

Danube Region Strategy

Evaluation of the knowledge society in the Danube region (2010-2021)



The aim of the analysis

The aim of the study is to assess the current state and progress in knowledge society in the Danube Strategy countries, as well as to make recommendations for improving the situation in the region. The analysis focuses on Priority Area 7 - Knowledge Society (Research, Education, and ICT), which is jointly coordinated by Slovakia and Serbia.



The analysis contains four parts

1. The chapter ***Analytical evaluation of the knowledge society*** is the basis of the whole evaluation focuses on the quantitative and qualitative description and evaluation of the current state and progress that has occurred in the analysed period. It is divided into four parts that reflect the innovation process - inputs, activities, outputs, and short and long-term effects.
2. In the chapter ***Fulfilment of Objectives from 2016*** we focus on the evaluation of the set objectives as well as their fulfilment.
3. The chapter ***Evaluation of the Best Practice to Date and a SWOT Analysis of PA7*** contains summaries of what has been done in the region so far and especially the evaluation of strengths, weaknesses, opportunities, and threats.
4. The last chapter, ***Recommendation to improve the current state*** contains a proposal for measures that could strengthen the cooperation between countries in the region under PA7 in the next programme period.



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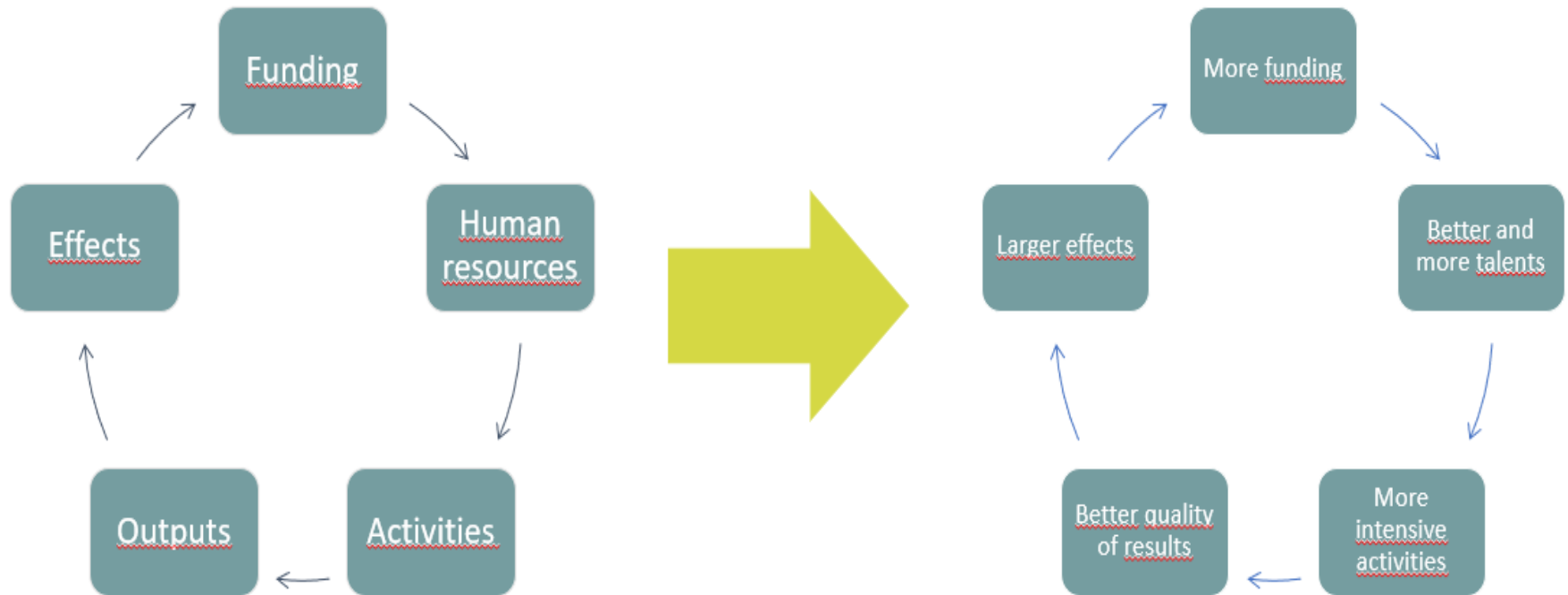


Methodology

- The analysis focuses primarily on the comparison of the knowledge society (especially research and innovation) in the Danube region since 2010. For some indicators and comparisons where data for 2010 are not available, we used data for 2014.
- The comparison was based primarily on data available in the databases of Eurostat, OECD, UNESCO, European Patent Office, WIPO, E-corda, and the Web of Science Core Collection. In the evaluation, we combined quantitative and qualitative methods, focusing primarily on the countries of the Danube region. In some cases, if a better comparison required it, we also used comparisons with other European countries. The analysis is partly influenced by the availability of data for individual countries and regions. First, data for non-EU countries are more difficult to access or are not available. This concerns mainly comparisons in the European Innovation Scoreboard.



Five main elements



Meeting the Danube strategy objectives

1. Increase the efficiency of funding research and innovations by setting up a coordinating funding network to initiate at least two activities per year (e.g., joint calls; proposals for joint strategic project applications (within a multilateral framework)).
2. Increase by 20% the number of EPO and PCT patent applications filed in the Danube region by 2020.
3. Enhance regional research and educational collaboration with a view to achieving 20% of academic mobility by 2020.
4. Increase the annual share of joint publications by 15% by 2020.
5. Develop RIS3 in each country (and its regions) by 2020.



1. Effectiveness of investment in research and innovation

- Three calls were announced under the Interreg Danube Transnational Programme. The first in September 2015, the second in May 2017 and the third in January 2019. The second round of the third call was concluded in November 2019 and the chosen projects were approved in May 2020.
- Seventeen projects were supported in the first call in the Innovation and Social Responsibility priority. Eight projects were supported in the second call. The third call included nine implemented projects.



2. Increase the number of patents

- The second objective of PA7 is to achieve a 20% increase in the number of EPO and PCT patent applications filed by the Danube region countries by 2020.
- While in our previous analysis we stated that the number of EPO patent applications increased by 0.33%, if we compare the data for 2010 and 2020, the number of patent applications even decreased, by **2.09 %**.
- As we have mentioned previously, this objective does not appear to be optimally adjusted, since, to meet the objective, the number of patent applications would have to increase by 4,435. The number of such patent applications, excluding Germany, attained 2,932. In other countries, except for Austria, the number of patent applications can be calculated mostly on two hands, sometimes there are dozens.



2. Increase the number of patents

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth
AT	1 744	1 734	1 874	1 993	1 964	1 989	2 024	2 209	2 281	2 346	2 303	32,05%
BA	2	0	3	1	0	0	2	0	1	2	4	100,00%
BG	11	16	13	23	34	33	20	32	31	35	52	372,73%
CZ	167	162	140	151	167	213	189	206	248	203	205	22,75%
DE	27 328	26 202	27 249	26 510	25 633	24 807	24 932	25 539	26 663	26 762	25 954	-5,03%
HR	17	18	19	10	12	9	16	10	14	19	22	29,41%
HU	107	96	105	103	114	97	107	95	118	97	107	0,00%
MD	2	0	1	2	2	1	0	1	2	2	1	-50,00%
ME	0	0	1	1	0	0	1	1	2	0	2	200,00%
RO	14	20	35	33	28	30	31	52	50	40	54	285,71%
RS	8	6	5	11	11	4	1	10	9	9	8	0,00%
SI	131	129	108	135	125	118	113	98	100	122	165	25,95%
SK	25	43	35	29	26	47	44	41	51	42	55	120,00%
UA	11	11	12	25	14	19	12	20	22	21	17	54,55%
Total	29 567	28 437	29 600	29 027	28 130	27 367	27 492	28 314	29 592	29 700	28 949	-2,09%

EPO patent applications and growth (2010-2020)



3. Increase academic mobility

- In assessing mobility, we again focused on joint projects within the framework of Marie Skłodowska-Curie activities which entailed the **mobility of researchers** and in which at least two Danube region countries collaborated.
- The most active was country Germany, which collaborated in at least one project with each of the Danube region country. Austria, Bulgaria and Romania follow in the list, each cooperating with twelve countries.
- Montenegro has the lowest number of collaborations (5). Bulgaria and Romania, the Danube region member countries which are in the middle of the region, collaborate with almost every country.



3. Increase academic mobility

	AT	DE	BG	CZ	HR	HU	RO	SI	SK	ME	RS	BA	MD	UA	Total
AT	290	1 137	5	90	20	91	37	60	28	3	7	0	1	10	1 779
DE	1 137	3 232	48	295	56	282	90	132	82	1	29	16	5	81	5 486
BG	5	48	553	3	6	1	6	3	4	0	11	1	1	1	643
CZ	90	295	3	48	2	35	20	8	16	0	8	0	0	12	537
HR	20	56	6	2	149	5	4	7	5	0	7	2	0	0	263
HU	91	282	1	35	5	104	25	8	11	0	9	0	2	3	576
RO	37	90	6	20	4	25	376	7	8	2	1	0	3	15	594
SI	60	132	3	8	7	8	7	82	2	2	0	3	0	2	316
SK	28	82	4	16	5	11	8	2	47	0	4	0	2	7	216
ME	3	1	0	0	0	0	2	2	0	6	2	0	0	0	16
RS	7	29	11	8	7	9	1	0	4	2	126	2	0	1	207
BA	0	16	1	0	2	0	0	3	0	0	2	14	0	0	38
MD	1	5	1	0	0	2	3	0	2	0	0	0	6	9	29
UA	10	81	1	12	0	3	15	2	7	0	1	0	9	37	178
Total	1 779	5 486	643	537	263	576	594	316	216	16	207	38	29	178	10 878

Common MSCA mobility projects

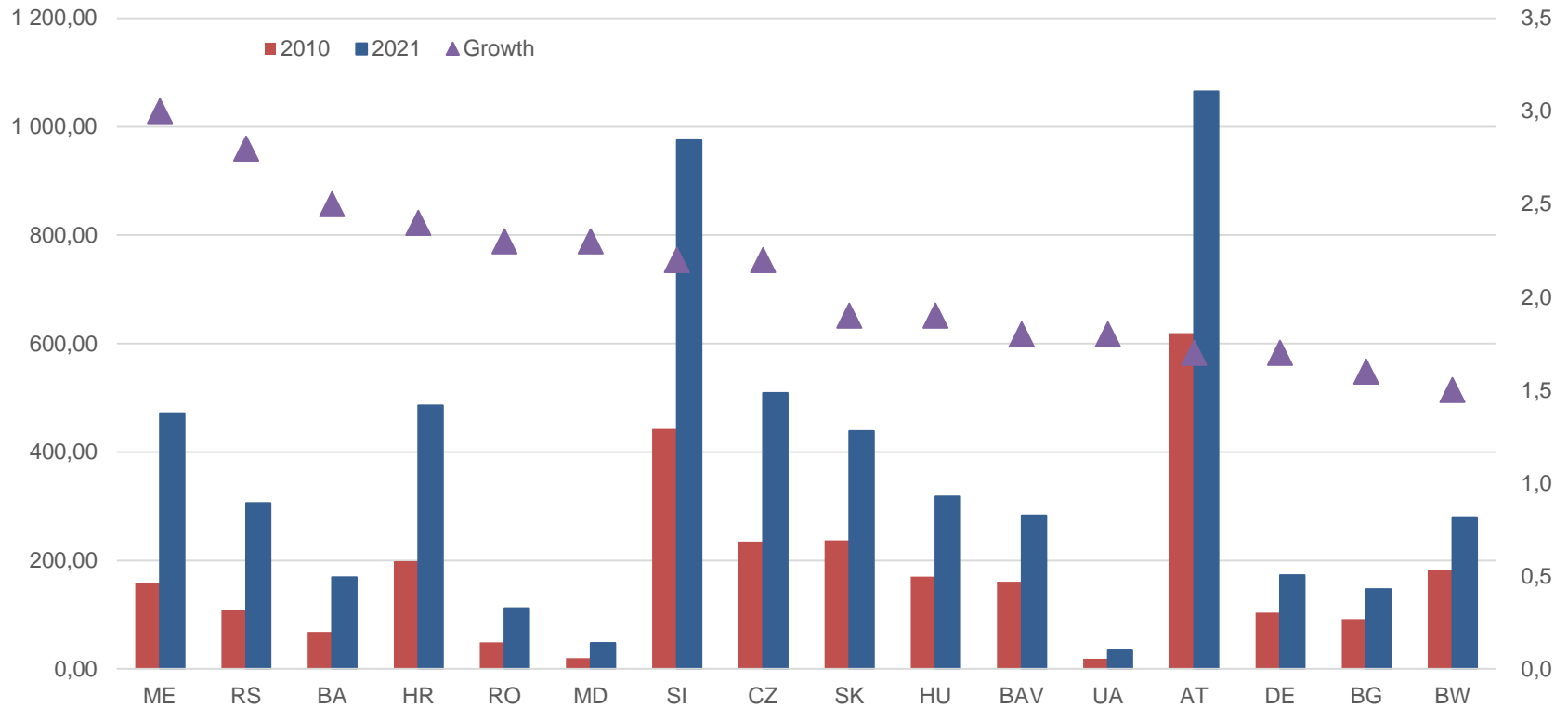


4. Increase the number of joint publications

- The fourth PA7 objective was to achieve a 15% increase in the number of joint publications of the Danube region countries by 2020.
- The number of joint publications increased on average by 102.93%.
- It grew the most in Montenegro, Slovakia and Bosnia and Herzegovina. However, it significantly exceeded the level of 50% in all countries. Hence, we can conclude that the production of joint publications between the Danube region countries has intensified
- The growth in the total number of publications is obvious even when we compare the total number of publications in countries over 5-year-periods. On average, their number increased by 59.22%. We recorded the most significant increases in Montenegro, Bosnia and Herzegovina and Moldova.



4. Increase the number of joint publications



Number of publication and growth by country with other countries in the Danube region



4. Increase the number of joint publications

	2010-2014	2011-2015	2012-2016	2013-2017	2014-2018	2015-2019	2016-2020	2017-2021	Growth
DE	48 220	51 226	54 896	58 297	61 851	65 759	69 215	70 931	47,10%
AT	29 896	32 011	34 705	37 218	39 891	42 627	45 160	46 520	55,61%
CZ	14 831	16 499	18 339	20 225	22 322	24 241	25 809	26 824	80,86%
HU	10 335	11 206	12 203	13 129	14 195	15 208	15 954	16 146	56,23%
SK	7 282	7 930	8 839	9 682	10 555	11 407	12 154	12 322	69,21%
RO	6 859	7 703	8 570	9 261	9 861	10 515	11 110	11 246	63,96%
SR	5 657	6 351	6 968	7 418	8 063	8 895	9 466	9 960	76,07%
SI	5 559	6 191	6 796	7 352	8 017	8 745	9 180	9 623	73,11%
CR	5 296	5 834	6 396	6 960	7 613	8 394	9 017	9 472	78,85%
UA	5 071	5 365	5 694	6 128	6 533	7 132	7 609	7 749	52,81%
BG	3 796	3 953	4 351	4 681	4 935	5 223	5 597	5 518	45,36%
BA	1 412	1 549	1 683	1 918	2 200	2 459	2 644	2 813	99,22%
ME	568	629	707	791	864	1 014	1 163	1 270	123,59%
MD	556	653	724	795	879	962	1 012	1 008	81,29%
Total	145 338	157 100	170 871	183 855	197 779	212 581	225 090	231 402	59,22%


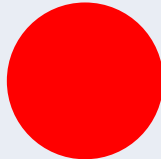





5. RIS3 in each country

- The fifth objective is to develop a Strategy for Smart Specialisation (RIS3) for each country and region within the Danube Strategy by 2020.
- The evaluation is based on the Smart Specialisation Platform operated by the Joint Research Centre of the European Commission.
- All the Danube Region countries developed and approved the RIS3 strategies or other strategic documents for research and innovation. In some countries, the national RIS3 strategy applies to all the regions (e.g., Slovakia).



Meeting the Danube strategy objectives

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Recommendations

1. Projects supported within the Danube Region should focus on interconnection and capacity building, which would in turn allow for greater joint participation in other instruments and programmes at European level.
2. A separate part of the Danube programme should focus on the mobility of researchers and students within the region, while maintaining a balanced brain circulation and preventing brain drain.
3. Projects should support the networking of different stakeholders from a variety of sectors - e.g., academic, private, public but also social stakeholders.
4. Short-term placements of researchers, innovators as well as project managers could also be supported within the region to disseminate best practice.
5. The exchange of best practices between public institutions should be encouraged within the region.
6. Separate part of the Danube programme should address the issue of technology and knowledge transfer.

