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SUSTAINABLE DEVELOPMENT AND ECONOMIC/MANAGEMENT CULTURE – A BIBLIOGRAPHIC QUANTITATIVE ANALYSIS

Katarzyna Mazur-Włodarczyk¹

Summary: Sustainable development issues are extremely important in the context of the world's environmental problems, as well as the shared resolution regarding the implementation of seventeen Sustainable Development Goals. The article focuses on presenting the results of a bibliometric study on the issues of sustainable development and culture in the field of economic sciences. It includes a review of the most popular scientific bibliographic databases of scientific texts - Web of Science and Scopus, and a structured literature review of texts published until January 2023 in English. Quantitative results were presented in the form of the word clouds and bibliometric maps.

Key words: sustainability, economic culture, management culture, sustainable development culture, literature review, bibliographic analysis

JEL classification: M14, Q01, Z1

Introduction

The research conducted in the area of sustainability and economic culture points to many complementary contexts. For instance, cultural rights, heritage, cultural diversity and creativity are essential elements of sustainable human development. Therefore, cultural aspects play a role in the success of the 2030 Agenda. Participation in cultural life can contribute to improving health and well-being. Cultural factors influence the behaviour of the representatives of given social groups and often inadvertently underlie production and consumption patterns. In addition, cultural factors, including relevant local and traditional knowledge, should be taken into account in the design, implementation and evaluation of policies and programs aimed at sustainable development (UCLG, 2018). In the area of culture located between sustainable development and human well-being, cultural indicators can be divided into subjective well-being, social well-being and governance (Martínez Rodríguez, 2021). The importance of culture is also described as special within the context of the transformational potential of thinking about sustainable development (De Beukelaer and Freitas, 2015). Sustainable development achieves higher indicators in countries with a specific cultural profile, e.g. representing the values of Western civilization

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(Pink, 2018). On the other hand, the culture of sustainable consumption (moderation) is contrasted with the dominant consumer culture (the culture of overuse). The culture of moderation is fostered by, among others, community mentality and the spiritual dimension of responsibility, therefore, the culture of sustainable consumption can be shaped by religious potential (Sadowski, 2021). Culture is also one of the candidates for the fourth pillar of sustainable development created by the area of economic, social and environmental responsibility. Whereas, the scientific discourse on the sustainable development of culture is organized around: heritage, vitality, economic viability, diversity, locality, eco-cultural resilience, and eco-cultural civilization (Soini and Birkeland, 2014).

Scientifically, texts devoted to the issues of sustainable development and culture can be divided into two groups: a sustainable environment for culture or cultural sustainability (Overbergh, 2014; Wang et al., 2021; Zhang et al., 2019; Bacchini and Valentino, 2020), and sustainable development culture (Domańska-Szaruga, 2020; Kountouris, 2022; Vveinhardt and Andriukaitiene, 2016; Wang et al., 2019). The first group is related to the cultural sector and the creative economy, while the second one is related to the organization (management culture/ organizational culture) conducive to achieving sustainable development.

In order to continue research on sustainable development in connection with economic and management culture, the article attempts to conduct a structured literature review (SLR) with a high degree of formalism and quantitative methods of analysis, enabling the conversion of quantitative results into bibliometric maps within the VOSviewer program. As part of the SLR applied among others: detailed inquiries, a narrow range in the selection of data sources and the selection of sources following the adopted criteria for the exclusion of texts that do not meet the conditions adopted at the beginning of the research (Ćwiklicki, 2020).

1. Material and Methods

The study used bibliometric analysis applicable to describing and explaining scientific phenomena and the generated stream of information (Grygiel et al., 2009). The resources of two databases were used - Web of Science (WoS) and Scopus. The first of the databases has been operating since 1960, and over 171 million documents are indexed within it. The second database includes over 84 million records, and most of the texts (over 58.5 million records) were published after 1995. Moreover, there are 404.3 thousand texts available in the WoS database under the key "*sustainable development*", while "*sustainability*" appears in over 23.8 thousand results. In the Scopus database, the first of these entries is associated with 376.6 thousand texts, and the second with 1.7 thousand.

In the study, a two-stage method of text selection was applied, including articles in journals and conference materials, reviews and chapters of monographs. The first stage was related to the selection of texts published until January 5th, 2023, in the titles, keywords and abstracts of which the following entries appeared: "*sustainable development*" AND "*economic culture*", "*sustainable development*" AND "*management culture*", *sustainability* AND "*economic culture*", and *sustainability*

AND “management culture”. The WoS database allows one to choose the title and abstract criteria, while the Scopus database has - title, abstract and keywords. The second stage was related to the removal of duplicates, which resulted in undertaking the analysis of 116 works. The query terms were formulated for each database separately, and their results were presented in the comparative tables. The total value of queries for WoS - 72 and Scopus - 44 was obtained by adding the results for each of the searched queries. Tables 1 and 2 present the above literature review process and the quantitative results obtained during query generation.

Table 1. A structured literature review process.

Stage 1 Positive selection within the title, abstract/ or title, abstract and keywords	Search with multiple terms n _{WoS} : 81, n _{Scopus} : 50
Stage 2 Negative selection within the acquired texts	Duplicate removal n _{WoS} : 72, n _{Scopus} : 44
Stage 3 Review of texts qualified for the study using programs WordArt and VOSviewer	n _{WoS} : 72, n _{Scopus} : 44

Source: own elaboration

Table 2. Quantitative SLR results.

	Entries	Scopus	WoS
Stage 1			
1	“sustainable development” AND “economic culture”	14	13
2	“sustainable development” AND “management culture”	0	18
3	sustainability AND “economic culture”	10	10
4	sustainability AND “management culture”	26	40
	Sum	50	81
Stage 2			
1	“sustainable development” AND “economic culture”	14	10
2	“sustainable development” AND “management culture”	0	12
3	sustainability AND “economic culture”	4	10
4	sustainability AND “management culture”	26	40
	Sum	44	72

Source: own elaboration

Files from the databases were downloaded in Tab-delimited (WoS) and CSV (Scopus) formats. The obtained results were processed with the use of publicly available programs, WordArt generating a cloud of words, and VOSviewer enabling the generation of maps of connections between entries. The quantitative results were analyzed separately for each of the databases.

2. Results

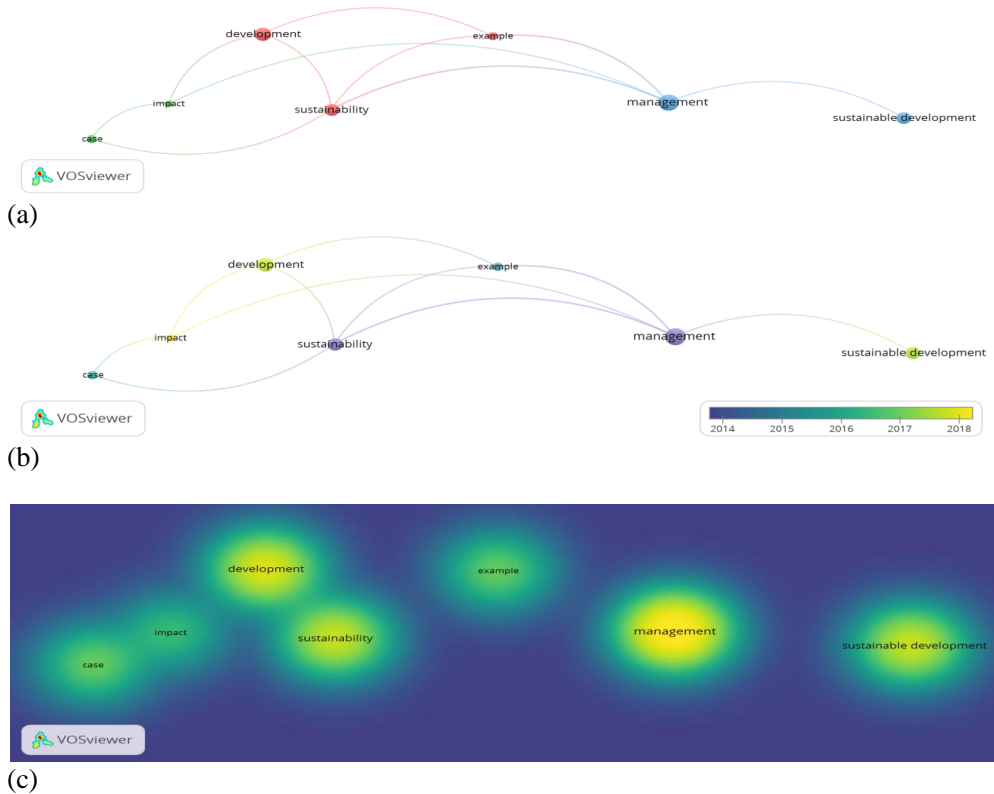
The analyzed articles from the WoS database concerned the following main categories → business: 19 texts; environmental studies: 31 texts; green sustainable science technology: 16 texts; economics: 13 texts; management: 9 texts; management and region urban planning: 7 texts each; social sciences interdisciplinary and education educational research: 6 texts each; engineering environmental: 5 texts; engineering industrial: 4 texts; engineering multidisciplinary and computer science interdisciplinary applications: 3 texts each; international relations, materials sciences multidisciplinary and mathematic interdisciplinary applications: 2 texts each, and one text each within: public administration, ecology, geography, law, humanities multidisciplinary, geosciences multidisciplinary, computer science information systems, engineering chemical, philosophy, psychology, psychology multidisciplinary, transportation, political science, plant sciences, urology nephrology, development studies, cultural studies, operational research management science, agronomy, behavioral sciences, operational science multidisciplinary, operation research, biodiversity conservation, public environmental occupational health, construction building technology, engineering civil, gerontology, health policy services, information science library science, and meteorology atmospheric sciences.

The articles from the Scopus database selected for analysis concerned the following categories (subject areas) → environmental science and social science: 16 texts; business, management and accounting: 15 texts; engineering: 10 texts; economics, econometrics and finance, as well as decision sciences: 5 texts each; mathematics, and medicine: 4 texts each; arts and humanities, agricultural and biological sciences, energy, and computer sciences: 3 texts each, earth and planetary sciences: 2 text, and material science: 1 text.

The obtained quantitative results regarding the content of titles, abstracts and keywords were entered into the WordArt program, which is an online word cloud generator. In this program, it is possible to sort words according to the criterion of their most frequent appearance. The resulting word clouds are shown in Figure 1a-b.

development, and 3. green - impact and case. Figure 2a-c presents the obtained results of bibliographic coupling and the density visualization co-occurrence.

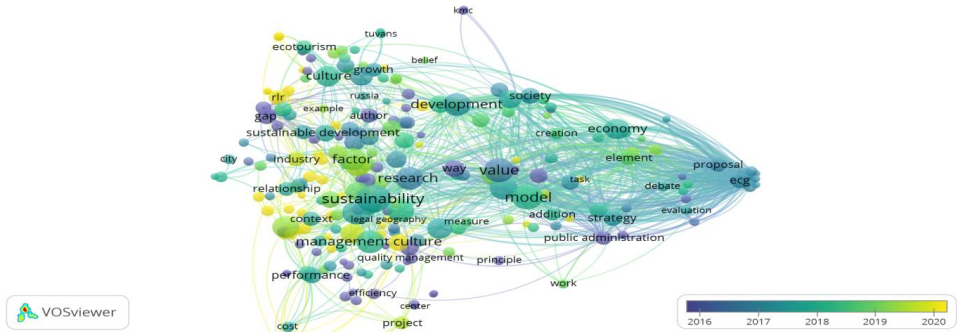
Figure 2a-c. Network associations (a), overlay visualization (b), and density visualization (c) for the WoS



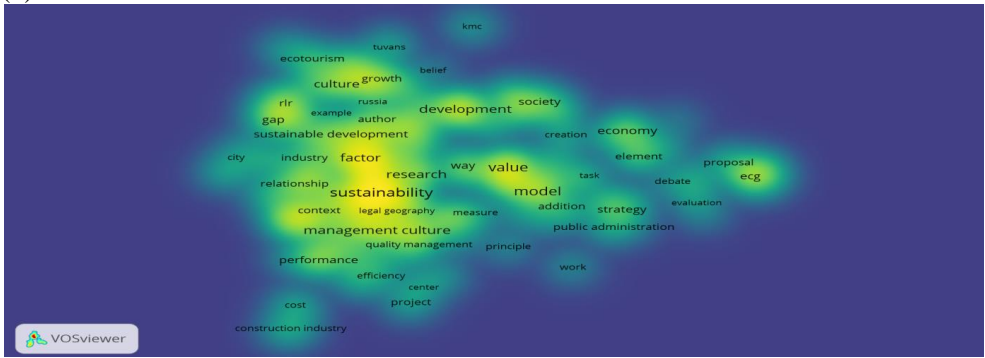
Source: Own elaboration.

The above visualizations show that the subject of management is the best-researched area. In addition, the highest density is also associated with the terms sustainability, development, and sustainable development, indicating that these issues are more widely researched than the others.

As part of this database, publications on the researched topics appeared in print in the period 2002-2022. There is a noticeable upward trend in scientific involvement in the researched subject (Figure 3), the years 2016, 2019 and 2022 were particularly intense. During this period, 45 articles in journals, 25 papers were presented at scientific conferences and 1 series were published. Among authors appearing most often in the study group, the following should be mentioned: Gunter Meeh-Bunse and Guido



(b)



(c)

Scopus. Own elaboration.

As part of this database, publications on sustainability and culture appeared in print in the period 2002-2022. There is a noticeable upward trend in scientific involvement in the researched subject, especially in the years: 2015, 2019, and 2022 (Figure 3). During this period, 6 papers were presented at scientific conferences, as well as 33 articles in journals, 1 book, and 4 book chapters were published.

Conclusion

The analysis of quantitative results focused on 72 texts from the WoS database and 44 texts from the Scopus database, using the WordArt word cloud generation program and integrating bibliometric analysis in the VOSviewer program. Based on the above results and discussions, it can be concluded that the development of research on the selected subject has been increased. The presented maps of relationships between the elements selected for the study indicate their connections and the observation, that the best researched areas are *management*, *sustainability*, *development*, and *value*. The researched issue has been among the research interests since 2002. The topics of the texts listed in the WoS database, analyzed based on the titles, focus around management issues. The bibliographic link within the Scopus database, created on the basis of titles

and abstracts, focus around economics and management issues. The upward trend of publications devoted to these issues emphasizes not only the importance of sustainable development in human life but also the change in the perception of this issue in the world of science, researched on improving the current situation and raising public awareness.

It is worth emphasizing the group of limitations of this study related to a focusing only on two databases, that indexing mainly English-language texts. As well as the fact that not all published scientific texts have been indexed in WoS and Scopus.

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VULNERABILITY AND SUCCESS IN HUNGARIAN RURAL AREAS

Réka Horeczki¹
Péter Póla²

Summary: Addressing the interacting economic, social, and environmental problems of rural areas is a key area of regional science. A sectoral approach alone is rarely successful in tackling problems; an interdisciplinary and territorial approach, considering many aspects of analysis, is more likely to produce results. What is needed is an approach in which everyone has something to contribute to rural development in their own area of expertise, and in which these added values can be synergised in development policy practice. Rural development is not just a complex problem, solutions must usually be sought and applied in a context of sharply conflicting interests and values. The last three decades have witnessed an intensification of conflicts, compounded by economic interest structures that tend to negate the issue of long-term sustainability, which significantly reduce the chances of organic rural development. The aim of this study is to present the vulnerability factors of the Hungarian rural areas.

Key words: rural areas, successful, vulnerability, Hungary, Baranya county

JEL classification: P25

Introduction

This paper indicates that, although the problems in rural areas vary in nature and severity, the overall situation of these areas (some valuable but atypical exceptions), the situation in urban areas is significantly better than in rural areas significantly worse. In addition to statistical data at the level of municipalities and sub-regions, the results of various research studies (regional science, sociology, geography, etc.) also help to gain a detailed understanding of the situation in rural areas. Addressing the interacting economic, social, and environmental problems of rural areas is a key area of regional science. A sectoral approach alone is rarely successful in tackling problems; an interdisciplinary and territorial approach, considering many aspects of analysis, is more likely to produce results.

What is needed is an approach in which everyone has something to contribute to rural development in their own area of expertise, and in which these added values can be synergised in development policy practice. Rural development is not just a complex problem, solutions must usually be sought and applied in a context of sharply conflicting interests and values. The last three decades have witnessed an intensification of conflicts, compounded by economic interest structures that tend to negate the issue of long-term

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sustainability, which significantly reduce the chances of organic rural development. The aim of this study is to outline the nodes that may be factors of rural vulnerability in Hungary especially in Hungarian peripheral areas – in Baranya county.

1. Main characteristics of the rural research in Hungary

The Covid-19 epidemic sweeping across the globe onwards has triggered meaningful transformations in almost all spheres of life, in many ways generating changes in urban-rural relations (Forster et al., 2020). Its impact is different in dynamic metropolitan areas and less developed rural areas. Nevertheless, closures and the re-launch of life and the economy offer many opportunities. The question is to what extent rural municipalities (especially in the municipal, civil and business sectors) are prepared to see these opportunities, to develop strategies to match them, and to design and implement appropriate projects.

The study focuses on the challenges facing the rural areas, not forgetting the legacy of outstanding Hungarian personalities – Bálint Csatóri¹, Éva G. Fekete², Attila Buday-Sántha³ – in rural studies, which still permeates Hungarian rural studies, educational activities, and everyday practice. Several aspects of the changing role of the countryside have emerged over the years, including the adaptability of rural restructuring as an Anglo-Saxon concept and the problems of rural shrinkage. The meaning of the countryside is unchanged, but it is evolving; the society that lives in it is constantly being reshaped; think of rural gentrification, Covid-19, second homes, the emergence of dormitory settlements, etc. (Horeczki and Finta, 2022). In terms of responses to shocks, the rural areas have so far moved rather slowly, as if it did not believe it was changing is necessary.

The designation and perception of the countryside have undergone significant changes over the last fifty years. The traditional role of settlements/municipalities was shaped by the modern agricultural mass production, the changed market relations, the new directions of industrialization, the phenomenon of suburbanization, the peripheralization (aging, depopulation). Researchers of the topic (Csatóri, 2011; Csatóri and Farkas, 2006; Murdoch, 2000) see the biggest problem as the phenomenon was hardly predictable in the region; the devaluation of certain areas of the countryside and the loss of its support capacity have accelerated the social, economic and environmental problems of the countryside. This is reversed in the current situation, both national policies (family support system, Hungarian Village Programme) and digitalisation have facilitated rural development and increased its vulnerability.

It could be said that there have been too many negative impacts on rural areas, both on the settlements and on the people living in them. The most serious problem remains depopulation, which is now a permanent feature of the definition of the countryside in general. Hungarian rural concepts have a negative connotation in relation

¹ Csatóri, B. bibliography: <https://m2.mtmt.hu/api/publication/30785788>

² G. Fekete, É. bibliography: <https://m2.mtmt.hu/api/author/10001808>

³ Buday-Sántha, A. bibliography: <https://m2.mtmt.hu/api/author/10004953>

to demographic trends (Pirisi and Trócsányi, 2011). Either because they are already included in a composite index of population trends, thus excluding dynamic growth settlements, or more nuanced, for example when the EU's definition (Eurostat, 2023) of rural areas is defined on an administrative basis (taking into account population density). Population change in rural areas has changed with the waves of urbanisation (table 1). There are large differences between countries in terms of the number and proportion of the rural population. For countries with a secure rural income, the population is stagnating or minimally increasing. A big problem in the eastern countries is the remote areas, the abandoned villages and the young generation moving away.

Table 1. Proportion of rural areas in Eastern- and Central-European (% , total population is 100%)

Country	1960	1970	1980	1990	2000	2010	2018
Austria	35,28	34,74	34,61	37,04	39,79	42,6	41,7
Bulgaria	62,9	47,7	37,9	33,62	31,1	27,7	24,99
Czech Republic	40,45	35,6	24,83	24,78	26,01	26,74	26,21
Germany	28,62	27,73	27,16	26,88	25,03	23,03	22,69
European Union	38,79	34,33	31,09	29,58	28,23	25,99	24,33
Croatia	69,85	59,8	52,71	48,96	46,57	44,84	43,05
Hungary	44,09	39,89	35,81	34,16	35,42	31,09	28,65
Poland	52,11	47,87	41,91	38,73	38,28	39,11	39,94
Romania	65,79	59,68	53,93	46,78	47,00	46,17	46,00
Slovak Republic	66,54	58,94	48,36	43,51	43,77	45,31	46,27
Slovenia	71,80	63,00	51,95	49,61	49,25	47,34	45,46

Source: own editing based on citypopulation.de

In Hungary, the structure of settlements is still dominated by villages (or farm areas – in Hungarian terms: ‘tanya’); the centre of the rural area is usually a small town (or possibly a former agrartown or oppida). The concentration of the economic and institutional system in the area is low. The dominance of agriculture as an occupational sector is noticeable. Its society has a rural feel. Unfortunately, the drastic change in Hungary's external migration balance has a negative demographic outcome. In the longer term, we should expect not only a decline in the country's population, but also the depopulation of certain types of regions and settlements. At the same time, the suburbanisation of the capital city and regional centres and the increase in commuter areas have been a trend since 2001.

The current pandemic period has, on the one hand, intensified ongoing trends, i.e. the spread of atypical employment and teleworking, but has not generated a welfare migration phenomenon. Also considering domestic policy influences, positive trends have started in smaller towns, in commuting areas of regional centres with good infrastructure. If anything, the reversal of these processes after the pandemic has passed

raises further questions for which the answers are currently unknown. The changed labour market demands and the economic policy following the systemic change resulted in the decrease of the population in Hungarian settlements (Beluszky and Sikos T., 2007). Settlement policy has also greatly influenced the life of the municipalities (Józsa, 2014; Horeczki and Póla, 2022), and the system of concentration-proximity-convenience (Enyedi, 2012) can be considered as the cornerstone of urban development.

This (called after the capital letters of the Hungarian terms) 3K criterion system have been complemented by the European Union's rural policy's local economic development based on local values, setting the objective of catching up of disadvantaged areas (1698/2005/EC). The operation of municipalities and the different scope and quality of public services provided for local economic operators as well as the physical, legal, and local fiscal environment fundamentally influence and determine the development and growth opportunities of the society and the economy of settlements, or even region types. These opportunities and features are the decisive elements of the country's competitiveness, so the competitiveness of a country cannot be evaluated without assessing the functioning of the local government system.

2. The impact of late urbanisation

In Hungary, rapid employment restructuring took place in the 1960s and 1980s, resulting in only modest changes in settlement structure. The change in the share of industrial employment was not accompanied by a change in the share of people moving to urban areas. This period merely increased the tolerance and stability of society; the materialisation of rural savings (house building, renovation), the development of agricultural subsidiary income activities and thus the petty bourgeois of village society began. The shocks of the regime change brought radical changes for the industrialised villagers. The reduction and elimination of employment in industry and construction affected commuters first (in addition to the reduction in wage costs, the removal of travel allowances also saved businesses money); the closure of rural establishments and the elimination of complementary activities were both problematic; the decline in agricultural production and employment increased the instability of villages, creating an existential crisis.

The rapid urbanisation since the 2000s has been one of the forced solutions for rural areas. The expansion of the links between towns and villages was already well-timed (Horeczki, 2022); the roles of supply, income and job creation changed during the period. In 2021, more than three quarters of the European population (Eurostat) and more than two thirds of the Hungarian population will live in cities - approximately 7 million people in 348 cities (KSH, 2021). Small towns with a population of less than 3,000 covered less than 2% of the population in 2010, but by 2018 this proportion had doubled, due to the growth in the number of small towns and the tendency for them to " fall down " into this category. In most cases, these small towns were also small regional centres, but no longer district seats. Their development has often become dependent on the resources of the surrounding localities.

The total population of the counties has decreased over the last decade, so the proportion of small towns able to retain their population within the total county population has increased (Beluszky and Sikos, 2020; Horeczki and Egyed, 2021). Current policy impacts (housing renovation programme, Kisfaludy Programme, village CSOK, housing subsidies, etc.) have had a positive impact on both small towns and suburban settlements. The situation in rural Hungary has changed a lot in the last decade. Several old and new development programmes have been launched to help rural areas catch up (LEADER, Hungarian Village Programme, Digital Village Programme, Smart Village, etc.).

The programmes support targeted development, but it is relatively difficult to identify their actual job-creating and long-term effects. For example, the four main areas of the Hungarian Villages Programme are mainly concerned with infrastructure renewal, the preservation of the townscape and cultural heritage, and subjective factors of well-being of the population. On average, these development opportunities amounted to HUF 1.5-5.5 million per settlement and target area in 2020. Like village policy in the 1960s, there are many similarities between Hungarian development programmes. In particular, they aim to build and maintain the infrastructure links that are still in place.

The strengthening of the internal cohesion of the population is expected to be enhanced by the installation of surveillance systems in public spaces and by spending money on traditional maintenance. In response to the challenges of digitalisation, the government is also seeking to give smaller municipalities an edge by promoting smart solutions and technologies. Some good examples can already be found in the areas of environmental awareness, smart living, improving housing conditions, increasing the sense of security (Horeczki, 2022).

The difference between urban and rural economies and societies is taken as evidence by academic and non-academic interpretations. Despite recent trends in rural sociology now questioning the validity of traditional rural-urban differences (Bell, 2006; Short, 2006). Villages have begun to build the infrastructure and institutions that were previously considered urban privileges. The rural-urban boundaries of housing and other living conditions have become blurred (Konjar et al., 2018). The settlement network has been defined as a relatively rigid and long-lasting system, in which the set of settlements can be understood as a collection of spatially distinct groups in society (Hajdú et al., 2017). However, the incredibly rapid rate of depopulation of some types of settlements, as evidenced by statistical data, seems to override the rigid and long-term nature of the previous perception (Horeczki 2020).

It is the physical links between settlements that are in most cases established (infrastructure, ecological systems) and sustainable. Economic, social and other inter-settlement interactions are less well functioning. Fragmented local government systems create a competitive environment in which smaller towns and cities tend to lose out. The centralisation of public services and institutions has removed from the remit of small towns several functions that could have attracted and retained population. The statistical tables (KSH 2021; TeIR) list as urban institutions the car dealership, hotel, boarding house, high school, vocational college, public enterprise, ambulance station, document

office, which are already present in most of the large municipalities or in the main suburban municipalities.

The level of institutions and development can therefore be treated separately for villages and small towns. In terms of institutional specialisation, some areas favour tourism and commercial services and build up the appropriate range of services (e.g. small towns on the shores of Lake Balaton), while some small towns focus on their educational function (development of human infrastructure, investment in human capital), which was also the main focus of their application for urban status.

Many of the municipalities that have been granted urban status after 2005 lack an urban image, an urban citizenry, public institutions and public sewerage (Horeczki-Egyed 2021). Most of the large municipalities in Transdanubia saw urban status as an opportunity to renovate public spaces, possibly schools, or build a town hall. Although there were several promises of job creation, in most cases this did not materialise. The lack of functions in small towns has tended to increase over the last 15 years: there is no bookshop, no secondary school, no employment office, no notary, or insurance institute, and even no financial institution due to the integration of the savings and loan association (Horeczki 2022).

Urbanisation reduces the differences between towns and villages, as they become similar in terms of infrastructure. Separating urban and rural processes, especially in small towns, is difficult for a number of reasons. The concepts of rural and agricultural cannot simply be equated, since almost 80% of the rural population no longer live from agriculture. Over the last twenty years, this proportion has changed completely, with 80% of people living in villages having an agricultural income in 1991 (Illés, 1995). At the same time, the local problem of labour migration, the response of large enterprises located in smaller settlements to economic crises and the existential situation of the population remain unchanged.

Both the socialist large-scale industry and the foreign working capital-based development model operated with large units, mainly located near large cities or in concentrated growth zones, exacerbating centre-periphery relations. Beyond the rhetorical level, development policies have focused only to a limited extent on small and medium-sized enterprises, which are of considerable importance in small urban and rural areas. The deterioration of the existential situation can be traced at several points: the age structure of the slowly shrinking Hungarian population is also changing, with 15.4% of the total population over 65 years (KSH 2021). Statistics show that fewer children are being born in rural areas (KSH 2021), citing shortcomings in the health care system and transport conditions as reasons.

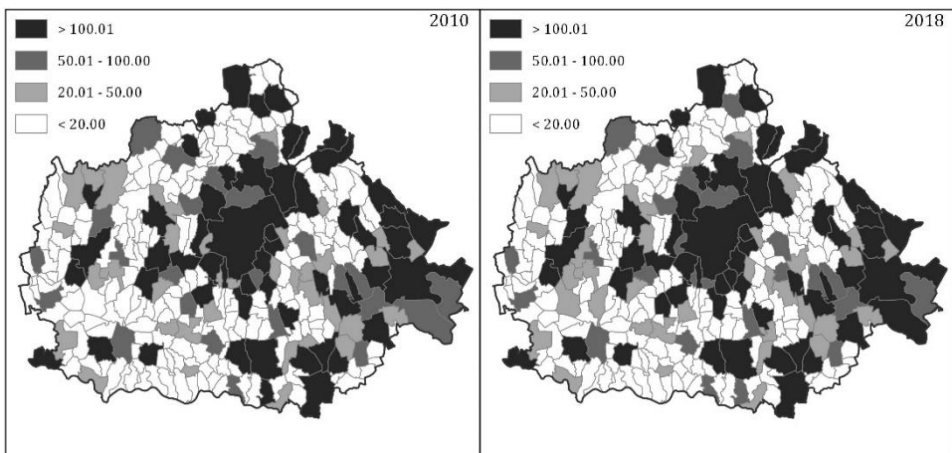
3. The case study of Baranya county

There is a lot of literature on the relationship between success and spatiality (see in Horeczki and Póla, 2022). For both urban and rural areas have been identified the factors that can be contributing to success. Success is synonymously identified in these studies with the definitions of viability, effectiveness, competitiveness, supportiveness, good functioning, agility and resilience (Horeczki and Póla, 2022). The criteria for

successful settlement, can be defined on the basis of the research carried out so far in four main points: natural and cultural resources, local society - local elites, stability of the institutional system (the mayor and representatives), financing. These factors can be linked to both objective and subjective measures of success. The success of a municipality is always the result of comparative analysis: a region is not considered successful or unsuccessful in relation to itself, but always in comparison with others. It is assumed that success is a complex term that can be interpreted in many ways, and for the purposes of this study and research we have considered infrastructure and supply factors, attractiveness, the role of the public administration and its changing role, the quantity and quality of human resources, and the economic strength of the municipalities as being all part of it.

The focus of the analysis is Baranya County, which can be characterised as a peripheral region in Hungary, both in economic and infrastructural terms. The region of South-Transdanubia is the tenth poorest of the European Union, where the GDP per capita is only 44% of the average of the EU. Marginalization is generally characteristic of this region; the disparities have not decreased since EU membership. Baranya county is in the range by GDP the 15th from among the Hungarian counties while at the Millennium it was at the tenth place. Although there are some settlements in a relatively better situation that county, especially some of its micro-regions struggle with serious social and economic difficulties. Baranya county is located distant from the decision-making centers, lacks resources, and was avoided external capital investments during the past two decades.

Figure 1. Change in the number of enterprises in Baranya county, 2010, 2018 (number of registered enterprises per thousand inhabitants)



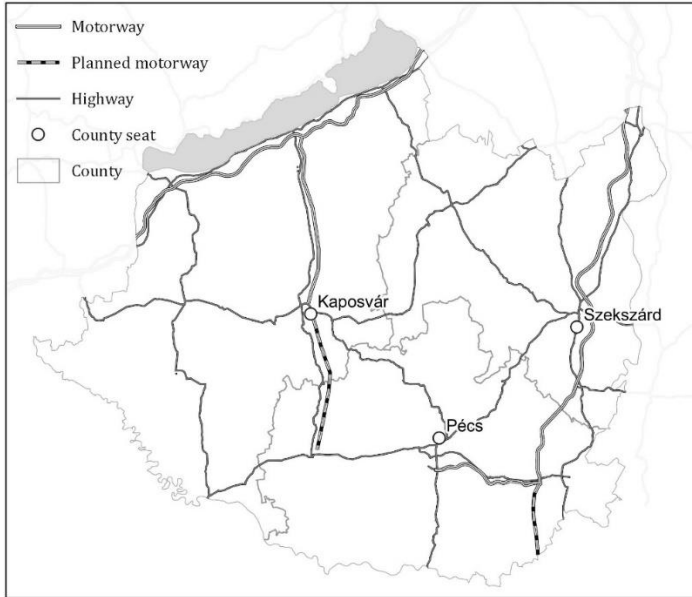
Source: own editing based on TeIR database

So, the county is not simply in a bad situation but its lagging and marginalization is continuous and so it is always more remote from the developed parts of the county and Europe. Knowing the serious socio-economic situation of Baranya county, it is a big challenge to find a basis for sustainable growth and a way out of the peripheral situation. In the global economy, there are very few traditional productive sectors in the county that can be made viable and competitive. All these generate structural problems in the labour market, affects governance abilities and service and development capacities as well. The peripheral character is caused by the geographic distance to the economic and power centres and the lack of resources and power. In addition to these the border location worsens these circumstances, that no merit and lasting relationships were developed between the two sides.

Baranya county is considered disadvantaged, except for the city of Pécs (the county-seat). Of these settlements, two-third of villages are listed as socio-economically and infrastructurally advantaged settlements, and one-third of villages as settlements with significant unemployment. The county's settlement structure is dominated by small villages, nearly 70%. Although there are some settlements in a relatively better situation that county, especially some of its micro-regions struggle with serious social and economic difficulties.

Workplaces are linked to the district seats and the county seat. In the small towns and villages, small businesses with 1 or max. 5 employees are more likely to be agriculture related. The most important condition for success is the existence of an economic base. Many believe that a key element of success is linked to municipal governance. Many people consider the mayor (his activity, preparedness, awareness) to be the reason for the success of the municipality.

Figure 2 Road transport map of the South-Transdanubia region



Source: own editing based on parlament.hu data

The county's internal resources do not show any special characteristics, neither in Hungary nor in Europe, that would provide a sector with a significant potential for expansion. Although we have some of the best conditions for certain developments in Hungary (number of hours of sunshine, early spring, diverse ethnicity, world-famous wine region, unique composition of the Harkány thermal water, uranium mines, black coal, early Christian monuments, etc.), none of these conditions alone can generate the kind of development and multiplication that could lift the Baranya economy out of its long depression.

The southern enclosure is reinforced by the fact that the county is bordered by the river Drava. It has only one bridge and there are still only three border crossings along the entire southern border. After the change of regime, the peripheral situation of the region, which suffered significant economic losses and was remote from the centres of power and economic activity, has not been resolved and has even increased in the western and north-western parts of the county. Infrastructural investments were not carried out on the frontier of the war and the county missed out on the first wave of re-industrialisation.

Baranya County is characterised by negative demographic, economic and social indicators, with significant differences in the internal resources and the ability to use them. The eastern half of the county, along the M6 and M60 motorways, is capable of development, and although infrastructure, accessibility, is a necessary but not sufficient condition for economic recovery. As we saw in Pécs, where the arrival of the long-awaited motorway did not bring the expected results. The districts of Mohács and Bóly

cannot be compared with the western parts of the county, where - especially in some municipalities - all the negative consequences of the double periphery are evident, and depression, extreme poverty and hopelessness are more prevalent.

Conclusion

Development is a complex process, and the success of catching up depends on many factors. Rural areas and rural economies are diverse and dynamic systems. Rural development aims to improve the quality of life of the people who live there, and therefore the assessment of the performance of the rural economy is a key element in the design of rural development instruments. As rural areas are specific and highly complex natural, economic and social spaces, the local economy in rural areas is always specific.

An important area of activity in rural areas is agriculture, but rural areas are by nature multifunctional, which means that, in addition to agricultural production, economic diversification is also necessary but in addition to this economic function, the countryside also has an ecological and social function, cultural and residential functions.

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CLUSTER AS AN ADVANCED WAY TO DEVELOP SUSTAINABLE CROSS-BORDER COOPERATION

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Summary: The wealth disparities between European countries are particularly evident in border regions, which affects cross-border cooperation and relations. The process of cluster development in the border area can be considered as one of the new challenges of cross-border cooperation, which is currently evolving from a bilateral partnership to a network model. Clusters are used for cooperation between institutions within a certain geographical area, which provides an opportunity to initiate and develop direct contacts between network participants. In the sustainable development of the border, both the social and economic aspects of development should be considered. Therefore, finding ways to promote the development of cross-border entrepreneurship based on existing forms of cross-border cooperation, including cooperation in the social sphere, is an important research problem. An important obstacle to the development of cross-border cooperation was the Covid-19 pandemic, which led to a systematic closure of national borders around the world and significantly affected the nature of cross-border cooperation in Europe, including the Polish-Czech-Slovak border. The aim of the article is to analyse cross-border cooperation using the example of Polish-Czech-Slovak cross-border cooperation between the Opole and Silesian Voivodeships (Poland), the Moravian-Silesian Region (Czech Republic) and the Žilina Region (Slovakia). The article examines whether the cluster can be an advanced way to develop the sustainable cross-border corporation.

Keywords: sustainable development of the border region; cross-border cooperation; cluster; Polish-Czech-Slovak cooperation; Polish-Czech-Slovak borderland

JEL classification: F53, F63, R11

Introduction

The cross-border cooperation contributes to the elimination of barriers related to the existence of national borders. The European Union's policy, which promotes a

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vision of a Europe without borders and has been fostering cross-border cooperation for 25 years, has led to the creation of so-called integrated cross-border regions in some parts of Europe (Durand, Decoville, Knippschild, 2020).

In fact, the cross-border cooperation is one of the components of European Territorial Cooperation. European Territorial Cooperation is the objective of cohesion policy to solve cross-border problems and jointly develop the potential of different areas. Cooperation activities are financed by the European Regional Development Fund through three key components: cross-border cooperation, transnational cooperation and interregional cooperation [European Parliament].

Globalization favours the expansion of large transnational corporations, while in the economy there are many mechanisms that stimulate the development of small and medium-sized enterprises. Small enterprises, mostly operating on a regional or local scale, also have good market prospects and also tend to integrate (also with larger companies), for example as clusters (Bleeke, Ernst, 1991).

Clusters are a form of partnership aimed at developing cooperation between enterprises, but also local governments, academic institutions and business environment institutions. They are located in close geographical proximity and represent related sectors. These two strategic conditions are necessary to create sufficiently strong bonds between cluster participants (Kurowska-Pysz, 2016).

The impulse for the development of any form of cooperation, including cooperation within clusters, can be both the needs and expectations of stakeholders as well as external factors encouraging integration. One can mention here particularly favourable system conditions supporting the development of cooperation, created in border regions.

Unlike many well-developed border towns in Western Europe or East Asia, Eastern European border regions develop rather poorly, especially economically and socially. They are disadvantaged and at risk of marginalisation, which requires special support

Integration activities stimulating the development of border areas are undertaken both at the level of the European Union and individually by neighbouring Member States, which foster the cross-border development of enterprises and the socio-economic integration of neighbouring municipalities.

It turns out that so far in cross-border cooperation, both in the field of social and economic cooperation, bilateral partnerships are the dominant type of cooperation existing between local governments and non-governmental organizations, and what is worth emphasizing - they occur much less often between enterprises (Kurowska-Pysz, 2016).

There is no doubt that long-term cooperation between the same partners strengthens cross-border relations, but does not fully serve the development of border areas. In order to effectively counteract the development problems of these areas, it is necessary, on the one hand, to create new partnerships between entities that have not previously cooperated with each other, as well as to develop networking opportunities.

Currently, most examples of cross-border cooperation occur in the social sphere, while at the economic level they occur only sporadically. In order to counterbalance this trend, it is necessary to define mechanisms to encourage the development of cross-border entrepreneurship and networked economic cooperation, which can develop as clusters (Kurowska-Pysz, 2016).

The analysis of cooperative relations taking place on the border encouraged the authors to consider the possibilities of developing cluster cooperation in these areas. This is facilitated by both the natural tendency towards cross-border integration, as well as external conditions resulting from the socio-economic policy of neighbouring border regions and the European Union Policy, as well as systemic support, e.g. in the form of INTERREG funds.

Therefore, the aim of the article is to analyse cross-border cooperation on the example of Polish-Slovak-Czech cross-border cooperation between the Opole and Silesian Voivodeships (Poland), the Moravian-Silesian Region (Czech Republic) and the Žilina Region (Slovakia).

1. Examples of clusters as part of cross-border cooperation

The territorial and integrative context of cluster activities is an important precondition for considering the possibility of cross-border development of clusters on the border. The relatively low level of socio-economic development of border areas indicates the need for greater emphasis on the economic aspects of integration and cooperation, which have so far been neglected in favour of social aspects. An important and key feature of innovation and competitiveness of organizations, not only in border regions, is their willingness to cooperate, including the development of various types of network relations (Henning, Moodysson, Nilsson, 2010; Lazerson, Lorenzoni, 1999; Bathelt, 2005; Sheppard, 2005).

It should be emphasized that the degree of institutionalization of clusters varies. They mainly concern enterprises, but also institutions operating in diverse business environments, local governments at various levels, non-governmental organizations, local development agencies, schools, banking institutions and the R+D sector, including scientific institutions (Fromhold-Eisebith, Eisebith, 2005).

According to the literature, a cluster is a geographical concentration of interconnected enterprises, specialised suppliers, service providers, enterprises operating in related sectors and institutions associated in particular fields, competing with each other, but also cooperating (Porter, 1990). A cluster can also be defined as geographically limited agglomerations of enterprises together generating synergy effects (Rosenfeld, 2000). An important assumption of the cluster concept is the possibility of achieving synergy through joint action for the benefit of a given community and territory. Clusters as a form of networking are often characterised by loose and voluntary relationships, involving the transfer of resources between individuals, including the transfer of information and knowledge (Lepik, Krigul M, 2009).

In economic practice, networks of cooperating enterprises are structures that can manifest themselves in many forms, such as: strategic alliances, virtual organizations,

joint ventures, integrated supply chains, holdings, enterprise clusters. Therefore, these are not unambiguous concepts, and there are many definitions (Almodovar, Teixeira, 2009; Maskell, Kebir). The common features of networks of enterprises and clusters include: loose links, voluntary relationships, transfer of resources between individuals, economic and legal autonomy of individuals, partly common economic goals.

The Green Paper on Cluster Initiatives (Sölvell, Lindqvist, Ketels, 2003-2006) specifies that one or more cluster initiatives in a given industry may be set up within the cluster's area of application. Cluster initiatives are therefore an effective instrument for concentrating resources and resources to achieve critical mass and accelerate the transfer of knowledge, resources and know-how.

Currently, on the example of the Polish-Czech borderland, especially the Opole region and the Moravian-Silesian region, culture and tourism can be identified among the key and dominant areas of integration. An example is the Polish-Czech Cluster of Sustainable Development and Pro-Health Tourism. Its specificity is associated with its following characteristics (Stowarzyszenie Aglomeracja Opolska):

- was scheduled for the period from 01.01.2019 to 31.12.2021
- was implemented under the INTERREG VA Czech Republic - Poland programme for 2014-2020
- was co-financed by the European Regional Development Fund "Crossing borders"
- was focused on an association of similar and cooperating private and public entities Polish and the Czech Republic (Opole Agglomeration Association, Multiserwis Sp. z o.o., Tecor – Meet new design, Top Farms Głubczyce, Gospodarstwo Rolne Grzeski Dąb, Konopex Ostrava, The National Cluster Association and Opole Agricultural Advisory Centre based in Łosiów);
- the area of interest of the associated entities was related to the issues of green economy, pro-health tourism, sustainable development and social economy
- these entities were represented by: business, non-governmental organizations, local governments, public institutions and representatives of local communities, as well as a group of scientists and students
- it enabled cooperation on a win-win basis, promotion and internationalization of economic initiatives and creation of an active platform for the exchange of experience;

On the other hand, to completed cross-border projects from the Polish-Czech-Slovak borderland within the framework of the European Grouping of Territorial Cooperation TRITIA (EGTC TRITIA/EGTC TRITIA) in Poland (Silesian Voivodeship), Slovakia (Self-Government Region of Žilina) and the Czech Republic (Moravian-Silesian Region) aimed at improving and promoting cross-border, transnational and interregional cooperation, strengthening economic and social cohesion there are six projects whose main characteristics are presented in table 1.

Table 1. Completed projects from the Polish-Czech-Slovak borderland

Tourism for all	Projects				
	You are what you eat	Discover your industrial past	Green transport service	Children Visegrad chess league	Sustainable business
	Local production	Tourism	Transport, education	Education	Business activity
TRITIA; Zamek - Instytut wania /stkich im. Michała Śląska Organizacja zna; Opolska lna Organizacja zna; Trianon z.s.; samosprávny kraj; vá agentúra Žilinského ívneho kraja; Krajská cia cestovného ruchu turistický kraj; EGWT ranum	EGWT TRITIA; lster-Granum European Grouping of Territorial Cooperation Ltd.	EGWT TRITIA; Agentura pro regionální rozvoj, a.s.; Žilinský turistický kraj; Opolska Regionalna Organizacja Turystyczna; Slaska Organizacja Turystyczna	Agencja Rozwoju Regionalnego Kysuce (SK), EUWT TRITIA, Stowarzyszenie na Rzecz Rozwoju Kraju Morawsko-Śląskiego (CZ), Gmina Hřčava (CZ), Gmina Ciernie (SK), Gmina Istebna (PL)	Uczniowski Klub Sportowy „Pionier”; EUWT TRITIA; "RODŁO" Opole; SK Slavia Orlová; Caissa Čadca; Gedeon Barcza SPORT CLUB ASSOCIATION; Belgrade chess association	EGWT TRITIA; Agencja Rozwoju Regionalnego Ostrava
and €	12 thousand €	10 thousand €	No data available		80 thousand €
	International Visegrad Fund				European Regional Development Fund/ Cross-border Cooperation Operational Programme Czech Republic-Republic of Poland 2007-2013
ig accessibility; idea sal design	Supporting the sale of local products; providing information and knowledge to manufacturers	Promotion of technical monuments and tourist potential	Mapping clean, alternative forms of transport; promoting alternative forms of transport in primary schools; reduction of CO2 in the air	Popularization of chess games supporting the development of children and young people	Creating a cross-border networks of organisations supporting start-up entrepreneurs on both sides of the border
ices; workshop; n	Conferences; workshop; exhibition	Creating and testing a board game for young people; publication of books; administration of the project site; exhibitions and conference	Creating maps of alternative forms of transport; workshops, conferences; creating a fanpage	Creation of a Children's Visegrad League Chess; organization of tournaments in the Czech Republic, Poland and Slovakia with participants V4 and Serbia; development of a promotional video	Seminar; elaboration of mapping study; open days of cross-border activities

Source: EGTC TRITIA

Conclusion

Clusters are currently emerging in all sectors of the economy, occurring in both high-tech and traditional sectors. They are characterized by different levels and scopes of innovation resulting from the way of knowledge transfer. In Poland, many clusters are in the initial stage of their development, so it is difficult to clearly evaluate this phenomenon in terms of determining the space and extent of cooperation. Most companies in the initial stage expect that this form of cooperation can lead to the following results: technology transfer, creation of joint products, complex services, joint performance of certain functions (marketing and advertising for the industry, design, procurement, distribution), and improvement of the flow of materials between companies.

The natural tendencies towards integration, the popularity of inter-company cooperation, and the availability of mechanisms to support this cooperation (including structural funds) are certainly an important factor favouring the development of cluster structures in border regions, which concern external actors interested in the development of clusters and networks. The European Commission points out that regions that combine venture capital, competence and high-quality research on a broad portfolio of clusters have a chance to become innovation hubs (Ketels, Lindqvist, Sölvell, 2012).

Such development impulses are important for border regions, which are often peripheral and marginalized and are usually characterized by relatively low levels of economic and social development, which also have lower potential than that of the preferred local areas. For these regions, it is particularly important to have access to valuable knowledge and skills to overcome various types of obstacles to development, including obstacles in cross-border relations, thanks to which the economic and social cohesion of the border area is supported.

There is a tendency that there is a growing interest in the creation of international clusters in Poland. A cluster initiative has been launched in the border region with the Czech Republic, which includes companies operating in the Opole and Ostrava regions. Within the framework of cross-border cooperation, the objectives of companies operating in the field of health-promoting tourism are to be achieved, as well as the strengthening of cooperative relations and the further development of neighbourly relations between communities, economic operators and territorial authorities.

Clusters have a chance to become effective, future-oriented forms of cross-border cooperation that will contribute to better use of the diverse potential of the entire border, effectively overcoming barriers in building mutual relations between neighbouring communities, as well as achieving a more dynamic development of the entire cross-border region.

The development of cluster structures on the border contributes to overcoming the negative aspects of the peripheral location of border areas, including the use of the development of opportunities arising from the proximity of a neighbouring country, as well as the promotion of the idea of Europeanness, unity and international cooperation, and the dissemination of socio-cultural influence and innovation.

There is no doubt that the socio-economic development of the border region should be ensured by all key stakeholders of the two neighbouring countries. The creation of a cross-border cluster should primarily involve entities engaged in economic activity (including companies, social organisations, public and government institutions providing certain paid services, and certain schools and media). In addition, there is also a place for non-profit institutions and organizations as well as broadly understood business-related and social environment.

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CHALLENGES FOR THE DEVELOPMENT OF R&D AND HIGHER EDUCATION IN THE CONTEXT OF EUROPEAN INTEGRATION

Alla Levitskaia¹
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Summary: Purpose of the study – and critical assessment of the quality assurance system of higher education in the Republic of Moldova in the context of European integration process. The objectives of this study: analysis of the current state of the higher education system in the Republic of Moldova; comparative analysis of quality assurance of higher education in Moldova and EU countries. Research methods includes system approach, analysis and synthesis, logical generalization and analogies and foreign scientists and leading experts, analytical materials on the research problem. The analysis of recent studies and publications despite the existing scientific research, the issues of quality assurance of higher education do not lose their relevance and require further study. The results of this study can be used by stakeholders to promote the development and improvement of the quality assurance system for higher education and research in the context of the country's European integration, as well as for the formation of quality assurance strategies in the universities of the Republic of Moldova.

Keywords: higher education; quality of higher education; research quality; quality assurance; assessment of the quality of education; European integration.

JEL Classification A22; I23; I25; I26

Introduction

The intensive processes of European integration that are taking place in the Republic of Moldova contributed to the accession of the country's higher education system to the Bologna Process, the implementation of the draft Intergovernmental Framework Agreement on the recognition of diplomas, academic qualifications, skills and competencies with European countries.

Republic of Moldova is preparing to sign the Global Convention on the Recognition of Qualifications concerning Higher Education which was adopted on November 25, 2019 in Paris [5]. Therefore, in order to deepen the integration processes of the system of higher education of the Republic of Moldova into the European

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educational space, it is necessary to subject the existing databases and empirical studies in this field to a comparative analysis.

Analysis of recent research and publications. Quality of teaching processes has become a major strategic issue in tertiary education systems across the globe (Harvey and Williams 2010; Enders and Westerheijden 2014). The processes taking place in the system for assessing the quality of the educational process in Europe and in the Republic of Moldova as integrated into the Bologna process accelerate the processes of their unification and standardization.

Quality management tools are based on the comparison of educational outcomes and the development of university rankings and the work of managers (Broucker and de Witt 2015; van Vught and de Boer 2015). Under these conditions, it is important to develop tools for international cooperation, including student and teacher mobility programs across European higher education institutions (Teichler 2012), as well as joint research and development.

Studies of issues related to the analysis of the quality and evaluation of higher education in the Republic of Moldova were devoted to the work of such Moldovan researchers as: Cotelnic A., Codrunianu I., Stratan A., Bordian E., Guslicova N., Belostehnik G., Petrov E. et al. However, despite the existing scientific research, the issues of quality assurance of higher education in the Republic of Moldova do not lose their relevance and require further study.

Material and Methods

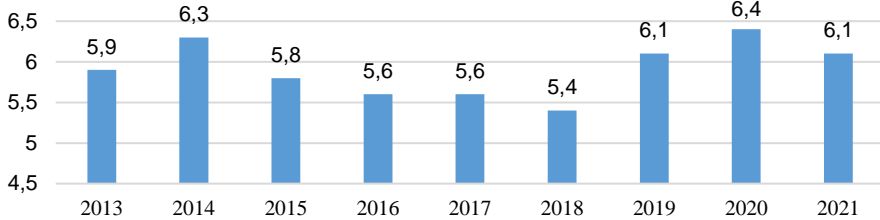
The purpose of this study is to analyze and critically evaluate the **challenges and potential for growth of higher education and R&D system in the Republic of Moldova** in the context of European integration processes. Objectives includes analysis of the current state of the higher education and R&D system in the Republic of Moldova; comparative analysis of quality assurance of higher education in Moldova and EU countries.

Scientific methods used in the research process includes system approach, methods of studying economic phenomena and processes, analysis and synthesis, logical generalization and analogies and foreign scientists and leading experts, analytical materials on the research problem.

According to the plans of the Ministry of Education and Research, the implementation of Education 2030 Strategy will contribute to the achievement of the goals of European integration in the field of education. Through this strategic document, the Ministry intends to ensure the quality of education and training, as well as to establish a link between the education sector and the labor market, which is constantly evolving. The Strategy plans to improve the quality of research, the effectiveness of inventions and innovations, which will ensure that the national educational system is linked to European requirements and values.

Education is one of the most important factors in the sustainable development of society, competitiveness and national security of the state. According to the theory of endogenous growth, the formation and build-up of human capital allow for a more efficient use of physical capital, which in turn leads to an increase in GDP per capita [10].

Fig. 1. The dynamics of education spending as a share of gross domestic product (GDP) in Moldova in period 2013 -2021, %

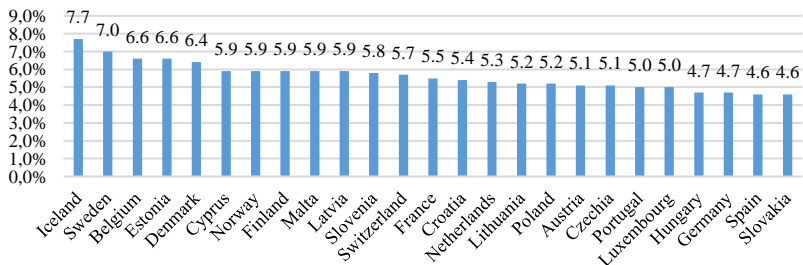


SOURCE: MOLDOVA: EDUCATION SPENDING, PERCENT OF GDP.
 URL: WWW.THEGLOBALECONOMY.COM

The average indicator of spending on education in the GDP of the Republic of Moldova is 5.92% (Fig. 1). The lowest value of this indicator for the analysis period of 2013-2021 is observed in 2018 - 5.44%, the largest in 2020 - 6.39%. In 2021, spending on education amounted to 13.5 billion lei, which is 6.1% of the country's GDP [13].

In the structure of public expenditures for education, in 2020 the highest share was held by secondary education: 5,9 billion lei or 49%, followed by early education and primary education: 3590 million MDL (30%), professional technical education: 1,1 billion lei or 9%, higher education: 1,07 billion lei or 8% [13].

Fig. 2. Education spending as a share of gross domestic product (GDP) in Europe in 2020, %

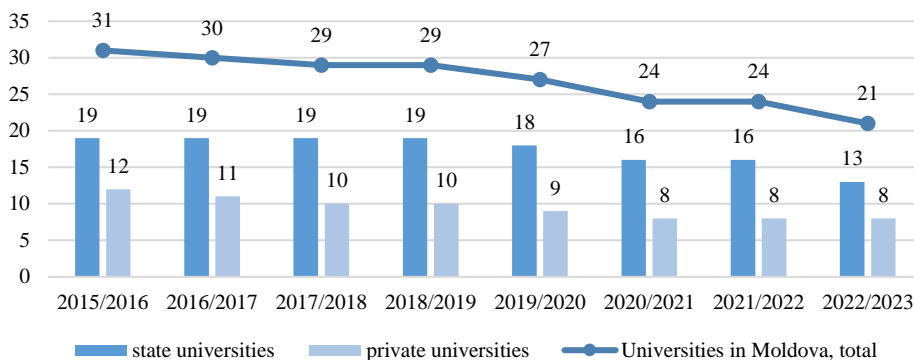


Source: Education spending as a share of gross domestic product (GDP) in Europe in 2020. URL: [www.statista.com/statistics](http://WWW.STATISTA.COM/STATISTICS)

One of the most important indicators of the state's participation in the development of the educational sector is the percentage of education expenditures in the country's GDP. A comparative analysis of this indicator with the EU countries illustrates that, on average, in European countries, expenditures on education in the country's GDP amount to 5%. The largest share of spending on education in the GDP of Iceland is 7.7%, the smallest share of spending on education in the GDP of Bulgaria is 4%, neighboring Romania is 3.7% and Ireland is 3.1% (Fig. 2.).

It should be noted that the Republic of Moldova, in terms of the share of expenditures on education in the country's GDP, exceeds the average European indicators, which made it possible for the Republic of Moldova to rank 13th among the 132 economies featured in the Global Innovation Index 2022 on contributions to education [5].

Fig 3. The dynamics of HEI's in Moldova in period 2015-2023



Source: Research and development activity in 2021. URL: www.statistica.gov.md

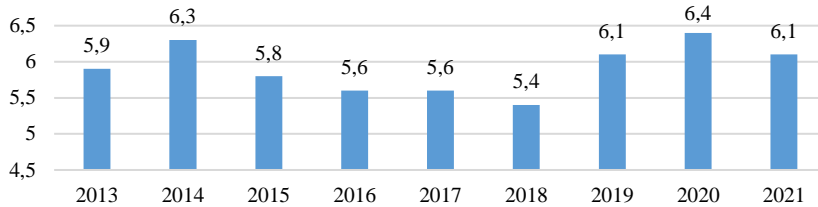
The number of higher education institutions in the 2022/2023 academic year is 21 units, which is 10 institutions or 32.2% less than in the 2015/2023 academic year. 2020 and 3 fewer institutions compared to 2021/22, as a result of the reorganization of a number of public higher education institutions (fig.3).

The functioning of universities includes not only the training of educational personnel, but also employees for R&D work. However, research and development funding in the Republic of Moldova is low. The data presented in Figure 5 illustrate the share of spending on research and development in the country's GDP over the past 10 years at the level of 0.24%.

If in terms of the share of spending on education the Republic of Moldova corresponds to the European average, then in terms of the share of spending on R&D in GDP, Moldova lags behind the EU countries (about 600 million lei), which is clearly shown in Figure 6. The average share of spending on R&D in the GDP of the EU countries is 2.3% in 2020. The largest share of R&D expenditures is observed in the

GDP of Belgium and Sweden - 3.5% respectively, the smallest share of R&D expenditures in Romanian GDP - 0.5%, which is 2 times higher than in Moldova [9].

Figure 4: The dynamics of R&D expenditure as a share of gross domestic product (GDP) in Moldova in period 2013 -2021, %



Source: Research and development expenditure Moldova. URL: <https://data.worldbank.org>

EU gross domestic spending on R&D as a percentage of GDP has been relatively stable at 2.03% on average. The long-term goal of the EU is the level of achievement of 3% of R&D costs of the total GDP. The sources of investment in R&D in the EU member states are divided into four main sectors: business, government, higher education and the private non-profit sector. The business sector of the EU member states remains the largest source of investment in R&D (about 65% of total investment), the contribution of education structures is about 24%, the public sector is at the level of 12%, the non-profit sector is 1% [2].

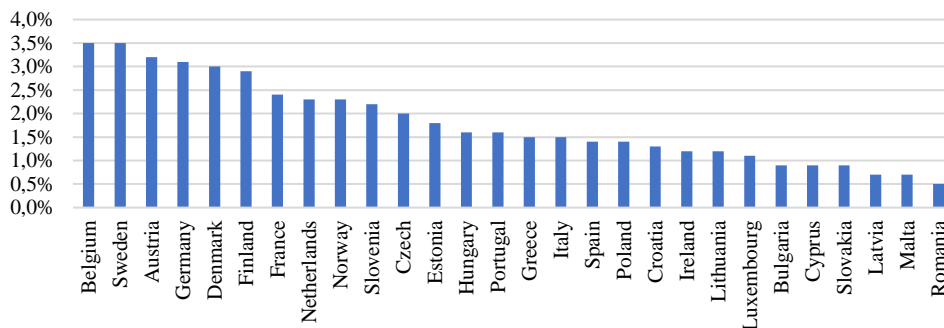
According to the National Agency for Research and Development of the Republic of Moldova, own investments in the innovative development of enterprises in 2022 amounted to 4.9 million lei, which does not reach the funding level of 1% of the total R&D costs. Public investments for the implementation of research projects in 2022 amounted to 122.4 million lei, or 20% of the total R&D costs [13]. The existing difference in the basic methodology for calculating this indicator in the Republic of Moldova, namely, the lack of accounting for investments from three other sources when taking into account only public expenditures, does not allow us to speak correctly about the level of investment in research and development.

Also, in addition to increasing public funding for R&D in the EU countries, tax incentives are widely used, funding programs are being developed, in particular, through the EU Framework Program and the functioning of structural funds.

According to the data of the National Bureau of Statistics of the Republic of Moldova, in 2021, expenditures on research and development amounted to 560.5 million lei, which, as noted, is 0.23% of GDP. In 2021, compared to 2020, spending on research and development activities increased by 90.9 million (by 19.4%), including public institutions - by 36.7 million or 8.8%. From the data illustrate a large share in the total

amount of costs for research and development is occupied by current costs - 95.9%, capital costs - 4.1%.

Figure 5: R&D expenditure in the EU as a share of gross domestic product (GDP) in 2020



Source: R&D expenditure in the EU at 2,3% of GDP in 2020 <https://ec.europa.eu>

The current expenditures are dominated by personnel costs (394.1 million lei or 73.3%), material costs in the amount of 61.1 million lei (11.4%), other current expenses in the amount of 82.1 million lei (15.3 %). Compared to 2020, both personnel costs increased (by 44.6 million lei or 12.8%) and other components of current expenses (by 44.5 million lei or 45.1%). In capital expenditures, the costs for the purchase of equipment and other fixed assets had the largest share - 78.9%.

According to the Global Innovation Index 2022 data, the Republic of Moldova ranks 78th in terms of contributions to innovation, which is higher than last year, but lower than in 2020. However, despite low spending on R&D, in 2022 the Republic of Moldova shows better results in terms of contributions to innovation than in terms of contributions to innovation - 46th place. The position is higher than in 2021 and 2020. The trend line between income levels (GDP per capita) and innovation performance indicators (GII) shows the expected performance of innovations depending on the level of income [6].

In relation to GDP, the indicators of the Republic of Moldova exceed the expected level of its development. Republic of Moldova ranks 78th in innovation inputs, higher than last year but lower than 2020. However, despite low R&D costs, the Republic of Moldova performs better in innovation outputs than innovation inputs in 2022 - ranks 46th. This position is higher than both 2021 and 2020. the trend line shows the relationship between income levels (GDP per capita) and innovation performance (GII score) are performing better than expected and those below are performing below expectations [6].

Results and discussions

It is necessary to note a paradoxical situation - the Republic of Moldova produces more innovation outputs relative to its level of innovation investments, that is, they are effectively translating costly innovation investments into more and higher-quality outputs. The Republic of Moldova performs above the upper-middle-income group average in four pillars, namely: Human capital and research; Market sophistication; Knowledge and technology outputs and, Creative outputs. The basis of the quality of any education and science is personnel.

In the period 2020-2021, most researchers worked in the field of natural sciences (32.2%), and the fewest researchers worked in the field of humanities (8.5%). At the same time, in 2021, the share of researchers from the natural sciences (by 1.7 p.p.), engineering and technical sciences (by 0.6 p.p.), and medical sciences (by 0.2 p.p.) decreased), and the share of researchers from the fields of social sciences (by 1.9 p.p.), agricultural and human sciences (by 0.3 p.p.).

The proportion of women researchers is higher than that of men in the following fields - medical sciences (60.6%), social sciences (60.4%) and humanities (53.2%), a minority in three other fields - natural sciences (49.8 %), agricultural (48.7%) and engineering sciences (20.5%). Researchers with scientific titles (doctor and doctor habilitat) in 2021 accounted for 54.3% of the total number of researchers. At the same time, the share of researchers with the title of doctor in the total number of researchers is 42.4%, and with the title of doctor of habilitate - 11.8%. Doctor habilitate women researchers account for just over half of all doctors (50.8%), and doctor habilitate women researchers account for 30.3%.

Compared to 2020, there is a decrease in the number of researchers with the academic title of doctor, both among women and men (by 3.2% and 2.4%, respectively). The number of male researchers with the academic title of Doctor (Habilitation) also decreased (by 5.1%), and only among female researchers - Doctor (Habilitation) increased by 29.6%.

Another challenge facing the system of higher education and the necessary condition for ensuring the quality and sustainability of education and research is the introduction of digital technologies, which is reflected in the Development Strategy "Education 2030". The list of main activities and the required amount of funding from other sources includes [13]:

- ✓ equipping at least 80% of educational units with equipment, software and other information and communication technologies
- ✓ ensuring the initial and continuous training of 100% of employees in the education sector regarding the development of digital skills and the implementation of education computerization standards
- ✓ developing the institutional capacity of 95% of educational institutions in the creation, use and evaluation of digital learning tools
- ✓ development and implementation of higher education programs with distance learning.

Conclusions

The results of the study illustrate a fairly high level of funding for the education sector, while the number of students and educational institutions is decreasing at the same time. R&D funding indicators require the construction of a system of statistical accounting of private investments, the development of incentive systems for financing this area. The study of the system of development of higher education in the Republic of Moldova makes it possible to note that the system of higher education cannot develop outside of global processes and trends - digitalization processes, inclusion more women in the field of science.

Solving the issues of reforming and developing the country's universities cannot be based on criteria only at the national level. Without studying and implementing best practices, universities will not be able to train specialists who meet the requirements of the modern market and ensure sustainable development. It should be noted the importance of strengthening the international component in the organization of the training of a competent specialist, the development of the internationalization of higher education and the field of scientific research.

National Agency for Quality Assurance in Education and Research (ANACEC) is already recognized in the Republic of Moldova as a body of competence and expertise in the field of external quality assurance of studies [14]. Since its establishment and to date, the Agency has made great progress in developing and improving its activities in line with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) recommendations. ANACEC is already recognized in the Republic of Moldova as a body of competence and expertise in the field of external quality assurance of studies.

Overall objective of the project: to contribute to deeper integration of Moldova into European Higher Education Area (EHEA) through the enhancing of quality assurance in higher education system. Specific objective of the project: to promote and strengthen the Quality Assurance culture in Moldova and to build national consensus of the key-actors on the development issues; to develop and advance a national legislative framework and stimulate regulatory changes on Quality Assurance in HEIs in Moldova; to enhance the Quality Assurance management of HEIs in Moldova through International institutional accreditation; to build the institutional capacities of HEIs in Moldova for efficient and effective implementation of Quality Assurance reform.

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