Access to the European cultural heritage of settlements and towns in the Danube macro-region through interoperable strategies digital transformation

Babin ANATOLIE,
Academy of economic studies of Moldova, Chisinau, Republic of Moldova
anatolie.babin@ase.md, https://orcid.org/0000-0002-7253-0890

Elena PRUS,
Free International University of Moldova, Chisinau, Republic of Moldova
eprus@ulim.md, https://orcid.org/0000-0001-9419-5459

Elena MARGINEANU,
Free International University of Moldova, Chisinau, Republic of Moldova
emargineanu@ulim.md, https://orcid.org/0000-0002-6157-8506

Abstract

Tangible cultural heritage is a strategic resource for the development of rural and urban settlements. Cooperation with stakeholders from EU countries and regions within the Danube macro-region, such as cultural heritage institutions and competent authorities, allows to agree on the preparation and adaptation of compatible digital innovation strategies in local initiative groups in the Republic of Moldova and Ukraine, as well as on impact mapping through a set of pan-European socio-economic indicators. Objectives of the study: to analyse the available European best practices and methodology for adaptation in the integration of the regions of the Republic of Moldova and Ukraine in the interregional innovation partnership on the smart specialisation "Cultural and Creative Regional Ecosystems" (CCRE-S3) [1]. The overall horizontal objective of the integration into the platform should be to add value to the common characteristics of the cultural and creative sector and to create a permanent discovery mechanism that will carry out activities to identify strategic investments and the use of innovation transfer tools. Previous works: previous concept, research and experience are described in the articles [2] and [3]. Approach: European benchmarking, comparative analysis, bibliographic research. Outcome: recommendations aimed at stimulating new ideas and opportunities related to cultural and creative experiences for local communities and residents by involving several groups of professions that use, apply and implement new technologies in the cultural and creative industries sector. The European Programmes provide resources to support their implementation. In this way, the Danube Strategy participating States [4], by supporting partnerships between the cultural heritage sector and other sectors such as higher education and vocational education and training, creative industries and sustainable cultural tourism, will be able to stimulate innovation for new services and applications in their regions.

Keywords: digital cultural heritage, creative entrepreneurs, smart specialization.

1. Introduction

The emergence of the knowledge economy has found many institutions of the regional communities of Moldova and Ukraine unprepared to deal with the problems arising from several issues that have been brought to the fore precisely because of the development of science: questions of ethics in science. , the boundaries of research and the role of science in management are some examples of complex issues that could also be considered in the regional context and benefit from its richness and diversity. In order to open up new opportunities in the field of 'Smart Specialisation' [5], the regions of Moldova and Ukraine, as new EU candidate countries, have the opportunity to examine their position in European

and global value chains. On the basis of these analyses, Smart Specialisation strategies need to be coordinated not only with national priorities and programmes, but also with other countries' regions, as no region has complete and comprehensive knowledge of all opportunities for cooperation at regional, national and European level in their areas of 'Smart Specialisation'. Such an alignment requires a focused approach to trans-regional cooperation, including related issues such as administrative responsibilities, risks and scope of authority.

European universities [6] are important repositories of knowledge and tradition through ongoing academic engagement with the cultural heritage of European regions, including new forms related to digital technologies. They continue to protect heritage by being responsible for historic buildings and will be a place for experimentation with new architecture. This is confirmed by the experimental theme of our interdisciplinary research, which was initiated as a result of participation in the 10th Danube Participation Day - Ukraine's Restoration on the Road to EU Accession, 23 October 2023 in Ljubljana (Slovenia) and the official side event. of the 12th Annual EU Danube Strategy Forum, which aimed to answer the question: how can the EU Danube Strategy strengthen civil society and local actors for a sustainable recovery towards EU accession and what can we learn from/for Moldova? Cooperation between the Danube countries is of particular importance in terms of coordinating research and innovation (R&D) activities, as they make a significant contribution to the competitiveness and economic growth of the macro-region [7] and, at the same time, are areas where cross-border cooperation and knowledge sharing can be essential to help achieve the best results.

The smart specialisation activities of the EU Strategy for the Danube Region promote interregional cooperation in the thematic priority areas/components "Strengthening the Region", "Connecting the Region", "Creating Prosperity" and "Protecting the Environment", which aim at sustainable development, connectivity and increased competitiveness through innovative approaches that promote prosperity and economic and social growth in the region. Smart Specialisation (S3) can make a valuable contribution to a better integration of the Danube region through the implementation of the EU Strategy for the Danube Region (EUSDR) in that it can stimulate the constructive use of regional diversity, avoiding uniformity and duplication of regional investment objectives and contribute to the creation of a critical mass for solving common core problems. The rationale for the interoperability of smart specialisation approaches in the regions of the new EU candidate countries is the need to achieve a higher degree of territorial integration of the highly heterogeneous Danube region. S3 collaboration is a policy driver to address common challenges and needs in specific S3 priority areas. The planning of transnational and interregional projects between Danube countries and other macro-regions is of particular importance, as coordinated research and development activities can make a significant contribution to the competitiveness and economic growth of these countries, as well as to improving the cohesion of the whole macro-region through more effective use of EU financial instruments. Collaboration on learning and policy analysis can be particularly important for lagging regions, especially for non-EU countries, which could benefit from the S3 process by improving their existing R&D strategies, access to R&D infrastructure and increased research capacity.

2. Common cross-border concepts of strategies for the digital transformation of natural and cultural heritage.

The Danube Cooperation Zone stretches from the Black Forest (Germany) to the Black Sea (Romania-Ukraine-Moldova) and covers the entire Danube basin. The cooperation area for 2021-2027 coincides with the previous programming period (2014-2020) and includes: Austria, Bulgaria, Croatia, the Czech Republic, South-East Baden-Württemberg and Bavaria in Germany, Hungary, Romania, Slovakia, Slovenia, as well as Bosnia and Herzegovina, Moldova, Montenegro, Serbia and four provinces of Ukraine. A map comparing the old and new borders can be seen in Figure 1.
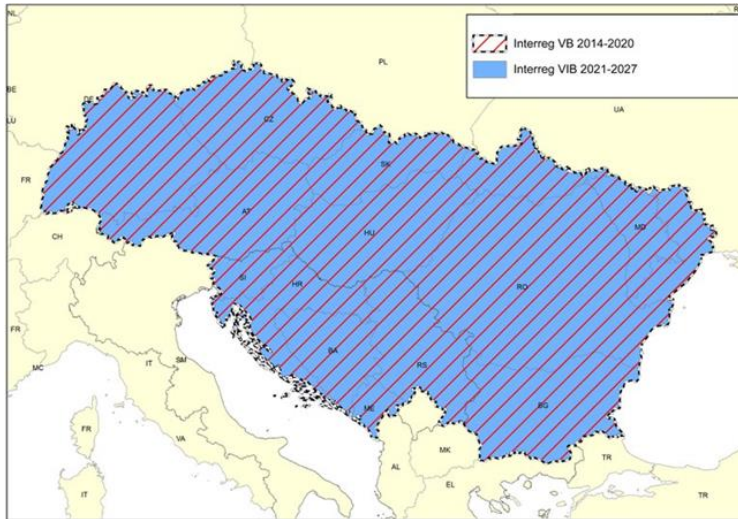

Fig. 1. Comparative map of the Danube
Source: https://climate-adapt.eea.europa.eu/en/countries-regions/transnational-regions/danube.jpg/view

As part of the targeted integration into the European Research Area [8] and the theme proposed by the organizers of the SCIC conference "Sustainability and Innovation", our research aims to support local initiative groups in unlocking the entrepreneurial potential of smart specialization of localities, regions and border areas of the Republic of Moldova, Romania and Ukraine. The practice of European countries participating in the Danube Cross-Border Programme (DTP) shows that the Entrepreneurship Discovery Process (EDP) [9] should go beyond the priority setting stage and enter the policy making process at different stages. The "Digital Transformation Strategy of Moldova - 2030" [10] was adopted by the Government in September 2023 and is a guiding document for coordinating innovation and sustainable development policy in cities and towns. Recommendation (EU) 2021/1970 of 10 November 2021 on a "European Common Data Area for Cultural Heritage" [11], as well as the complex challenges faced by public administrations in the context of EU integration, require research organisations to develop innovative approaches to improve the digitisation and digital preservation of tangible cultural heritage, which is a strategic resource for the development of human settlements in rural and urban areas.

At the DCSF [12] discussed the possibility of developing and/or regularly updating comprehensive and forward-looking cross-border digital strategies for cultural heritage at

the respective national or regional levels of the Danube Strategy countries to accelerate the digital transformation of innovation. In this context, the attention of the authors of the article was drawn to the "Common Concept for Digital Innovation of Natural and Cultural Heritage", which is a key document for digitization and interpretation of heritage in the cross-border UNESCO biosphere reserve area Mura Drava Danube Biosphere Reserve (MDD TBR) in "Europe's Amazing Amazon" [13], as it introduces what digitization of natural and cultural heritage means and provides a key understanding of the technological and non-technological building blocks for creating digital heritage tourism experiences. The concept was developed within the DTP project "AMAZING AOE - Responsible Green Destination Amazon of Europe" and fully complies with the recommendations of the European Commission [14].

In addition to the DTP cross-border cooperation concept model, the Republic of Moldova and Ukraine, in order to implement the EC recommendation, it is necessary to include in national and regional strategies measures to support cultural heritage institutions in the development of advanced technologies such as 3D, artificial intelligence, extended reality, cloud computing, data technologies and blockchain to enable a more efficient digitization and digital preservation process. There is also a need to provide higher levels of quality content for wider access, use and re-use. For the joint projects of the cross-border and national pilot territories of Romania, Moldova and Ukraine, the cross-border Danube Mura Drava Reserve (MDD TBR) Fig. 1, which links 12 protected areas and unites 5 countries along 3 rivers and is the world's top five biosphere reserve, can serve.
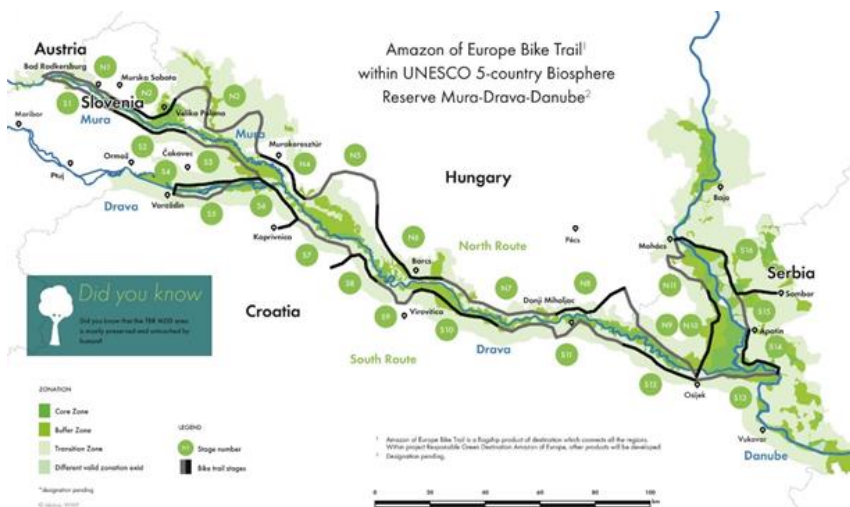

Fig. 1: The Mura Drava Danube Transboundary Nature Reserve (MDD TBR) [14]

The aim of the AoE project was to promote sustainable economic growth and tourism development based on the unique natural and cultural heritage, which led to the creation of a network of cooperation between key actors and the creation of favourable conditions for high quality tourism that responds to limited ecosystem resources. The AoE destination has become a collaborative example of European best practice and an integrated solution for sustainable tourism, including:

- The Eco Destination Tourism Impact Model combining social and technological innovation;
- A common strategy and model for destination management,
- Common flagship tourism products bringing together the best experiences along rivers: river trails, walking trails, AoE experiences,
- Testing the model in two transnational pilot regions and educating stakeholders on environmental responsibility.

The Amazing AoE provided sustainability opportunities to manage the diversity of natural and cultural heritage and resources in the AoE from local to transnational levels, while providing unique experiences for international visitors. The project identified the following:

1. Skills needed to develop innovative new digital cultural heritage products/services: engaging digital heritage design; unique offer; knowing your target; awe-inspiring moments; storytelling experience; identifying heritage sites and stories; collaborating with stakeholders and local businesses; enriching the amazing AoE story.
2. IT tools and technology solutions for developing new innovative digital heritage products/services:

- Digital capture: laser scanning; photogrammetry; sonar; 3D model modelling.
- Reconstruction modelling.
- Other technological solutions: AR-web - augmented reality web technologies and mobile apps; virtual tours; VR games are video games played on virtual reality (VR) hardware; Holographic projectors; interactive object recognition (OR) tables; interactive screens and walls; immersive cameras.

3. Regional experiments as part of the implementation of macro-regional strategies: reflections on the example of INTERREG CBC programmes

Transnational cooperation in the Danube region has a long tradition, dating back to 1996 with the CADSES programme [15]. This was followed by CADSES II until 2007, when the South East Europe (SEE) Programme was created with some geographical adjustments. It can be seen as the direct predecessor of the Danube Transnational Programme. 16 participating countries participated in the SEE Programme, some of which are not part of the Danube Transnational Programme [16], but continue to cooperate in the Adriatic-Ionian Programme [17] (Albania, Greece, Italy and the Balkans-Mediterranean, Former Yugoslav Republic of Macedonia). Compared to the previous SEE, the Danube Transnational Programme includes the German states Baden-Württemberg, Bavaria and the Czech Republic.

The Three Seas Initiative (TSI), also known as the Baltic-Adriatic-Black Sea Initiative (BACI) or the Three Seas Initiative, is an association of thirteen European Union states and two partner countries [18]: Ukraine (from 2023) and Moldova (from 2023), located in Central and Eastern Europe. The territory of the participating countries has access to the Adriatic, Baltic and Black Seas. The aim of the organisation is to promote regional dialogue

on various issues affecting the member states. The first summit meeting of the participating countries took place in 2016 in Dubrovnik.

Organisations from outside the programme area can only participate in DTP competitions as Associate Strategic Partners (ASP) [19]. These, according to the Guidelines, do not have their own project budget, but one of the funding partners will support their participation through "Sponsored" travel and accommodation expenses. The Programme Management also provides for the costs of external expertise and services [20] provided by a public or private law body or an individual who is not a beneficiary of the project. For the purpose of "Integration" in international thematic projects with the participation of organisations from the regions of the Republic of Moldova, examples of European best practice of cross-border cooperation, which underpins the EU Regional Policy based on the results of the participation of our researchers in international conferences, we provide a comparative analysis of the practice of the programme Macroregion "Adriatic-Ionian" [21] . The definition of "embedding" used in the project Embedding Macro-Regional Strategies (MRS) [22] means addressing MRS priorities, and possible approaches for projects, activities or other implementation processes in these programmes and initiatives, such as the «Three Seas Initiative» (3SI). This allows you to use programme data to implement macro-regional strategies. By 'mainstreaming', the integration of measures and projects foreseen or planned under macro-regional strategies into national, inter-regional or cross-border programmes can be achieved [23], Figure 3.
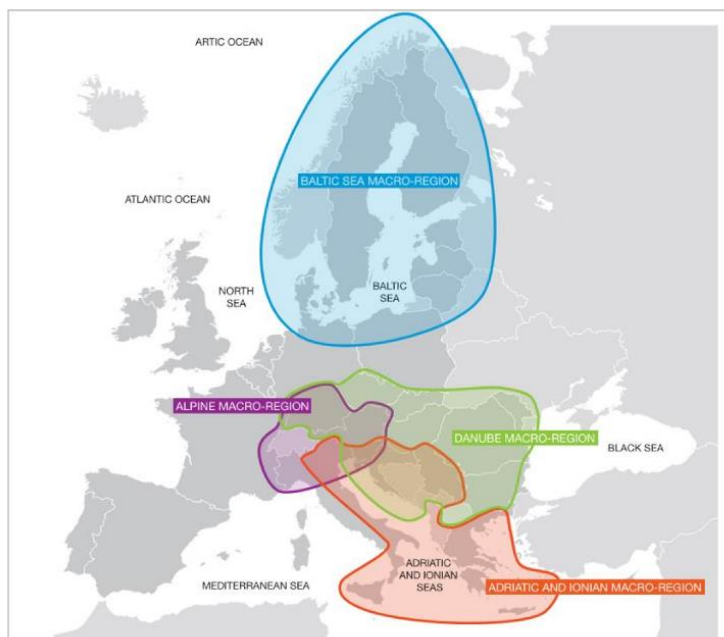

Fig. 3: Integration of macro-regional strategies into Interreg CBC programmes [23]

On 1 July 2023 the cross-border project "RecapMCV" [24], Interreg VI-A Italy-Slovenia 2021-2027 programme, was launched, which aims to contribute to increasing the visibility

of the cross-border tourism region by adding value, upgrading and promoting digital products and their impact developed within the MerlinCV project, which is based on increasing the value of the untapped potential of cultural and natural heritage and gastronomy. The project aims at: digitization of innovative cultural heritage, supporting innovative, integrated and sustainable tourism products in the Slovenian-Italian cross-border region; scientifically and professionally supported use of the unexploited heritage of castles and villas, as well as the heritage of the Patriarchate of Aquileia for innovative digital products for tourism; promoting learning or transfer of best practices in the context of transferring and improving methods of popularizing the project results among the general public. On this basis, the re-use and promotion of several pilot projects will be developed: customised trails, innovative presentation of cultural and natural heritage, digital products, thematic cycling trails and stories in tourism.

One of the potential reference regions [25] in interregional and transnational cooperation projects is the Friuli Venezia Giulia region (Italy). Its regional science park, AREA [26], promotes the socio-economic and socio-cultural development of all sectors of cross-border, transnational and interregional cooperation through a range of different activities, including "translating ideas into economic results", accelerating business and supporting innovation in traditional companies in the region. Given the relevance of the Culture and Creativity sector, the regional science park applies its innovative methodologies to cultural and creative enterprises as well. The business model for startups [27] (Figure 3) is an incubation model that aims to increase the chances of success of business initiatives by consciously and competently addressing every aspect of the project.

Fig. 3: AREA Science park startup business model (FVG, Italy) [27]

Park employees and partner organisations promote new investments, identify opportunities for development and innovation, promote collaboration in the world of research, business and culture and experiment with best practices, tools and methodologies for specific activities to take business to national and international dimensions in other areas. regions of Southern Eastern Europe. The Park is particularly committed to:
- Develops ideas and promotes the growth of startups.
- Accelerating the growth rate of existing companies.
- Promoting ecosystem development through cooperation between traditional and cultural-creative businesses.

The aim of the regional park is to create an innovation ecosystem in which public administrations, research centres, businesses, associations and independent professionals

work in synergy, benefiting from the value created by cooperation between traditional economic systems and cultural and creative systems. Area Science Park also participates in the High Impact Net, which, in combination with other assets of the ARGO system [28], aims to facilitate the creation of digital start-ups through the adoption of technologies that contribute to Industry 4.0. What tools are useful to turn an idea into a successful enterprise? Which new business models are most effective? How can digital transformation boost innovation and creativity in production processes in the cultural and creative sector? These are some of the areas covered by Creative.net, a coaching, clustering and networking system specifically designed for cultural and creative businesses in the Friuli Venezia Giulia region and beyond, promoted by Area Science Park in the context of the ARGO scheme.

The aim of Creative.net is to provide cultural and creative businesses with the opportunity to develop and/or strengthen the technical, managerial and business expertise needed to grow and consolidate successful businesses. In addition to training, this track also provides participants with the opportunity to meet and network with other businesses in the sector, creating networks and developing synergies. Creative.net is aimed at all cultural and creative organisations interested in innovation, technology transfer and business development: start-ups and innovative businesses, professionals, companies and associations, government agencies, research centres and universities.

The Interregional Innovation Investment Facility (I3) work programme [29] aims to promote innovation through smart specialisation and interregional cooperation. The I3 instrument supports stronger cross-regional investment collaboration and creates sustainable connections by uniting regional ecosystems into common smart specialisation areas, vital for accelerating market uptake of research results and stimulating innovation. It therefore focuses on:

- Strand 1 - Financial and advisory support for investment in interregional innovation projects.
- Strand 2a - Financial and advisory support for the development of value chains in less developed regions

Increasing the capacity of cross-border and regional innovation ecosystems in less developed regions to participate in global value chains, as well as the capacity to engage in partnerships with other regions, is a priority for members of the European University Association (EUA). As EUA argues in its recent report [30], universities are key drivers of sustainable innovation ecosystems. Innovation involves the co-creation and transfer of knowledge that brings social, economic and environmental benefits through new ideas, approaches, technologies or ways of organising. Ensuring that new solutions are the right ones and that regions embark on innovation paths that are relevant and realistic therefore depends on a proper understanding of the social needs and requirements on the ground. Achieving this requires conceptualising innovation as a process based on co-creation, rather than an outcome driven solely by technical solutions.

The famous phrase of Dokuceaev V.V. [31], which has become a kind of spell: "Codry is particularly characteristic in the Reut and Byk basins, where the area can truly be called

the Switzerland of Bessarabia", as well as the territory of the national reserve "Codry" [32] and the north-western corner of the Khotyn [33], which are described in the report of the scientist's expedition, can become pilot areas of interregional and cross-border cooperation within the priorities of the Danube Strategy 2021-2027 administered by the working groups. Many people know this expression and are proud of this comparison, but it should not be taken too literally: after all, in the Codri there are no Alps, Mont Blanc, eternal snow, but there are such gentle, so artistic perspectives of nature and there is no such harshness as in the Alps. But perhaps Dokuchaev considered this the highest praise, elevating the Codri in terms of picturesqueness and beauty to something in this respect absolutely recognized by everyone - Switzerland! These conclusions served as a motivation for the authors of the article to get acquainted with the new interregional research and cooperation territory "Macroregion of the Alps" [34] and its strategy, which involves 7 countries: Austria, France, Germany, Italy, Liechtenstein, Slovenia and Switzerland.

In order to apply the subsidiarity principle, the Committee of the Regions proposed that 'Community programmes devoted to research and regional policy should be coordinated in order to promote research development projects as close as possible to the citizen' [35]. In addition, after adopting a positive conclusion on the Commission's October 2000 Communication on European guidelines for research, it also stressed the importance of the regions' role in linking the European and local levels in research and innovation activities, including strengthening international cooperation by mobilising the potential. of local universities with regional and local authorities.

The starting point for the methodological approach to the UNECE smart city indicators were the smart city profiles developed by AOCA in 2013 for 12 Austrian cities [36]. As many cities and municipalities in Austria were actively implementing energy and climate strategies, creating case studies that could help build a common knowledge base and disseminate best practice models was an effective way to support cities in achieving this goal. In our paper, we decided to merge AOCA (UNECE) practice in relation to the development of the National Concept of Smart Settlements in Rural Development Regions in the context of identifying opportunities for impact mapping using a set of pan-European socio-economic indicators for inter-regional measurements/comparability of the tangible cultural heritage of digital transformation:

Table: Smart Sustainable Cities indicators

Domeniul	Subiectul	№	Index	Tipologie
Economie	T1.1 Infrastructura TIC	1	C1.1.1 Acces la internet în gospodării	de bază
		2	A1.1.1 Distribuția dispozitivelor electronice	de bază
		3	A1.1.2 Abonament wireless în bandă largă	adițional
		4	A1.1.3 Abonament fix în bandă largă	adițional
	T1.2 Inovare	5	C1.2.1 Cheltuieli de cercetare-dezvoltare	de bază
		6	C1.2.2 Brevete	de bază
	T1.3 Angajare	7	C1.3.1 Tendințe de ocupare	de bază
		8	A1.3.1 Angajarea în creative industrie	adițional

		9	A1.3.2 Ocuparea forței de muncă în industria turismului	adițional
	T1.4 Comerț – comerț electronic	10	C1.4.1 Tranzacții de comerț electronic	de bază
		11	A1.4.1 Plăți electronice și mobile	adițional
		12	A1.4.2 Export/import intensiv de cunoștințe	adițional
	T1.5 Performanță	13	A1.5.1 Companii care furnizează servicii electronice	adițional
		14	A1.5.2 Platforme de calcul	adițional
		15	A1.5.3 Tendințe în IMM-uri	adițional
Societate și cultură	T3.5 Cultura		C3.5.1 Biblioteci inteligente	de bază
			C3.5.2 Infrastructura culturală	de bază
			C3.5.1 Situri de patrimoniu cultural protejat	adițional

Source: developed by UNECE-ITU [36]

4. Regional cultural and creative ecosystems

The integration of the regions of the Republic of Moldova into the interregional innovation platform of the smart specialization "Regional Cultural and Creative Ecosystems" [37], with the support of innovative university organizations, will increase the potential of the richness of its "Local Cultural Heritage". The European identity and the dynamism of cultural and creative industries (CCIs) with increasing influence both economically and socially, both at European and national level. For example, in EU countries, CCIs contribute to the economy, providing 5.3% of total European GVA (Gross Value Added) and employ over 12 million people, accounting for 7.5% of total employment in the economy as a whole . Their growth potential is expected to be further enhanced by new technologies (NT):

- CCIs are increasingly recognised as a catalyst for NT innovation. Design is increasingly seen as a strategic tool for user or user-centred innovation.
- CCIs are in a strategic position to create ripple effects in other industries. Culture and creativity have a direct impact on sectors such as tourism and are integrated along the value chain in other sectors such as food, fashion and high-tech.
- CCI has the power to improve lives, transform communities and local/regional economies and generate growth and skilled job creation. The combination of art, markets and technology also has the potential to be used more widely in low-tech companies and in the services sector related to well-being and quality of life (e.g. housing, education).

The Regional Cultural and Creative Ecosystems Platform (CCRE-S3) aims to stimulate new ideas and opportunities around cultural and creative experiences for local communities and residents by engaging four clusters of professions that use, apply and implement STEM in the CCI sector:

- Creative entrepreneurs (including art and design), architects, urban planners;
- Cultural heritage specialists in cultural institutions;

- Cultural and creative intermediaries and managers (cultural institutions and operators promoting participation, cultural interaction and communication on cultural experiences/expansion of offers);
- Publishing professionals and audiovisual professionals involved in various forms of cultural production (including digital).

CEMR-S3 will facilitate Joint Research Center of EU Commission (JRC) investments and joint projects based on DIGITAL TECHNOLOGIES (geo-referenced information systems, seismic, acoustic and ultrasonic sensors, remote sensing with drones - UAVs, digital photogrammetry and 3D/4D modelling, Internet of Things, advanced protocols) multimedia, mobile applications, smart guides, Gamification and serious games, augmented reality, 5G implementation, etc.), PHOTONICS (Laser systems for restoration, Laser instruments for diagnostics and archaeometry, X-ray and tomography devices, Holography and laser show, etc. .) AND OTHER KETS (Nanomaterials for deoxidation, purification, consolidation, Biomaterials for recovery, Microwave processing systems, Nanotubes for controlled heating, etc.).

In addition, CEMR-S3 promotes multi-stakeholder dialogue to unify views on new KIC models based on human-centred user experience design, circular economy creativity and urban/rural regeneration and open and collaborative innovation paradigms. The overall horizontal objective should be to increase the value of the overall characteristics of the CCI sector and to create a permanent discovery and update mechanism to carry out activities to identify strategic investments in regions and use innovation transfer tools.

5. Management of state protected natural areas in terms of cultural heritage

Preservation of natural heritage is one of the priorities of any state, and the Republic of Moldova is no exception, thus aligning itself with international standards on the management of natural resources in general, and state protected natural areas in particular. Unlike Romania, which established in 2016 a separate structure to ensure the systemic management of these areas - the National Agency of Protected Natural Areas ANANP by Law 95/2016, the Republic of Moldova only initiated a project in 2023 to strengthen efforts towards integrated management of state protected natural areas. The consolidation of the national network of state protected natural areas will be achieved by establishing a National Agency on the Administration of Protected Natural Areas [38].

In terms of legislation, the Republic of Moldova is already in line with international criteria for the management of natural elements, for example - the National Ecological Network was created on the basis of the international environmental framework (Pan-European Ecological Network in Strasbourg, 1997; Convention on the Conservation of European Wildlife and Natural Habitats in Bern, 1979; Convention on Biological Diversity in Rio de Janeiro, 1992; Convention on the Protection of the Black Sea against Pollution in Bucharest, 1992 etc. The Moldovan legislator defines the National Ecological Network (REN) as part of the pan-European ecological network (Law 94/2007, art.1) recognising its core areas as "territories of particular value for the conservation of habitats, species and landscapes". Both the categorisation of natural areas in the Republic of Moldova and the descriptions of the core areas are based on IUCN standards. Many natural areas, such as

scientific reserves, have a well-profiled social and economic value, with "scientific and cultural-educational importance" expressly mentioned in their statutes [39].

In essence, nature and scientific reserves are a genetic reserve of rare and endangered plant species, and also a place for the development of ecological tourism and photographic activity, and tourism as an activity is one of the most dynamic areas of development. The promotion of natural heritage, ecological tourism and the study of local traditions in terms of cultural heritage - form a nexus that must be analysed ecosystemically and developed in symbiosis. "Ecotourism is travel to natural areas to learn about host communities, generating economic opportunities in support of ecosystem conservation and protection" [40]. A relevant example of this is the Lower Dniester Nature Park (Figure 4).
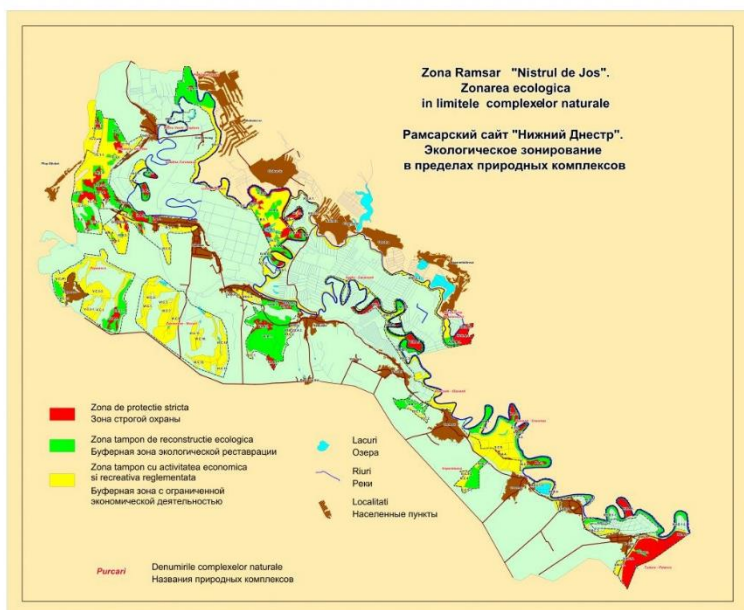

Fig. 4. Ecological map of the Lower Dniester Ramsar Area

The Lower Dniester Nature Park obtained this status in 2022, previously the status of Nature Park was held only by Old Orhei. It is also part of the network of Ramsar Sites (Ramsar Wetlands of International Importance) and is the only national park on the Dniester under the Ramsar Convention. The historical heritage of the Lower Dniester is reflected in the number of tourist attractions that have a well-defined historical value and cultural diversity that are part of the national and international heritage [41]. The Ramsar area includes the most famous winery in Moldova "Purcari", the emeralds of the Dniester necklace, churches, islands (including the largest island on the Dniester at the confluence with the Turunciuc arm), marshes, gardens ("Turkish Garden" being one of the oldest protected areas in Europe) museums, fortresses etc., and in the section where it meets the Nistru River (144 km), it has the greatest degree of meandering in the Republic of Moldova. The traditional events included in the calendar of large-scale festivals in the Lower Dniester Ramsar Area bring together folk craftsmen from more than 8 localities, representing more

than 21 local communities. The cultural heritage (medieval glasshouses, ancient and medieval fortifications, representative churches, wine trail, etc.) is thus enhanced in tandem with nature conservation measures through the integrated management of state protected natural areas.

One of the targets of the EU Biodiversity Strategy is to increase the area of protected areas to 30% (currently reported at 26%) [42]. Thus, both Romania with 23% coverage of natural areas and the Republic of Moldova with just over 5% will continue for the next 7 years to develop national programmes in this direction. In this context, the management of information data on zonation and relevant activities is a new challenge for all actors involved. The European Union has created an official website for biodiversity information systems, with the aim of systematizing key measures and factors for effective nature conservation [43]. The EU's interest is to ensure not only the quantitative but also the qualitative aspect of protected area management, so through the Strategic Plan of the Convention on Biological Diversity 2011-2020, it has established a commitment in which parties have undertaken efforts to develop a more systematic assessment of protected area management effectiveness (PAME) and to provide information on these results to the Global Database on Protected Area Management Effectiveness (GD-PAME), this is the most comprehensive global repository of information, covering over 28,000 different protected areas and providing information on 20% of global protected area coverage according to UNEM-WCMC. The database is hosted on the Protected Planet website and provides 14 results for the Republic of Moldova [44].

Thus, measures with a practical impact at local level must be linked to regional objectives through collaboration with regional development agencies, at national level through the programmes drawn up by the executive and the legislator's national strategies, and, in a systemic way, with the European Union's strategic direction which prepares recommendations on the criteria for standardising working instruments. Through its commitment to digital transformation, the Republic of Moldova can raise its success indicator for the valorisation of cultural heritage if it emphasises the environment-culture-tourism nexus, but also support the collaboration of creative entrepreneurs in the Danube macro-region.

6. Conclusions
The presented best practices from the countries of the Danube Strategy Macro-region and South-Eastern Europe play an important role in enhancing inter-regional cooperation of HEIs from the Republic of Moldova [45] with stakeholders within local innovation ecosystems. The contribution of HEIs from the Danube Region [46]and SEE and their impact at policy and system level has a much stronger integration, linkages and acceleration in their local ecosystems, within the cooperation framework of the European Universities Alliance (EuUn) initiative than Knowledge Alliances, which is ensured by conducting detailed preliminary analyses with higher probability, S3 areas and local skills and supply needs for the examples. The South East European practice presented in the article and introducing the researchers to the innovation ecosystem of the Autonomous Region FVG from Italy shows that in terms of organisational and individual impact, the Knowledge Alliances (KA) initiative can demonstrate a strong focus and impact with regard to the

development and implementation of innovative learning and teaching methods and the adoption of challenge-based, collaborative and interdisciplinary approaches. The business model of start-ups in the cultural heritage and creativity sector of AREA Science Park demonstrates the potential to enhance the institutional and individual benefits of CA actions in cooperation with the European University of Trieste, which are significant and sustainable, while academic activities and models of cooperation can be built and improved after the end of the project term and extended to other communities, fields of knowledge and disciplines. In this context, the need to develop and/or regularly update comprehensive and forward-looking digital strategies for cultural heritage at the relevant national or regional level to accelerate the digital transformation of the sector, leads the authors of the article to make the following recommendations:

1. Cultural Heritage and Identity in South-Eastern Europe emphasise the fact that cultural heritage is a cornerstone of local, regional, national and European identity. Their preservation and protection as well as the strengthening of social identity at local and regional level are key factors for sustainability. Cultural heritage is centred on society and plays a pioneering role in the fight against poverty and social exclusion, as it is a source of economic development and social cohesion. In this context, in adapting new forms of university-business interaction, such as the Life Lab Campus, it is advisable to organise opportunities for hybrid exposure (with virtual and physical presence) to cultural heritage at local and regional levels. This will help stimulate new ideas and opportunities related to cultural and creative experiences for local communities and residents regions Republic of Moldova [47] by creating cross-regional formal education programmes attracting several groups of professions that use, apply and implement new technologies in the cultural and creative industries sector.

2. Cultural heritage as an economic resource is considered important if policies for the sustainable development of cultural heritage are to have positive effects in the short, medium and long term to improve the economic situation and quality of life in the region concerned. Cultural heritage can also be a driving force in planning for inclusive local and regional development and the development of creative industries, as well as contributing to economic growth by increasing access to cultural assets. In this regard, it is advisable, when planning measures to stimulate competitiveness, to take into account its key elements - openness to innovative solutions for the preservation of cultural heritage, implemented also through innovative public-private partnerships within the frameworks of the "Digital Transformation Strategy Moldova 2030", the National Programme "European Village" and others.

3. According to the updated EU Higher Education Programme it is emphasised that Higher Education Institutions (HEIs) should participate in the development of their regions and cities by integrating local, regional and social issues into their curricula, collaborating with business, involving the local community in teaching, research and lifelong learning, but also by building links with the local community and contributing to regional development. Following the European recommendations, universities in the Republic of Moldova can contribute to the sustainability and regeneration of regions and localities, through more effective inter-regional partnerships and transnational co-operation in addressing social challenges, and through increased co-operation with their industrial ecosystems.

References

[1] Cultural and Creative Regional Ecosystems (CCRE-S3): https://s3platform.jrc.ec.europa.eu/cultural-and-creative-regional-ecosystems# ;

[2] Some aspects of the formation of an innovation ecosystem for sustainable development of smart villages in the Republic of Moldova: https://dl.acm.org/doi/abs/10.1145/3551504.3551517

[3] Smart Infrastructures for Rural Areas - Best Practices and Suggested Actions for Moldova: https://ibn.idsi.md/vizualizare_articol/132721;

[4] Participating countries. https://danube-region.eu/about/the-danube-region/;

[5] Smart Specialisation activities in the EU Strategy for the Danube: Region.https://s3platform.jrc.ec.europa.eu/danube-region

[6] European University Association (EUA).https://eua.eu/about/who-we-are.html

[7] Creșterea prosperității: Sinteză privind: Comunicare privind Strategia Uniunii Europene pentru regiunea Dunării și Document de lucru – Planul de acțiune care însoțește Strategia Uniunii Europene pentru regiunea Dunării, data ultimei actualizări: 09.04.202. https://eur-lex.europa.eu/RO/legal-content/summary/european-union-strategy-for-the-danube-region.html

[8] European Research Area (ERA). https://www.consilium.europa.eu/en/policies/european-research-area/

[9] Entrepreneurial Discovery Process (EDP). https://s3platform.jrc.ec.europa.eu/edp

[10] 6 septembrie 2023, Chișinău - Cabinetul de miniștri a aprobat "Strategia de Transformare Digitală a Republicii Moldova pentru anii 2023-2030: https://cancelaria.gov.md/ro/content/cu-privire-la-aprobarea-strategiei-de-transformare-digitala-republicii-moldova-pentru-anii

[11] Recomandarea (UE) 2021/1970 din 10 noiembrie 2021 privind o „zonă europeană comună de date pentru moștenirea culturală". https://op.europa.eu/ro/publication-detail/-/publication/bb05f4db-435a-11ec-89db-01aa75ed71a1/language-ro

[12] Danube Civil Society Forum (DCSF). https://danubestrategy.eu/about

[13] UNESCO declares world's first 5-country biosphere reserve along Mura-Drava-Danube. https://www.iucn.org/news/protected-areas/202201/unesco-declares-worlds-first-5-country-biosphere-reserve-along-mura-drava-danube

[14] Danube Transnational Project "AMAZING AOE Responsible Green Destination Amazon of Europe". https://www.interreg-danube.eu/approved-projects/amazing-aoe

[15] Transnational cooperation in the Danube region has a long tradition, dating back to 1996 with the CADSES program. https://www.interreg-danube.eu/about-dtp/south-east-europe-programme-2007-2013

[16] Danube Transnational Cooperation Programme. https://www.interreg-danube.eu/

[17] ADRIATIC – IONIAN REGION: https://www.adriatic-ionian.eu/about-eusair/adriatic-ionian-region/

[18] Joint Declaration of the Eighth Summit of the Three Seas Initiative, article 6, Bucharest, 6-7 September 2023. https://3seas.eu/media/joint-declaration-of-the-eighth-summit-of-the-three-seas-initiative

[19] Associate Strategic Partner (ASP), Danube Transnational Cooperation Programme: https://www.interreg-danube.eu/uploads/media/default/0001/04/5cc0994a30a3938c783f2a4fc824a30e743745db.pdf

[20] Manual on eligibility of expenditure DTP, art.2.2.4. External expertise and services costs, page 21: : https://www.interreg-danube.eu/uploads/media/default/0001/56/8f79e943cbe22423ccde34cb95b6ae690fb44c02.pdf

[21] Interreg IPA ADRION Programme (2021-2027). https://www.adrioninterreg.eu/

[22] Embedding of Macro Regional Strategies: Reflexions based on the example of Interreg CBC Programmes: https://danube-region.eu/danube-events/embedding-of-macro-regional-strategies-reflexions-based-on-the-example-of-interreg-cbc-programmes/

[23] Expertise: Embedding of Macro-Regional Strategies: reflexions based on the example of INTERREG CBC Programmes:. https://danube-region.eu/expertise-embedding-of-mrs-austria/

[24] Program Interreg VI-A Italia-Slovenia 2021-2027, project "RecapMCV" (Recapitalization of MerlinCV – to provide inovative experiences of natural and cultural heritage in a cross-border area: https://www.ita-slo.eu/en/recapmcv

[25] Benchmarking Regional Structure Rev. 2013, finding reference regions based on structural similarities. https://s3platform.jrc.ec.europa.eu/region-page-test/-/regions/ITH4

[26] AREA Science park now-how activities: https://en.areasciencepark.it/startups/culture-creativity-and-tourism/

[27] Business Model for Startups: https://en.areasciencepark.it/startups/business-model-startups/

[28] AREA Science Park now-how - Industrial development method ARGO SYSTEM: https://www.sistemaargo.it/en/industrial-development/industrial-development-method/

[29] Interregional Innovation Investments (I3) Instrument - the new instrument of the ERDF aims to strengthen economic cohesion in the EU by helping businesses work with innovation actors in other regions. https://eismea.ec.europa.eu/programmes/interregional-innovation-investments-i3-instrument_en

[30] Kamila Kozirog, Sergiu-Matei Lucaci and Stephane Berghmans, march, Results of the EUA survey on universities and innovation:, 2022. https://eua.eu/downloads/publications/innovation%20report.pdf;

[31] I. Krupennikov, "V.V. Dokuchaev about Bessarabia", Ministry of Agriculture of the Republic of Moldova, Institutul de Pedologie, Agrochimie și Protecție a Solului 'Nicolae Dimo', 1996. http://www.eco-tiras.org/docs/berg/Krupenikov-about-besarabia.pdf ;

[32] Rezervația"Codri". https://moldova.md/ro/content/rezervatia-codri;

[33] City Khotyn, Ukraine. https://placesofpeace.eu/2021/12/29/the-city-of-khotyn-ukraine-joined-enpp/ ;

[34] Macroregion Alpine. https://mrs.espon.eu/EUSALP/index.html;

[35] Priorities: https://cor.europa.eu/en/our-work/pages/cor-priorities.aspx ;

[36] Economic Commission for Europe (UNECE) Committee on Housing and Land Management, page 2 art 5, Seventy-sixth session Geneva, December 2015. https://unece.org/fileadmin/DAM/hlm/projects/SMART_CITIES/ECE_HBP_2015_4.pdf ;

[37] S3 Industrial Modernisation partnerships, Cultural and Creative Regional Ecosystems: https://s3platform.jrc.ec.europa.eu/cultural-and-creative-regional-ecosystems;

[38] Notă oficială a Ministerului Mediului privind inițierea unui nou proiect dedicat ariilor protejate: https://www.mediu.gov.md/ro/content/4509

[39] Legea Republicii Moldova privind fondul ariilor naturale protejate de stat nr. 1538 din 25.02.1998.https://www.legis.md/cautare/getResults?doc_id=108578&lang=ro

[40] M. Viorel and G. Veaceslav, Turismul în ariile naturale din Republica Moldova, Chișinău: „Continental Grup", 2005.

[41] Ghid Turistic Nistrul de Jos. Societatea Ecologică Biotica, 2020.

[42] European Environmental Agency - Indicators on Terrestrial Protected Areas in Europe: https://www.eea.europa.eu/en/analysis/indicators/terrestrial-protected-areas-in-europe

[43] Biodiversity Information System for Europe: https://biodiversity.europa.eu/europes-biodiversity/protected-areas/management

[44] World Database on Protected Areas (WDPA). Protected Planet: https://www.protectedplanet.net/en/thematic-areas/protected-areas-management-effectiveness-pame?tab=Results

[45] „Noi provocări ale cercetării la începutul secolului XXI". [S. n.], CEP UPSC, 2023, p. 11-16, ISBN 978-9975-46, Chișinău: In Știință și educație: noi abordări și perspective: Materialele conferinței științifice internaționale, Seria 25, 24-25 martie 2023 https://drive.google.com/file/d/1e3Avqs8t8_Gf8RQHriwuMWAOZH5DxB2w/view

[46] „Noua geografie literară: Ucraina europeană" Lexic comun / lexic specializat. Fascicula XXIV din Analele Universității „Dunărea de Jos" din Galați. www.fabula.org

[47] V. Moraru, Recenzie la monografia „La République de Moldova: les enjeux du passé, du présent et de l'avenir", In: Moldoscopie, nr. 1(98), pp. 199-203. ISSN 1812-2566., 2023.