharmonized infrastructures persist including technical differences in gauge parameters, rail border control systems, electrification and number of tracks, need for gauge changes and track switches	2.4.1.2. Railway network, 2.4.1.3. Border crossing points	Coordination in the identification and elimination of bottlenecks
O2. Loosening border regime towards Ukraine, accession of Romania to the Schengen Zone	2.4.1.3. Border crossing points	In connection with the launch of the EES, development of service facilities, terminals near the border crossing points and enhancing services regarding the cross-border mobility (e.g. multilingual border information services)
T17. Uncertain situation caused by the COVID-19 pandemic requires stronger cooperation since the permeability of borders heavily depends in the upcoming years on how the different measures are harmonised and put into practice	2.4.1.3. Border crossing points	Better harmonisation of border control and information procedures connected to pandemic and other emergency situations especially.
W10. Unfavourable quantity and quality character of the crossing points. Low density and capacity of the existing border crossings	2.4.1.3. Border crossing points	Establishment of new border crossing points and capacity increase at existing ones
W11. Weak interoperability and long caused waits at border crossing points on the external border of the EU in particular. Daily migration has become largely impossible due to increased congestion and long control mechanisms.	2.4.1.3. Border crossing points	Cooperation of authorities in capacity increase (improvement of technical conditions, know-how exchange and training of border guards and custom officers, unification and simplification of customs and border control systems) / Complementary activities to the EES installing
W12. The Schengen external border is heavily exposed to illegal border crossings linked to petrol, alcohol and cigarette smuggling, black trade and distinct contraband products.	2.4.1.3. Border crossing points	Enhancing police cooperation and border control techniques on the green borders to tackle organised crime
W13. Weak and uncoordinated public transport connections, with the involvement of only two countries in general	2.4.1.4 Public transport	Support for eliminating technical obstacles to international passenger services, for multimodal traffic management and real-time passenger information.

SWOT Items[117]	Chapter	CBC Response
O3. Growing life expectancy at birth	2.5.1.2. Life expectancy at birth	Cross-border elderly care, silver economy
O4. Largely similar leading causes of death	2.5.1.3. Distribution of deaths by major death causes	Establishment and development of specialised centers offering high quality treatment
S8. Relatively good network of hospitals and health care institutions	2.5.1.4. Health services and infrastructures	Joint initiatives and projects based on the existing institutional background
W14. Medical service is not accessible or available in remote areas	2.5.1.4. Health services and infrastructures	Telemedicine, cross-border ambulance service, regional centers
S9. Existence of several Faculties of Medicine in the region	2.5.1.5. Medical employees	Attracting and keeping talent in the cross-border region
W15. Large number of emigrating medical personnel	2.5.1.6. Emigration of medical personnel	Provision of attractive career model in the region
W16. Underdeveloped cross-border rescue procedures	2.5.1.7. Cross-border rescue procedures	Creation of the legislative, administrative and technical framework for cross-border rescue
O5. Existence of thermal and mineral water sources in the region	2.5.1.8. Medical tourism	Developing medical tourism based on thermal and mineral springs
T18. High number of confirmed COVID-19 cases	2.5.1.9. COVID-19 health indicators	Creation of joint procedures for fighting pandemics
O6. Similar and complementing endogenous assets appropriate for medical tourism	2.6.1.1. Description of the key cultural and natural assets of the cooperation area	Establishment of cross-border medical tourism facilities
S10. Abundance of cultural heritage sites	2.6.1.1. Description of the key cultural and natural assets of the cooperation area	Creating cross-border networks and thematic routes based on the cultural heritage sites
S11. A high number of pristine natural environments	2.6.1.1. Description of the key cultural and natural assets of the cooperation area	Creating cross-border thematic routes and services for active tourism (hiking, skiing, cycling, rowing etc.)
T19. The decay of built heritage in the absence of renovation	2.6.1.1. Description of the key cultural and natural assets of the cooperation area	Creation of a cross-border 'heritage watch' dedicated to the preservation of the built heritage from further decay
O7. Especially renowned religious and pilgrimage sites and architectural heritage elements in a degraded state	2.6.1.2. Potentials for religious tourism	Creating cross-border networks and thematic routes based on the religious sites, joint renovation projects
O8. Many surviving forms of folk traditions	2.6.1.3. Cultural events, festivals	Organizing cross-border events and festivals

SWOT Items[117]	Chapter	CBC Response
W17. Weak international visibility of the existing festivals and cultural events	2.6.1.3. Cultural events, festivals	Establishment joint marketing strategies and platforms
W18. Required multilingualism	2.6.1.3. Cultural events, festivals	Supporting multilingualism in the region through education programmes
T20. Forbidden tourism due to closed borders and COVID-19 pandemic	2.6.1.4. Data, information on tourist arrivals and tourism facilities	Facilitating the creating of administrative, legal and healthcare regulations that would benefit tourism while securing the health of every involved actor
W19. Low number of guest nights	2.6.1.4. Data, information on tourist arrivals and tourism facilities	Creation of longer holiday plans offering several sites from each counties of the programme area
W20. The low number of the validated air quality stations in this region hampers the accuracy of the air quality observations.	2.2.1.6 Environmental pressures	Work on cross border warning mechanisms for pollution peaks (including actions to improve monitoring and modelling). Implementing air quality measures
S12. High potentials in the utilization of geothermal energy.	2.2.1.7 Sustainability	Coordination of joint geothermal researches, preparation for the sustainable and efficient utilisation of renewable energy sources
W21. Lack of safe roads for non-motorized road users	2.4.1.1. Road network	Planning and implementation of cycling infrastructure in the cross-border area
T21. There are lot of industrial and mining sites in the border area with harmful cross-border pollution requiring environmental revitalization.	2.3.1.5 Human-made disasters	Development and implementation of joint revitalization plans.

4.2 Potential cooperation fields and activities

Based on the items of the "SWOT table" above, the potential and essential fields and activities of the next programme can also be listed. Most of them are connectable to the pre-selected topics; however, some of them can be characterised as horizontal issues. Although the following tables cannot substitute the careful reading of the whole territorial analysis and the overview of the SWOT Table, these boxes summarise the main findings of them in order to assist the Programming Committee's decision about the thematic framework of the next programme.

Table 14: Potential cooperation fields and activities regarding TO6-P1 Environment

TO6-P1 Environment	
Rank based on the prioritising of the pre-selected topics for the next programme	1st place (the most widely supported topic)
Rank based on the collected project ideas	2nd place (26 project ideas / Essential topic with a lot of subtopics and diverse groups of stakeholders.)
Potential activities	• Joint environmental actions (e.g. monitoring, researching, revitalisation, awareness raising etc.) • Environmental infrastructural developments • Cooperation to maintain biodiversity and protected areas • Joint preparation for climate-related hazards • Regional cooperation to increase resource efficiency • Implementing air quality measures • Monitoring of the transboundary groundwater bodies
Thematic fields	• Nature reserves • Biodiversity • Illegal logging • Temperature extremes • Extreme rainfall • Waste management • Sewage treatment • Resource efficiency (including renewable energy sources) • Air quality • Groundwater bodies

Table 15: Potential cooperation fields and activities regarding TO8-P1 Disasters

TO8-P1 Disasters	
Rank based on the prioritising of the pre-selected topics for the next programme	2nd place (middle range)
Rank based on the collected project ideas	4th place (14 project ideas / Essential topic, but the number of competent stakeholders is limited.)
Potential activities	• Knowledge sharing, developing low responsive capacities • Technical preparation (e.g. infrastructural developments and purchase of equipment) • Joint prevention, preparation and management of the potential disaster situations • Common disaster management strategies • Rehabilitation and revitalisation • Establishment and operation of monitoring and warning systems (including information systems)
Thematic fields	• Floods / Water management • Extreme rainfall • Illegal logging • Extreme temperatures (drought, heat wave) • Forest fires • Industrial disasters • Landslides • Ice march • Poisoning and pollution

Table 16: Potential cooperation fields and activities regarding TO7-P1 Transport

TO7-P1 Transport	
Rank based on the prioritising of the pre-selected topics for the next programme	4th place (lower range)
Rank based on the collected project ideas	4th place (14 project ideas / Essential topic, but the number of competent stakeholders is limited.)
Potential activities	• Coordination of transport development activities • Preparation of studies and plans • Infrastructure construction projects • Development of transboundary transhipment zones • Preparing for easier border crossings • Development of service facilities near the border crossings (additional improvements to the EES) • Creation of new border crossing points • Expanding the capacity of existing border crossing points

TO7-P1 Transport	
	• Police cooperation against smuggling • Development of international passenger transport • Development of cross-border cycling routes
Thematic fields	• Sustainable, climate-resilient, intermodal mobility • Road network • Railway network • Public transport • Non-motorized transport (cycling) • Border crossing points • Crime prevention • Logistic zones

Table 17: Potential cooperation fields and activities regarding TO8-P2 Health

TO8-P2 Health	
Rank based on the prioritising of the pre-selected topics for the next programme	5th place (the lowest range)
Rank based on the collected project ideas	3rd place (22 project ideas / The topic itself is relevant and essential, but the relatively high number of project ideas reflects primarily the outstanding applicant activity.)
Potential activities	• Healthcare professional collaborations • Knowledge sharing • Development of common epidemiological procedures • Development of specialised centres based on the joint health challenges • Development of telemedicine solutions • Attracting and keeping talent in the cross-border region (e.g. joint career model)
Thematic fields	• Retention of health professionals • Similar leading causes of death • Epidemiology • Cross-border emergency rescue • Medical tourism • Elderly care

Table 18: Potential cooperation fields and activities regarding TO3-P1 Heritage

TO3-P1 Heritage	
Rank based on the prioritising of the pre-selected topics for the next programme	3rd place (middle range)
Rank based on the collected project ideas	1st place (41 project ideas / The high number of ideas shows, it is a popular, easily understandable topic.)
Potential activities	• Cooperation for safe tourism in the post-COVID-19 period • Development of cross-border networks and thematic routes • Support for multilingualism • Organization of cross-border events and festivals • Support for common marketing strategies and platforms • Establishment of a monument monitoring service • Creating joint holiday packages • Development and promotion of products
Thematic fields	• Tourism based on natural heritage • Tourism based on cultural heritage • Active tourism • Festival tourism • Religious tourism • Medical tourism • Local products (e.g. handicraft, agricultural, organic)

Activities which should be supported programme wide

Besides the activities mentioned above, the supporting of the following processes is necessary across the programme. In different measure, but these are almost relevant to all the pre-selected topics:

- Co-operation between institutions, authorities and civil organisations
- Creation of joint procedures for fighting pandemics and cooperation to overcome the harmful effects of the current COVID-19 situation
- Knowledge sharing
- Joint education and training programmes (including formal and informal education)
- Exchange of best practices and expertise, study tours, education
- Joint awareness campaigns
- Supporting joint research programmes with regional relevant topics
- Elaboration of joint strategies
- Coordination of the data collection
- Installation and operation of monitoring and information systems
- Infrastructural developments and purchase of equipment
- Development of joint products and services
- Support for multilingualism

Other cross-border topics

The main mandate of this document was to elaborate a territorial analysis regarding the topics pre-selected by the Programming Committee. The analysis has been performed; however, during the elaboration, some other relevant cross-border topics were also identified. Although the financial sources of the next programme will be limited, and focusing is preferred, the decision is in the hands of the Programming Committee on whether it wants to deal with the following issues in the next phases of the program preparation or not.

- Based on the stakeholder participation, the following topics are also considered as important to address in the next programme: educational cooperation (formal and informal as well); joint labour market issues; enhancing economic relations. (See more information in the following chapters: 2.8.4.3 Other cross-border topics; 2.1 Key characteristics of the programme area).
- Based on the Joint Operation Paper, the next programme should also deal besides the health with the following social topics: unemployment, education and social inclusion. (See more information in the following chapters: 2.9.3 Joint paper on Interreg NEXT Strategic Programming 2021 – 2027; 2.1 Key characteristics of the programme area).
- Based on the Shortlisted Actions of the EUSDR Priority Areas, further potential cooperation areas could be the knowledge society (EUSDR-PA7); competitiveness of enterprises (EUSDR-PA8); people and skills (EUSDR-PA9). (See more information in the following chapters: 2.7.3 Synergic connections with the EU related macro-regional strategy; 2.1 Key characteristics of the programme area).