ESPON

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Co-financed by the European Regional Development Fund

Inspire Policy Making with Territorial Evidence

ESPON TARGETED ANALYSIS

TEVI 2050

Territorial Scenarios for the Danube and Adriatic Ionian Macro-regions

Final Report, PART I _ Looking into the future // 11 April 2022

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Disclaimer

This document is a final report.

The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2020 Cooperation Programme.

The final version of the report will be published as soon as approved.

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Abbreviations

EGTC	European Groupings of Territorial Cooperation
EU	European Union
EUSAIR	European Union Strategy for the Adriatic Ionian Region
EUSDR	European Union Strategy for the Danube Region
GDP	Gross Domestic Product
PA	Priority Area
R&D	Research and Development
SME	Small and Medium-sized Enterprise

1 Executive summary

The world is in a constant flow. Today, more than ever, our world is all but static. It is constantly changing with new developments taking place daily and new trends emerging. Trends, developments and challenges influence people in different ways and have different consequences in different territories. At the same time, in today's interconnected and interdependent world, changes in one place often have impacts on others. The recent COVID-19 pandemic and the war in Ukraine are examples of how unexpected things may influence people lives, shaking the economy, policies and the global power balance. Such events provide food for thought for the future, highlighting the need for more unity and cooperation, as well as for more structured and informed dialogue about the future.

An antidote to presentism. Since ancient times people have wanted to know what will happen in the future. Nevertheless, our attitude towards the future is often described as 'tempus nullius', 'nobody's time' (Krznaric, 2020), making changes challenging. Long-term thinking is a weakness in current democracies, which seem to have difficulties tackling longstanding challenges such as climate change (Randers, 2012). Such 'presentism' often results in political and social myopia, with short-sighted political decisions that prioritise current generations over future ones, who will be more affected by current decisions (Krznaric, 2020). Long-term thinking is pivotal for the survival and wellbeing of future generations. As an antidote to 'presentism', future thinking and foresight processes allow exploration of different possible and plausible futures. Although we cannot predict the future, we can definitely prepare for it. Foresight process and scenarios are an appropriate discipline for this.

Territorial scenarios as eye-openers. Territorial scenarios can be a useful and powerful tool to prepare for the future and show how things may develop by looking at interrelations of different trends. Territorial scenarios are a plausible description of how the future might develop, based on coherent and internally consistent assumptions (scenario logic) about key relationships and driving forces. Scenarios do not make predictions or accurate prognosis. They allow glimpses into possible futures, by considering how different trends or developments may interact, how different factors may change and how these changes may affect other factors. Territorial scenarios add a focus on the implications of developments in different types of territories. They stimulate out-of-the-box thinking and prompt people to increase their social imagination.

The ESPON TEVI 2050 project. Against this background ESPON launched a project to develop territorial scenarios for the Danube and Adriatic Ionian macro-regions. Using thorough desk research, the project has identified trends and developments affecting the future development of the two macro-regions and their territories. A broad participatory and co-creation approach with regional players collected additional inputs and contributed to guiding the foresight process. The project developed two baseline scenarios (one for each macro-region), also called 'business as usual scenarios', and four alternative territorial scenarios (two for each macro-region), i.e. more extreme scenarios. The territorial scenarios for the ESPON TEVI 2050 project are policy scenarios, meaning that they are designed for the support of policy makers and the development of sound policies for the future.

The Danube and Adriatic Ionian regions today. The Danube and Adriatic Ionian regions have their own challenges and potential, though some areas overlap and therefore share some of the challenges. The Danube Region faces mass outmigration, a brain drain, digital divides between its eastern and western territories, regional disparities, low climate change adaptation, pollution and ageing. The Adriatic Ionian Region is challenged by pollution, lack of adequate connectivity infrastructure, a brain drain, socio-economic disparities and the influence of external global powers. At the same time the two regions have identified topics where cooperation can be intensified. Key topics for EUSDR are digitalisation, migration and demographic change as well as climate change and sustainable development. Key topics for EUSAIR are the blue economy and innovation, mobility and connectivity as well as the Green Deal and sustainable development. These are the starting point for the thematic discussions in the project.

What trends are there for the Danube and Adriatic Ionian macro-regions? Trends and drivers that may influence the development of the two regions range from environmental threats, such as biodiversity loss, clean energy uptake, pollution, sustainable lifestyles and climate change, to shifting economic models, such as net-zero societies, increased local economies, sustainable mobility and the circular economy. There are also population trends such as ageing, social inequality, wellbeing and life quality, as well as technological breakthroughs like digitalisation, robotisation, the platform economy and biotechnology as well as trends related to increased global power influences and collaborative governance. All these trends may have

different consequences on the different territories in the two macro-regions and the choices of policy makers may have many different outcomes. As the future is very uncertain, territorial scenarios can help policy makers explore different alternatives and develop different pathways for the future by looking at different ways of how trends may play out. They offer important inputs to guide the choices and decisions of policy makers. What will happen if we choose not to act on current challenges and things continue as they are? What if we dare go a step further and imagine more extreme futures of the Danube and Adriatic Ionian macro-regions? These are questions that the ESPON TEVI 2050 baseline and alternative territorial scenarios have tried to answer.

Baseline scenario: Business as usual. In the most probable future for the Danube and the Adriatic Ionian Regions by 2050, their transition to sustainable economies is slow, with the green transition being gradually but not fully realised by 2050. Furthermore, depopulation is a trend that seems destined to continue, leading to even more uneven development. Digital divides persist, and differ largely across regions, whereas a lack of skilled labour slows the adoption of technological advances. Last but not least, the road to EU integration is bumpy. Some countries may get further along this road and some may even join the Eurozone. Others may show resistance or unwillingness to integration, especially natural and tourism areas where a green transition has failed. Places with limited services of general interest are hampered further, due to ageing and migration. Industrial regions and transport hubs are also challenged by the clean energy transition. Lastly, regions that have progressed with the digital transition and reaped the benefits of technological breakthroughs have an advantage.

Flourishing in green and social wellbeing in the Danube and Adriatic Ionian regions. The first alternative scenario builds on the same assumptions for both regions, but with different territorial implications. In this highly policy-driven scenario, the Danube and Adriatic Ionian regions are in transition towards a greener and more just future. By 2050, the two regions have focused on increasing the quality of life, side-lining economic growth and GDP, concentrating on ecological and social enablers that improve lives. Here, citizen involvement plays a key role in developing open and democratic societies by 2050, thanks to the digital transition. The green transition has been possible through the strong regulatory presence of the European Union, which has become more strategically autonomous and an important global player. Flourishing wellbeing in a green and social society shows that despite the challenges faced in the 2020s, people in the Danube and Adriatic Ionian Regions have taken core decisions to adjust their lives. These include actions and policies that add to their wellbeing by following the Aristotelian 'eudaimonia', i.e. 'good spirit', where people find life purposes in good environmental and social conditions.

Transforming to a hyper-digital economy in the Danube Region. The Danube-specific alternative scenario builds on extreme implementation of the digital transition. The scenario bases the region's prosperity on high economic growth through hyper-digitalisation. This affects people's work and everyday lives. Hyper-digitalisation has highly impacted industries, which gradually walked the industry 5.0 path. In addition, key interactions for citizens are through virtual reality. The Danube River has turned into the key transport method for trade, increasing in volume and sustainability. With an intense focus on economic growth, EU integration in the Danube Region is highly driven by the economy by 2050. Transforming into a hyper-digital economy shows that the Danube Region has turned challenges in the region into opportunities. This has not been an easy path however the region went 'all-in' and bridged digital gaps to achieve a better economic situation in the territory.

Restoring nature for a revived ecosystem. The Adriatic Ionian-specific alternative scenario builds on extreme implementation of a green transition. The scenario highlights the shift of people's mindset towards green growth and decisions to give back to nature, to improve and restore natural habitats in their region. This has increased urbanisation to key vibrant urban centres, as people moved from shrinking and rural areas to urban ones, so as to rewild nature. This has been supported by the new geography of work which made it easier for people to work for companies abroad, reversing the brain drain. The sea has become the key transport node for trade especially short-term shipping, reducing the need for other transport. EU integration has become a priority in the region, re-branding the European Union Strategy for the Adriatic Ionian Region (EUSAIR) as the macro-regional strategy to integrate non-EU member states. Restoring nature for a revived ecosystem has shown that people in the Adriatic Ionian Region have made radical decisions that address the most long-term challenge of our times, climate change. With the power of the people and the support of adequate policies the region has moved towards creating a positive and desirable future to maintain regional comparative advantages and personal fulfilment, as well as appreciating natural and cultural heritage.

Our choices matter. All scenarios developed in the ESPON TEVI 2050 project touch on the green, digital and just transitions. The scenarios show how different choices and decisions can evolve by 2050, and what their implications can be. Such choices and decisions need radical and provocative thinking to imagine future pathways. If policy makers need to decide about a transition, they should be daring and not succumb to middle-measures. This will be the best way for change to bear fruit. Green, digital and just transitions will not be the only changes. People and decision-makers need to be prepared to create the future they wish for. Therefore, when thinking about the future, it is important to think positively and collectively, to imagine desirable futures.

What outlooks of the scenarios do we want to avoid or would we like to see in future? Developing policy recommendations means shifting from a general discussion of possible futures to definite ideas about a desirable future. It is about asking what scenarios policy makers would like to encourage or want to avoid in future. This means policy recommendations are subjective and a matter of (personal) choice. Cross-cutting policy recommendations require more future-oriented debates, with macro-regional sector plans and strategies taking into account transnational bodies and agreements. In addition, ESPON could build repositories of national and regional plans and strategies, support the development of macro-regional masterplans and sector strategies as well as strengthen continuous macro-regional monitoring. The following provides a teaser of more specific policy recommendations from the European Union Strategy for the Danube Region (EUSDR) and the European Union Strategy for the Adriatic Ionian Region (EUSAIR) scenarios.

EUSDR policy pointers teaser:

- EUSDR master plan and road map for green mobility
- EUSDR transnational body to reduce border barriers
- EUSDR digitalisation in green transformation of transport
- EUSDR concept and pilot actions on valorisation of ecosystem services
- EUSDR boost educational, people-to-people and local cooperation

EUSAIR policy pointers teaser.

- EUSAIR territorial vision for demographic change
- EUSAIR spatial action plan for green and blue transitions
- EUSAIR biodiversity plan
- EUSAIR taxation agreement for the digital workforce
- EUSAIR masterplan for future-wise tourism

Territorial foresight and scenarios for sound future policies. Policymakers often need to take decisions with mid-to long-term implications, without full evidence. Territorial foresight is a future-oriented approach that provides tools and methods to support policy makers and stakeholders in their work to develop more appropriate, flexible and robust policies. It informs policy makers through more focused thinking about the future and improved understanding of the present, by providing different possible pathways for developing desirable futures for citizens and avoiding future dystopias. The territorial scenarios of the ESPON TEVI 2050 project are policy scenarios informing decision makers developing sound policies for the future, asking about ‘what if-s’ instead of later confronting the ‘what now-s’, so they can build a better future for generations to come. The study has taken the COVID-19 pandemic and the war in Ukraine as important changes into account, to the extent that they do not shape the core of the scenarios and neither alter the results of the co-creation process carried out during the project.

2 Introduction

The ESPON project Territorial Scenarios for the Danube and the Adriatic Ionian macro-regions 2050 (TEVI 2050) belongs to the Specific Objective 2 of the ESPON Programme. The project aims to 'develop territorial scenarios for the European Union Strategy for the Danube Region and European Union Strategy for the Adriatic Ionian Region as the means to enhance the territorial dimension of the respective EU Strategies and to embed the territorial evidence in policymaking at relevant levels of the countries involved in their implementation' (ESPON EGTC, 2020).

2.1 Introduction to the study

As stated in the Terms of Reference, the objectives of the project are as follows (ESPON EGTC, 2020):

- Identification of the main processes, factors, obstacles and drivers that will shape the territorial development and spatial integration of the Danube Region and the Adriatic and Ionian Region in 2050. The common challenges identified in the strategic documents for each macro-region (e.g. demography, energy issues, mobility, connectivity, digitalization, innovation and climate change) shall be taken into consideration.
- Identification of synergies and conflicts between the above-mentioned factors, obstacles and drivers (in particular, from the perspective of the key policy processes).
- Formulation of baseline territorial development scenarios for the Danube Region and for the Adriatic and Ionian Region for 2050.
- Production of alternative territorial development scenarios for the Danube Region and for the Adriatic and Ionian Region through a participatory dialogue with the steering committee and possibly involving other stakeholders.
- Development of policy recommendations on possible policy pathways i.e. policy actions requiring joint attention of the European Union Strategy for the Danube Region (EUSDR) and the European Union Strategy for the Adriatic Ionian Region (EUSAIR) governance bodies and other levels of governance in the respective EU macro-regions in order to steer the development towards the chosen scenarios. In this case, soft cooperation and multi-level governance actions shall be taken into consideration.

2.2 Introduction to Part I

Part I provides the key findings of the findings of the report. Chapter 3 provides some conceptual clarifications on the method used for the development of the scenarios, as well as how the foresight process run throughout the project. Chapter 4 presents the content of the key results of the project, presenting the two macro-regions in a journey from the present to 2050, including information on the trends and drivers, the baseline and the alternative territorial scenarios. The chapter concludes with the policy recommendations and some overall conclusions.

3 How to talk about the future?

This chapter details the conceptual clarifications the project is built on. The ESPON TEVI 2050 project has applied the territorial foresight approach, also used in other ESPON projects (ESPON Territorial Futures, ESPON BT 2050) to develop baseline and alternative territorial scenarios for the Danube and the Adriatic Ionian Regions in 2050. Section 3.1 presents the territorial foresight approach. Section 3.2 details the territorial foresight process used throughout the project to develop the scenarios.

3.1 The territorial foresight approach

Foresight, also called forward thinking, is based on systemic thinking bringing together qualitative and quantitative analysis. It is a framework for a group of people that are concerned over a common issue to think constructively about the future. The territorial foresight approach builds on thorough participation and co-creation, supported by comprehensive desk research and mapping to visualise the scenarios. Territorial foresight is a continuous process combining content update and desk research with a parallel participatory approach where stakeholders guide the process. Territorial foresight has already been used in earlier ESPON projects, such as ESPON European Territorial Futures and ESPON Territorial Scenarios for the Baltic Sea Region 2050 (ESPON, 2019).

Territorial foresight is a new approach to foresight that combines elements of standard foresight approaches and territorial impact assessments. It is a future-oriented with tools and methods to support policy makers and stakeholders in their work to develop more appropriate, flexible and robust policies (ESPON, 2018a). Territorial foresight involves (a) critical, lateral thinking concerning long-term developments and their impacts on territorial development; (b) wider participatory engagement using qualitative and quantitative information and (c) informing public and / or private decision making. (ESPON, 2018; Böhme, Lüer, & Holstein, 2020).

Territorial foresight can develop territorial scenarios, paying particular attention to place sensitivity and policy relevance. It should not be confused with forecasting which is a narrower concept referring to scientific prediction, where theory is implemented in a mathematic formula and often computerised in forecast models. Such an approach is unlikely to provide accurate predictions for social sciences or cover multi-faceted challenges (ESPON, 2018a). Territorial foresight means approaching the complexity and uncertainty of challenges to understand the territorial consequences of different trends, it enables strong ownership and participation and aims to inform policymaking, as it creates wider awareness. In its design, territorial foresight takes into account four key elements (ESPON, 2018a):

Policies. Foresight and policies are connected to each other. Foresight is closely linked to decision-and policy-making, including influencing and being influenced by future policies. (ESPON, 2018a)

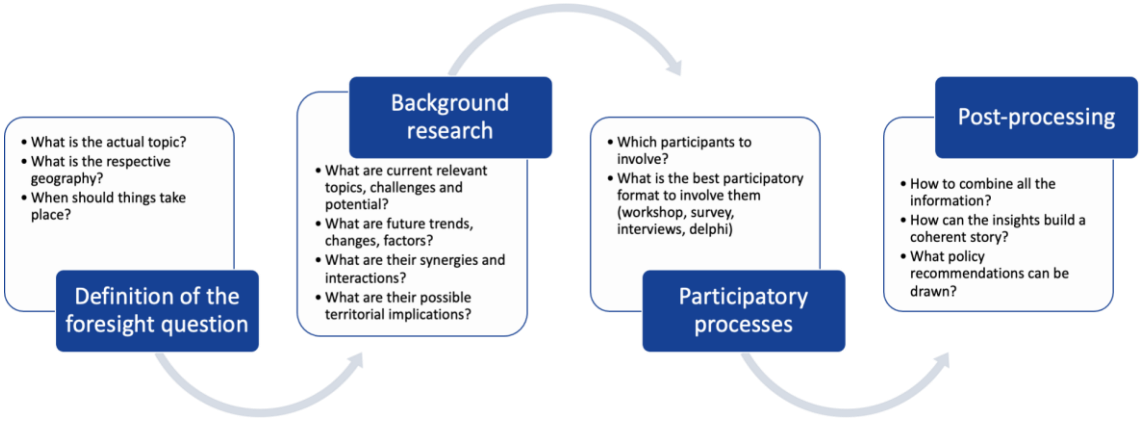
Time. Very often our attitude towards the future can be described as ‘tempus nullius’, ‘nobody’s time’ and our view is clouded by political and social myopia (Krznaric, 2020). Such ‘presentism’ often results in short-sighted political decisions that prioritise current generations over future ones, which are more affected by current decisions. Therefore, foresight presupposes future thinking.

Place. In our evermore interconnected world, policies and other developments directly influence places. Foresight needs to be place-specific, looking closer at what changes have more impact in which territories and what this would mean for wider territorial development, to encourage more place-based policies. (ESPON, 2018a)

People. Last but not least, policies and places are inextricably connected with people and their wellbeing. Foresight does not mean predicting the future with accuracy, so taking on board people’s opinions from different places can inspire well-informed and multifaceted future possibilities that can in turn be relevant to a wider audience. (ESPON, 2018a)

There are four key steps to take into account for a territorial approach, as shown in the figure below.

Figure 3-1 Steps to territorial foresight



Source: authors' own.

More specifically, the steps to guide territorial foresight are (Böhme et al., 2020):

- Step 1: Define the question. Clearly defining the topic is the first step for territorial foresight. This means having a clear understanding of the content (what is the topic?), the geography (what is the territory?) and the time horizon (by when should things take place?).
- Step 2: Background research. The cornerstone is thorough desk research. Existing literature and data are key to identifying relevant challenges, topics, trends and factors, their synergies and interactions, as well as their possible influence on territories.
- Step 3: Participatory processes. Well-structured participatory processes include lateral, out-of-the-box thinking in territorial foresight. They minimise a 'vertical' logic and induce creativity through a more problem-solving way of thinking. Participatory processes break existing mental models and encourage new ways of thinking and information exchange to come up with new ideas and solutions. The forward thinking of engaged experts is especially useful in identifying the territorial implications of trends, developments and challenges. Participation can be through surveys, workshops, role-play, forecathons, webinars, etc.
- Step 4: Post-processing. This involves combining the previous steps, looking at how the results and insights build a coherent story. This can include policy recommendations for the future, mapping implications and policy pointers.

These steps have been followed throughout the project, combining thorough desk research with informed participatory and co-creation approaches. The whole process of the project is described in section 3.2.

3.2 The territorial foresight process

Territorial foresight is an important and useful method for generating collective knowledge and inputs to talk in a structured and informed way about different possible futures. Territorial foresight has been used throughout ESPON TEVI 2050 to arrive at baseline and alternative territorial scenarios. A key component of the process has been the well-organised co-creation process, involving one steering group with key EUSDR implementers in discussions about the EUSDR and one steering group with key EUSAIR implementers in discussions about the EUSAIR. The groups participated in individual workshops throughout the course of the project, as well as in joint sessions to discuss joint issues. This close cooperation and involvement of the players has increased ownership of the project results, as well as assisted the project team in choices for the next steps of the scenario development. The co-creation process involved participants from the beginning in choices for the process. There were three closed steering group workshops, plus a role-play workshop, which was open to more stakeholders (the detailed participatory plan, including the events where the project was presented can be found in Annex 1). All workshops took place from May 2021-February 2022. In addition to the co-creation process with the steering groups, internal workshops within the project team also took place to verify results, fine tune findings and brainstorm.

Desk research. The first core step in the foresight process has been desk research, which continued until the end of the project. The desk research served two key purposes. First, it helped screen current challenges and developments in the two macro-regions. It has been important to have a key reference point on the present, before discussing the future. Second, it was basis for identifying relevant trends, factors and drivers of change. A beacon for thematic orientation and defining the present challenges has been the project's Terms of Reference. This identified three key topics for each macro-region; digitalisation, migration and demographic change, as well as climate change and sustainable development for EUSDR, and blue economy and innovation, mobility and connectivity as well as the Green Deal and sustainable development for EUSAIR. These topics were the starting point for the desk research on the 'status quo', i.e. current challenges, and also helped guide the selection of relevant trends. The first part of the desk research led to identifying key challenges and opportunities, which resulted in the development of a mapshots for each macro-region, i.e. a visualisation of cooperation patterns and examples for stimulating discussions around transport connections, GDP, green corridors, etc. In addition, it made a first selection of trends to be discussed with the steering groups. The desk research then added more trends, covering the thematic categories of PEEST (Political, Economic, Environmental, Social and Technological).

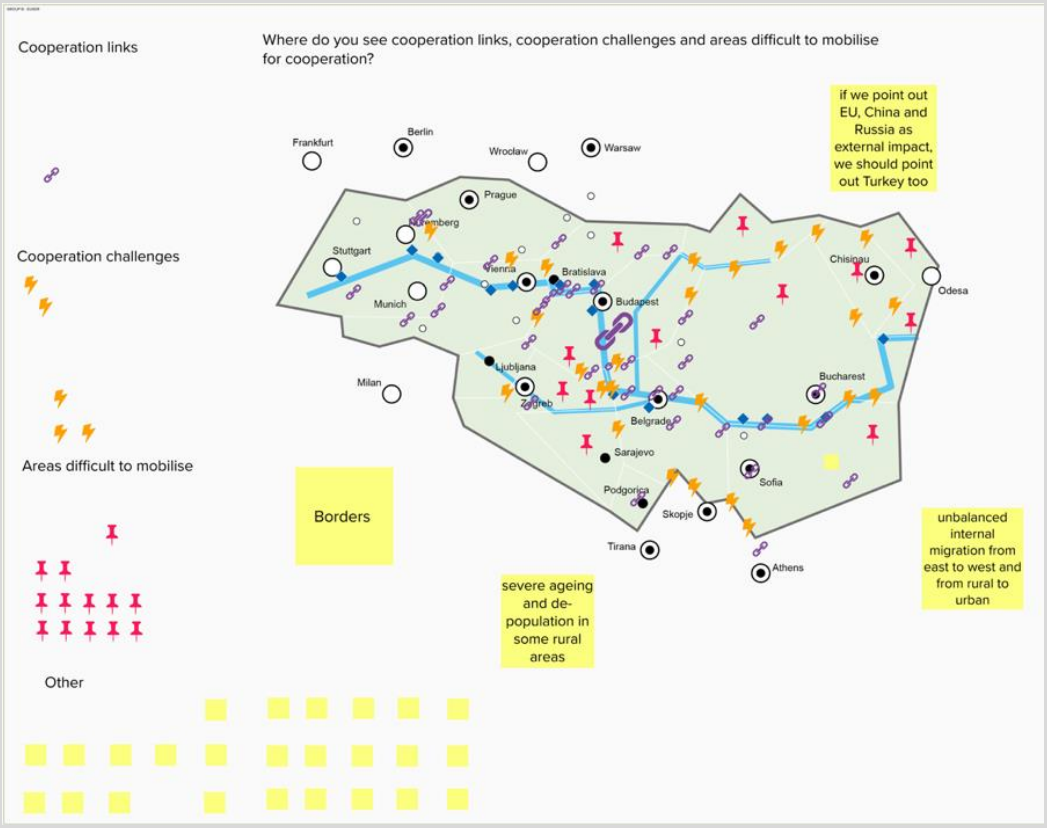
What are mapshots?

Mapshots are a conceptual representation of a cooperation area that includes geographic features, patterns and trends for existing or potential cooperation dynamics, developed for the ESPON ACTAREA project. The quantitative information is based on geographical and socio-economic data (national or regional statistics), while qualitative information is based on expert interviews, legal documents and grey literature. The objective of a mapshot is not to show all the different aspects in a single map. By simplifying administrative borders and the main features of a territory, a mapshot is a simplified illustration of a more complex reality. This guides the reader on important elements of a territory and conveys a common understanding of a territory and its characteristics. (ESPON EGTC, 2017)

Workshop 1. During the first workshop, participants discussed the mapshots and were engaged in developing their own mental mapshots through a co-creation process, highlighting additional challenges and opportunities for the two macro-regions (see box below). This exercise helped the project team to improve the mapshots, as well as to collect additional points on current challenges.

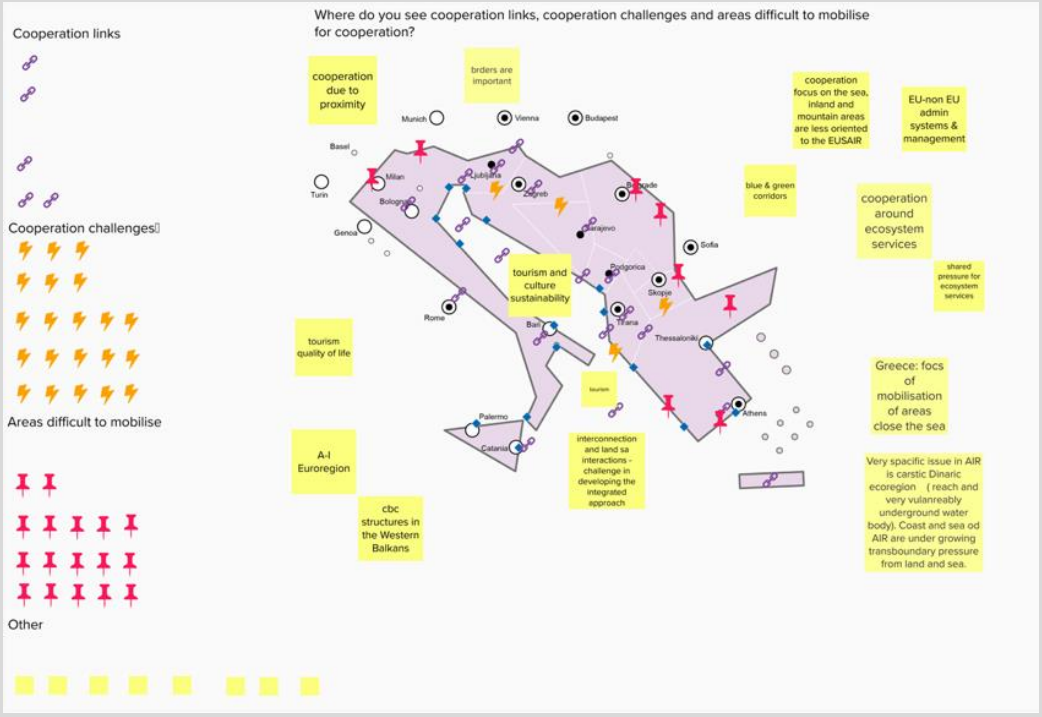
Example from the co-creation process

Mental mapshot – Cooperation links & challenges – EUSDR



Source: First Meeting of the Steering Committee for the EUSDR, TEVI 2050

Mental mapshot – Cooperation links & challenges – EUSAIR



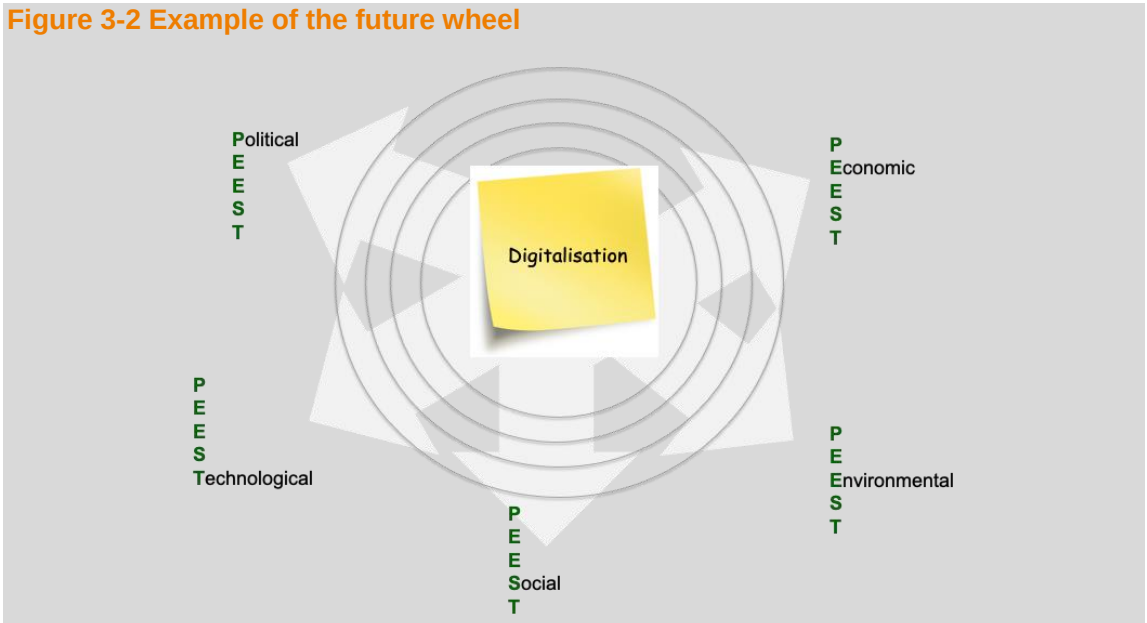
Source: First Meeting of the Steering Committee for the EUSAIR, TEVI 2050

In a second exercise, participants brainstorm and discuss relevant trends and any visionary, future-oriented projects that may be relevant for the two macro-regions. Participants worked on brainstorming trends along the five PEEST categories and voted to rank the three trends with the highest impact in the region by 2050. The second exercise helped the project team understand key stakeholders' points of interest and possible topics to focus on.

Survey. To complement the selection of key trends, the project team launched a survey beyond the two steering groups, of players in the region, European institutions, as well as national and regional authorities. The survey collected additional information on relevance, trend status and development, the time horizon, uncertainty, impacts and the types of territories it may affect. It also helped select core trends when working on scenarios. Certainly, additional trends and drivers influence the course of scenarios, though those selected are the core ones, in line with the identified topics of each macro-region.

Trend processing. The next step in the process was to analyse the trend material. For this, the team used the 'future wheels' method, i.e. a visual tool to help think about relevant factors of a particular topic, trend or change. In the future wheel, a topic is placed at the centre of multiple concentric circles. Different orders of factors are then displayed. A complete future wheel depicts a large variety of factors relevant to the topic, relations between factors as well as the direction of the relations, whether driving or hampering (more information about the future wheel can be found in Scientific Annex 2 of the final report).

Figure 3-2 Example of the future wheel



Source: authors' own

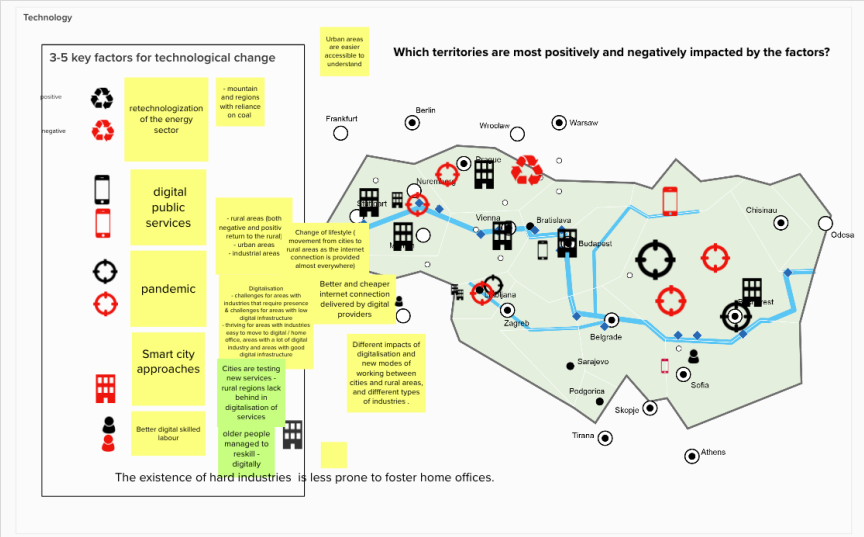
Development of the baseline scenario. The baseline or 'business as usual' scenario presents a plausible version of how a territory develops if no further policies are implemented. It is based on core assumptions, i.e. foundations, derived from the trend selection. The next step was to 'territorialise' the trend implications and assumptions. Participatory approaches, expert judgement and lateral thinking were key to defining the territorial implications of trends, due to a lack of territorial data for modelling. The approach included expert judgement on types of territories affected by trends, e.g. the effects of trends on mountain regions, islands, cities, rural regions, industrial, tourism, border regions, etc. In addition, experts assessed the extent that trends will positively or negatively affect these regions. Findings from desk research and maps helped experts assess these territorial aspects. Four key assumptions have been developed for the baseline scenario: transition to sustainable economies, depopulation, a digital divide and EU integration.

The desk research and process identified common challenges in the two macro-regions. In addition, parts of the two macro-regions territorially overlap, raising discussions in the second workshop about whether to have two baseline scenarios (one for each macro-region), based on the same assumptions.

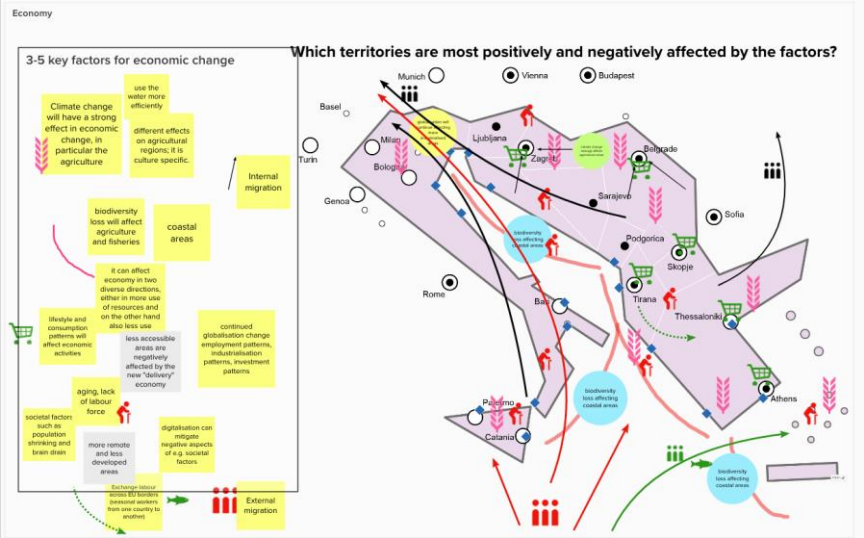
Workshop 2. In the second workshop participants discussed the territorialisation of trends. The workshop first validated the baseline scenario logic, formulated from the first steering group meeting, initial document studies and first outcomes of the survey which were shared during the workshop. Subsequently, possible

territorial consequences of the trends and their developments were discussed. This forms a key input for maps of possible territorial futures (see example below).

Example from the co-creation process



Source: Second Meeting of the Steering Committee for the EUSDR, TEVI 2050



Source: Second Meeting of the Steering Committee for the EUSDR, TEVI 2050

Maps were developed for baseline scenarios using alternative mapping, combining quantitative and qualitative data.

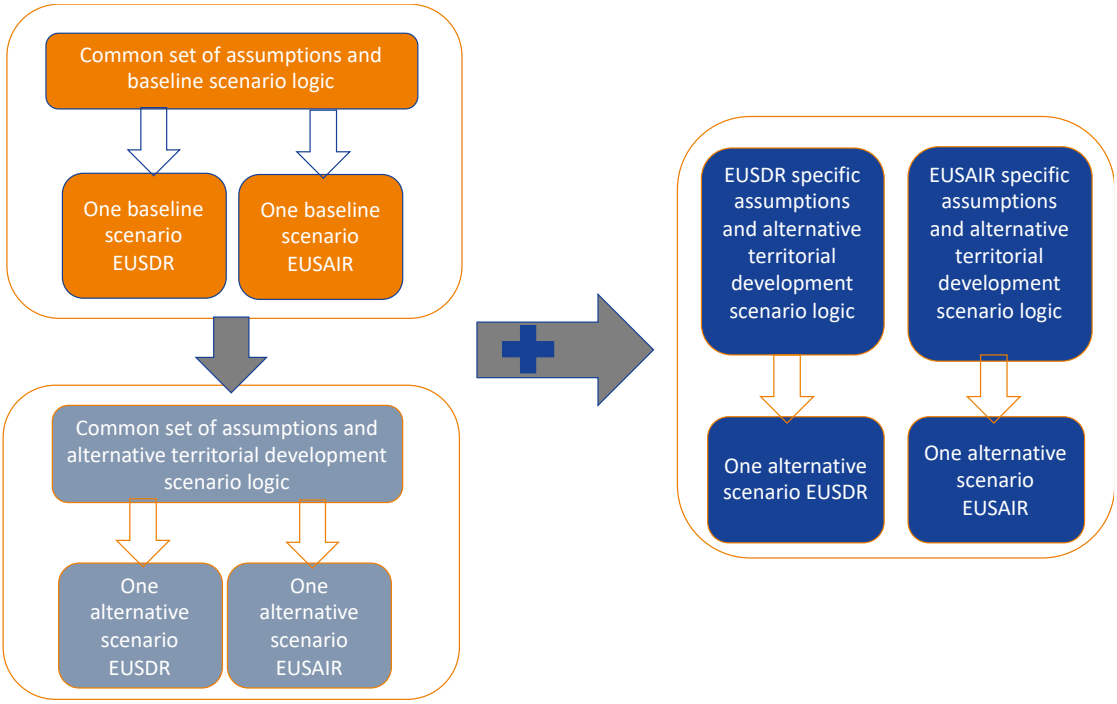
What is creative alternative mapping?

Creative alternative maps allow a graphic illustration of quantitative and qualitative data, using non-standard graphic illustration. By focusing on the presentation of key messages for the policy process, these maps help to break down the complexity of territorial patterns and convey them in a simplified manner. In doing so, the creative maps take a step further and deviate from previous symbology in a legend, employing whatever presentation is useful for conveying the key messages. Creative maps are usually based on real figures or qualitative observations collected in collaborative workshops. In this regard, the maps show tacit and non-tacit information that is difficult to extract from standard sources but is important for the policy process. Beyond that, creative maps can illustrate territorial patterns that cannot be depicted by standard maps often used in the policy process.

In the joint workshop, where both macro-region steering groups participated, a decision was taken to develop two baseline scenarios (one for each macro-region), based on the same assumptions, as well as to follow a similar approach for the alternative territorial scenarios. This means that two of the alternative scenarios

(one for each macro-region) are based on the same assumptions, while the other two (one for each macro-region) are based on unique assumptions for each (see Figure 3-3).

Figure 3-3 Scenarios and options



Source: authors' own

These steps helped to develop baseline scenarios for the two macro-regions. The next step was to develop alternative territorial scenarios. These show a more extreme version of the future in 2050 for the two macro-regions compared to the baseline scenario describing different development paths, exploring different futures. They are a plausible description of how the future may develop, based on coherent and consistent assumptions (the scenario logic). They are realistic, i.e. could happen, as well as balanced, i.e. discussing both positive and negative implications of these paths. The aim is to raise awareness about the future and support out-of-the-box thinking. Based on the key topics of interest for the two macro-regions, as defined in the terms of reference, the desk research and co-creation process identified further related trends that go beyond these themes. The trend selection and co-creation process have both framed the assumptions and narratives below. These may have a direct effect on other relevant topics for the two macro-regions and although they are not the starting points for the assumptions, they were considered when developing the alternative scenarios.

Alternative territorial scenarios. The next step in the process was to develop the scenario logic in matrices, based on a combination of trends and factors. For the alternative territorial development scenarios, the scenario logic is based on a few trends and focused on a more extreme version of their future path.

What is a scenario matrix?

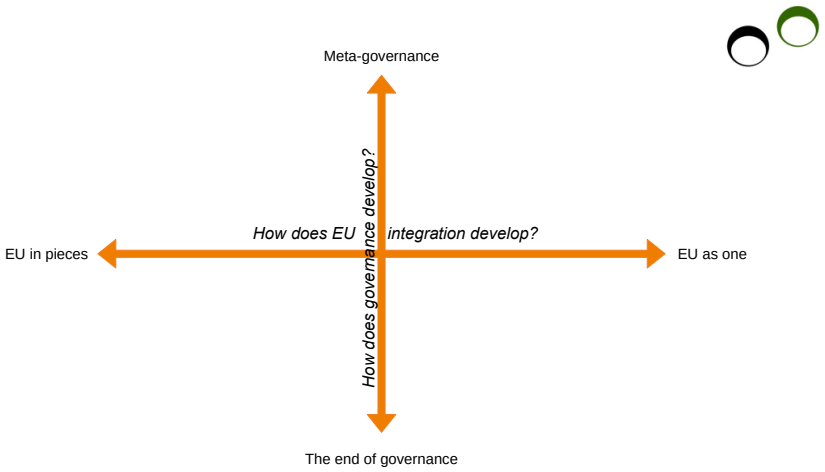
It is a method for developing the scenario logic. More specifically, the scenario matrix is a way to visualise different extreme and contrasting trends. The two axes represent the way, the framework or the assumptions for the scenarios . Each axis represents the direction of extreme versions of a trend and serves as a guiding question. To ensure plausibility and balance in the territorial scenarios, those extreme versions should still be plausible by 2050 (the timeframe set by the Terms of Reference), i.e. not science fiction. The scenarios should be balanced, i.e. present both possible negative and positive aspects in the narratives. A first step to the scenario matrix is to select global trends with high future impacts and possibly causing societal changes.

Developing the alternative territorial scenario assumptions. As mentioned, four alternative scenarios were developed. Two are based on common assumptions for the two macro-regions, and two on distinct assumptions for each. Therefore, three scenario matrixes were developed. A detailed explanation of the alternative scenarios development can be found in Scientific Annex 3 of the final report.

For the common assumption territorial scenarios, the future development of governance and European integration is very important for both macro-regions. These two elements are the common assumptions for the common territorial scenario. The figure below presents these assumptions in a scenario matrix and the four extremes that shape it. The extremes aim to answer two questions:

- 'How does EU integration develop?' looking at the extremes of 'EU as one' against 'EU in pieces' on the horizontal axis.
- 'How does governance develop?' looking at the extremes of 'metagovernance' against 'the end of governance' on the vertical axis.

Figure 3-4 EUSDR and EUSAIR common assumptions' scenario matrix

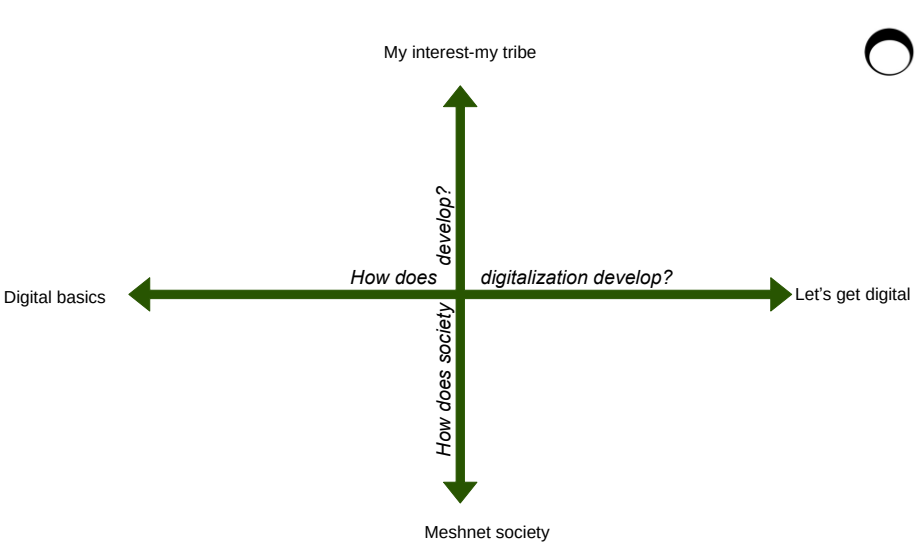


Source: authors' own

The way digitalisation and society may develop are key assumptions for the EUSDR territorial scenario. The figure below presents these assumptions in a scenario matrix and the four uncertainties that shape it. The extremes in the axes aim to answer two questions:

- 'How does digitalisation develop?' looking at the extremes of 'let's get digital' against 'digital basics' on the horizontal axis.
- 'How does society develop?' looking at the extremes of 'human tribes' against 'meshnet society' on the vertical axis.

Figure 3-5 EUSDR scenario matrix

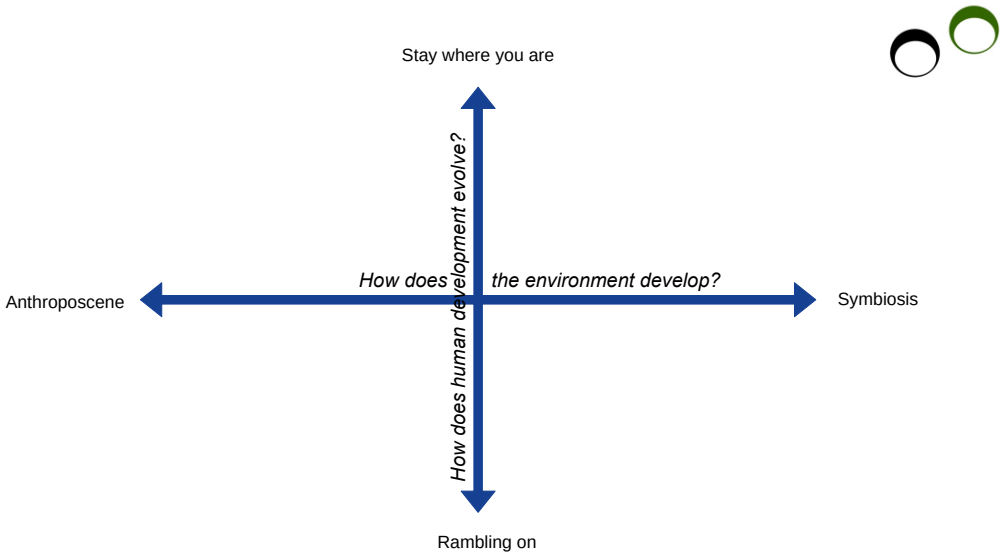


Source: authors' own

The way environmental and human development may change in the future are the key assumptions for the EUSAIR territorial scenario. The figure below presents these assumptions in a scenario matrix and the four extremes that shape it. The extremes in the axes aim to answer two questions:

- 'How does the environment develop?' looking at the extremes of 'symbiosis' against 'anthropocene' on the horizontal axis.
- 'How does human development evolve?' looking at the extremes of 'stay where you are' against 'rambling on' on the vertical axis.

Figure 3-6 EUSAIR scenario matrix



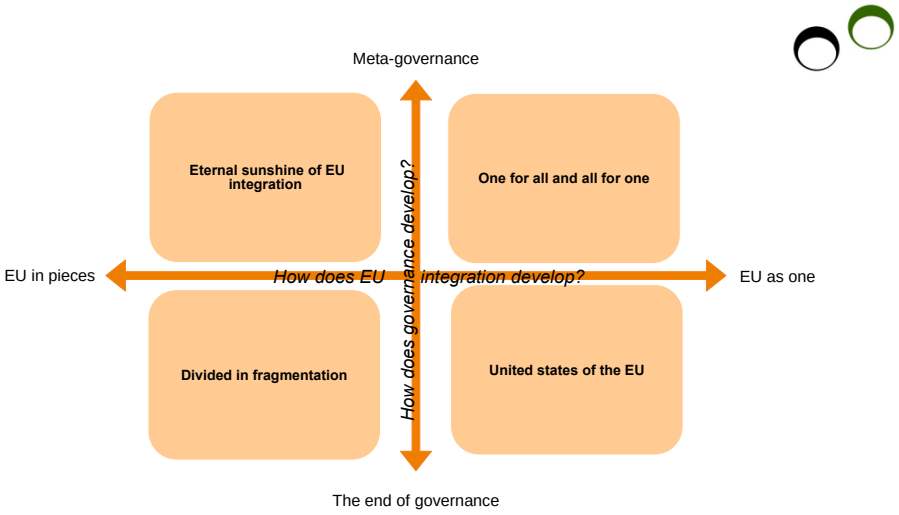
Source: authors' own

Developing the extreme narratives. Combining the different extremes in each scenario matrix axis, the next step was to develop four extreme narratives in the four quadrants. These include forward-looking statements to describe new services, developments, expectations, products, habits and actions. They involve risks and uncertainties, as they refer to the future. Several other factors or trends may bring other results or developments that diverge from these statements which aim to show a very extreme future and give a more complete idea of how far things may develop. The detailed extreme stories can be found in Scientific Annex Annex 3 of the final report.

The four extreme narratives for the EUSDR and EUSAIR are combinations of the extremes in the four quadrants, as shown in Figure 3-7, these are

- 'Eternal sunshine of EU integration', from combining 'EU in pieces' and 'Meta-governance,
- 'One for all and all for one', from combining 'Meta-governance' and 'EU as one',
- 'United states of the EU', from combining the 'EU as one' and 'the end of governance' extremes, and
- 'Divided in fragmentation', from combining 'the end of governance' and 'EU in pieces'.

Figure 3-7 The four common extreme narratives for EUSDR and EUSAIR

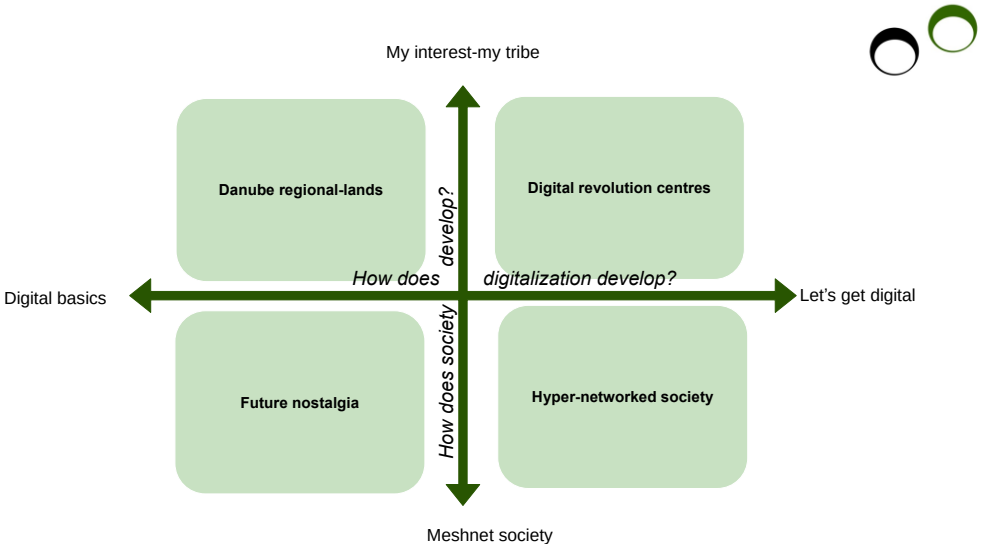


Source: authors' own

The four extreme narratives for the EUSDR are combinations of the extremes of the four quadrants, as shown in Figure 3-8, these are:

- 'Danube regional-lands', combining the extremes 'My interest-my tribe' and 'Digital basics',
- 'Digital revolution centres', combining 'My interest-my tribe'' and 'Let's get digital' extremes,
- 'Hyper-networked society', combining 'Meshnet society' and 'Let's get digital', and
- 'Future nostalgia', combining 'Meshnet society' and 'Digital basics'.

Figure 3-8 The four extreme narratives for EUSDR



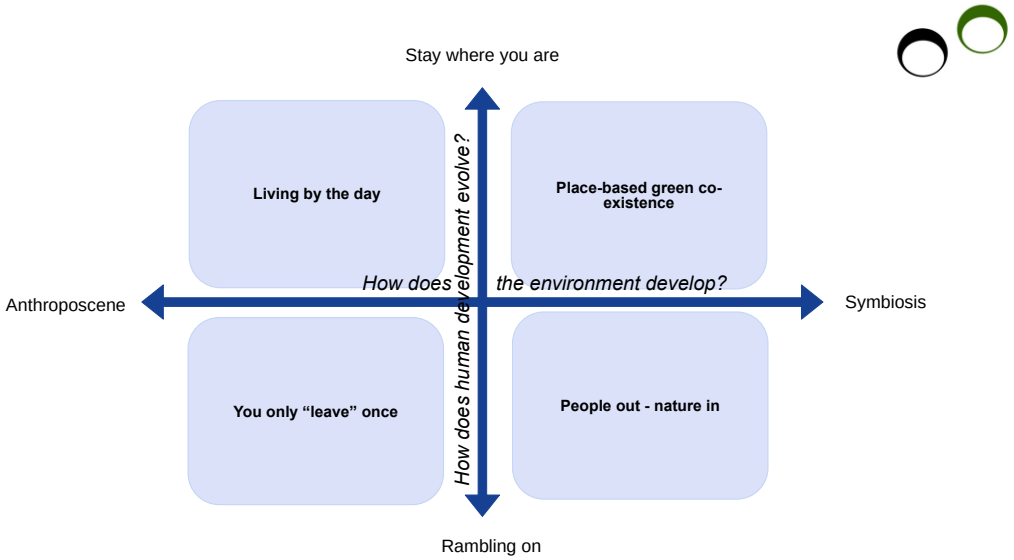
Source: authors' own

The four extreme narratives for the EUSAIR are combinations of the extremes of the four quadrants, as shown in Figure 3-9, these are:

- 'Living by the day', combining the extremes 'Stay where you are' and 'Anthropocene',
- 'Place-based green co-existence', combining 'Stay where you are' and 'Symbiosis',
- 'People out-nature in', combining 'Rambling on' and 'Symbiosis', and

- ‘You only “leave” once’, combining ‘Rambling on’ and ‘Anthropocene’.

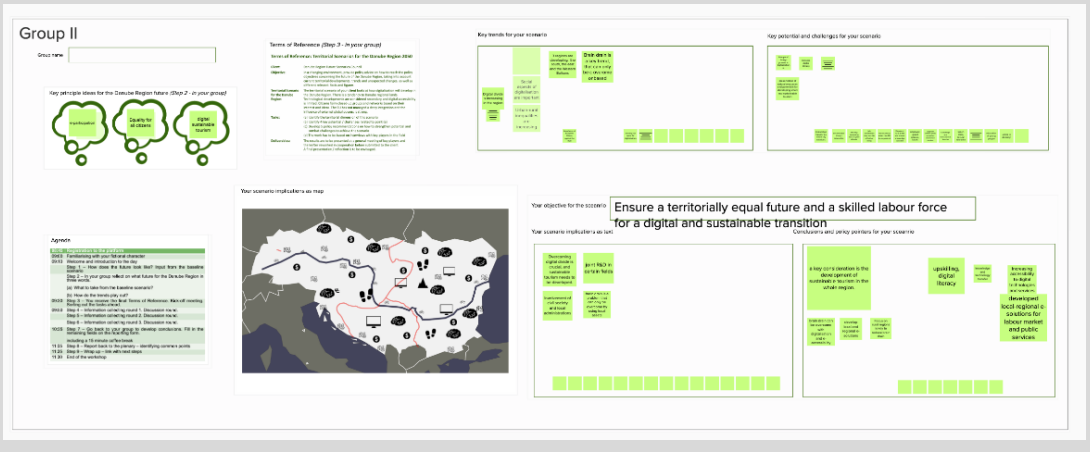
Figure 3-9 The four extreme narratives for EUSAIR



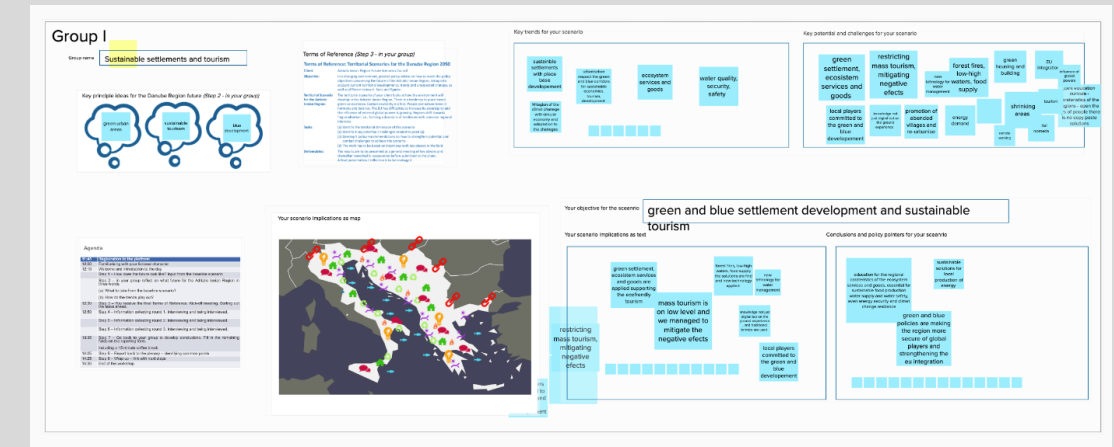
Source: authors’ own

Role-play workshop. The role-play workshop helped to reduce uncertainty and get an idea of where the future could go for the two macro-regions. Participants were engaged in a highly interactive workshop, where they forgot about their current role and took an assigned role throughout the workshop, prepared by the project team. This enabled out-of-the-box thinking with an open mind, overcoming existing biases. Participants discussed possible futures of the two macro-regions and worked on possible territorial implications. The inputs of the workshop helped guide the direction of the scenarios, as well as how extreme they could be and what territories are most likely influenced.

Examples from the co-creation process



Source: Role-play workshop of the Steering Committee and wider audience for the EUSAIR, TEVI 2050

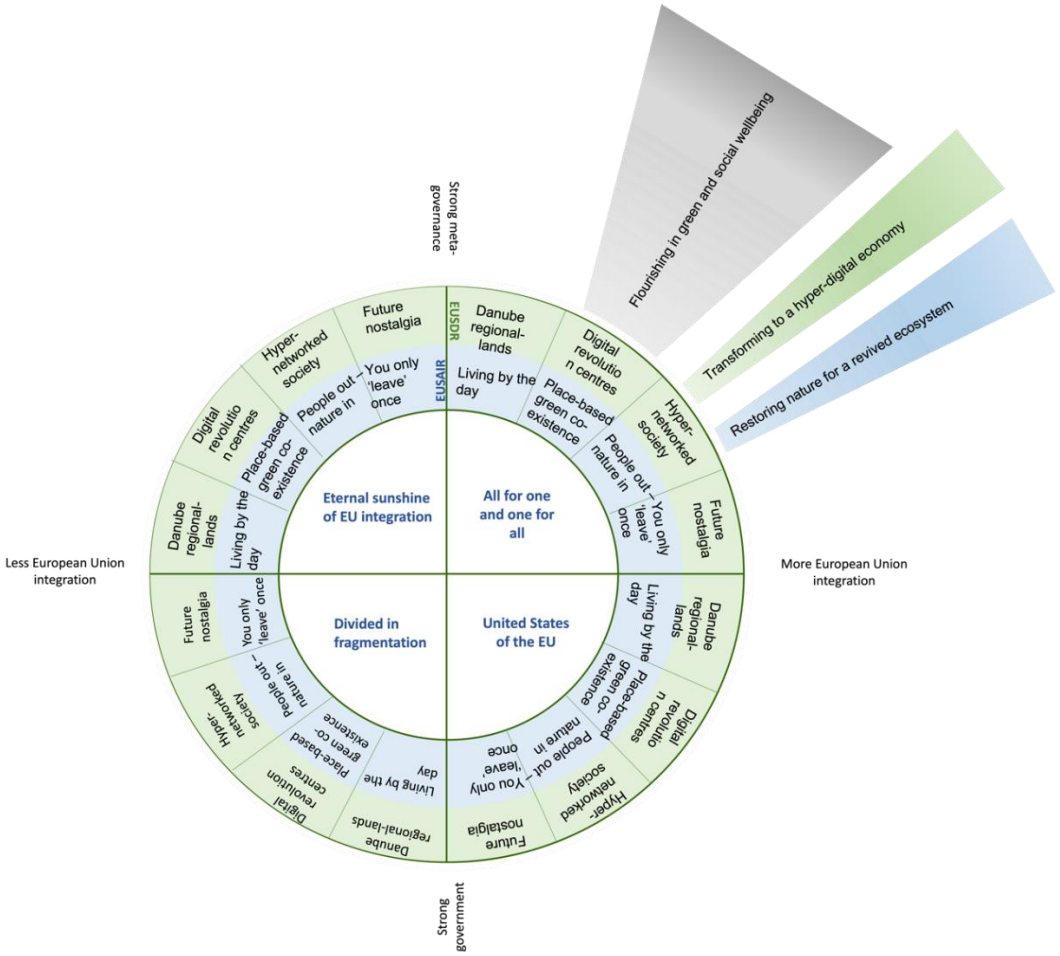


Source: Role-play workshop of the Steering Committee and wider audience for the EUSAIR, TEVI 2050

Positioning the alternative territorial scenarios and given the complexity of the exercise, the next step was to synthesise all the information and inputs, as well as the choices made in the workshop, to position the final scenarios in a synthetic scenario matrix. The matrix below combines the joint assumption scenarios with specific ones, as they interplay and overlap, resulting in the following scenarios:

- Flourishing in green and social wellbeing: the EUSDR and EUSAIR scenario;
- Transforming into a hyper-digital economy: the EUSDR scenario;
- Restoring nature for a revived ecosystem: the EUSAIR scenario.

Figure 3-10 Position of the alternative territorial scenarios



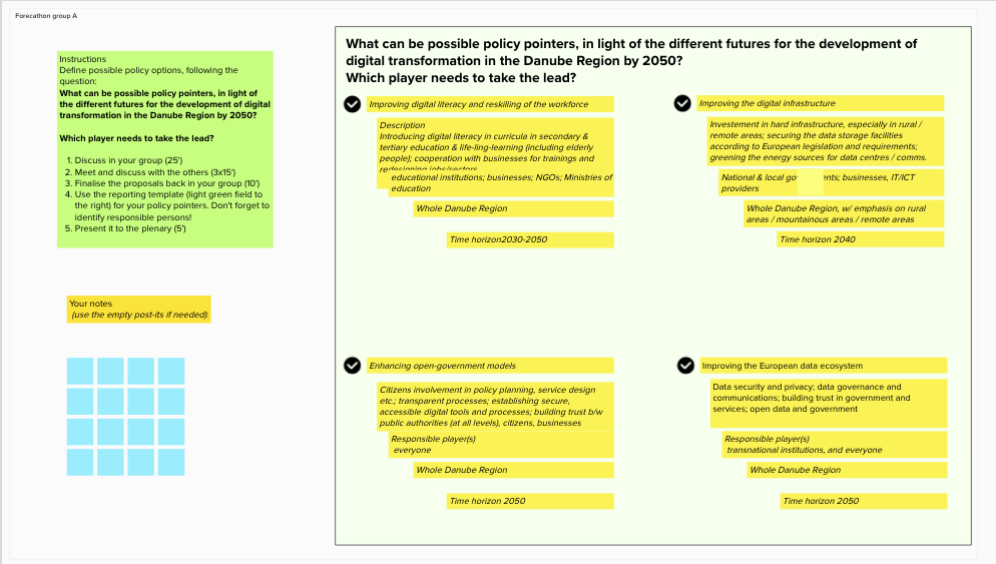
Source: authors' own

The alternative territorial scenarios and their territorial implications were drafted based on the above. In addition, four alternative maps were developed, showcasing future territories of the Danube and Adriatic Ionian macro-regions in 2050. The final scenarios are plausible, possible and balanced. This means they are future oriented and excessive in their narrative, but remain logical and plausible (i.e. not science fiction, nor wishful future visions). Furthermore, the scenarios are balanced, so rather than one negative and one positive scenario for each macro-region, they include both positive and negative implications from the assumptions and the scenario logic.

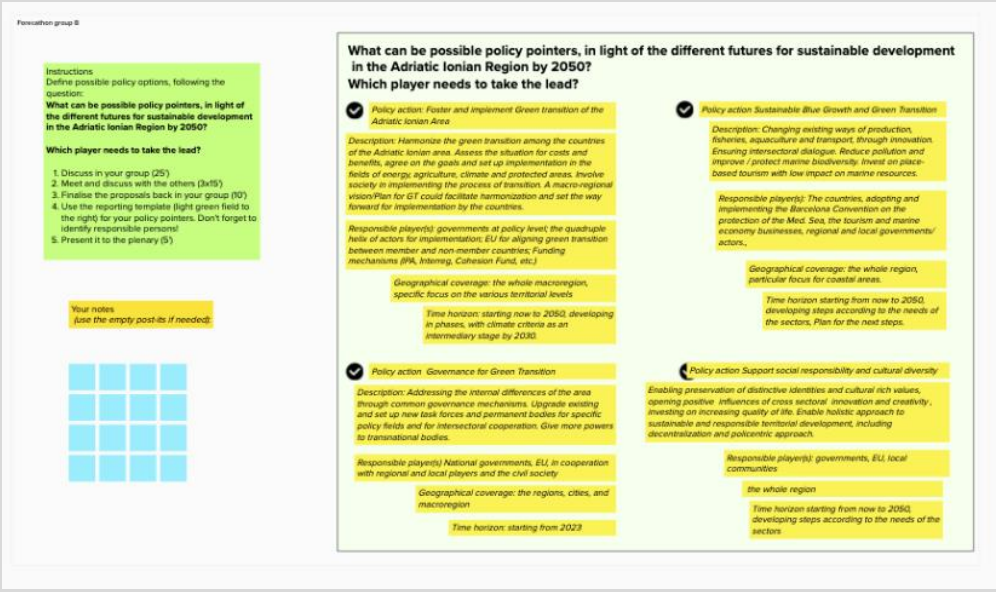
Developing policy recommendations. The last step in the process has been to develop policy recommendations. These were also developed in a co-creation process, where the steering group members discussed the different futures of the two regions and different policy options.

Workshop 3. The third workshop focused on developing policy recommendations. Participants focused on key elements of the possible futures, to identify the actions, players, time-frames and territorial levels. The workshop provided a first selection of ideas on policy pointers, which were then summarised and filtered by the project team.

Example from the co-creation process.



Source: Forecathon workshop of the Steering Committee on policy recommendations for the EUSAIR, TEVI 2050



Source: Forecathon workshop of the Steering Committee on policy recommendations for the EUSAIR, TEVI 2050

The foundation of the foresight process has been the co-creative approach to developing the scenarios. Having key stakeholders all through the process has been essential for making good choices to elaborate the scenarios. These choices have been important both in guiding the project, as well as in increasing ownership among the key players. The ESPON TEVI 2050 scenarios are policy scenarios, involving policy players and taking their choices into account, making the scenarios more relevant and useful in their work.

The next chapter gives an overview of the results of the project. More details can be found in Parts II and III of the final report. More information about the methodology and process can be found in the Scientific Annexes.

4 What does the future hold for the Danube and Adriatic Ionian regions by 2050?

The future is full of uncertainties. Both the COVID-19 pandemic, as well as the most recent war in Ukraine are yet more examples of this uncertainty. The ESPON TEVI 2050 has developed different possible futures for the Danube and the Adriatic Ionian regions taking into account different trends, challenges and factors that may influence these futures.

4.1 From the tyranny of now to the prospects of the future

An antidote to presentism. Since ancient times people have wanted to know what will happen in the future. Nevertheless, our attitude towards the future is often described as 'tempus nullius', 'nobody's time' (Krznaric, 2020), making changes challenging. Long-term thinking is a challenge and a weakness in current democracies, which seem to have difficulties tackling longstanding challenges such as climate change (Randers, 2012). Such 'presentism' often results in political and social myopia, resulting in short-sighted political decisions that prioritise current over future generations while the latter will be more affected by current decisions (Krznaric, 2020). Long-term thinking is pivotal for the survival and wellbeing of future generations. As an antidote to presentism, future thinking and foresight processes allow exploration of different possible and plausible futures. Although we cannot predict the future, we can definitely prepare for it.

Preparing for the future. In a world that is rapidly changing, where new developments take place constantly and uncertainty increases, preparing for the future and thinking long-term is necessary. Foresight, also called forward thinking, helps us prepare for the unexpected and deal with uncertainties. It is based on systemic thinking, bringing together qualitative and quantitative analysis and providing a framework for people concerned over a common issue to think constructively about the future. Territorial foresight is a new approach that combines elements of standard foresight and territorial impact assessments paying particular attention to place sensitivity and policy relevance. The territorial foresight approach builds on critical and lateral thinking, a thorough participatory and co-creation approach, supported by a comprehensive desk research and mapping for visualisation. This creates collective knowledge and useful inputs for possible long-term developments. One way to carry out territorial foresight is the development of territorial scenarios.

Territorial scenarios as eye-openers. Territorial scenarios can be a useful and powerful tool for preparing for the future and showing how things may develop by looking at different trend interrelations. Territorial scenarios are a plausible description of how the future might develop, based on coherent and internally consistent assumptions (scenario logic) about key relationships and driving forces. Scenarios do not make predictions or accurate prognoses. They allow glimpses into possible futures, by considering how different trends or developments may interact, looking at how different factors may change and how these changes may affect other factors. Territorial scenarios add a territorial dimension and focus to the territorial implications of changes and development in different types of territories. They stimulate out-of-the-box thinking and prompt people to increase their social imagination.

Territorial foresight and scenarios for sound future policies. Policymakers often need to take decisions with mid-to long-term implications, without enough information. Territorial foresight is a future-oriented approach that provides tools and methods to support policy makers and stakeholders in their work to develop more appropriate, flexible and robust policies. It is a discipline to inform policy makers through more focused thinking about the future and an improved understanding of the present by providing different possible pathways towards desirable futures for citizens, avoiding future dystopias. Territorial foresight and scenarios are key to informing decision makers developing sound policies for the future, asking about 'what if-s' instead of later confronting 'what now-s', so they can build better for future generations.

Territorial foresight in the ESPON TEVI 2050. The ESPON TEVI 2050 project has implemented the territorial foresight method to develop territorial scenarios for the Danube and Adriatic Ionian macro-regions for 2050. The project has used thorough desk research to identify trends and developments for the future of the two macro-regions and their territories while a broad participatory and co-creation approach with regional players has collected additional inputs and contributed to guiding the foresight process. In the framework of the project, two baseline scenarios, one for each macro-region, and four alternative scenarios, two for each macro-region, have been developed.

4.2 The Danube and Adriatic Ionian macro-regions: from today…

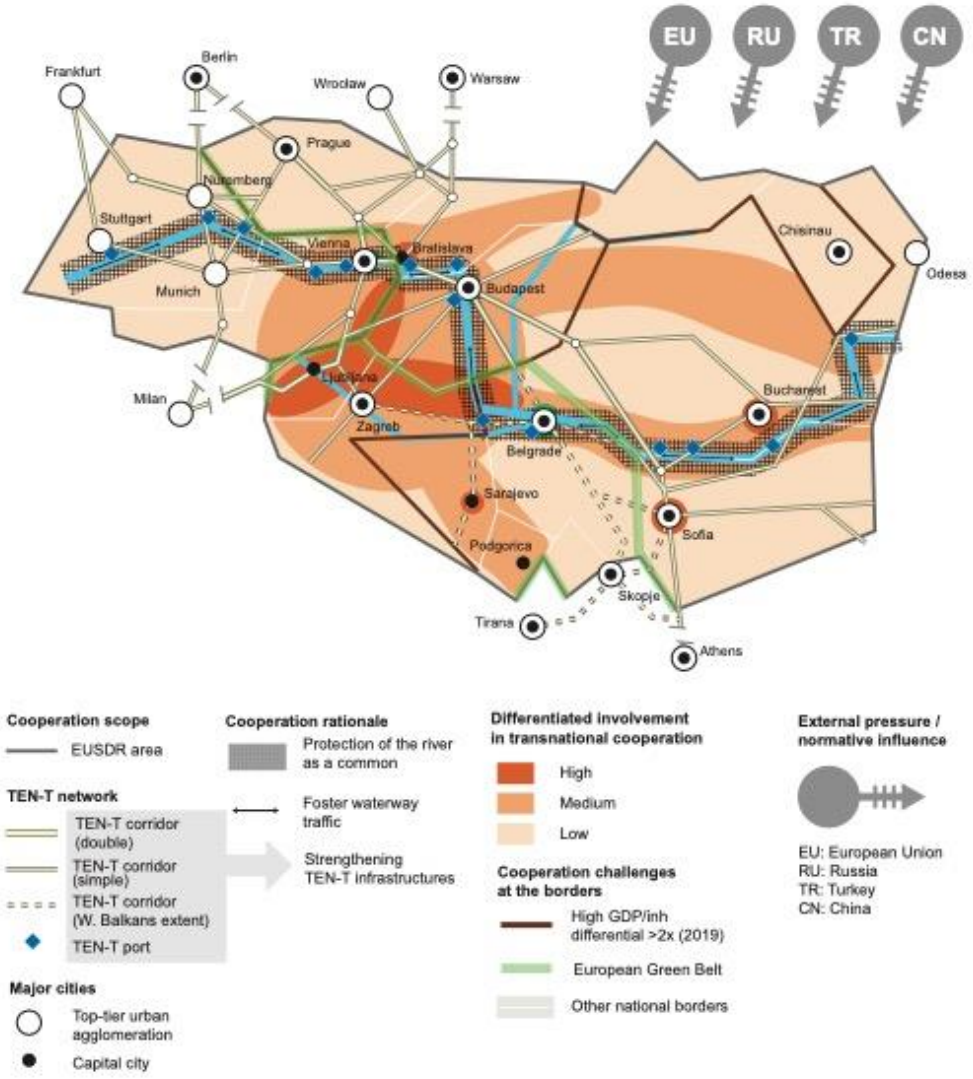
Setting the territorial context of today. Understanding the present, current territorial development with its challenges and opportunities is useful when discussing and developing baseline and alternative territorial scenarios, as it helps to have a reference when it comes discussing the future. The Danube and Adriatic Ionian macro-regions have distinct features and characteristics. They are also home to two macro-regional strategies, the EU Strategy for the Danube Region and the EU Strategy for the Adriatic Ionian Region. Although they share some overlapping territories, each has different key topics of cooperation to focus on. This section sets the scene by taking those key topics as a starting point, as they were identified in the terms of reference as the most relevant for the future. Key topics for EUSDR are digitalisation, migration and demographic change as well as climate change and sustainable development. Key topics for the EUSAIR are the blue economy and innovation, mobility and connectivity as well as Green Deal and sustainable development. The project does not take stock of every possible development, challenge or characteristic, nor does it focus on changes deriving from the COVID-19 pandemic. The section and report aim to give an overview of the present situation.

4.2.1 About the Danube Region – in a nutshell

The Danube region is a large and very diverse territory, home to several capital cities and top-tier urban agglomerations with the Danube River being the common denominator for cooperation (Map 4-1). The region is home to 115 million people from nine EU member states, three EU candidate countries and two neighbouring countries, with the Danube river being the longest and most international river in the EU (European Commission, 2020). The economic picture of the Danube macro-region is heterogeneous. Although GDP has increased overall, there are several regions still catching up, particularly in the eastern part of the Danube Region, while in the western part, growth has been moderate. Overall, there is a gradual GDP per capita decline from the Western to the Eastern regions, with the exception of capital regions (ESPON, 2020b). Despite increasing cooperation over the years, there are persistent regional disparities, relatively slow economic restructuring and a weak Small and Medium-sized Enterprise (SME) and innovation ecosystem. Improvements in digitalisation are necessary to bridge the digital gap and explore further possibilities such as smart cities, i.e. using digital and technological solutions to improve the quality of life in urban areas (CESCI, 2020). The Danube region's rich natural habitat faces environmental risks, especially the quality and quantity of water sources as well as negative climate change impacts. Therefore, more actions for cooperation to support the circular economy, sustainable energy and further actions to address climate change, need to be taken to tackle air and water pollution.

Mass outmigration from the region, migration from rural to urban areas, ageing, weak integration of immigrant and minority groups, weak institutionalisation, high income inequalities and a brain drain increase East and West divides with borders becoming more and more important (CESCI, 2020). Navigation, improved access and multi-modal transport are also deemed important and require intervention, with ports along the Danube playing an important role in freight transport and in fostering waterway transport (Map 4-1). Furthermore, although TEN-T networks and connections exist in the area, there is still progress to be made in finalising the network connections in the Western Balkans part (Map 4-1). Energy scarcity, monocentrism, strong urbanisation and reluctant innovation are only a few examples of trends specific to the Danube region (Institute for Regional Studies, Research Centre for Economic and Regional Studies,Hungarian Academy of Sciences, 2013). To address existing fragmentation, increase integration and achieve balanced territorial development, cooperation and stronger multi-level governance with the involvement of local actors seems to be necessary. Already today, the Danube Region shows significant cooperation, which appears to be higher in the mid-west part of the region, in Slovenia, Croatia, Austria and Hungary. At the same time, global power developments such as from the EU, Russia, Turkey and China seem to influence the region's development (Map 4-1).

Map 4-1 EUSDR mapshot



Source: ESPON TEVI 2050, 2022

Digitalisation in the Region remains challenging despite current actions. Overall, the Danube region has a low share of total employment in information and communication, mainly due to slow progress in non-EU member states. The region has both innovation leaders and followers, with the former mainly in Austria and Germany and the latter in Bosnia Herzegovina, Ukraine, Montenegro, Romania and Serbia. In addition, there is weak access to digital and remote learning which increases social inequality. Minorities, people with disabilities and the elderly tend to be excluded from many forms of education and employment because of digital illiteracy, weak skills, low income and digital poverty, or a lack of infrastructure and services (CESCI, 2020). Digitalisation is also particularly relevant for SMEs in the region. Although the SMEs density is low, they will need to take digitalisation into account. Overall, enterprises lack innovation in the region and are slow in adopting industry 4.0. A lack of skilled human capital contributes to this challenge. In addition, the digital divide for broadband access between East and West persists in the region, while regions that previously had low broadband access mare making big leaps towards increasing access (CESCI, 2020).

Migration and demographic change – urban-rural and East-West divides. Migration is a key topic for the Danube macro-region, with migration from lagging rural areas to more developed urban areas, both within countries, as well as from the East to the West of the region. At the same time, there is high outmigration, especially of young and highly educated people. As the region has a strong urban-rural division, the high degree of urbanisation has large implications on migration. There is positive migration in the western part of the region, while the east suffers emigration. Ageing is a further challenge affecting large areas in the

Danube region due to low fertility, increasing life expectation and high emigration. This directly affects the labour market, with some regions challenged by a brain drain and others by high unemployment (European Commission, 2020). Last but not least, the war outbreak in Ukraine has already brought a large influx of people to the EU, which may influence the demographic balance not only in the Danube macro-region, but also in the EU in general.

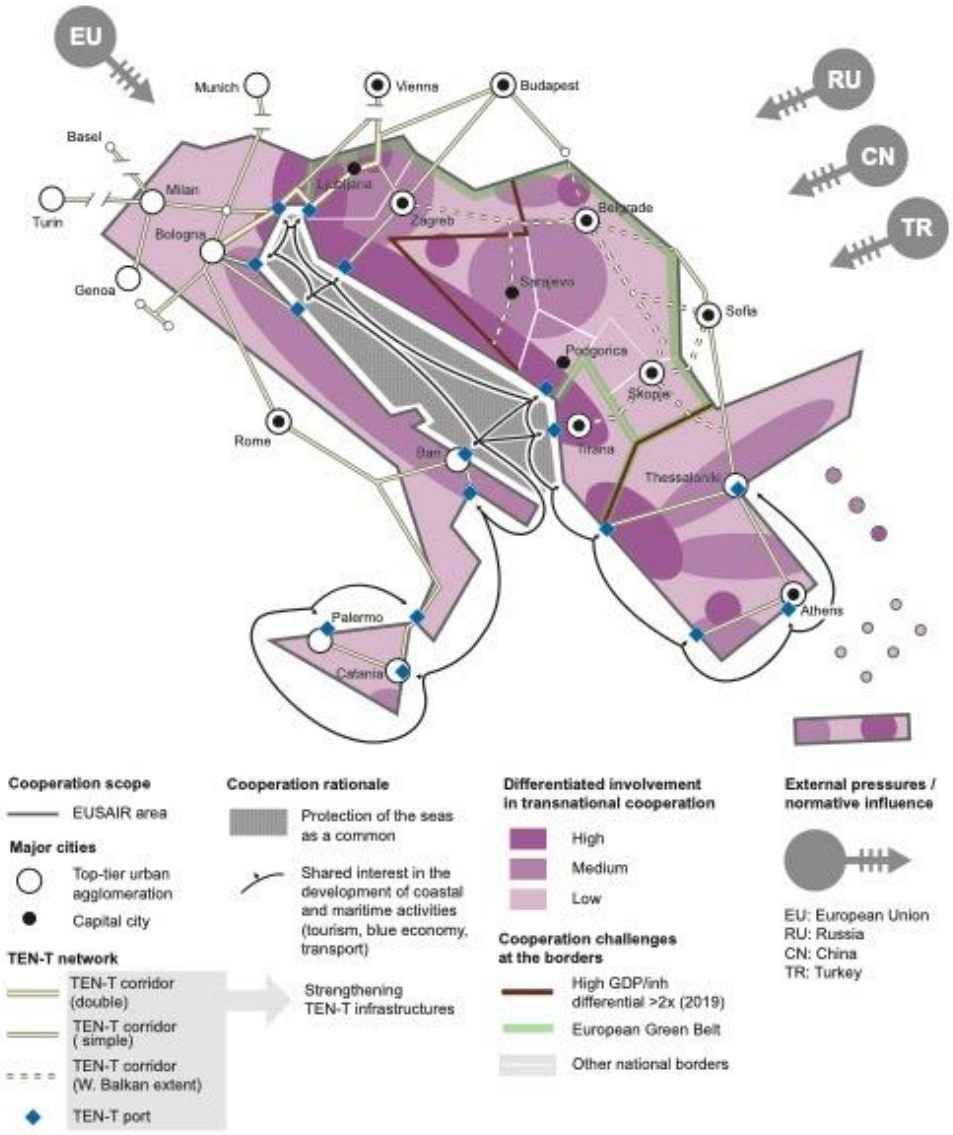
Climate change and sustainable development. The Danube Region has a rich natural habitat and biodiversity with European Green Belts. Climate change remains a key challenge in the region, affecting flora and fauna (Map 4-2). In addition to river basin areas, the region is also home to large forests. Land use in the region is about 30% forest and 33% arable land and agricultural areas make up more than half of the territory (CESCI, 2020). The region has limited climate change adaptation, making environmental protection even more challenging. The natural environment is at risk from temperature and greenhouse gas increases, water pollution affecting both river and groundwater bodies, influenced by pollutants such as nutrients, organic material and hazardous substances (ICPDR, 2002), infrastructure, such as transport projects, as well as the canalisation of the river. Furthermore, the Danube region is heavily exposed to extensive flood risks, especially in regions in the north-east of the macro-region. In addition, there is a low share of renewables in the area, resulting in strong energy dependency and heavy reliance on fossil fuels (CESCI, 2020) negatively impacting sustainable development. Therefore, sustainable development is key to protect and improve the river. In addition, protected areas along the Danube region are a valuable source of biodiversity, with many categorised as Natura 2000 areas.

4.2.2 About the Adriatic Ionian Region – in a nutshell

The Adriatic and Ionian region is a large transnational area with more than 70 million inhabitants, several capital cities and top-tier urban agglomerations with unique natural and cultural characteristics (Interreg ADRION, 2015). The common denominator for cooperation in the region is the Adriatic Ionian Sea and its protection as a common benefit, bringing its own challenges and potential (Map 4-2). The economic situation differs significantly across the macro-region. As shown in the map below, GDP is strong in Northern Italy and Slovenia (Map 4-2). The picture is similar for capital cities compared to their surroundings. GDP appears lower in the Western Balkan regions, but this is improving (ESPON, 2020b). The Adriatic and Ionian region has spatial and socio-economic disparities, territorial fragmentation and a lack of connectivity. Emigration, global power involvement, especially China's Belt and Road Initiative investments, governance and societal challenges, a lack of transport connections in the Western Balkans and, climate change are a few examples of existing challenges in the region. There is a digital divide, especially between urban and rural regions further challenging the development of sustainable blue economy opportunities, with the latter being key to the development of coastal and maritime activities (Map 4-2). More R&D spending will support the uptake of such technologies.

Although the Region is rich in biodiversity and natural habitats with European Green Belts, a more sustainable approach to development seems necessary as extreme weather events and high CO_2 emissions challenge the region. The transition towards cleaner energy and the uptake of renewable energy, circular economy opportunities and environmentally friendly aquaculture are important steps to counterbalance this. The sustainability shift should be relevant for transport, too, as the analysis shows the prevalence of air transport. However, expected environmental actions on carbon neutrality are unlikely to counter having the carbon footprint of air transport. At the same time, road and rail networks face challenges particularly in the Western Balkans, with rail freight and passenger traffic decreasing (Map 4-2). All in all, to address the existing disparities, stronger cohesion and integration is necessary with cooperation across places, policy sectors and society. Already today, though, cooperation in the Adriatic Ionian macro-region is high mainly between EU member states, with the most along the coastal part and the north part of the region. There are challenges across borders, particularly regarding integration and cohesion in the region (Map 4-2), with EU enlargement and Western Balkan integration remaining important. Global power developments including from the Russia, Turkey and China seem to play a role in the region's development, while EU developments also influence the region (Map 4-2). In addition, the outbreak of the war in Ukraine in February 2022 reflects possible geopolitical risks in the region, subject to different power games along the different countries of the Adriatic-Ionian macro-region.

Map 4-2 EUSAIR mapshot



Source: ESPON TEVI 2050, 2022

Blue economy offering possibilities for innovation. The region is not leading in innovation, digitalisation or internationalisation. Instead, SMEs are the backbone of the economy in the macro-region, with wholesale, retail and manufacturing being the key business sectors. No country in the macro-region is close to 3% of GDP spending on R&D as set by the EU. Digital connectivity is another important element, affecting people and businesses. About 78% of households have access to broadband, with the Western Balkans taking big leaps towards digitalisation. The urban-rural divide for internet access is visible throughout the region. Digital transformation remains a challenge for SMEs and businesses, resulting in further internationalisation challenges. (SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa, 2020). The blue economy and particularly aquaculture offer opportunities for the Adriatic Ionian macro-region. A challenge is that outdated technologies hamper marine technologies from thriving. In this case, clusters are particularly important for further development. Fishing is small scale in the region, lacking global competitiveness. Sustainable fishing is vital, not only to preserve the fishing population and sustain biodiversity, but also to provide income to local communities. Lastly, maritime and marine governance highlights the importance of cooperation and coordinated activities. (SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa, 2020)

Mobility and connectivity – Land and sea coming together. Connectivity and transport are another important cooperation element especially for land and sea interactions. Maritime transport and port

infrastructure are pivotal, for both local traffic and tourism, as the latter heavily depends on ports, cruise ships, yachting, as well as seaplane transport. At the same time, ports are often also the entry point for organised crime activities, such as drug trafficking and other illegal goods elevating the importance of security. Road and rail networks face challenges particularly in the Western Balkans. While rail freight and passenger traffic volumes decrease, air transport seems to gain importance, given the lack of road and rail infrastructure in the area. (SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa, 2020). Connectivity also regards energy networks, with energy markets being fragmented. Nevertheless, there are efforts to diversify the energy sources in the macro-region, such as the Eastern Med energy cooperation schemes, which at the same time, though, may pose their own challenges. Implementation of the Green Deal, decarbonisation and carbon neutrality, put the regions highly reliable on fossil fuels at risk. These are the majority of regions in the area.

Green deal and sustainable development. The Adriatic Ionian macro-region has very rich biodiversity, with many areas protected under the Natura 2000 framework. Nevertheless, this rich biodiversity is challenged by climate change and is vulnerable to natural hazards such as earthquakes, floods, wildfires, storms and droughts. The region is also covered by a large area of forests, but these are challenged by excessive forestry and wildfires. Air pollution is another big challenge in the region as a result of CO_2 emissions. In addition, the majority of countries in the macro-region have coal plants, with coal and wood also being the main heating sources. Coastal and soil erosion add to the environmental challenges in the region, leading often to floods. Marine resources are also challenged, mainly through the overexploitation of fisheries, water contamination and marine litter, as well as tourism (SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa, 2020). Exploiting opportunities for more environmentally friendly, carbon neutral solutions are necessary.

4.2.3 Some key messages for both macro-regions

A few elements are key for future development. Looking at the two macro-regions, the project has shown a number of elements that are key for future development in the two regions. Digitalisation is of utmost importance for the Danube macro-region, with digital access and business digitalisation seen as a future opportunity for territorial development in the macro-region. Sustainable development with links to blue growth and sustainable tourism are highly important for the Adriatic Ionian macro-region. The sea is the common denominator for cooperation and exploring the opportunities of the rich natural habitat is necessary for the region's future. Sustainable development remains a key priority for both macro-regions to address climate change and biodiversity challenges. In addition, the valorisation of cultural heritage and cultural diversity in both macro-regions is important and is incorporated in the priorities and objectives of the two macro-regional strategies. There are still physical and mental borders in both areas, hampering further integration. Together with external influences and cross-border obstacles, more cooperation needs to be considered. Nevertheless, EU integration and enlargement are important topics for both macro-regions. Macro-regional strategies play a major role in contributing to further EU integration and facilitating cooperation between EU member states and third countries, specifically to help prepare accessing countries for EU Membership.

Comparative advantage: cooperation opportunities. Macro-regional strategies are cooperation and coordination frameworks to implement shared priorities and be driving forces for change in territorial development (Toptsidou, Böhme, Gløersen, Haarich, & Hans, 2017). Macro-regional strategies require cooperation across national and regional borders, operating along soft borders at transnational level. Both the EUSDR and the EUSAIR are flexible cooperation frameworks with their own priorities to address challenges and untap potential in the respective macro-region. Cooperation is key. Through four pillars (connect the region, protect the environment, build prosperity and strengthen the region) and 12 priority areas, the EUSDR works on five strategic objectives. These are counteracting climate change, stimulating sustainable development, establishing and enforcing knowledge society, stimulating the economy and fighting poverty, improving mobility and connectivity, enhancing democracy, sound administration and strong involvement of civil society and youth[1]. The strategic objectives, pillars and priority areas of the EUSDR encompass actions and objectives on a variety of topics, ranging from rail-road and air mobility, to sustainable energy resources, the valorisation of cultural and natural heritage, water quality, ecosystem preservation, education and others.

[1] https://danube-region.eu/

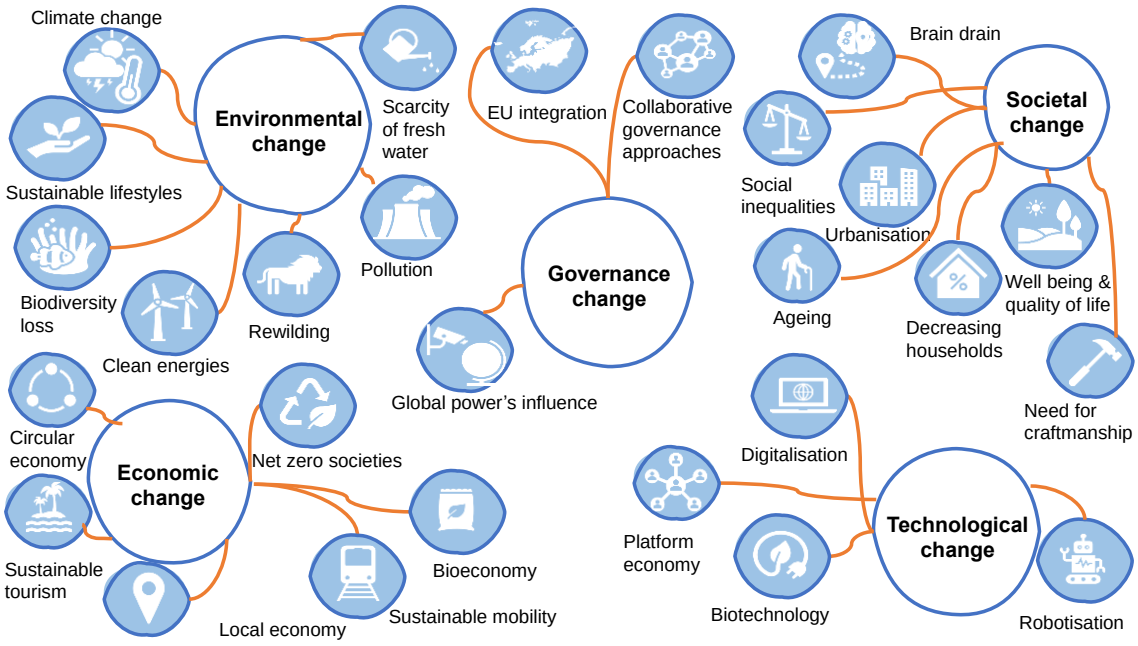
The EUSAIR, through its four pillars (sustainable tourism, environmental quality, connecting the region and blue growth) and its 10 topics aims to promote economic and social prosperity and growth in the region, increase its attractiveness, competitiveness and connectivity [2]. Through these pillars and topics, further themes are encompassed, such as the rehabilitation of cultural heritage and cultural tourism under sustainable tourism, as well as maritime and intermodal transport under connecting the regions.

4.3 The Danube and Adriatic Ionian macro-regions: …to tomorrow

The future seems even more challenging. Both macro-regions face several challenges today, but trends and developments indicate that the future holds more challenges requiring vital decisions and actions. Trends are patterns of change that may impact territories and require a response. Trends can be environmental, economic, societal, technological or governance based and can shape territories to different extents. Trends have positive and negative implications for territorial development and cooperation by 2050. In addition, the development of trends as well as links between them will bring new opportunities and challenges to consider for the future development of the macro-regions.

What trends are there for the Danube and Adriatic Ionian macro-regions? The desk research and co-creation process of the project have identified and selected a number of trends that are relevant for the Danube and Adriatic Ionian macro-regions up to 2050 and beyond. Also driving and hampering factors describe details of a trend or can change a trend's development over time. Trends can be mature or emerging, i.e., mature trends are impacting our societies and territories increasingly, while emerging trends potentially impact our societies and territories more in the future. Trends close to peaking, impact our societies and territories to a large extent and are often part of daily lives. Figure 4-2 provides an overview of the trends which are the basis for the territorial scenarios. Trends have been summarised into environmental threats, economic models, ongoing population trends, technological breakthroughs and diffusion of power. More information on trend descriptions, their development, factors and territorial scope can be found in Scientific Annex 2 of the final report.

Figure 4-1 Trends collection



Source: authors' own

[2] https://www.adriatic-ionian.eu/about-eusair/

Environmental threats. By 2050, climate change, land and marine biodiversity loss, clean energy and pollution impact territories across Europe. Key driving factors outweigh hampering or mitigating factors for these trends. For example, technological advancement in carbon capture techniques or carbon storage are currently too limited to counteract continuous greenhouse gas emissions (Fehér & Mérő, 2019). In addition, some trends reinforce each other. For example, climate change is a key driver for land and marine biodiversity loss and accelerates sea level rise, threatening coastal areas and economic activities there. Hence, these trends make their effects increasingly visible for territorial development as shown in the literature and highlighted by Steering Committee members.

In addition, sustainable lifestyles, scarcity of fresh water and rewilding are increasingly important by 2050. Although their effects on territorial development will remain small, they are important to the previously mentioned trends. Increasing adoption of sustainable lifestyles is important for climate change adaption and mitigation and the uptake of clean energy, as changed public opinion accelerates implementation. Water scarcity has a similar effect, as its impact on many territories accelerates actions to alter climate change and biodiversity loss. Rewilding, driven by population decline may alter biodiversity loss and mitigate the effects of climate change. So, the emerging character of these trends by 2050 make them relevant game changers to be considered.

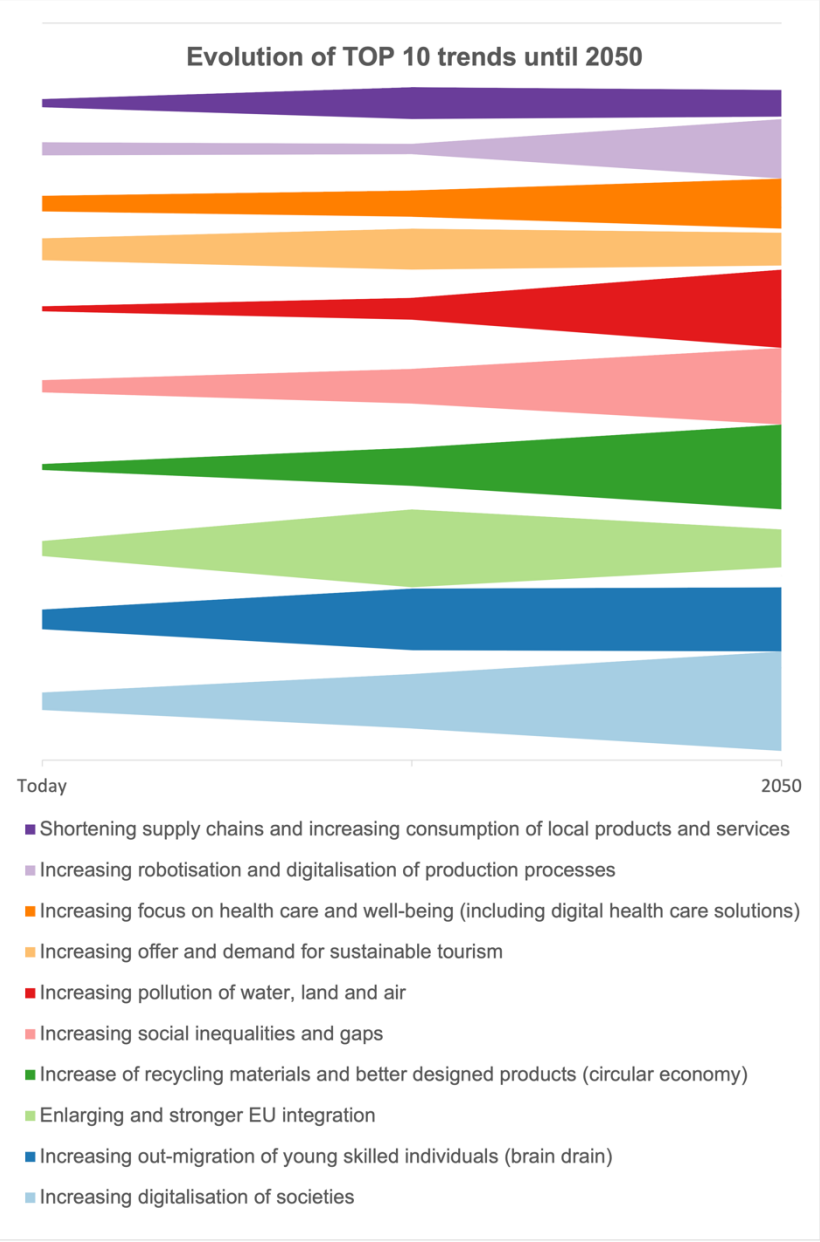
Shifting economic models. These mostly depict a transition to sustainable development where economic functions co-exist with environmental and societal trends. The European Green Deal promotes such an economic shift. It aims to overcome environmental challenges such as climate change and environmental degradation (Section 3.1) by transforming Europe's economy into a resource efficient and competitive economy with net-zero greenhouse emissions in 2050, with resource use and economic growth decoupled and no person or place left behind (COM(2021) 550 final, 2021). Certainly, the energy crisis and uncertainty following the war in Ukraine, may influence the implementation of the Green Deal, either by accelerating its implementation, or by hindering it and resorting back to fossil fuels or other non-environmentally friendly energy sources, something which remains to be seen. Relevant trends regard the shift towards net-zero societies, biodiversity loss, sustainable mobility, circular economy, sustainable tourism and local economies.

Ongoing population trends. Most societal trends observed today will continue to define territorial development by 2050. Ongoing population trends reinforce each other. Ageing, as well as domestic and intra-European migration, a brain drain and smaller families and households pose challenges to welfare systems and to local and regional development (European Commission Directorate General for Research and Innovation, 2012). These demographic dynamics have severe social implications including increased social exclusion and inequalities. They also challenge objectives of the European Pillar of Social Rights, particularly equal access to education, health, and other public services as well as to labour markets and housing. They also have economic implications, including insufficient workers in labour intensive industries, such as tourism. Increased attention to quality of life and well-being is another important trend for 2050, however, its development is uncertain.

The ten trends considered by stakeholders to affect territorial development most in the coming decades provide a glimpse of the territorial diversity. The selection of trends is interesting as sometimes deviates from mainstream discussions at European level. It shows the trends expected to shape our local and regional development are strongly affected by where in Europe we are and what places we have in mind. In other words, places matter to trend discussions.

In the context of the Danube and Adriatic Ionian macro-regions, digitalisation, social disparities and migration trends as well as EU integration are perceived as more decisive for framing the medium-term future than climate change (see the figure below).

Figure 4-2 Evolution of top 10 trends until 2050



Source: authors' own

Technological breakthroughs. Technological breakthroughs are unavoidable by 2050. Key trends such as digitalisation, robotisation, biotechnology and the platform economy point to digital transitions available to all by 2030. This will involve improving skills, investing in secure and sustainable digital infrastructure, digital transformation of businesses, and the digitalisation of public services. The timespan of these trends remains uncertain. Technological trends are gamechangers for socio-economic and environmental development (National Intelligence Council, 2021). Research and development, access to digital solutions and technologies as well as general trust in their use facilitates swift uptake of technological breakthroughs in society. At the same time, a lack of investment, low population density or a lack of trust hamper the use of technological breakthroughs. In addition, the path from fundamental research to start-up and scaling-up takes time and depends on large scale infrastructure developments that also take time.

Diffusion of power. Governance trends, such as increasing EU integration, collaborative governance and increasing influence of global powers illustrate the diffusion of power. Increasing European integration supposes a transfer of some competences to European levels, notably on competition, environmental and monetary policies as well as contributing to European wide objectives. Collaborative governance entails more

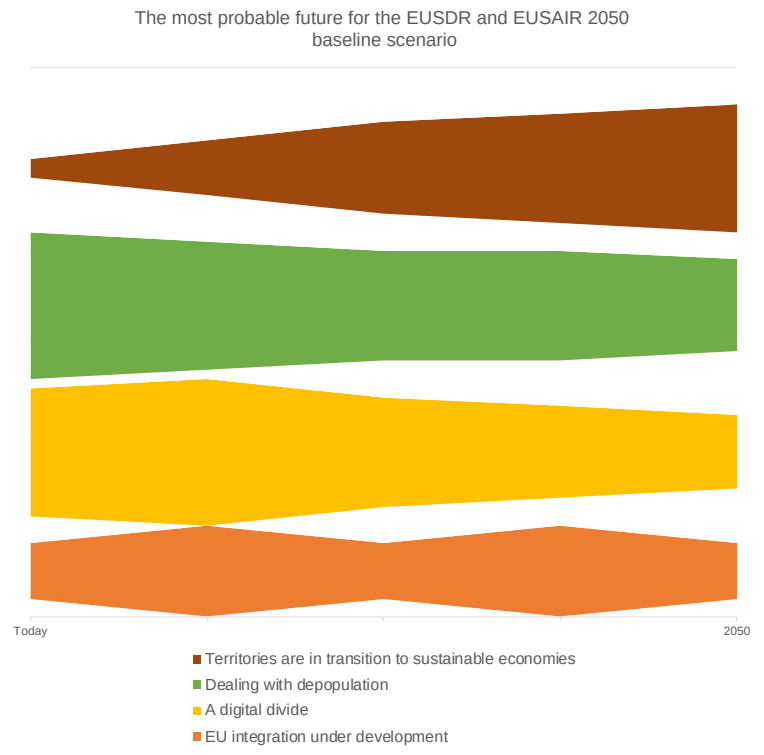
sharing of decision-making powers with non-public players. Global powers influence domestic policy and decision making. New global powers provide new investment opportunities and challenges. The diffusion of power makes the development of governance trends uncertain in the long-term. Particularly since such factors are beyond the influence of stakeholders in the Danube and Adriatic Ionian territories. For instance, the influence of global powers depends on socio-economic developments in these countries, while enlarging the EU and stronger European integration has less uncertainty, as many processes are already in motion today it is just the duration of these processes that is uncertain.

How could the future develop based on our choices? The future is characterised by uncertainty, and nobody knows exactly how these trends will develop by 2050. Territorial scenarios, however, help us explore different alternatives and develop different pathways for the future by looking at different ways that trends may play out. They offer important inputs that can guide the choices and decisions of policy makers. What will happen if we choose not to take action on current challenges and things continue as such? What if we dare go a step further and imagine more extreme futures for the Danube and Adriatic Ionian macro-regions? The ESPON TEVI 2050 project has dealt with these questions and developed a baseline scenario for each region looking at how the future may develop if nothing changes. There are also four alternative territorial scenarios (two with same assumptions once for each region, and two alternative scenarios, with different assumptions for each region), looking at more extreme versions of the trends.

4.4 The ‘business as usual’ future for the Danube and Adriatic Ionian Regions by 2050

The baseline scenario, often also referred to as the ‘reference’ or ‘business as usual’ scenario, shows how the future in the Danube and the Adriatic Ionian regions is most likely to develop if nothing changes by 2050. It depicts a future where no new policies will be implemented apart from those already in the pipeline. The scenario looks at how different trends develop and also what territories are affected by this development. By 2050, the developments will play out differently (see Figure 4-3). The transition to sustainable economies starts slowly in the 2020s, and the green transition is not fully implemented by 2050. Furthermore, depopulation seems to be a continuing challenge highlighting that ageing and outmigration lead to even more uneven development. Digital divides persist, and differ significantly across regions, while a lack of skilled labour slows the adoption of technological advancements. The picture improves slightly after the 2030s, with policies driving digital transformation in the regions, but inequalities remain, though to a lesser extent. Last but not least, the road to EU integration is bumpy and under development. Some countries may get further along the road to EU integration, with some even joining the Eurozone, while others may change path and show resistance or unwillingness towards EU integration. This is a path that changes over the years, with ups and downs, with countries being in favour of EU integration or not, also largely influenced by external factors and pressure from external forces, beyond the EU.

Figure 4-3 EUSDR and EUSAIR baseline scenario assumptions



Source: authors' own

The storyline below presents an integrated scenario for both macro-regions. The more detailed version of the scenario can be found in Parts II for the Danube and III for the EUSAIR of the final report.

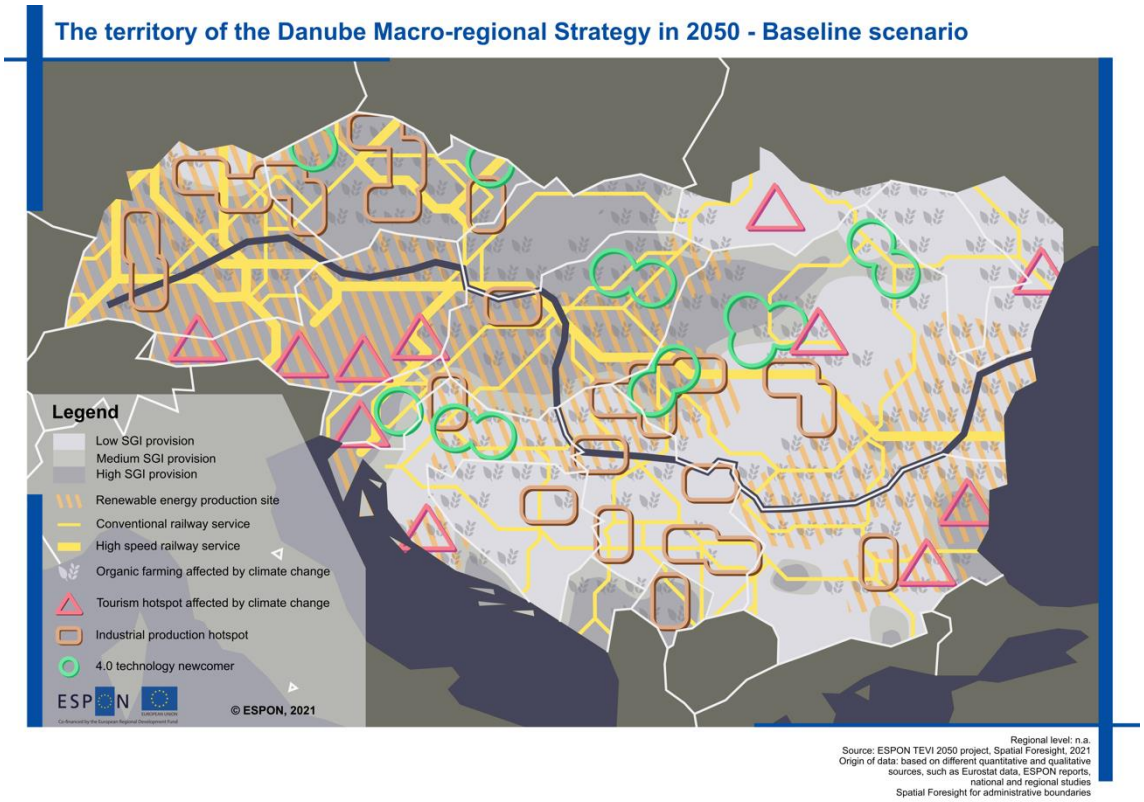
By 2050, the Danube and Adriatic Ionian regions suffer continuous biodiversity loss. Climate change and pollution have intensified due to an incomplete transition to sustainable economies and failure to achieve European Green Deal objectives. Industry, transport, and energy production remain contributors to greenhouse gas emissions and pollution. As such they continue to threaten environmental quality including plant and animal lives. Natural areas and territories most vulnerable to climate change are those most affected. In the Danube macro-region mountain areas and river valleys are particularly vulnerable to climate change. Mountain regions in Austria and Slovakia as well as the Danube valley on the border between Romania and Bulgaria and the Danube delta on the Black Sea are among the regions most negatively impacted by climate change (ESPON, 2014). Also, the northern Ukrainian regions which are part of the Danube Region, as well as Moldova are vulnerable to climate change. In recent years these areas experienced regular floods (CESCI, 2020). In the Adriatic Ionian Region, coastal areas and islands are particularly vulnerable to climate change, including the Venetian lagoon and Istria (BBSR & ESPON, 2020) as well as Albanian coastal regions (Zoï Environment Network, 2012). In addition, mountain regions are particularly vulnerable, for example South Tirol in Italy, as well as coastal regions and islands in Croatia, Bosnia-Herzegovina and Montenegro, Albania and Epirus in Greece (BBSR & ESPON, 2020).

Furthermore, tourism destinations also lose part of their attractiveness with enhanced biodiversity loss. Examples are Bulgarian and Croatian coastal areas, parts of south Austria as well as northern Bohemia in Czechia (Map 4-3) (Eurostat, 2020). Similarly, in the Adriatic Ionian Region, the regions of Veneto Puglia and South Tirol in Italy, Croatian coastal regions, Lake Ohrid in North Macedonia, as well as the Ionian islands, Crete, and South Aegean islands in Greece. Last but not least, agricultural land is also affected by environmental consequences, such as organic farming areas vulnerable to climate change that include mostly Austrian regions as well as northern Bohemia in Czechia, parts of Hungary and the Slovak Košic region (Eurostat, 2020) in the Danube Region (Map 4-3) as well as Central Greece and the Aegean Islands in Greece, along the coasts of the Italian Veneto and Marche regions as well as around Taranto in Puglia (European Commission, DG MARE, 2021).

By 2050, depopulation in the two macro-regions highlights that ageing and outmigration tendencies continue leading to more uneven services of general interest. In the Danube Region there is a clear West-East divide,

with the West having better services of general interest, while in the Adriatic Ionian Region the picture is more diverse, with northern Italy, parts of the Western Balkans and Greece having better provision (Maps 4-3 and 4-4).

Map 4-3 The 'business as usual' future for the EUSDR in 2050– Baseline scenario



Source: ESPON TEVI 2050, 2022

The transition to more sustainable economies also highlights the need for clean energy. Most regions in the Danube and the Adriatic Ionian Regions rely heavily on fossil fuels, which require a substantial transition to sustainability. The Green Deal implementation has not been accelerated in the aftermath of the energy crisis caused by the war in Ukraine, as many regions resorted back to fossil fuels, while gas and nuclear power has been considered as a 'green option' for years. Opportunities rely however on clean energy production and in the northern part of the Pannonian basin between Budapest, Vienna and Bratislava up to Moravia in Czechia there is the most unutilised potential for wind power (ESPON, 2018d). Croatian coastal regions, regions of the Pannonian basin as well as in the lower Danube river valley and along the Danube have most unutilised potential for renewables (ESPON, 2018d) in the Danube Region (Map 4-3). In the Adriatic Ionian Region, Puglia and Sicily in Italy, Croatian coastal regions, Attica, parts of the Peloponnese, Evoia, the northeast of Greece, Crete and south Aegean in Greece have the highest potential for renewables (Map 4-4).

Industrial areas and transport hubs in the Danube Region experience the energy transition most negatively. Areas in Czechia, eastern Romania and Serbia are particularly negatively impacted due to their high share of industry (BBSR & ESPON, 2020) and issues of reliable energy provision as discussed above. Romanian and Bulgarian regions along the Black Sea and the Danube are particularly negatively impacted due to the importance of water borne transport (ESPON, 2018b). In addition, reduced competitiveness of industry is most evident in territories with high industrial employment, with non-competitive industry likelier to lay off people or go out of business. The share of people working in industry is particularly high in Baden-Württemberg, Germany, regions in Czechia including Northern Bohemia, Plzeň and Zlín, as well as regions in eastern Romania and southern and western Serbia (Map 4-3) (BBSR & ESPON, 2020).

As shown in Map 4-3, rail transport in the Danube Region provides a relatively cheap and sustainable option, while interoperable hydrogen systems for trucks, inland shipping or flights are still being set up. Afterall, this scenario assumes that territories are still in transition to sustainable economies. Assuming the realisation of the European transport network, rail infrastructure covers all parts of the Danube macro-region by 2050.

Regions in Germany, Austria, Czechia and Hungary are best connected to high-speed lines. Regions in other parts of the Danube macro-region are predominantly connected by conventional railways (DG MOVE, 2020). As such, industrial regions in Romania (e.g. Banat), Bulgaria (e.g. Stara Zagora), Serbia (Southern and Eastern Serbia and Western Serbia) are less competitive in European and global markets.

Map 4-4 The 'business as usual' future for the EUSAIR in 2050 – Baseline scenario

Source: ESPON TEVI 2050, 2022

By 2050 the digital divide persists and differs greatly across regions, whereas a lack of skilled labour slows the adoption of technological advancements. Early adopters of 4.0 technologies are most visible as islands of innovation. In the Danube Region, German and Austrian regions as well as Budapest are technology leaders, along with Czechia, parts of Serbia, Romania and Bulgaria (Map 4-3). In the Adriatic Ionian Region, such territories are in Tyrol, south Italy, Slovenia, south of Albania, Athens and Crete in Greece (Map 4-4).

By 2050, transportation hubs have changed location in the Adriatic Ionian macro-region. Cargo ports in EU member states that function as transit points for other European destination are most affected by the transition to sustainable economies and stricter rules to encourage sustainable transport. In the Adriatic Ionian macro-region this particularly concerns the ports of Piraeus and Thessaloniki in Greece, Gioia Tauro, Ancona and Venice in Italy and ports in Croatia and Albania (Map 4-4).

In addition, the end of mass tourism significantly affects largely tourism areas already affected by climate change, such as most places around the Adriatic Ionian coast, the Greek islands, parts of Serbia and northern Italy (Map 4-4), bringing in addition economic sustainability concerns to the most sensitive areas.

To conclude, the baseline future for the Danube and Adriatic Ionian regions is diverse by 2050. The regions include places that adapted early to climate change, transformed their economy and society, and reap the benefits of digitalisation. At the same time, diverse hampering factors hinder many territories from using their full potential. An incomplete transition to a sustainable economy, depopulation, a digital divide and incomplete EU integration result in great disparities in the regions by 2050.

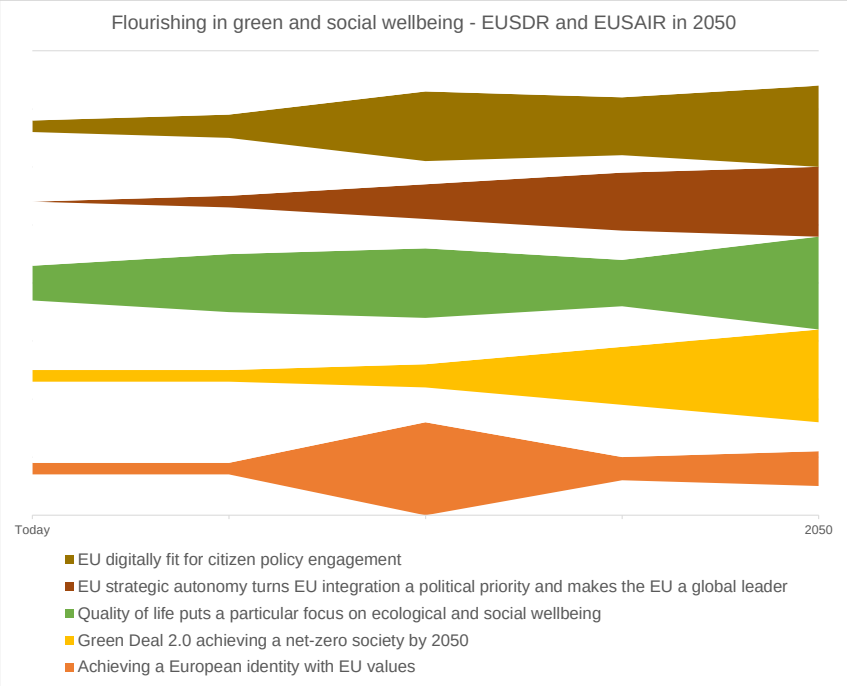
4.5 Flourishing in green and social wellbeing

The alternative scenario 'flourishing green and social wellbeing' is based on joint assumptions for both the Danube and the Adriatic Ionian Regions extending developments such as digitalisation, increasing EU

integration, climate change, quality of life and wellbeing to a more extreme version and explores how they would develop.

By 2050, citizens of the Danube and the Adriatic Ionian regions have taken big leaps to achieve a better quality of life. Particularly after the COVID-19 pandemic, the importance of a good quality of life increased, as people realised that it is not only economic growth, wealth and profit that brings joy, but primarily personal relations, improved social life and free time. In addition, the pandemic highlighted more than ever that good environmental conditions and good governance are inextricably linked to good health and quality of life. The scenario storyline builds on five key components that structure the story (Figure 4-4).

Figure 4-4 Flourishing in green and social wellbeing foundations – EUSDR and EUSAIR in 2050



Source: authors' own

By 2050, quality of life puts a particular focus on ecological and social wellbeing, as being close to nature and living in a healthy environment are parts of a good life. Green infrastructure and protected areas i.e. the access to green places rich in biodiversity and nature increase the opportunities for relaxation, health, sport and leisure. At the same time, good air and water quality, little soil contamination, reduced CO_2 emissions and decarbonisation of the economy, all contribute to reducing climate change risks and make territories more resilient and more sustainable (ESPON, 2020a). Furthermore, the social sphere also plays a key role, as by 2050 prosperity is also a matter of trust in government and services. Discourses around 'places that don't matter' and the 'geography of discontent' highlighted regions with persistent poverty, economic decay, lack of opportunities and declining features (Dijkstra, Poelman, & Rodríguez-Pose, 2018; Rodríguez-Pose, 2020). This brought an avalanche of developments with the most characteristic being a rise in populism, while government response to the pandemic increased the trust of people in governments and institutions. This development started slowly in the 2020s and increased steadily, with the adoption of green and social policy measures.

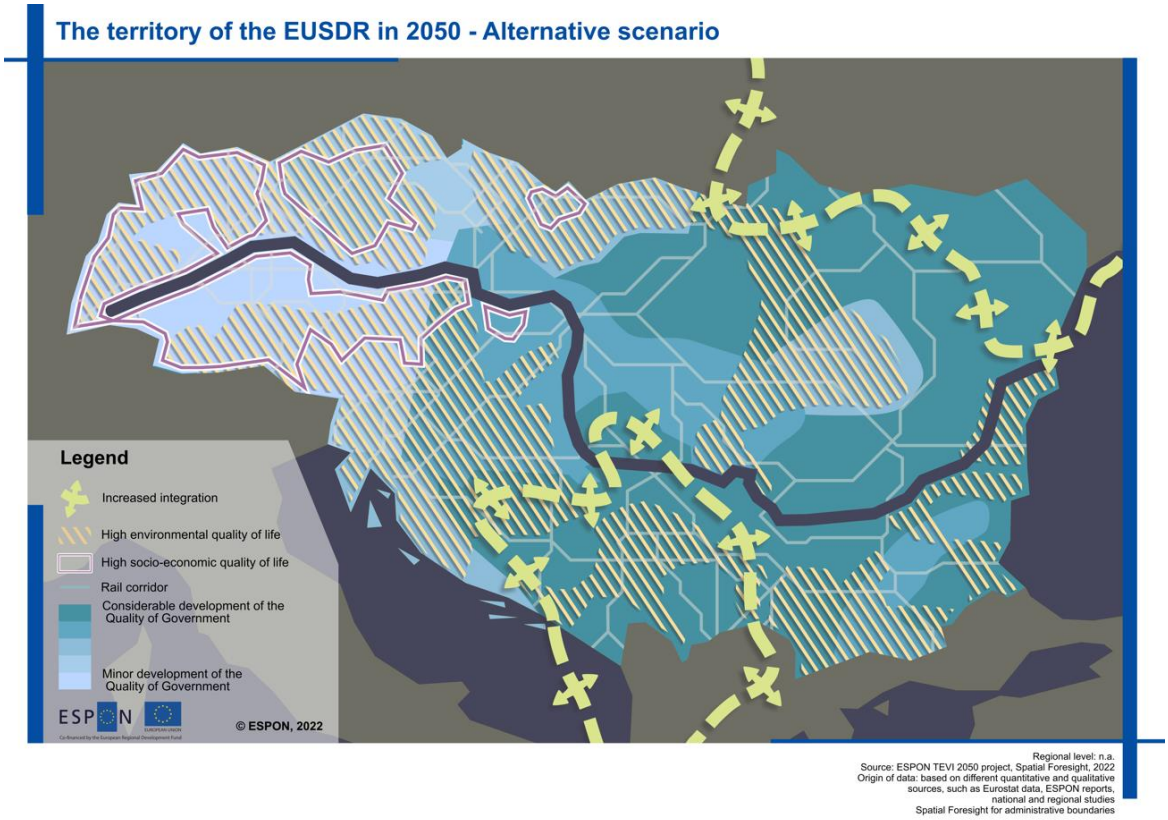
In the Danube Region, places with ecological enablers, such as green infrastructure and protected areas, are where green wellbeing can flourish. This is seen in the regions of Voraldberg and East Austria, regions in Central Slovakia, most parts of Czechia and Slovenia, as well as the regions of Caras-Severin, Hunedoara and Maramures in Romania. (ESPON, 2020a). Furthermore, places with protected areas or large natural parks, such as the Danube Delta biosphere reserve and the Iron Gates natural park in Romania, the Lower Prut nature reserve in Moldova, the Duna-Ipoly national park and the Duna-Drava national parks in Hungary, are some examples. In addition, high socio-economic quality of life can be observed in parts of Germany, Austria, Czechia and Slovenia. (Map 4-5) In the Adriatic Ionian Region, examples are the regions of Central Macedonia, East Macedonia and Thrace and West Greece in Greece, Epirus, most regions of Slovenia, as well as Adriatic Croatia. (ESPON, 2020a). Furthermore, places with protected areas or large natural parks,

such as the Sutjeska national park in Bosnia and Herzegovina, Northern Velebit national park in Croatia, Durmitor national park in Montenegro, Tara National park in Serbia and Triglav national park in Slovenia (Adriatic Your Regional Destination Specialist, n.d.), as well as Lake Prespa national park and Zakynthos marine park in Greece, as just some examples of places where ecological wellbeing thrives by 2050. Socio-economic wellbeing increased mostly in parts of north Italy. (Map 4-6)

As shown in Figure 4-4, the new role of the EU which capitalises on its strategic economy makes it a global player, and EU integration is a political priority. By 2050 the EU has become more strategically autonomous, which has influenced the integration of its territories and macro-regions, with more self-rule and more resilience. The COVID-19 pandemic and the war in Ukraine in the 2020s, exposed vulnerabilities, dependencies and gradual disempowerment across Europe and its neighbourhood. Contrary to that, the EU aims for a more resilient future, where mutual interdependencies are well managed and power is spread across the EU (Joint Research Centre, 2021a). As a result, by 2050, the EU has become more proactive, being true to its interests and values, taking a leading role in geopolitics, the environment and society. This strategic autonomy has signified a next step of the EU project evolving from an economic and social union to a 'governance of governance' over decades. This has not only had implications for EU member states, but particularly for EU enlargement, which has become a key influence and priority tool in the wider territory and enlargement countries have largely become EU member states. Through its strategic autonomy, the EU has become a strong regulatory player functioning as a large umbrella organisation, safeguarding sustainability and the social charter through legislation. At the same time, this overarching autonomy of the EU strengthened the subsidiarity principle of member states and allowed the EU to play a more global role. This development started very slowly in the 2020s and steadily increasing over the years to 2050, as such developments need substantial time to take shape.

Regions where the quality of governance was low have shown substantial leaps in increasing trust in governance and governance quality by 2050. These include most regions of Romania, particularly the metropolitan region of Bucharest, coastal Bulgaria such as the regions of Severoiztochen and Yogoistochen, Eszak-Alfold and Eszak-Magyarorszag in Hungary, as well as most regions in Serbia. In the Adriatic Ionian Region examples are the region of Calabria in Italy, the Ionian islands and Western Greece in Greece, as well as regions in Albania, Serbia, Bosnia-Herzegovina and North Macedonia. (Sandberg, Klockars, & Wilén, 2019) (Map 4-5 and Map 4-6)

Map 4-5 Flourishing in green and social wellbeing – Danube Region 2050

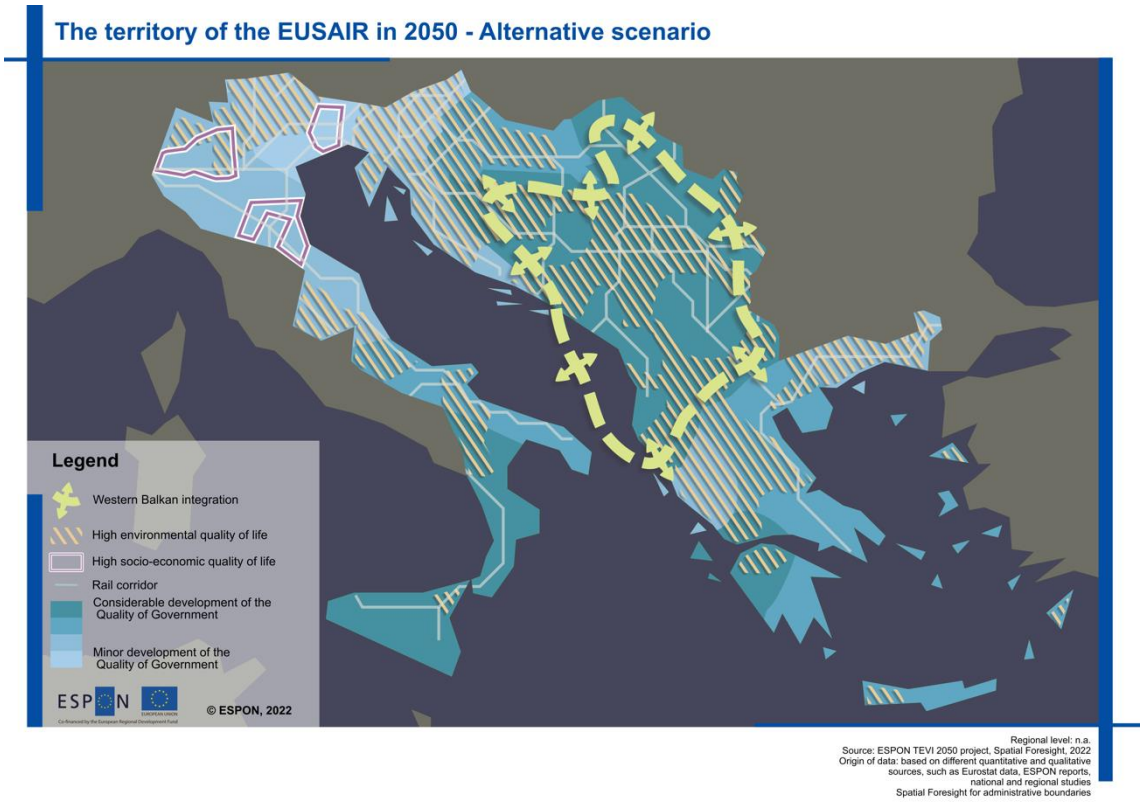


Source: ESPON TEVI 2050, 2022

This increased trust also contributed to the digital revolution up to 2050, with the EU and its citizens becoming digitally fit. Digital infrastructure and literacy increased in the region, as well as the educational background in general, and have been enablers for open and democratic societies that bring people together. Digital platforms allow citizens to participate in online assemblies, discussing regulations, important matters, plans for their territories and debates. In addition, digital government services also increased by 2050, facilitating online public services and interactions with public authorities. With future generations becoming digital nomads, public policies need to keep up and ensure their engagement. Such digital participation has brought governance close to citizens, with the co-creation of public services and redesigning them for citizens' needs. This development took small steps in the 2020s until almost the 2030s, but technological advancements, it substantially increased by 2050 (Figure 4-4).

In that respect digital connectivity plays a key role in bringing people together, so regions in the Danube and the Adriatic Ionian Regions that already had high household digital connectivity in the 2020s seem to have been frontrunners. This transition was first in urban areas, followed by rural areas, which transitioned slowly over the years.

Map 4-6 Flourishing in green and social wellbeing – Adriatic Ionian Region in 2050



Source: ESPON TEVI 2050, 2022

Considering that ecological wellbeing is a priority for citizens in the Danube and the Adriatic Ionian Regions, putting additional efforts to implement the EU Green Deal has been a priority up to 2050. A Green Deal 2.0 took the policy a step further to achieve a better ecological status, not only for EU member states, but also for non-EU member states. Increasing efforts to implement the Green Deal has transformed the Danube and Adriatic Ionian Regions. Taking the Green Deal to a next level, where a net-zero society has to a large degree been achieved across Europe, with CO_2 emissions reduced and most Green Deal goals achieved has improved the quality of life for citizens over the years. This includes actions for fresh air, clean water, healthy soil, biodiversity, as well as healthy and affordable food. With better public transport, renovated and energy efficient buildings, cleaner energy, long lasting products and circular economy approaches (European Commission, 2019b) the Green Deal has been an overarching umbrella for the Danube and Adriatic Ionian Regions to achieve a better ecological status and gradually become a net-zero society.

By 2050, an improvement in CO_2 emissions per capita has been a result of the climate neutrality policy. This is particularly to be seen in the eastern regions of Romania, in the city of Vienna and East Austria region, in

the eastern part of Bulgaria, in north west Czechia, as well as in Western Greece and the Peloponnese in Greece, Puglia, Molise and Sicily in Italy, as well as most parts of Croatia and Slovenia (European Committee of the Regions, 2019). In addition, regions formerly highly dependent on coal noticed this shift.

All these developments have gradually allowed the development of a stronger EU identity until 2050, fostering EU values, cooperation and solidarity among the two macro-regions. This has not happened overnight, with ups and downs over the decades until 2050 due to external factors. However, essential steps have been taken in that direction. Over the years, the integration of countries from the Western Balkans has taken shape, as well as stronger cooperation with Ukraine and neighbours. Stronger together has been a motto for territories in the Danube Region and integration has been a beacon for future policy developments. The more strategic role of the EU has allowed it to become more extrovert and play a more global role, strengthening at the same time subsidiarity within member states. In its new global profile, the EU has focused on ensuring and promoting core European values. These shape both the old as well as new EU members. Citizen exchanges on different platforms, as well as interactions and engagement have increased trust in the EU, and helped in further developing, cultivating and sharing the EU values, realising an overall EU culture and citizenship across the continent. The EUSDR has been a microcosm of such a common culture. Core values such as human dignity, democracy, freedom, equality, rule of law and respect for human rights have been foundations for the European way of life and incorporated by Danube Region citizens.

The transition to a better quality of life by investing more in environmental and social enablers has affected people's lives to a great extent. It has influenced the way people work and the economy, adjusted technological infrastructure, affected transport and improved health. At the same time, with the EU's strong regulatory presence and new global role allowed for more solidarity and more integration across territories and people which played a role in their overall prosperity and wellbeing.

In this strongly policy driven scenario, changes happen gradually, however, decisions have been radical and bold. People in the two regions decided to put their wellbeing first, rather than economic progress. Discussions on 'the end of GDP' have been raised, as have environmental and social dimensions. In particular, redefining prosperity by embracing social fairness, i.e. paying particular attention to leaving 'no one behind' to building resilient societies, as well as decoupling prosperity from natural resource use, as well as supporting a fair green transition and exploitation of natural resources have brought a new breeze to the discussions. In combination with the digital transformation, this has brought a shift in the way of thinking about work and the way of work. People value their free and family time more, leaving workaholic cultures, reducing work schedules and increasing flexibility, working more from home or completely changing career. Digitalisation also increased robotisation and automation, changing the profiles of different jobs and raising the need for social support.

The green and digital driven future also impacts on industries, which have greened products through circular economy practices, and also increased their e-commerce services. Energy provision has also been influenced, both due to energy crises, as well as to the green transition, with alternatives, e.g. hydropower in the Danube Region and some parts of Adriatic Ionia, such as Albania, as well as coal regions in both macro-regions. More use of alternatives, such as different gas suppliers, or nuclear power have been discussed.

Transport has also changed with rail connectivity being the main transport means in the two regions (Map 4-5 and Map 4-6), developing an interconnected and multimodal transport system by 2050. Last but not least, tourism has become more sustainable, particularly the way people travel to their destination, as well as the shift of holiday products towards more sustainable solutions. Agricultural production, with the support of technology and strong policy implementation has also become more sustainable, reducing pollution and contributing to people's wellbeing.

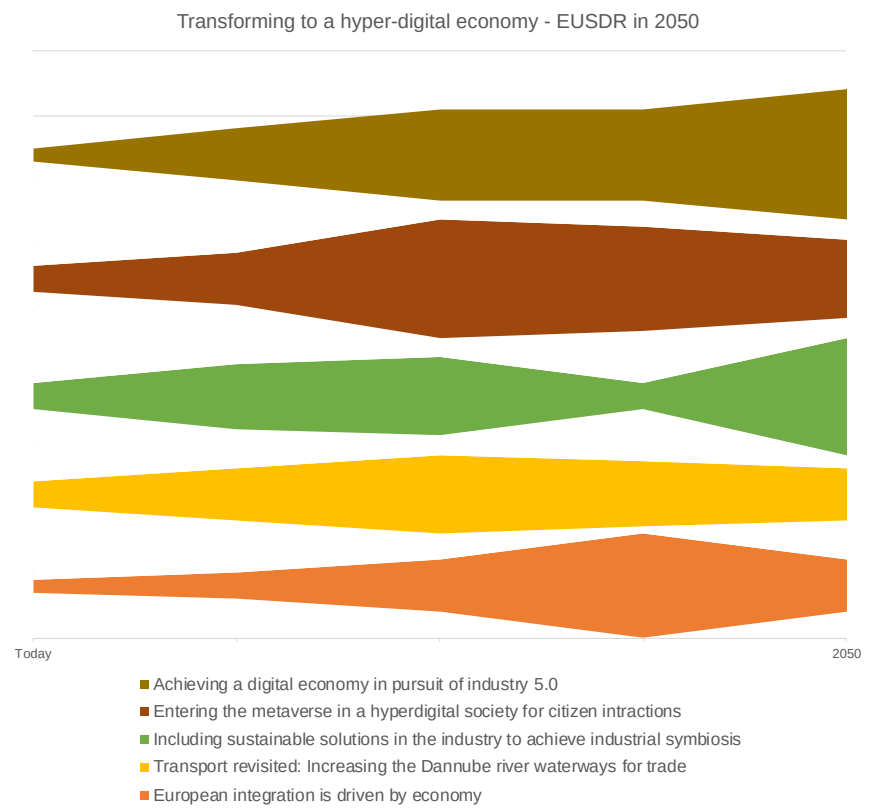
Flourishing in green and social wellbeing shows that despite the challenges faced in the 2020s, people in the Danube and the Adriatic Ionian Regions have taken core decisions to adjust their lives, take action and implement policies that add to their wellbeing, by following the Aristotelian 'eudaimonia', i.e., 'good spirit' where people find life purposes in good environmental conditions and togetherness.

4.6 Transforming to a hyper-digital economy

The alternative scenario 'transforming to a hyper-digital economy' has been developed based on unique assumptions for the Danube Region, taking a number of developments primarily digitalisation, change in economic growth, ageing and social inequality, exploring how things may develop if they take different directions and could progress by 2050.

By 2050, the Danube Region has taken big steps to profit from the new global digital era and became the first macro-regional strategy with a clear digital focus. Long-lasting digital divides in the Region (CESCI, 2020) have been bridged through the commitment of macro-regional players. By 2050, the digital transformation of the Danube Region has become a key priority with direct effects on businesses, employment, infrastructure and public policies, as well as people, as it has changed their lifestyles, leisure and work. The COVID-19 pandemic of the early 2020s triggered an increase in digitalisation, technological advancements and technology and digital solutions which sped up innovation. In addition, there was a strong focus on economic development and growth. Besides the digital acceleration, the COVID-19 pandemic has brought back attention to the importance of economic growth and development for people's prosperity. Although the numbers gradually increased over the following years, to slowly regain pre-pandemic levels, further crises, such as the Ukraine war, high inflation and global competition highlighted the need for greater preparedness and greater focus on economic growth as a means for prosperity. Although the key focus has been on digitalisation and economic development, the importance of the civil society and people should not be neglected. The steep digital and economic progress up to 2050 led to concerns over safety and increasing uncertainties, as well as rising inequalities among societal groups in the Danube Region, which called for increased social preparedness and 'people power', to ensure safety, stimulate bottom-up political decision-making, ensure that social needs are embedded in innovative solutions and democratic values are integrated, putting the individual at the centre of attention and increasing stability (European Strategy and Policy Analysis System, 2015). The scenario storyline builds on five key components that structure the story (Figure 4-5).

Figure 4-5 Transforming to a hyper-digital economy foundations – EUSDR in 2050



Source: authors' own

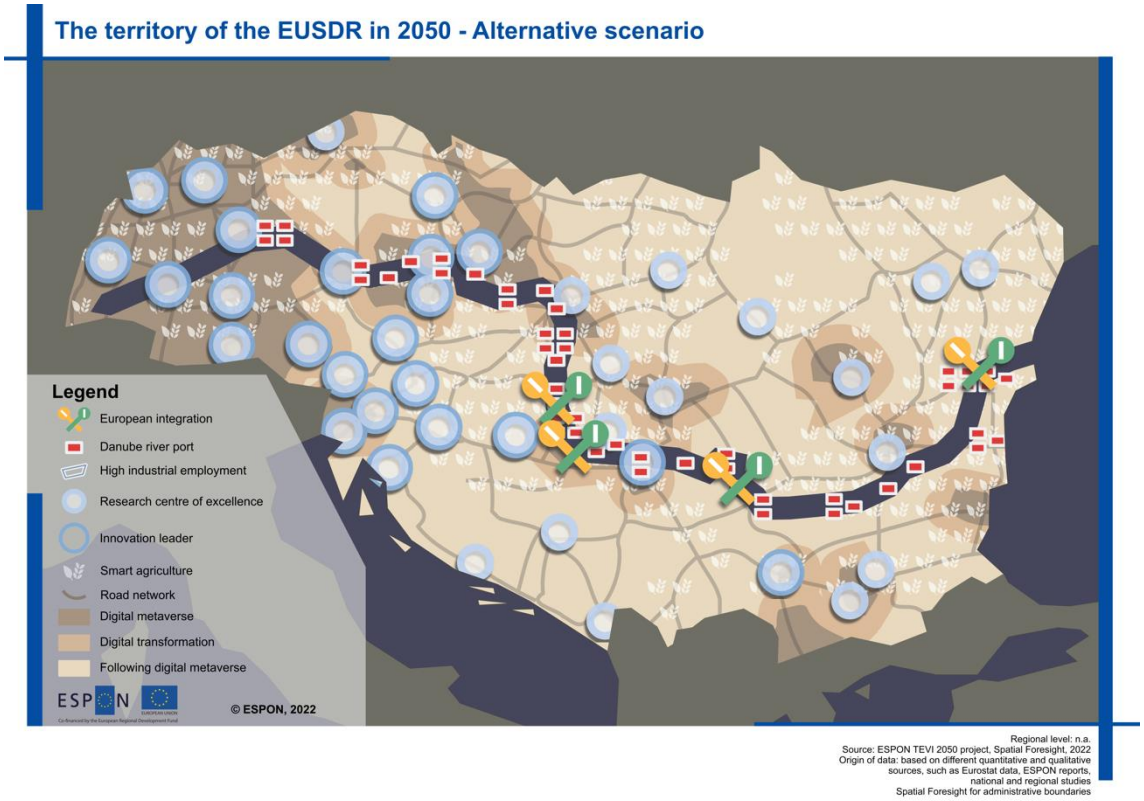
By 2050, achieving a digital economy in pursuit of industry 5.0, is a key priority for the Danube Region, which takes time. However, in the 2030s it takes a big leap, with regulatory support from the EU and a gradual increase in industry 5.0. The Danube Region transitioned from the 4th industrial revolution to industry 5.0. Industry 4.0 already in the 2010s revolutionised innovation, technology and industries, bringing an enormous shift in consumption, work and communication patterns. Technological breakthroughs such as the Internet of Things, big data and data mining, brain machine interfaces, super calculators, smart devices and cloud computing have transformed IT platforms, smart mobility, sensors, additive transformation and 3D printers, synthetic biology, nano-, bio- and information technology in healthcare, and of course virtual reality becoming

mainstream are all examples of the technological revolution that by 2050 has become a ‘status quo’ in the Danube Region (European Strategy and Policy Analysis System, 2015).

Places in the Danube Region that already had strong innovation profiles in the 2020s transitioned faster to industry 4.0, especially regions in Germany, like Oberbayern, Tubingen, Freiburg, Schwaben, Mittelfranken, Karlsruhe and Stuttgart as well as all regions in Austria and Prague who were already strong innovators or innovation leaders. Further, moderate innovators in the 2020s took important steps to adjust, such as regions in Czechia, Slovenia, North Croatia and Pannonian Croatia, as well as Belgrade and the region of Yugozapaden in Bulgaria (European Commission, 2021) (Map 4-7).

On the other hand, regions that had a strong research profile had skilled employees and further research developments in leading innovation industries. Such regions are largely capital cities across the Danube Region, but also smaller places, such as Iasi, Timis, Cluj-Napoca in Romania, Maribor in Slovenia, Zadar in Croatia, Novi Sad in Serbia, Szeged and Debrecen in Hungary and Brno in Czechia, to name a few (CORDIS, n.d.). (Map 4-7)

Map 4-7 Transforming to a hyper-digital economy – Danube Region 2050



Source: ESPON TEVI 2050, 2022

Moving to industry 5.0, hyper-digitalisation has allowed entrepreneurs to further innovate and grow their businesses, indirectly also supporting the green and just transitions. Industry 5.0 introduces a paradigm shift in industrial policy, by alleviating environmental pressures and social inequalities stemming from hyper-digitalisation. An industrial symbiosis creates a more resilient, robust, sustainable and human-centric industry. The industrial symbiosis path started gradually in the 2020s and 2030s, fluctuating until it increased up to 2050. As places need time to adapt, this path may not be harmonious for all (Map 4-7).

Regions with a high share of employment in industry were the first to adopt the shift to industry 5.0 in slow and gradual steps. This included the regions of Plzen, Liberec, Hradec Kralove, Prardubice, Vysocina and Zlin in Czechia, Komarom-Esztergom in Hungary, Carinthia in Slovenia, Timis, Arad, Hunedoara, Sibiu and Arges in Romania, Zagora and Gabrovo in Bulgaria, the Zenica Doboj canton in Bosnia-Herzegovina, as well as Moravica, Zlatibor, Jablanica, Pcinja and Pirot, in Serbia. (BBSR & ESPON, 2020)

The shift to hyper-digitalisation has not only affected industrial models in the region. It played an immense role in influencing businesses and social lives. Artificial intelligence and robotisation have made some jobs redundant while also creating new ones. The shift to automation has created more niche and high-skilled jobs. Middle-income jobs requiring at most secondary education, have been significantly displaced by automation, including truck drivers, office clerks and repetitive artisan jobs. At the same time, many jobs have been transformed, requiring specific and high skills, such as social and cognitive intelligence, in healthcare, technology and creative industries, but also data experts, ethics officers, etc. (European Commission, 2019a). Manufacturing has also adjusted to the digital transition, becoming more niche and related to high end innovation. This shift also required upskilling and continuous learning for people to be able to adapt to changes.

Hyper-digitalisation also affected social lives, as the Danube Region has become a pioneer in using the metaverse. The first steps date back to the 2020s and over the next decades evolved into the new tool for social communication. This digital environment platform mingles with real life and has been built on two key ideas, virtual reality and a digital second life (Chen, 2022). The metaverse has been used for telepresence working (World Economic Forum, 2019), ending business trips, as well as for leisure, as people meet and play online games in virtual reality, participate in global e-sports events, as well as attend virtual concerts. Real and virtual lives are blended with people socialising in different and multiple ways. These changes started gradually but went quickly after the 2030s, as technological shifts arrived at great speed (Figure 4-5).

Broadband access and high-speed internet coverage are important for the metaverse experience. Although back in the 2020s broadband connectivity divides were visible, especially between the east and west of the Danube Region, by 2050 speedy global technological developments bridged most of these divides. Regions which already had good broadband access while regions with both good broadband access and ultrafast broadband or next generation coverage, had more potential (Map 4-7).

Another important shift with hyper-digitalisation has been a new Danube transport era, where the Danube River has become the main means of transport for goods in the region, with faster connections across the river. Efforts to make ports more sustainable have been initiated by 2050. Therefore, the Danube Region increased its focus and investments on exploring waterway transport possibilities instead of rail. By 2050, increased integration across the EUSDR has reduced administrative transport barriers (Map 4-7) and increased the use of inland river waterways around the Danube. Bottlenecks have been resolved, sustainable solutions, such as hydrogen, have been implemented, an enhanced network of multi-modal ports gradually developed and more agreements between countries have led to easier transportation. Ports and port cities have gained importance over the years (Map 4-7) as key transport hubs. This transition has been gradual over the years, and has brought continuous development (Figure 4-5).

By 2050 there was high economic growth in the region, which was more visible in the 2040s, once hyper-digitalisation had taken shape and administrative barriers were gradually lifted. Following this, EU integration has been largely driven by economic relations (Figure 4-5). Given the focus on the new digital economy and the industrial profile of the Danube region with economically driven progress, European integration has inevitably improved these relations. Cooperation with regions which may result in an economic benefit is a must for stronger economic and trade integration in the region. Therefore, integration is furthered and supported where economic integration is promoted. The more politically and economically integrated the EU is and the more capacities has to deal with political and economic crises, the more it can guarantee its own security and lead globalisation (European Strategy and Policy Analysis System, 2015).

The transition towards a digital economy with a focus on technological progress and economic growth has affected people's lives to a great extent. It has influenced businesses, the way people work and live, the economy, changed technological infrastructure, affected transport and improved health. At the same time, strong civil society has kept a balance between growth and ethical development, protecting peoples' rights and safety as much as possible, playing a role in overall prosperity.

In this strongly digitally driven scenario, businesses and people's lives change and adjust to immense shifts with digital transformations. Such shifts influence both how industries operate, making the Danube a pole of attraction for investment, generating new companies and attracting funding from business angels, with the aim to achieve a digital economy and a high increase in GDP. Technologies such as carbon capture, utilisation and storage and better use of digital centres have helped green the environment too, while the discovery of recyclable thermoset plastics, where polymers can be reused multiple times and turned into new products can reduce landfill substantially (World Economic Forum, 2015). Digital decarbonisation through

increased compatibility across devices has also to a large extent been achieved. Hyper-digitalisation, in combination with the energy crisis sparked by the Ukraine war in the 2020s, required a shift in energy provision, giving natural gas a bigger role in replacing coal and possibly oil. Although Liquified Natural Gas and nuclear energy were one of the first solutions to cope with the crisis they did not prove sufficient. In fact, the EU has labelled gas and nuclear investments 'green' to speed up the processes before the Green Deal policy started (Abnett & Jessop, 2022). What is more, breakthroughs in nuclear fusion technology changed the energy landscape covering needs, as well as slowing global warming (European Strategy and Policy Analysis System, 2015).

Hyper-digitalisation also changed human relations and behaviour, hyper-production resulted in an apogee of consumerism, digitalisation made products more tailor-made and personalised, sometimes putting efficient resource management at risk. Furthermore, fast-paced developments have led to fast paced lives. Keeping up with new technological developments for both professional as well as the social life has added pressure. Phenomena of 'Fear Of Missing Out', the 'hustle culture', overwork, high stress and burnouts have increased, especially among young people who struggle to keep up.

Tourism has become virtual, alternative and tailored to new users, with smart solutions. Agriculture has seen precision agriculture and other technological breakthroughs being implemented to produce new crops from alternative protein sources to respect new diets, reduce environmental consequences and cope with a lack of resources.

What has been key, however, in this scenario is the increased role of civil society, which acts as a guardian angel to address societal challenges, starting from social inequalities between the haves and have nots, between people well connected and those not, or between skilled and unskilled personnel, as well as dealing with ethical dilemmas on automation, health and security.

Transforming into a hyper-digital economy has shown that the Danube Region has taken existing challenges and made a big step towards turning them into opportunities. This has not been an easy path however the region went 'all-in' for digitalisation to improve the economy in the territory.

4.7 Restoring nature for a revived ecosystem

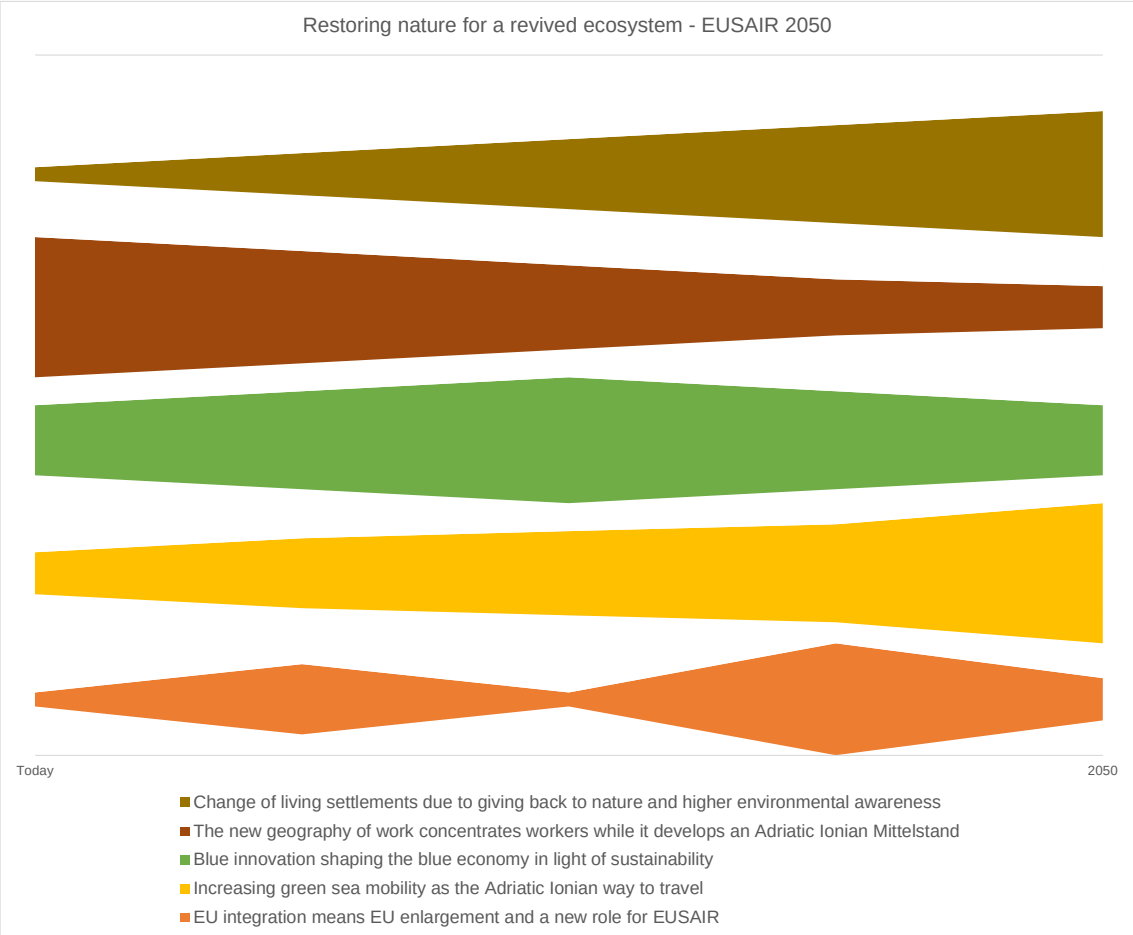
The alternative scenario 'restoring nature for a revived ecosystem' is based on unique assumptions for the Adriatic Ionian Region, primarily increased biodiversity loss, climate change, a brain drain, sustainable lifestyles, urbanisation and rewilding, exploring how things could play out and progress by 2050.

By 2050, the Adriatic Ionian Region has taken big moves towards restoring its rich nature, reviving and cleaning the ecosystem. Citizens in the Adriatic Ionian Region have decided to restore and 'give back' to nature large parts of their territories to mitigate climate change. The numerous devastating natural hazards in the past decades, as well as the challenging evolution of biodiversity have highlighted the need to mitigate the negative effects of climate change and take serious actions to address them. The region has been severely hit by droughts, floods, forest fires, earthquakes, landslides and even volcanic eruptions over many decades, while overexploitation of resources, climate change, pollution, changes in land and sea use and invasive alien species have put the region's biodiversity at risk (COM(2020) 380 final, 2020). All these risks, emphasise that nature is pivotal to developing healthy and resilient societies. Besides, the COVID-19 pandemic of the early 2020s has made the need to protect and restore nature even more urgent, as it raised more awareness about the links between human and ecosystem health. In addition, nature restoration is not only essential for the health and wellbeing of people, but also for the post-pandemic economic recovery.

Besides underlining the importance of nature for the overall good and the wellbeing of people, the COVID-19 pandemic also influenced the geography of work. The lockdowns and restrictions led to home office practices which lasted long enough to become routine. Remote work has given people the flexibility for people to choose 'where and when' they work. Hybrid models have also been implemented in many businesses in the region, allowing workers to share their work time between office and home or any other place. This shift has not only been supported by stricter global actions, such as the United Nations Sustainable Development Goals calling for climate action, life on land and in water and more sustainable communities (United Nations, n.d.), but particularly by youth environmental activism. Realising that resources are not eternal, and nature is at stake, youth activism, awareness and knowledge of environmental issues have increased substantially by 2050. At the same time, COVID-19 and discussions around 'new normals' have led to a new social contract, putting the environment first and transforming people's perception of nature and

life, moving towards de-growth and reconsidering consumption and production habits. The scenario storyline builds on five key components that structure the story (Figure 4-6).

Figure 4-6 Restoring nature for a revived ecosystem foundations – EUSAIR 2050



Source: authors' own

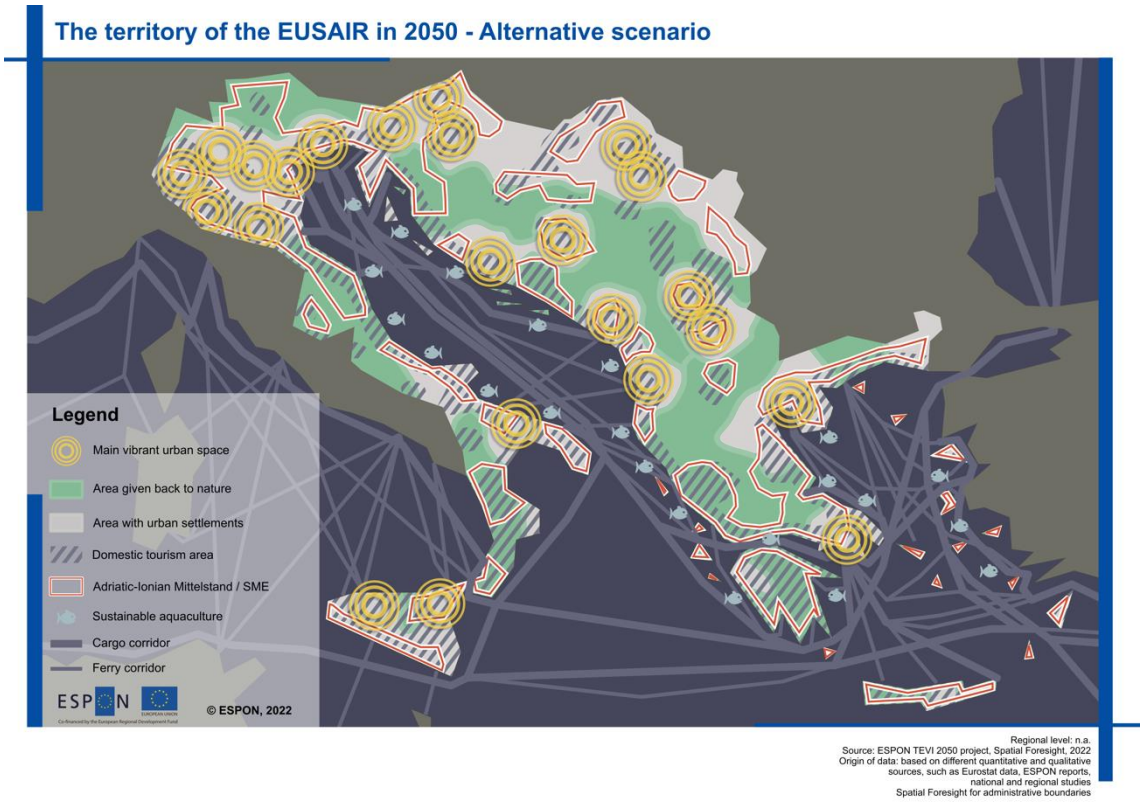
The increasing risk of biodiversity loss and efforts to preserve the ecosystem in the Adriatic Ionian Region led to changes in living settlements, as well as increasing awareness of people. This change has been slow and gradual, with first steps taken in the 2020s, increasing closer to the 2040s and 2050s (Figure 4-6). The Adriatic Ionian Region has rich land and marine biodiversity. It has substantial freshwater from multiple rivers and is home to more than 7,000 species, including endemic, unique, rare and endangered species (WWF, 2015). Nevertheless, sea level rise, recurrent droughts, forest fires, floods, saltwater intrusion, species invasion and increased sea temperature challenge its ecosystems. Already projections from the 2010s indicated an expected sea level rise between 7-12 cm by 2050 (WWF, 2015). The Anthropocene era, the latest recognised epoch and the only one characterised by a single species being responsible for epoch changes has brought consequences that immensely influence the environment. All these challenges have made it clear that a shift in the way people think and act has been necessary (Dasgupta, 2021) to protect nature. As human beings are responsible for most of these environmental changes, a mentality change in the Region sparked immediate action to improve the situation, backed by strong environmental regulations.

By 2050, the Adriatic Ionian Region has to a large extent achieved the ambitious goals set by the European Commission, both the older EU members in the Region, as well as those who joined later. In the 2020s biodiversity in Europe was in decline, despite large Natura 2000 areas and multiple conservation efforts. By 2050, the Adriatic Ionian Region was close to increasing its land and sea protected area to 30% (COM(2020) 380 final, 2020) and even go beyond that, putting a particular effort on forests, and other carbon rich ecosystems like peatlands and grasslands. For this, the Region decided to capitalise on its rich natural habitat and invest in green infrastructure. Nevertheless, the Adriatic Ionian Region has decided to go a step beyond in this process due to decades of population decline, with shrinking regions and more rural areas with no

vision. Although some shrinking regions managed to halt the decline, especially after the influx of Ukrainian refuges who settled in the area, many did not adjust and became desolate.

Large areas are protected by Natura 2000, nature reserves, national parks, habitat/species management areas, protected landscapes and protected areas defined by national regulations where biodiversity was at risk and more action needed (Map 4-8). These are to be found all across the region and more specifically mostly in the province of Belluno in Italy, Gorizia and South East region and Littoral-Inner Carniola region in Slovenia, Primorje-Gorski Kotar county, Lika-Senj county, Zadar county, Sibenik-Knin county in Croatia, the regions of Kilkis and Thessaloniki in Greece, Kukes region in Albania, Polog region in North Macedonia and Pirot region in Serbia (BBSR & ESPON, 2020).

Map 4-8 Restoring nature for a revived ecosystem – Adriatic Ionian Region 2050



Source: ESPON TEVI 2050, 2022

In combination with ‘giving back to nature’, where large territories were abandoned, the new geography of work has also brought new developments in the Adriatic Ionian Region, showing a high increase until the 2030s, prompted by the COVID-19 pandemic aftermath, steadying by 2050 (Figure 4-6). This had two key consequences. First it shifted work to a hybrid and flexible model, involving working from home with limited office attendance, flexible hours and working for multiple companies. At the same time, this allowed the Region’s diaspora, which was working abroad for years, to return to their home regions. Brain gain has become a first indication that the economy in the region is reviving and becoming attractive, drawing the attention of global companies, such as digital behemoths, international consultancies and global players to invest in the region’s people. This has changed living settlements in the region, concentrating people in large vibrant urban centres gradually until 2050 (Figure 4-6). Such centres are all across the Adriatic Ionian Region, mainly capital and second-tier cities (Map 4-8).

Secondly, this shift in the geography of work has concentrated people in smaller urban areas (Figure 4-6) where an Adriatic Ionian ‘Mittlestand’, i.e. many strong small and medium-sized enterprises has developed. This gradual concentration of people in urban and smaller urban areas has further increased the critical mass of these places by 2050. With the manufacturing sector supporting the shift towards the circular economy and repairing culture, the number of SMEs in smaller places gradually increased, employing many people. Such enterprises include manufacturing, low-carbon intensive or creative economy companies

(ESPON, 2018c). Places with many SMEs have been greatly influenced by the changes. In addition to major urban centres in Serbia, North Macedonia, Albania, Bosnia and Herzegovina and Montenegro, are examples in the north of Italy, most parts of Slovenia, north east Croatia, as well as around urban centres in Greece (ESPON, 2018c) (Map 4-8).

The profound technological integration that took place by 2050 not only triggered a change in the workplace, but also supported the modernisation and advancement of work and industries in general. Together with greener approaches, innovation has also revived, especially in the blue, eco, social and circular economies. In particular blue innovation has been vital (Figure 4-6), gradually developing up to 2050. Marine and maritime research and innovation has used big data, artificial intelligence, advanced modelling and other technologies to enable traditional sectors like fisheries and aquaculture to improve sustainability. It also developed earlier adopters of blue biotechnology, biotechnology and offshore renewable energy (European Commission, 2021a). Blue innovation not only introduces sustainable solutions in fishing and aquaculture, but also for energy and shipping, transforming the region into a blue innovation champion in the EU. Regions across the Adriatic and Ionian Seas and the Aegean have a strong blue and aquaculture economy (Map 4-8).

Restoring nature and changing mentalities towards environmental protection has also changed transport in the region. The sea has for years served as a key means of transport. By 2050 the sector has been greened and increased further in importance (Figure 4-6). Piraeus is the major port in the Adriatic Ionian Region and the region is home to 352 ports just on the Adriatic. Short sea shipping is used extensively for the transport of goods within the Adriatic Ionian region by 2050 (SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa, 2020). Important cargo corridors facilitating trade, as well as ferry connections in the region highlight this importance (Map 4-8).

The future of the Adriatic Ionian Region underlines that environmental protection knows no borders. This has prompted stronger cooperation and integration in the region. Over the decades, non-EU members of the Adriatic Ionian Region have joined the EU family, due to stronger integration efforts. The support and rebranding of EUSAIR, the Region's macro-regional strategy for integration in the Adriatic Ionian Region, has been pivotal and key for the inclusion and integration of non-EU member states. The process had a number of ups and downs, mainly as a result of external power shifts (Figure 4-6). However, by 2050 when ideas about restoring nature matured, it increased.

The transition towards a clean natural habitat by giving back to nature and adapting work and employment to that cause affected people's lives greatly. It has influenced the environment, the way people work and the economy, adjusted technological infrastructure, affected transport and improved health. At the same time, the strong commitment of people and especially youth, as well as technological progress allowed for a more conscious shift to prosperity and a clean ecosystem which is crucial for the wellbeing of future generations.

In this scenario of increased biodiversity and environmental protection, the Adriatic Ionian Region has seen substantial changes in people's mindsets, lifestyles and settlements. It has not only improved the environmental situation, but also developed an Adriatic Ionian way of life. More green and blue infrastructure has been built, industries have greened to adjust to the new lifestyles of people, developing new markets around sustainability with increasing demand for locally grown food and renewables (European Commission, Research and Innovation, 2016). In addition, more people gained environmental awareness and work skills. Energy has also become more sustainable, investing in the renewable energy potential of the region, mainly solar and wind. As industrial production reduced, energy needs did so too. Furthermore tourism, a key income generator for the region, shifted from mass tourism towards more sustainable and domestic or nearby tourism products. In addition, after the food crisis following the war in Ukraine, the Adriatic Ionian Region has become more autonomous for food, investing in bio, organic and regenerative production.

All these have led to 'slow living' and a new Adriatic Ionian way of life, where people are clear that preserving natural habitats means preserving their values and culture and by 2050 building a stronger macro-regional cultural heritage. People changed their mindsets for the common good, a choice which has supported policies that correspond to these values and support this transition (Joint Research Centre, 2021b).

Restoring nature for a revived ecosystem has shown that people in the Adriatic Ionian Region have sparked a movement towards taking extremely radical decisions to address the most long-term challenge of our times, climate change. With the power of the people and the support of adequate policies the region has moved towards creating positive and desirable futures to maintain regional comparative advantages, personal fulfilment, and the natural and cultural heritage.

4.8 Policy pointers for the EUSDR, EUSAIR and beyond

The three scenarios for EUSDR highlight overarching challenges and potential to be addressed.

Regardless of which scenario seems more desirable or likely, issues such as demographic decline and ageing, climate change, loss of biodiversity, digitalisation, energy demand and growing global tensions will need to be addressed in the region.

Based on these a number of policy recommendation themes can be developed. Each could be linked to the four EUSDR pillars. Developing policy recommendations means shifting from a discussion of possible futures to ideas about a desirable future. What outlooks do we want to avoid or would we like to see? This means policy recommendations are subjective and a matter of (personal) choice. The following provides an idea of possible policy recommendations, based on a co-creation workshop with the Steering Group. More detailed information, including the rationale, actions, players, timeline, expected effects and links with the strategies can be found in Part II and Part III of the report.

4.8.1 Policy pointers for the EUSDR

Taking the discussion one step further, the following five policy pointers have been developed.

- **EUSDR master plan and road map for green mobility**

  Idea: The pressure of climate change, the EU Green Deal and not least rising energy prices due to the war in Ukraine accelerate the need to shift to green energy. This concerns not only the transport sector. The shift to green mobility needs to be at macro-regional or European level to ensure integration of the Danube region avoiding different technical solutions and standards in different parts of the region.

- **EUSDR transnational body to reduce border barriers**

  Idea: National borders are still barriers to macro-regional cohesion, development and the seamless transport of goods and people. This is true also for EU internal borders given different national regulations. It is especially true for EU external borders crossed by the Danube. These barriers hinder integration and economic development.

- **EUSDR digitalisation in green transformation of transport**

  Idea: Over the next decade the digital and green transitions will be unavoidable. In many regards these can reinforce each other. This includes the shift to sustainable transport and attempts to reduce transport flows without reducing people's mobility or quality of life. Digital transport platforms and mobility services can play a crucial role. This ranges from ride sharing platforms to services showing how to get from one place to another.

- **EUSDR concept and pilot actions on valorisation of eco-system services**

  Idea: Ecosystem services are direct and indirect contributors to human well-being. They are essential for fresh air, clean water, biodiversity, regulating disease and climate, supporting pollination and soil formation, as well as providing recreational, cultural and spiritual benefits. Therefore, it is essential to nourish them. At the same time, they often have no immediate price tag, and are not accounted for when it comes to development potential in terms of GDP or jobs.

  Mitigating climate change and ensuring no net loss of ecosystem services and biodiversity might change thinking on regional development potential and the division of labour between places. Places with high biodiversity or significant ecosystem services (e.g. clean air or clean water) could develop these into an economic specialisation. Of course, this does not imply ignoring a healthy living environment for citizens in other places. To some degree existing approaches, including the Common Agricultural Policy could adapt from compensation to regional development. This would mean delivering ecosystem services becomes a local and regional economic activity rather than compensating rural areas and requiring them to take care of the environment while others do not.

- **Boost educational, people-to-people and local level cooperation**

- **Idea**: Integration and place-based development is not limited to cooperation between regional and national authorities or trade. It involves also local and interpersonal cooperation. To educate young

people on macro-regional issues, cooperation between education and training centres is important. As with efforts to bring Europe closer to citizens, the EUSDR should be brought closer to citizens.

4.8.2 Policy pointers for the EUSAIR

Taking the discussion one step further, the following five policy pointers have been developed.

- **EUSAIR Territorial vision for demographic change**

  Idea: Demographic change is a major challenge for social, economic and territorial development in the coming decades. This includes migration, ageing, shrinkage, etc. leading to increasing territorial imbalances and difficulties for some places to access services of general interest, avoiding a vicious circle of economic and demographic decline. These issues are relevant at all geographical and administrative levels, from local to European.

- **EUSAIR spatial action plan for green and blue transitions**

  Idea: The green and blue transitions are essential for Europe to meet the challenges of climate change and loss of biodiversity. As economies and societies in places are highly interdependent, a successful transition cannot rely just on the individual strategies of cities, regions or countries, but needs an overarching framework as well.

- **EUSAIR biodiversity plan**

  Idea: The loss of biodiversity poses a substantial challenge to the future delivery of ecosystem services and the wellbeing of species. Ensuring 'no net loss' of ecosystem services or biodiversity might change the focus of regional development potential and land use in the coming decades.

- **EUSAIR taxation agreement for the digital workforce**

  Idea: Digitalisation of our economies and societies offers increasing possibilities for people to work remotely. This can take very different formats. In some cases, people stay where they are and work for employers in one or several locations. In other cases, people move between locations more frequently and work temporarily from outside their usual office. Digital nomads are an example. While such solutions are more frequent and popular, they pose considerable challenges in terms of labour law, taxation and social security payments.

- **EUSAIR masterplan for future-wise tourism**

  Idea: Many tourism initiatives aim at reducing the negative environmental effects of travel, accommodation, catering and activities. Tourism has to also become more responsible and respectful of the territory and local communities. Decarbonisation is an objective of many new tourism strategies and actions. Sustainable tourism goes beyond green and environmentally friendly offers at destinations. It requires rethinking the entire tourism value chain, linking tourism with local development and has to cover the full travel experience, from when a tourist leaves their home to the moment they return after the experience. This means it also needs to address place dependency and possible alternative concepts such as long-term tourism.

4.8.3 Cross-cutting recommendations

The scenario work for the Danube and Adriatic-Ionian macro-regions raises conclusions and recommendations going beyond the individual strategies while recognising territorial overlaps. The scenarios highlight that many future development issues go beyond the nation state. This leads to discussion about shared strategies, masterplans or action plans for issues which are addressed more effectively or efficiently at transnational level. It also leads to considerations concerning macro-regional or transnational bodies to drive such processes beyond single projects.

- **Cooperation between macro-regional strategies**

  Many of the points in the scenario work might be relevant for all macro-regional strategies and thus a topic for the European Commission or for cooperation and coordination between macro-regional strategies.

  Idea: Drive future-oriented debates. Managing the challenges and transitions also requires societal discourses and answers beyond local and regional development. Examples for this include:

- Encourage the debate on internalising external costs across sectors to achieve the Green Deal objectives.
- Encourage the debate on quality of life and beyond GDP, including testing alternatives under macro-regional strategies.
- Advance the debate on an improved EU data ecosystem, including data security, privacy, data governance, blockchain technology, digital hazard resilience, etc.
- Encourage the debate on citizen engagement in governance and macro-regional cooperation.

Idea: Think macro-regional sector plans and strategies. Given high spatial interdependencies new formats are needed to develop macro-regional strategies, plans or roadmaps for particular sectors. Examples include:

- Consider macro-regional transition plans on green, digital and just transitions.
- Consider macro-regional biodiversity plans and strategies.
- Consider macro-regional plans for carbon-neutral long-distance mobility.
- Consider macro-regional strategies on changing settlement patterns in times of demographic decline and aging.

Idea: Consider transnational bodies and agreements. . In many cases plans and strategies will not be sufficient to move forward. Binding agreements between countries will be needed, including even transnational bodies to ensure continuity over time. Examples include:

- Discuss possibilities for multinational agreements on taxation of digital nomads, workcation and alike.
- Discuss possibilities for multinational agreements reducing border obstacles of various kind, between EU member states and especially between EU and non-EU member states.
- Discuss possibilities for establishing transnational bodies of some sort for specific tasks related to the monitoring (and reduction) of border obstacles.

These are just a few examples for possible fields of action which go beyond the scope of individual macro-regional strategies.

- **ESPON**

ESPON is highly committed to supporting macro-regional strategies and could possibly consider actions to support work with territorial evidence:

Idea: Build up repositories of national and regional plans and strategies to connect the dots and bring them together in joint macro-regional plans or strategies. This could regard green and digital transition strategies, biodiversity strategies or spatial development plans.

Idea: Support the development of macro-regional masterplans and sector strategies, which help to better coordinate sector policies with wider territorial implications. This could include thematic studies providing territorial evidence or targeted cross-analysis of sector policies for macro-regional strategy countries, as well as making data available from projects. Possible topics are green and digital transitions, green and blue growth, demographic change, biodiversity, tourism and quality of life.

Idea: Strengthen continuous macro-regional monitoring, related to spatial inequalities, quality of life or cross-border obstacles. This could be an opportunity to establish databases or evidence on the aspects for the western Balkan part of both macro-regions.

These are just a few examples for possible fields of action which go beyond the scope of individual macro-regional strategies.

4.9 Our choices matter

Enslaved in inertia. Current trends and developments show that although humans are ‘homo prospectus’, eager to figure out what the future holds (Krznaric, 2020), they are often reticent about taking action to deal

with challenges. This short-term thinking inhibits positive change and hence positive futures which people themselves have defined. Short-termism is also observed in policy making, as politicians often fail to take big decisions and be bold about the future to avoid political cost. In the constantly changing and interdependent world we live in, long-term, out-of-the-box and radical thinking is pivotal. Therefore, when thinking about the future, territorial scenarios can inspire a different way of thinking and test different pathways.

Change is the only constant. Today, more than ever, our world is all but static. It is constantly flowing and rapidly changing. New developments take place daily and new trends and challenges emerge all the time. Although change is inevitable, evolving, progressing and preparing for this is necessary, so people should seriously start thinking about their future and take key actions that can bring change. Therefore, when thinking about the future it is important to take bold decisions.

Dealing with transitions. All scenarios developed in the ESPON TEVI 2050 project touch on the key green, digital and just transitions. The baseline scenario points at uneven development, where people are caught in inaction and do not take further initiatives or policies to deal with the transitions. This creates a future that is in limbo, with some territories progressing further and others stagnating, resulting in more inequality and places left behind. The alternative scenario 'flourishing in green and social wellbeing' shifts the importance to green and social spheres. A radical shift is being made towards achieving a better quality of life, putting protection of the environment and good government quality high on the agenda. The scenario 'transforming to a hyper-digital economy' puts the focus of the Danube region's prosperity on achieving economic growth through hyper-digitalisation, affecting people's work and everyday lives. Lastly, 'restoring nature for a revived ecosystem' highlights the mindset shift towards green growth and giving back to nature, to improve and restore the natural habitat of their region. All scenarios show how different choices and decisions can evolve by 2050, and what their implications could be. Therefore, when thinking about the future, it is important to be open-minded and explore different possibilities.

The future needs more radical thinking. What the territorial scenarios have shown is that choices and decisions need radical thinking. It is often said that 'any idea about the future should be ridiculous' (quote by futurist Jim Daton). If a statement sounds too logical, then it's probably about the present and not relevant for future discussions. Provocative thinking is necessary for future pathways. If policy makers need to decide about the future of a transition, they should make daring decisions and not succumb to middle-measures. This will be the only way where a change can bear fruit. It is important to focus on solutions, rather than just dealing with the problem, but being more result and solution oriented. Therefore, when thinking about the future, it is important to be daring and take holistic approaches.

People need a more positive future. Green, digital and just transitions will not be the only ones. By 2050 or beyond, more transitions and more policies will arrive. People and decision-makers need to be prepared to create the futures they wish for. The exercise needs to be seen as joint efforts, following the idea of a 'mission economy', i.e. seeing development as a public purpose for an optimistic future. Therefore, it is important to think positively and collectively, to create desirable futures.

Our choices today matter for the generations of tomorrow. Through territorial foresight, policy makers can have a better understanding of the present and be more informed about possible pathways for the future. Territorial scenarios are not about choosing which pathway is the right, best, or most feasible, they are about giving options to make the right choices based on developments in the pathways. Territorial scenarios serve as eye-openers to support policy makers in developing sound policies for the future, asking 'what if-s' instead of later confronting 'what now-s. This will lead to desirable futures for citizens, avoiding future dystopias. It is important that our choices today build better for the generations to come.

References

Chen, X. B. (2022, January 18). What's all the hype about the metaverse? https://www.nytimes.com/2022/01/18/technology/personaltech/metaverse-gaming-definition.html

Abnett, K. & Jessop, S. (2022, January 1). EU drafts plan to label gas and nuclear investments as green. https://www.reuters.com/markets/commodities/eu-drafts-plan-label-gas-nuclear-investments-green-2022-01-01/

European Commission. (2021a, May 17). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new approach for a sustainable blue economy in the EU transforming the EU's Blue Economy for a Sustainable Future. COM(2021) 240 final.

European Commission. (2021b, March 9). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. 2030 Digital Compass: the European way for the Digital Decade. COM(2021) 118 final.

COM(2021) 550 final. (2021). Fit for 55: delivering the E's 2040 climate target on the way to climate neutrality. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS EMPTY.

Dasgupta, P. (2021). *The economics of biodiversity: the Dasgupta review: full report*Updated: 18 February 2021. London: HM Treasury.

European Commission, DG MARE. (2021). European Atlas of the Seas. https://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas

Joint Research Centre. (2021a). *Shaping & securing the EU's open strategic autonomy by 2040 and beyond*.

Joint Research Centre. (2021b). *Values and Indentities. a policymaker's guide*.

National Intelligence council. (2021). Global trends 2040. https://www.dni.gov/index.php/gt2040-home

ESPON EGTC. (2020, December 9). Call for tenders. Terms of Reference. "Territorial Scenarios for the Danube and Adriatic Ionian Macro-regions (TEVI2050). Technical and Administrative Terms and Conditions.

BBSR & ESPON. (2020). *Atlas for the Territorial Agenda 2030: Maps on European Territorial Development*. Berlin: Federal Ministry fo the Interior, Building and Community.

Böhme, K., Lüer, C. & Holstein, F. (2020). From Territorial Impact Assessment to Territorial Foresight. In E. Medeiros (Ed.), *Territorial Impact Assessment*, pp. 157–176. Cham: Springer International Publishing. http://doi.org/10.1007/978-3-030-54502-4_9

CESCI. (2020). *Analysis of territorial challenges, needs and potentials of the Danube region and strategic options in view of the transnational cooperaiton for the period 2021-2027*.

COM(2020) 380 final. (2020). EU Biodiversity Strategy for 2030 Bringing nature back into our lives. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

DG MOVE. (2020). TENtec Interactive Map Viewer [TENtec Geographic Information System]. https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

ESPON. (2020a). *ESPON QoL - Quality of Life Measurements and Methodology. Final Report.* Luxembourg: ESPON EGTC.

ESPON. (2020b). *European Monitoring Tool for Macro-regions (EMTM)*. https://mrs.espon.eu/index.html

European Commission. (2020). *Action Plan replacing Staff Working Document SEC(2010) 1489 final accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. European Union Strategy for Danube Region* (Staff Working Document). Brussels.

Eurostat. (2020). *Eurostat regional yearbook: 2020 edition.* Luxembourg: Publications Office of the European Union. https://data.europa.eu/doi/10.2785/98733

Krznaric, R. (2020). *The Good Ancestor. How to think long term in a short-term world*. WH Allen, Penguin Random House.

Rodríguez-Pose, A. (2020). The Rise of Populism and the Revenge of the Places That Don't Matter. *LSE Public Policy Review*, *1*(1), p.4. http://doi.org/10.31389/lseppr.4

SITA-SOGES & Osservatorio Balcani Caucaso Transeuropa. (2020). *Analysis of the territorial challenges, needs and potentials of the Adriatic-Ionian region and strategic options for post-2020 ADRION Programme*.

World Economic Forum. (2019, June). Top 10 Emerging Technologies 2019.

ESPON. (2019). *BT2050 - Territorial Scenarios for the Baltic Sea Region 2050. Final Report.*

European Commission. (2019a). *AI. The future of work? work of the future! On how artificial intelligence, robotics and automation are transforming jobs and the economy in Europe.*

European Commission. (2019b). *Communication from The Commission to The European Parliament, The European Council, The Council, The European Economic And Social Committee and The Committee Of The Regions. The European Green Deal* (Text No. COM(2019) 640 final). Brussels. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

European Committee of the Regions. (2019). *Territorial Impact Assessment. Climate Neutrality.* Brussels.

Fehér, A. & Mérő, T. (2019). Sustainable Energy Storage Innovations in Danube Region Countries for the EU-Goals of the Paris Climate Agreement. Ministry of Foreign Affairs and Trade of Hungary, Budapest.

Joint Research Centre. (2019). *Smart Specialisation and wider innovation policy contect in the Western Balkans*.

Sandberg, M., Klockars, K. & Wilén, K. (2019). Green growth or degrowth? Assessing the normative justificaitons for environmental sustainability and economic growth through critical social theory. *Journal of Cleaner Production*, *2006*, pp.133–141.

Dijkstra, L., Poelman, H. & Rodríguez-Pose, A. (2018). *The Geography of EU Discontent* (Working Papers No. 12/2018). Luxembourg: Publications Office of the European Union. https://ec.europa.eu/regional_policy/sources/docgener/work/2018_02_geog_discontent.pdf

ESPON. (2018a). *Possible European Territorial Futures*. Luxembourg: ESPON. https://www.espon.eu/territorial-futures

ESPON. (2018b). *Possible European Territorial Futures. Volume E - 100% renewable energy*. Luxembourg.

ESPON. (2018c). *Small and Medium-Sized Enterprises in European Regions and Cities. Final Report*.

ESPON. (2018d). *Territories and low-carbon economy (ESPON Locate). Final Report.* Luxembourg: ESPON EGTC.

ESPON EGTC. (2017). *ACTAREA Main report*.

Toptsidou, M., Böhme, K., Gløersen, E., Haarich, S. & Hans, S. (2017). *Added-value of macro-regional strategies - programme and project perspective*. http://www.interact-eu.net/download/file/fid/6327

European Commission, Research and Innovation. (2016). *Changing gear in R&I: green growth for jobs and prosperity in the EU. Report of the European Commission Expert Group 'R&I policy framework for Green Growth & Jobs'*.

European Strategy and Policy Analysis System. (2015). *Global Trends to 2030: Can the EU meet the challenges ahead?* European Strategy and Policy Analysis System.

Interreg ADRION. (2015). *ADRION Interreg V-B Adriatic-Ionian Cooperation Programme 2014-2020. Approved on 20 October 2015*.

World Economic Forum. (2015). *Top 10 Emerging Technologies of 2015*. World Economic Forum.

WWF. (2015). *MEDTRENDS. Blue growth trends in the Adriatic Sea: The challenge of environmental protection*.

ESPON. (2014). Update of maps and related data on climate change.

Institute for Regional Studies, Research Centre for Economic and Regional Studies,Hungarian Academy of Sciences. (2013). *Discussion Papers. No.90. Danube Region - Analysis and Long-Term Development Trends of the Macro-Region.*

European Commission Directorate General for Research and Innovation. (2012). *Global Europe 2050.* LU: Publications Office. https://data.europa.eu/doi/10.2777/79992

Randers, J. (2012). *2052 : a global forecast for the next forty years*. White River Junction, Vt.: Chelsea Green Pub.

Zoï Environment Network. (2012). Climate change in the west balkans. United Nations Environment Programme. http://archive.zoinet.org/web/sites/default/files/publications/Climate-change-west-balkans.pdf

ICPDR. (2002). Water Pollution.

Adriatic Your Regional Destination Specialist. (n.d.). The Top 5 National Parks in the Balkans. https://www.adriaticdmc.hr/the-top-5-national-parks-in-the-balkans-b71

United Nations. (n.d.). United Nations Sustainable Development Goals. https://www.un.org/sustainabledevelopment/sustainable-development-goals/

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