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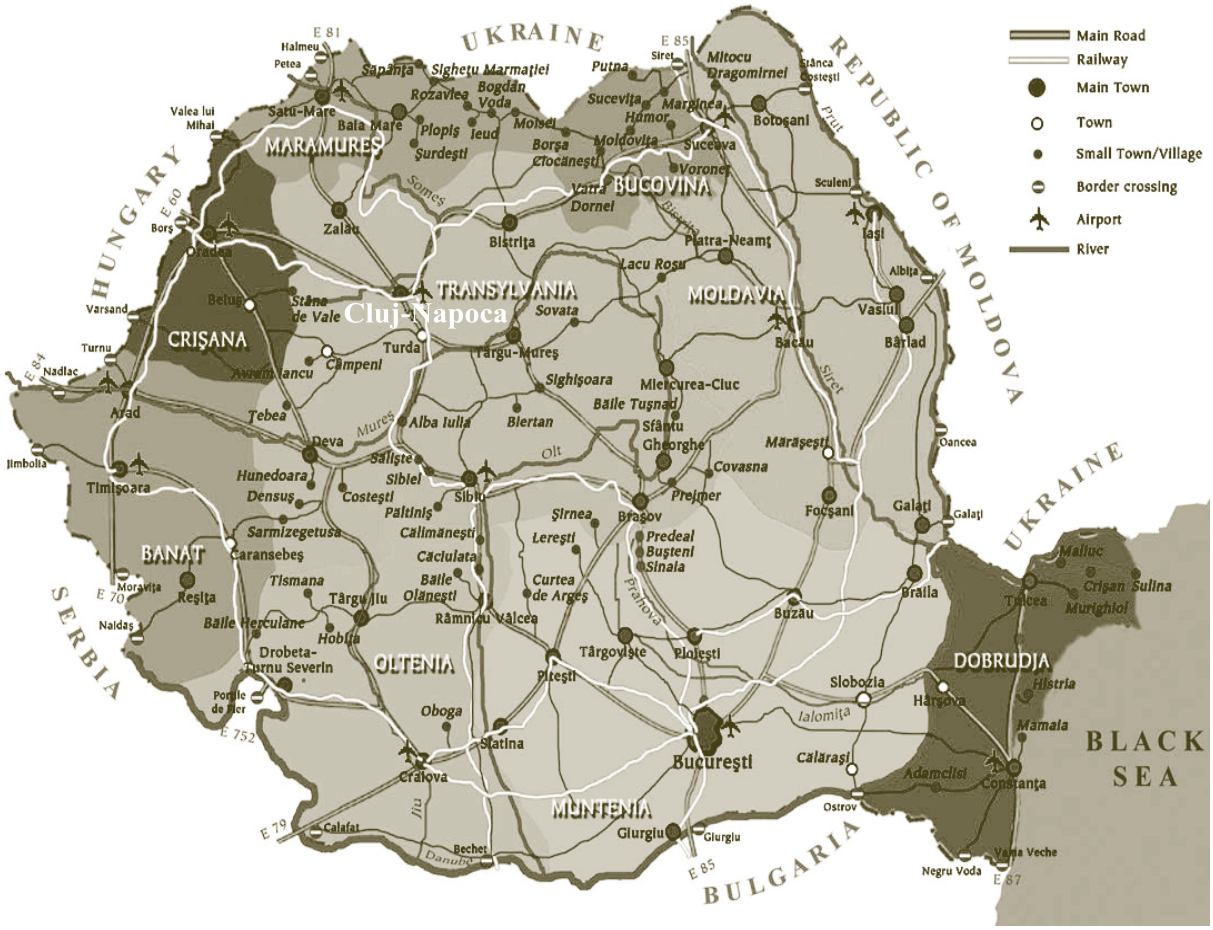

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CONTENT/ SOMMAIRE/ INHALT/ CUPRINS

BOOK REVIEWS

STUDIA UBB GEOGRAPHIA, LXVII, 1-2, 2022 (p. 5-22)
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USING UAV FOR THE DIGITALISATION OF PUBLIC ADMINISTRATION. A BIBLIOMETRIC ANALYSIS

Gheorghe-Gavrilă HOGNOGI[1], Ana-Maria POP[1], Alexandra-Camelia MARIAN-POTRA[2]

ABSTRACT. – Using UAV for The Digitalisation of Public Administration. A Bibliometric Analysis. The new European financial framework for 2021-2027 indicates digitalisation investments as a priority for the residential spaces, especially the urban ones. This is needed to increase the efficiency of the public administration and to optimize the relationships with the citizens (*POR 2021-2027*). In Romania, there are some recent good practice models in this regard, accelerated also by the current pandemic context. The scope of the paper consisted in highlighting the scientific production associated to the use of UAV technology in public administration by means of bibliometric analyses. Research included three stages: a). Selection of the documents in the Scopus database, b). Data extraction and visualization and c). Interpretation of bibliometric analyses conducted. The bibliometric analyses that were conducted highlighted that the interest for this topic was relatively recent (since 1988). It was strongly customized in the North-American and North-Western European research, but this type of approach is also necessary in the South-Eastern European countries.

Keywords: *UAV, Romania, VOSviewer, local administration.*

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1. INTRODUCTION

The digital territorial coverage degree becomes a priority that is taken into consideration given the importance placed on innovation and usage of various technologies capable of supporting an innovative process. According to the *Digital Economy and Society Index 2020*, Romania is in the lower quarter of the EU countries in terms of the performance of digital indicators (European Commission 2020). The phenomenon is accelerated in the current Covid-19 pandemic context. Hence, Romania's digital performances are as follows: over 49% of the houses have Internet connection; economy digitalisation is extremely low, half of the Romanians have never used the Internet and less than one quarter of the Romanian population has minimum digital skills.

The first governmental decision with impact on digitalisation at national level was that concerning the development of the National Authority for the Digitalisation of Romania. This is a structure intended for the acceleration of information/data transfer from physical to digital format (Romanian Government 2020). On the other hand, the lack of interoperability of some information systems in the Romanian public administration has been one of the problems identified over the last few years. This was generated by the lack of digital competencies, migration of IT experts from the public to the private sector, lack of an integrated vision of these digital services into the public administration (European Commission 2020).

In terms of spatial data that are used, there is a growing international interest for the use of data achieved by unmanned aerial vehicles with applications in various fields, from aviation and transport to public administration. The interest for the use of UAV/UAS (Unmanned aerial vehicles/Unmanned aerial systems) from the perspective of bibliometric analyses is recent (Greene and Roberts 2018; Zhang et al. 2018). The potential of the satellite and aerial high resolution images for the generation and update of cadastre maps is also recent (Crommelinck et al. 2017).

The scope of the paper consisted in analysing the scientific production related to the use of UAV technology in public administration, by means of bibliometric analyses. The originality of the research comes from the existing lack of compiling scientific materials on the analysed topic. The outcomes achieved by means of bibliometric analyses represent the first step for the researchers interested in the evolution of this topic.

The paper was structured into several sections: a). theoretical rationale of using the UAV technology in public administration, b). the working steps for achieving bibliometric analyses, c). the results of the bibliometric analyses that were conducted, d). discussions referring to the applicability field of the data achieved by means of the UAV technology, e). conclusions.

2. METHODOLOGY

The methodology was based on the bibliometric analysis of scientific materials related to the role of the UAV technology in public administration. This implied three stages (Fig. 1):

a) selecting the documents from the Scopus database. The Scopus database was used due to its high quality of the papers, to the international visibility of the studies and to the coverage of the journals publishing papers on the proposed topic. The descriptors used in the paper were "administration" AND "UAV" (based on using the Boolean logical operators). The reference time interval used was 1988-2020. Initially, 350 documents were selected in October 2020, and pursuant to applying document filtering criteria and after excluding some types of documents (conference paper, book chapter, review, conference review, book, short survey, editorial) and the languages used (Chinese, Spanish), 89 studies were selected (article type and only in English).

b) data extraction and visualization. The collected data were checked and validated for conformity of the content and their relevance to the analysed topic. Hence, 85 articles related to the analysed topic were validated. The CSV format was used in order to extract the data. Certain bibliographic data were extracted from Scopus. These included: authors, title, year of publication, title of the source, affiliation of authors, key words, and number of citations. The VOSviewer software was used for the bibliometric analyses (Eck and Waltman 2017; Briones-Bitar et al. 2020; Herrera-Franco et al. 2020; Río-Rama et al. 2020). The following bibliometric analyses were conducted: co-occurrence analysis of keywords, co-occurrence analysis of terms, co-citation analysis (by cited references, by cited sources), co-authorship analysis (by authors, organizations and countries). All the results were transposed onto bibliometric maps.

c) results analysis, by interpreting the achieved bibliometric maps, which enabled us to outline some clusters with various connections among them.

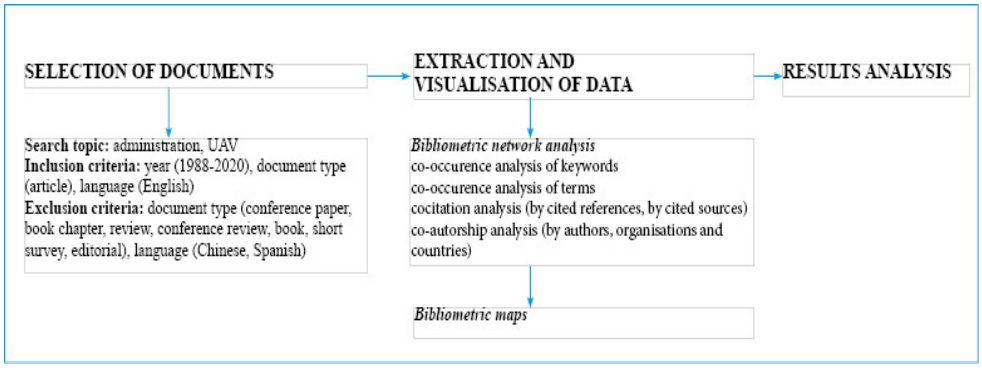

Fig. 1. Methodological flowchart. *Source: the authors*

3. RESULTS

3.1. Bibliometric features of the analysed documents

The 89 documents of the paper type associated to the use of UAV/UAS in administration highlighted some distinct aspects for the analysed interval – 1988-2020 (Fig. 2):

Fig. 2. Bibliometric features of the analysed documents in the Scopus database.
Source: the authors

- a field of activity developed during the last 20 years and with significant impact over the last 5 years;
- most of the authors interested in this topic come from the academic and research environment, but specialists in related fields are not excepted either (private companies and NGOs), especially from the USA;
- spatial distribution of the authors' affiliation reveals the predominance of the studies dedicated to the UAV technology in North America, some North-Western European countries, China, and India;
- of the 89 articles published, 64 benefited from the financial support of a project, with funding programs offered by governmental agencies and international programs offered by the European Commission, Horizon 2020, ministries and even by some education and research institutions.

3.2. Co-occurrence analysis of keywords

The keywords frequency analysis, totalling 1090 keywords, imprinted the research a trend of the studies on the use of the UAV technologies towards achieving data used in several fields of activity. Of the 1090 keywords, 25 terms reached a frequency of minimum 5 words, generating 5 clusters (Table 1, Fig. 3). The main term that polarizes all the research directions is UAV (*Unmanned Aerial Vehicles*) and its association with the field of data usage and with the Federal Aviation Administration and Federal Highway Administration (cluster 3, blue). Another cluster (cluster 5, purple) signals the existence of researches focusing on drone usage (Altawy and Youssef 2017; Sarghini and De Vivo 2017).

Table 1. Data associated with the frequency of keywords

No.	Cluster	Keyword	Occurrences	Total link strength
1	1	antennas	17	60
2	1	article	6	24
3	1	image enhancement	5	26
4	1	photogrammetry	5	18
5	1	priority journal	5	19
6	1	remote sensing	11	32
7	1	unmanned aerial systems	7	28
8	2	aircraft	6	25
9	2	NASA	8	28
10	2	national airspace system	6	25
11	2	sensors	6	20
12	2	unmanned aircraft system	10	38
13	2	unmanned vehicles	6	11
14	3	federal aviation administration	26	80
15	3	highway administration	5	10
16	3	small unmanned aircrafts	5	15
17	3	unmanned aerial vehicle	6	14
18	3	unmanned aerial vehicles (UAV)	57	154
19	4	aircraft accidents	5	22
20	4	national oceanic and atmospheric administration	5	21
21	4	UAV	7	17
22	4	United States	6	16
23	4	unmanned vehicle	13	42
24	5	drones	10	40
25	5	unmanned aerial vehicles	6	21

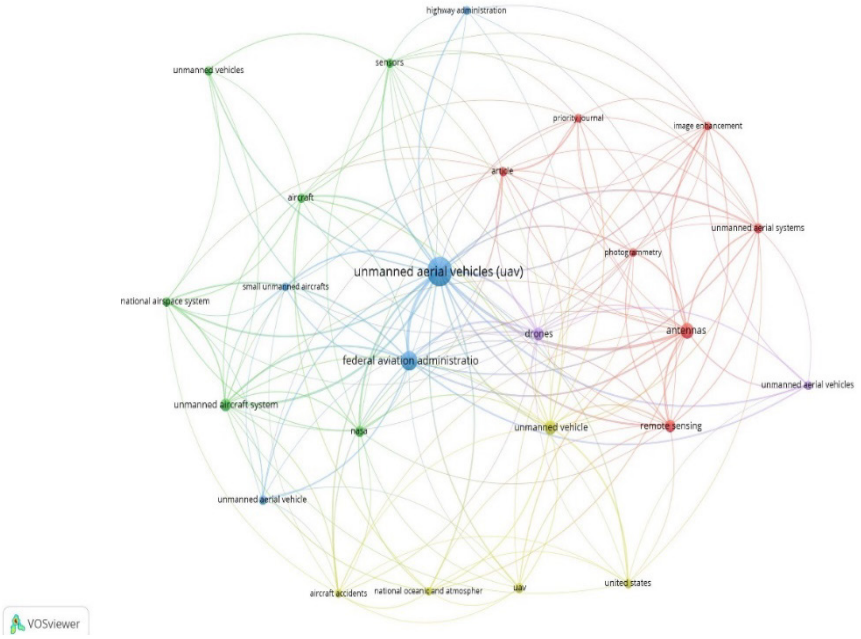

Fig. 3. Keywords co-occurrence map. *Source: the authors*

3.3. Co-occurrence analysis of term

Out of 3253 identified terms, 22 reached the threshold of minimum 10 occurrences of a term (Table 2, Fig. 4). There are two association groups of the terms: UAV - Unmanned Aerial Vehicle (cluster 1, red), used for aerial mapping and topographic modelling and UAS - Unmanned Aerial System (cluster 2, green), for various monitoring activities of some areas.

Table 2. Data associated with the frequency of the terms

No.	Cluster	Term	Occurrences	Relevance score
1	1	drone	15	0.4938
2	1	study	18	0.5905
3	1	UAV	47	16,167
4	1	UAVs	18	0.8117
5	1	unmanned aerial vehicle	40	14,971
6	1	use	22	0.4217
7	1	year	21	0.447
8	2	aircraft	28	0.4032
9	2	FAA	25	0.6828

No.	Cluster	Term	Occurrences	Relevance score
10	2	federal aviation administration	26	0.6504
11	2	system	51	0.5746
12	2	UAS	21	23,594
13	2	unmanned aircraft system	17	24,511

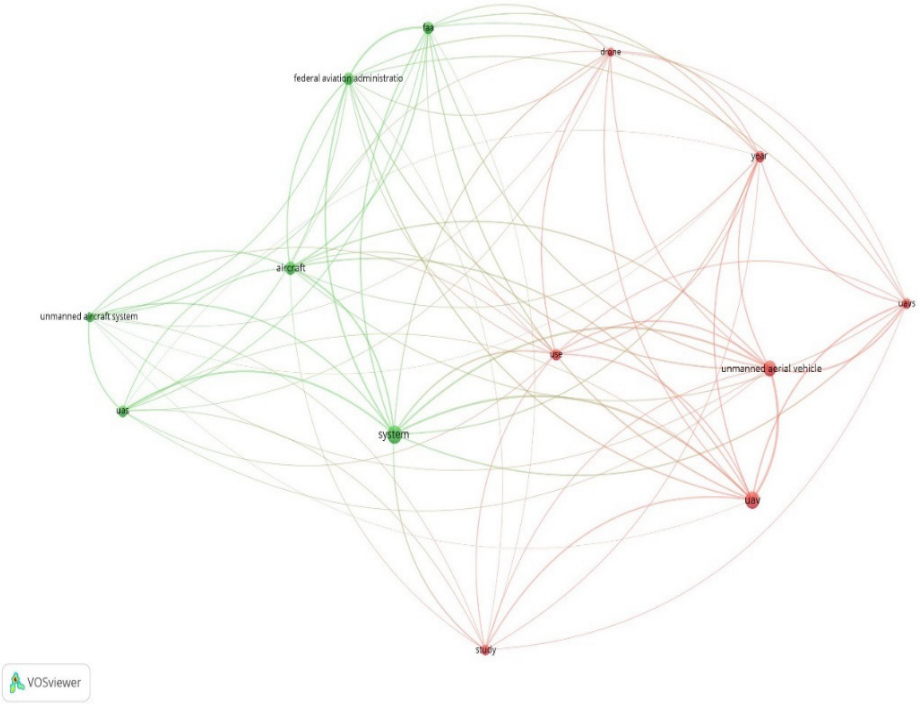

Fig. 4. Term co-occurrence map. *Source: the authors*

3.4. Co-citation analysis through cited references

The co-citation analysis revealed the intensity of the cooperation between institutions, the impact of research outcomes and the main approaches. Out of 3095 cited references, 21 meet the minimum number of two citations of a cited reference (Table 3, Fig. 5). The proximity between each node shows the networking degree of each author. Table 3 lists the most cited authors. Cluster 1 (red) refers to the basic resources for the understanding of the UAV technology, such as the role of the UAS-sourced imagery (Colomina and Molina 2014), but also their possible applications (Nex and Remondino 2014), assigning some UAS-sourced aerial images processing methodologies in order to improve the

existing cadastre data (Barnes and Volkmann 2015) and land management (Zevenbergen et al. 2013), error calculation methods for image calibration (James et al. 2017).

Cluster 2 (green) includes references addressing the accurate detection of the limits of natural areas based on the features of the aerial imagery (brightness, colour, texture) (Martin et al. 2004, Ramadhani et al. 2018) and the role of the cadastre systems in the developing countries.

Table 3. Data associated with the frequency of cited references

No.	Cluster	Cited reference	Citations	Links	Total link strength
1	1	Barnes, G., Volkmann, W., *High-resolution mapping with unmanned aerial systems* (2015), Surveying and Land Information Science, 74(1): 5-13	2	6	8
2	1	Colomina, I., Molina, P., *Unmanned aerial systems for photogrammetry and remote sensing: a review* (2014), ISPRS Journal of Photogrammetry and Remote Sensing, 92: 79-97	2	6	8
3	1	James, M.R., Robson, S., D'oleire-Oltmanns, S., Niethammer, U., *Optimising UAV topographic surveys processed with structure-from-motion: ground control quality, quantity and bundle adjustment* (2017), Geomorphology, 280: 51-66	2	6	8
4	1	Nex, F., Remondino, F., *UAV for 3D mapping applications: a review* (2014), Applied Geomatics, 6: 1-15	2	6	8
5	1	Zevenbergen, J., Augustinus, C., Antonio, D., Bennett, R., *Pro-poor land administration: principles for recording the land rights of the underrepresented* (2013), Land use policy, 31: 595-604	2	5	5
6	2	Martin, D.R., Fowlkes, C.C., Malik, J., *Learning to detect natural image boundaries using local brightness, color, and texture cues* (2004), IEEE Transactions on Pattern Analysis and Machine Intelligence, 26: 530-549	2	2	2
7	2	Ramadhani, S.A., Bennett, R.M., Nex, F.C., *Exploring UAV in Indonesian cadastral boundary data acquisition* (2018), Earth Science Informatics, 11: 129-146	2	7	7
8	2	Williamson, I., *The justification of cadastral systems in developing countries* (1997), Geomatica, 51: 21-36	2	2	2

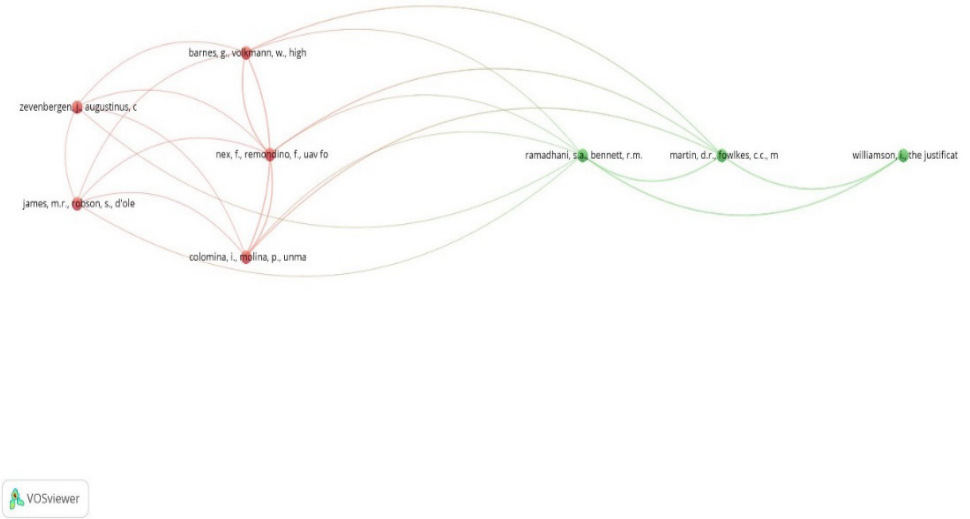

Fig. 5. Co-citation analysis map by taking into account cited references.
Source: the authors

Co-citation analysis through cited sources highlighted 1923 cited sources approved by researchers, of which three have the minimum number of 15 citations of a source. Remote Sensing has the highest impact.

3.5. Co-authorship analysis

This co-authorship analysis by authors provides information on the existing cooperation relationships between the authors in certain fields of research. If we consider the analysis of cooperation starting from the "Author" category, of the 281 authors who published papers on the analysed topic, only 4 exceeded the minimum number of 3 documents of an author (Table 4, Fig. 6). Cluster 1 (red) includes 4 authors: "Bennett", "Koeva", "Stocker", "Zevenbergen". The highest influence was manifested by Bennett, with topics focusing on the cadastral mapping based on the UAV technology and on the users' perceptions of data processed by aerial imagery.

Table 4. Data associated with the frequency of the co-authors

No.	Cluster	Author	Documents	Citations	Total link strength
1	1	Bennett R.	3	29	6
2	1	Koeva M.	3	16	6
3	1	Stöcker C.	3	8	7
4	1	Zevenbergen J.	3	8	7

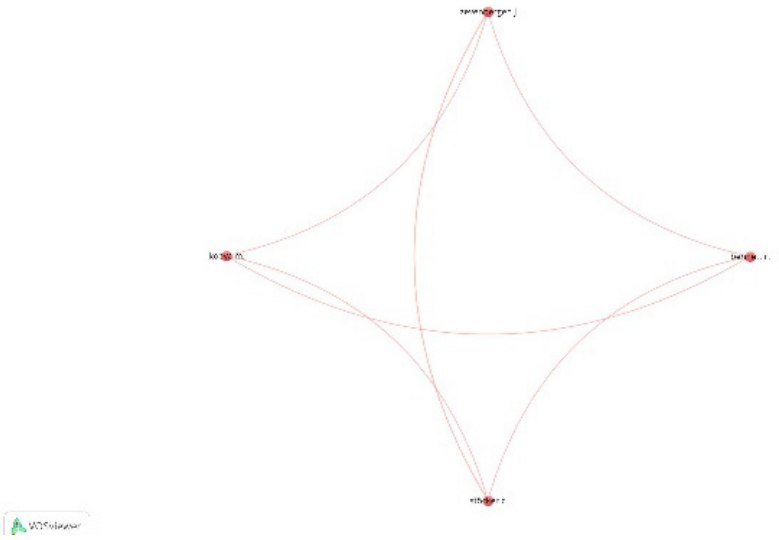

Fig. 6. Co-authorship map by authors.
Source: the authors

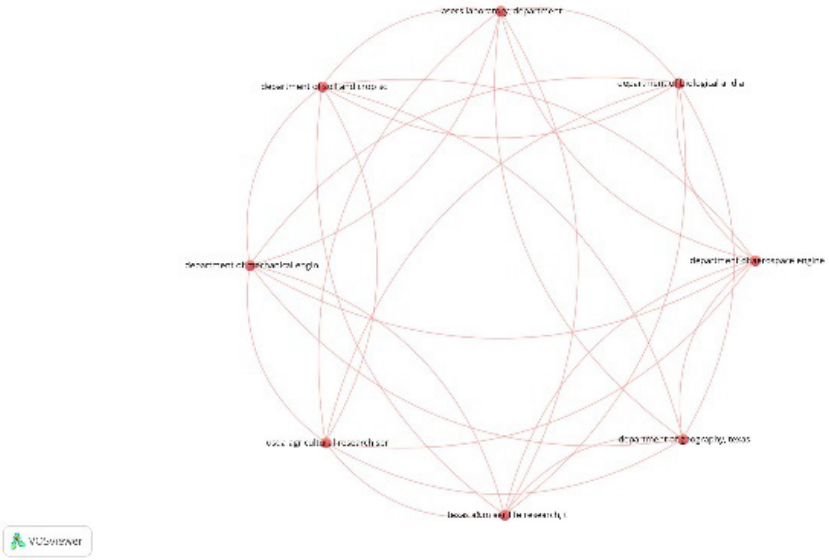

Fig. 7. Co-authorship map by organizations.
Source: the authors

If we consider the cooperation relationships in terms of the institutions where the authors work or cooperate with, i.e. co-authorship analysis by organizations, out of the existing 186 organizations, 101 have the minimum number of 5 citations per organization (Fig. 7). The first 8 units in terms of impact (with 132 citations) reveal again the predominance of the Americans regarding the interest in using the UAV technology (Texas A&M University, USDA).

Of the 26 countries with studies on the role of the databases (with the minimum threshold of 5 documents and 5 citations) (Table 5), two research schools stand up. On the one hand, there is the North European research (Faculty of Geo-Information Science and Earth Observation – ITC, KU Leuven, Kadaster, University of Twente), with 10 papers, and on the other hand, the USA, with a number of 44 papers (NASA Flight Research Center, NOAA National Oceanic and Atmospheric Administration, USDA Agricultural Research Service, Washington DC etc.).

Table 5. Data associated with the frequency of the authors at country level

No.	Cluster	Country	Documents	Citations	Total link strength
1	1	Belgium	5	32	4
2	1	Netherlands	5	39	3
3	2	United States	44	843	1

Source: the authors

4. DISCUSSIONS

The significance of the data achieved after certain UAV flights is also highlighted by the need of using them for other purposes, in various fields of activity (Table 6).

Table 6. The applicability of the UAV technology

No.	Purpose	Applicability	Author(s), year
1	Identification and registration of land and land use classes	Land administration	Crommelinck et al., 2017; Stöcker et al., 2019; Xia et al., 2019; Casiano Flores et al., 2020; Koeva et al., 2020
2	Assessment of road traffic analyses, accidents and damages for the building of bridges	Transportation	Skoglar et al., 2012; Sharma et al., 2017; Dorafshan and Maguire, 2018; Dorafshan et al., 2018; Inzerillo et al., 2018; Yoon et al., 2018; Julge et al., 2019; McCormack and Vaa, 2019; Congress et al., 2020; Outay et al., 2020

No.	Purpose	Applicability	Author(s), year
3	Avoiding collisions, UAV-, UAS-, and drone-type flight systems security assessments, flight route planning	Aviation	Lopez, 2007; Dalamagkidis et al., 2008; Newcome, 2009; Reitz and Crouse, 2013; Liu and Foina, 2016; Papa et al., 2017; De and Sahu, 2018; Fouda, 2018; Mahjri et Ayhan et al., 2019; Ghubaish et al., 2019; Lin et al., 2020; Xu et al., 2020; Vu et al., 2020; Woo et al., 2020
4	Management of the gas deposits	Petroleum administration	Xie, 2020
5	Management of the agricultural areas	Agriculture	Shi et al., 2016; Chávez et al., 2020
6	Monitoring, management and rehabilitation of brownfields	Extractive activities	Padró et al., 2019
7	Assessment of archaeological remains	Archaeology	Carvajal-Ramírez et al., 2019
8	Meteorological prediction models and behaviour simulation experiments	Meteorology	Berman et al., 2012; Thomas et al., 2012; Privé et al., 2014; Aurell et al., 2017; Wick et al., 2018
9	Supervising field interventions	Counter-terrorism, cyber attacks	Boyle, 2013; Rani et al., 2016; Birdsall, 2018
10	Resource management	Natural resources management	Rango and Laliberte, 2010

Source: the authors

The first field of activity where the use of the UAV technology was considered necessary was the aviation sector. The role of the UAV, UAS or drones in aviation was particularly highlighted by the studies conducted by the Federal Aviation Administration and NASA on the rethinking of the flight routes in order to avoid collisions by developing mathematical models (Reitz and Crouse 2013; Liu and Foina 2016; De and Sahu 2018; Mahjri et al. 2018; Ghubaish et al. 2019; Lin et al. 2020; Xu et al. 2020; Vu et al. 2020; Woo et al. 2020), pre-flight contingency planning (Ayhan et al. 2019), reporting incidents related to the UAS safety (Fouda 2018) or assessing the acoustical emissions generated by drones (Papa et al. 2017).

When speaking about the public administration, the use of the UAV technology is associated with achieving the spatial data related to the development of land cadastre and land use categories (Crommelinck et al. 2017; Stöcker et al. 2019; Xia et al. 2019; Casiano Flores et al. 2020; Koeva et al. 2020).

Drones are useful also in the transportation sector by the development of algorithms for data extraction (Yoon et al. 2018; Outay et al. 2020), identification of obstacles on crossroad sectors (Congress et al. 2020), avalanche monitoring

area (McCormack and Vaa 2019), testing of elevation models accuracy (Julge et al. 2019), analysis of the road pavings (Inzerillo et al. 2018), bridge inspections (Dorafshan and Maguire 2018), traffic management (Sharma et al. 2017).

The UAS are used for the detection and quantification of the waste dumps and monitoring of brownfield rehabilitation (Padró et al. 2019), investigation of the archaeological sites conservation status (Carvajal-Ramírez et al. 2019), management of agricultural crops and improvement of agricultural techniques (Shi et al. 2017; Chávez et al. 2020), supervising the gas deposits (Xie 2020). The data achieved after drone flights, by associating them with specific sensors, may be found also in the forecasts of meteorological models (Wick et al. 2018), for the determination of atmospheric pollutants (Aurell et al. 2017) or simulation of observation experiments (Privé et al. 2014). Regarding drone usage, the Obama administration campaigned for their application in counter-terrorism (Boyle 2013; Birdsall 2018) and cyber-attacks interventions (Rani et al. 2016).

5. CONCLUSIONS

The aim of the paper consisted in conducting complex bibliometric analyses on the use of the UAV technology during the 1988-2020 interval, based on the papers published in the Scopus database. Although the topic is relatively new, the need of introducing these types of aircrafts in various fields of activity has a growing impact over the last five years and an upward trend for the interest in this topic. The data obtained by means of drones and other unmanned flight devices provides accuracy and new categories of information, etc. The high number of citations from American studies on this topic highlights, including through the conducted bibliometric analyses, the significance of the papers published by various education, research and administration institutions in the USA.

The spatial distribution of the researches focused on the role of the UAV has revealed an interest in this topic also among the European education and research institutions, many of them funded by various programs of the European Union, with northern and western countries head of the list. Although there are recent initiatives for the processing of data by drones also in the South-Eastern European countries, including Romania, the international visibility of the published studies is modest, found only in certain databases.

In the context of yet unfinished process of systematic recording of real estates in Romania, the need of using some spatial data obtained pursuant to flights (the digital elevation model, land use, conservation status of certain resources in the territory) would accelerate these efforts, all the more so since there are already studies on the role of UAVs in land management and the use of this data by local public administrations.

Limitations of the study

The bibliometric analyses conducted in this research used only the Scopus database, which, together with WOS, represent the most relevant scientific databases. Therefore, the analysis of the documents is not exhaustive. Some materials were found also in other scientific databases. In addition, only papers related to the analysed topic were considered, not all the possible document categories (scientific reports, reviews, etc.).

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THE EVOLUTION OF CLUJ FORTRESS FROM EXTRAMUROS AREA AND THE IMPRINT OF THE GEOSITE IN THE GEOGRAPHICAL LANDSCAPE OF CLUJ-NAPOCA CITY

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ABSTRACT. – The Evolution of Cluj Fortress from Extramuros Area and the Imprint of the Geosite in the Geographical Landscape of Cluj-Napoca City. Cluj Fortress was built by the military garrison of the Habsburg Empire to have a defensive role in tragic periods. The site of its location was chosen possibly due to morphology, the presence of landforms developed on sandstones and conglomerates which led provided conditions for living and development in that place. The evolution of the area from extramuros to intramuros was shaped by the living necessities that the military garrison had to satisfy. By entering the area beyond the walls, "the world down there", they had access to the means of satisfying their needs, to the necessary substance and energy exchange. The emergence of miserable households, mere holes in the slope, was possible due to the geological structure. They had a negative impact on the geographical landscape, due to the negative look of the slope, but also because of the precarious living conditions of the inhabitants of that area. The development of communities including disfavoured people determined miserable living conditions, while they tried to survive in different manners. By means of the used methodology, the paper highlights the evolution of Cluj Fortress since ancient times until today, and to emphasize the importance of the Fortress site from a scientific and anthropogenic point of view, by means of the geomorphosite inventory list.

Keywords: *evolution, Fortress, extramuros / intramuros, sandstones and conglomerates, geosite, geographical landscape, Cluj-Napoca, Romania.*

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1. INTRODUCTION

The geographical landscape represents the result of the interaction that exists between the components of the (geographical) natural environment and the anthropogenic (man-made) ones, revealing the fact that geographical reality is a complex space having well-defined territorial functions (Irimuș, I.A., 1997, 2004, 2006). The landscape geodiversity existing within a territorial unit makes reference to all that is supposed and included in nature as a whole, highlighting its variety. This variety may rely on geological aspects (rocks, minerals, etc.), geomorphological aspects (landforms, landform typology, geomorphological processes), soil typology, fauna / flora, the presence of systems and processes (Irimuș, I.A., and Mureșan, Alina, 1994; Quesada-Román *et al*, 2022). Geodiversity outlines a higher importance depending on the quality of existing relations between different processes and the impact they have on morphology (Castre, N., 2019).

The natural component represents a proper space to support the social system (population, settlements, buildings, industry, transport, etc.). Medieval and early modern fortresses may also be added to this, as they served as defensive barriers in times of war. As a consequence, they may be included in the category of geosites, and they are also part of the man-made heritage, representing points of interest both in economic terms, and in educational – historical terms. In our perspective, the use of the term geosite refers both to the morphological forms, as well as to forms created as a result of anthropogenic activities (Carrion Mero, P. *et al*, 2020).

In time, this subject raised the interest of some scientists who made investigations in the field, trying to reconstitute the historical border objectives in a military context, highlighting the interests of colonialism and political nationalism (Di Paola, G.M.F., 2018). In a territory, fortresses represent a stage of urban development that started from the moment they were built and continued with the impact they had on the communities. Apart from their main military function, the fortresses also include buildings meant for the residential function of the human community.

An important element regarding the location of a fortress used for military purposes is based on the premise that any human settlement must be planned taking into account the opportunities for proper living conditions, and should be close to some attraction points, such as a source of water, it should be accessible, while a developed centre should be present nearby (Mac, I. and Hosu, Maria, 2003). All the above-mentioned elements make possible the existence of living and working conditions. Moreover, facilities and conditions related to height are to be monitored and assessed, as well as the existence of favourable angles, providing long-distance visibility. All these are essential

arguments regarding the location chosen for building a fortress. It is obvious that the morphology (the height) is a predominant and first-rank criterion in determining the optimal location for a fortress (Irimuș, I.A., Petrea, D., Rus, I., Corpade, A.M., 2010).

The urban community tends to closely follow the history of events and activities, as well as the land and estate property which existed in the moment when a new human component appeared (Deac, Simona, Irimuș, I.A., Păcurar, B.N., 2013; Guenzel, S., 2013). One should also analyse the development and changes occurred in time, by means of history, and also the impact performed on the environment (Hyun Sil Shin *et al*, 2015).

The purpose of this paper is to highlight the evolution of the Cluj-Napoca City Fortress from the extramuros areas towards an intramuros area. The detailed research aims at establishing the place and development of the fortress, the morphological features of the space where it was located, the suitability of the geological bedrock, the potential natural risks, the typology of the landscape created by the existing human community compared to the neighbouring human community, the role of the fortress for the nearby urban centre, as well as the resilience of the existing formations under anthropogenic influence.

The proposed objective should be reached by means of specific methods. These include the geomorphological methods of research and analysis, and the cartographic method by means of which a comparative analysis may be performed between bibliographic, topographic, informatic and photographic sources. The observations made by using the older or current cartographic materials have been confronted with the reality in the field. Analyses have been performed on the morphology, the geological bedrock, and the existing areas of risk. Also, an inventory sheet for the Fortress site has been accomplished, using the specific methodology related to the inventory of a geomorphosite. This sheet may be then used to reveal the importance of the site, taking into account several criteria of interest.

The creation of links between geographical components, the quality of the established links and the spatial dynamics of the relations between the components may be inferred from the manner in which the geographical landscape is structured and the way it functions.

2. SHORT HISTORY OF THE URBAN DEVELOPMENT IN THE FORTRESS HILL AREA

The Fortress Hill in Cluj-Napoca City is located on the fifth terrace of Someș River, also named the Fortress Terrace, at an absolute height of 390 – 405 m and a relative height of 55 – 75 m (Meszaros, N., Clichici, O., 1976).

The Habsburg fortress was built between 1715 and 1735 according to the plans of the military architect Giovanni M. Visconti, which provided a star-shaped architecture of the defensive walls (Danci, I., Irimuș, I.A., Vieru, Ioana, Toma, Bianca, 2010).

The fortress represented a form of human habitation, from where the military garrison had an excellent perspective and visibility over the entire urban centre. Its primary role was to control the intramuros (the entire settlement), but also to defend the city in case of a siege.

By order of the future emperor Joseph II, the Habsburg army accomplished the first military topographic survey of the Empire in the second half of the 18th century, in Transylvania between 1763 and 1773 (fig. 1). As a consequence, the series of maps created then will remain in the universal heritage under the name of Josephine maps. The hill fortress is represented together with the older "fortress" of Cluj, actually the city walls. On this map, one notices the star-shaped nature of the fortress, the access route, and one may also infer the use of the neighbouring land, as vineyards were present close to the fortress, on the southern and eastern slopes of the Fortress Hill. Also on this map, one may notice the absence of the households built outside the fortress.

Fig. 1. The Josephine Map – 1763 -1773

Photo source: Arcanum Publishing House

The second Habsburg military topographical survey campaign started in 1853 and led to the appearance of a new set of maps (1853-1873), which are universally known in the cartographical culture as the Franciscan maps (fig. 2). For the needs of research, the Franciscan maps are more detailed and more precise than the Josephine ones. Many patterns appear on the Franciscan map including Cluj, and a change of land use is also noticeable. In this sense, one remarks the first signs of habitation on the southern slope of the Fortress Hill (fig. 2).

The extramuros area (the Fortress Hill) was the poorest area of the town (fig. 3), and disfavoured people lived there. In the first period of their habitation in this place, the residents did not have any alternative, so they created their own households by digging holes in the slope (fig. 4), building inside, carving the slope along the contour line. This was made possible by the landform and topographical features of the terrain, the geological and lithological features, all contributing to the creation of these "households" in the rocks.

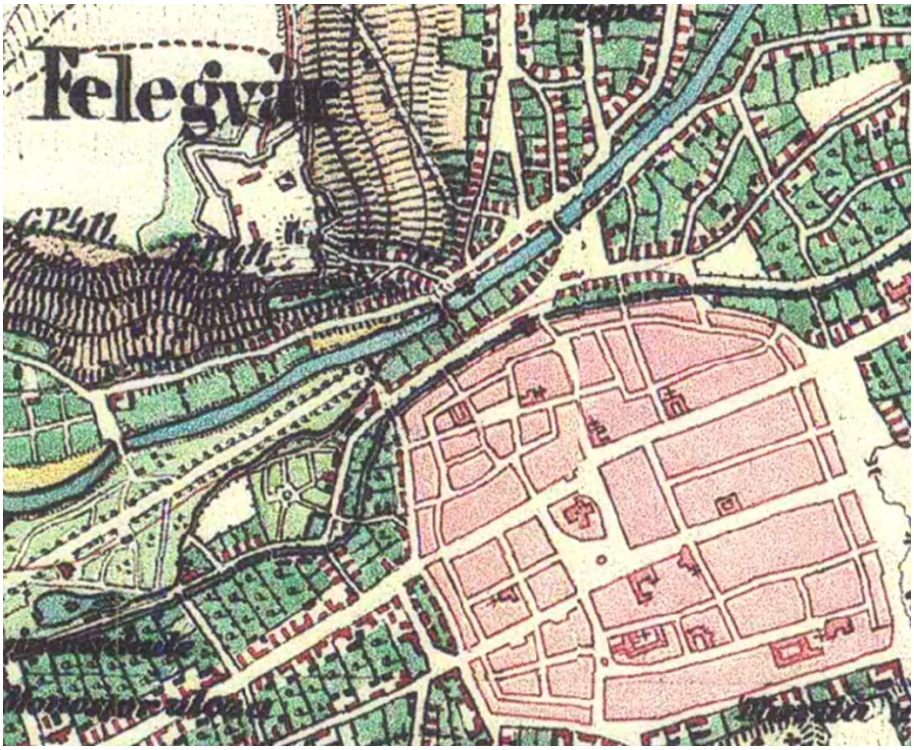


Fig. 2. Franciscan Map – 1853-1873
Photo source: Arcanum Publishing House

Fig. 3. Comparative images between the extramuros area (left) and intramuros area (right)
Photo source: https://clujwebstory.ro/cetatuia-acoperisul-clujului-in-ochii-clujenilor-de-altadata/

Fig. 4. Holes in the rock which served as human residence
Photo source: https://actualdecluj.ro/foto-cetatuia-de-acum-100-de-ani-era-locuita-de-banditi-prostituate-si-oameni-ai-pesterilor/

To better understand the geological bedrock which allowed for the creation of those carved households, it is necessary to analyse its features and manner of formation (fig. 5). The caves created by people looking for a shelter were carved in the sandy intercalations of the Cetăţuia (Fortress) strata. Above the striped complex of Ticu strata, the Cetăţuia strata appear on the upper part of the Fortress Hill. They have an Upper Oligocene age and are covered by marls and sandy clays. Above these, there is a thick series of sandstones, sands and microconglomerates. The sands present in the terminal part of the Cetăţuia strata horizon feature kaolinization phenomena.

The fortress itself is delineated by earth elevations, which have the aspect of mounds. In its surroundings, there is plenty of gravel, which indicates that the waters of Someş River were present during the Upper Quaternary, leaving behind alluvia, which form the terrace level of the fortress (Meszaros, N., Clichici, O., 1976).

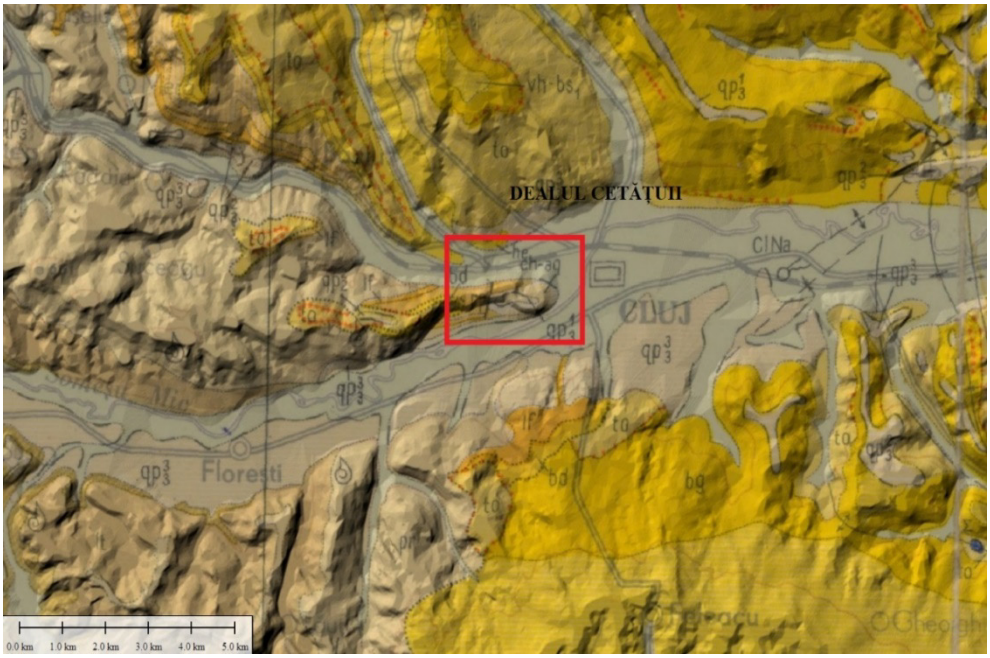
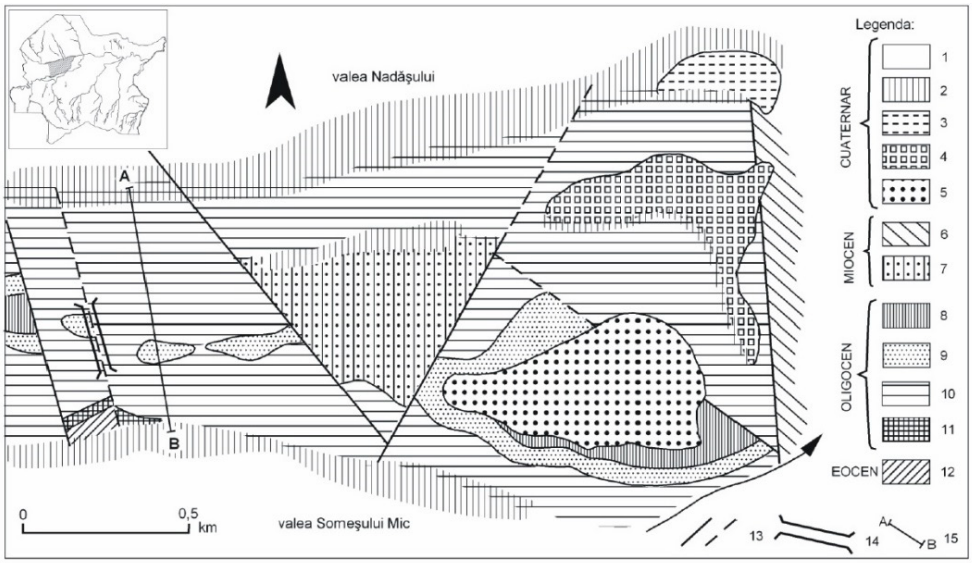
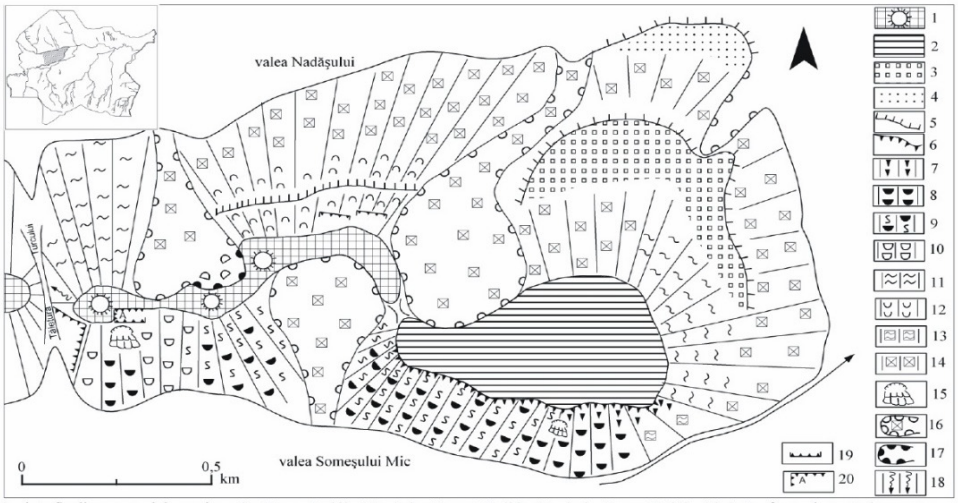


Fig. 5. The location of the fortress in geological context.
Photo source: Geological Map 1:200.000 (by IGR)



= aluviuni; 2 = glacis; 3 = Terasa II. (10-16 m); 4 = Terasa IV. (30-45 m); 5 = Terasa V. (60-75 m); 6 = Formaţiunea de Iris; 7 = Formaţiunea Tufului de Dej; 8 = Formaţiunea de Gruia; 9 = Formaţiunea de Dâncu;10 = Formaţiunea de Moigrad; 11 = Formaţiunea de Mera; 12 = Formaţiunea Marnelor de Brebi; 13 = falii; 14 = Tăietura Turcului; 15 = linia profilului

Fig. 6. Geological map between the Fortress Hill and Tăietura Turcului
Source: Szilárd-Lehel, P. (2011)



1 = interfluvii cu martori de eroziune; 2 = Terasa V. (60 - 75 m); 3 = Terasa IV. (30 - 45 m); 4 = Terasa II. (10 - 16m); 5 = frunte de tersă; 6 = cueste; 7=prăbuşiri; 8 = versanţi cu alunecări active; 9 = versanţi modelaţi de alunecări active şi creep; 10 = suprafeţe cu alunecări vechi; 11 = versanţi cu alunecări temporar stabilite; 12= versanţi predispuşi la alunecări; 13= versanţi temporar stabilite prin activităţi antropice; 14= versanţi cu construcţii predispuşi la alunecări; 15 = râpa şi corpul alunecării; 16 = văi derazionale cu construcţii; 17 = văi derazionale; 18 = eroziune difuză; 19 = terase antropice; 20 = excavaţii antropice

Fig. 7. Geomorphological map between the Fortress Hill and Tăietura Turcului
Source: Szilárd –Lehel, P. (2011)

The sector between the Fortress Hill and Tăietura Turcului is part of the hills between Someşul Mic River and Nadăş River and has been approached by many researchers whose studies stress the vulnerability of the area to slope processes (landslides and collapses) (Szadeczky-Kardoss, Gy., 1918, Xantus, J., 1942, Meszaros, N. and Clichici, O., 1976, Buzilă, L. et al., 2002, Szilárd-Lehel, P., 2011).

The building of the fortress for the garrison and the subsequent presence of the military led to the emergence of new problems out of human necessities, as the garrison became a centre generating demand. This is the main reason which determined the evolutionary stage of the fortress, from the extramuros area to the intramuros area. According to Mac I. and Hosu Maria (2003), any landform that provides support for an anthropogenic structure needs to exchange mass, energy and information with the surrounding environment. To better communicate with the world behind the walls, but also to satisfy the needs, the Germans' bridge was built at the end of the 18th century, linking the base of the Fortress Hill to the world below. This bridge represented the main access of the garrison to resources and other necessary supplies.

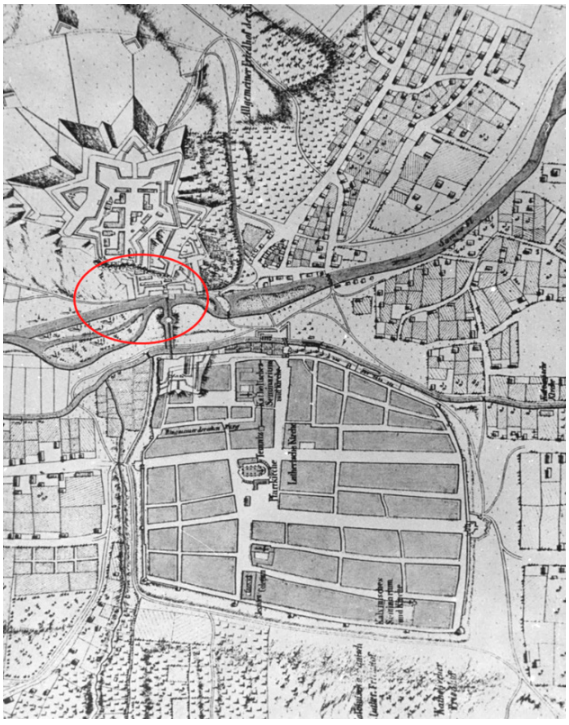


Fig. 8. The Germans' bridge
Source: https://www.omnia.ie/index.php?navigation_function=3&europeana_query=Dealul%20Cet%C4%83%C8%9Buia

In time, those who lived on Fortress Hill developed houses in the form of miserable hovels (fig. 9), creating a sort of shanty town, resembling those which currently exist in Brazil in some of the large urban areas, known as "favelas". They shelter the poorest community, which attempts to satisfy their needs for a living in different manners, by means of another nearby community, using various methods. Historian Tudor Sălăgean presented the situation that existed during the 19th century, stating that on the lower slopes of the Fortress Hill, on the left bank of Someș River, there was a suburb inhabited by poor people who had links to the Austrian garrison from within the existing fortress. Those links had the purpose of providing all sorts of services (women of loose morals, porters, etc).

Fig. 9. The shanty neighbourhood on Fortress Hill
Source: https://www.stiridecluj.ro/social/cetatuia-cluj-din-1890-pana-in-1965-de-la-oamenii-grotelor-la-demolari-si-civilizatie-video

These huts influenced negatively the geographical landscape of Cluj City, and for this reason the local authorities decided to dynamite the neighbourhood built by the people living there. Nevertheless, they rebuilt their households. This aspect highlights the fact that the geology, the landform typology and the location of the settlement create the support for habitation,

which allowed that community to resist to those living conditions, and even to develop further. The idea to blow up the neighbourhood was a real failure, so the local authorities appealed to another method by means of which they considered that the neighbourhood would integrate, applying taxes and fees. This idea also failed.

At the beginning of the 1960s, the communist leader of Romania, Gheorghe Gheorghiu Dej, during a politically-motivated visit to Cluj, toured the city and his route included the existing road at the foot of the hill. He noticed the landscape created by the hovels, and was negatively impressed by them. As a result, he ordered those miserable huts to be erased, because they represented a negative hotspot for the city of Cluj, and had a negative impact on the geographical landscape.

Therefore, the neighbourhood built on the Fortress Hill disappeared between 1960 and 1964 (fig. 10). In 1964, at the foot of the hill, modern blocks of flats were in process of being built, while the slope behind was perfectly cleaned up of huts, as one concretely notices the landform and its structure.

Fig. 10. The slope of the Fortress Hill and the presence of modern blocks of flats at the foot of the hill between 1960 and 1964

Photo source: https://actualdecluj.ro/foto-cetatuia-de-acum-100-de-ani-era-locuita-de-banditi-prostituate-si-oameni-ai-pesterilor/

3. Methodology

The research was based on the projection of the historical reality of the Fortress geosite in its geographical (geomorphological, geodemographic and geotouristic) syngeneic development. This study allowed us to perform a connection between the landform factor (Irimuș, 1994) with the geodemographic and political-administrative dynamics of Cluj-Napoca City, identifying morphological opportunities as pillars of resilience to geopolitical changes. The cartographic method has been used to compare the sets of maps, with the purpose of highlighting the manner of evolution of Cluj Fortress in different historical periods, and the part played by this geomorphosite in defining and structuring the geographical landscape of Cluj City (Pop, Simona-Octavia, Irimuș, I.A., Păcurar, B.N., Trif, Teodora, 2014).

The analyses performed on the sets of maps belonging to the historical heritage provided information related to the evolution of the Fortress, as a geosite integrated to the left bank and slope of Someșul Mic River, in *extramuros*. The satellite images and photos present the evolution of the Fortress as an internal part of the city, *intramuros*, and its impact on the geographical landscape.

The method used to create the inventory sheet comes from the qualitative and quantitative methods of assessment, developed to highlight the values of geomorphological interest, the degree of use, the aspects related to the managerial assessment, but also the restrictive features of the analysed landform. Cendrero, A. (1996), Pralong, J.P. (2005), Reynard, E. (2008), Pereira, P. (2007, 2010) proposed the methods of inventory to assess the site on the basis of which the inventory sheet was achieved. The method has first in view the geomorphological value, that is related to the scientific, cultural, aesthetic and landscape aspects. Another aspect is the degree of use of the site, including criteria regarding visibility, accessibility, risk typology, infrastructure, tourism flows and visiting hours. In terms of managerial aspects, the analysed criteria are sustainable development and educational activities, while the restrictive features are related to vulnerability to risks, the presence of risks which may affect the tourism activities, as well as inaesthetic elements. All the criteria are proposed, analysed and graded according to the subjective point of view of the researcher.

The mathematical formula to acquire the geomorphological value, the degree of use, the managerial aspects and the restrictive features is performed by means of the arithmetic method.

$$V_{TOTAL} = (V_{GEO} + V_{UTIL} + V_{MNG} + V_{AR}) / 4$$

4. Results and discussions

The morphology and the geological structure of the site made possible the establishment of a fortress and the development of living conditions on the location of the Fortress geosite. The geosite is representative within Cluj-Napoca City because of its history, as it had the main purpose to defend the city in case of attacks, because of its scientific importance, related to the geomorphological criteria of assessment, namely the landform typology and the geological composition, and because of its socio-economic and educational importance.

Table 1. Geomorphological value – the scientific criterion (Sce)

Scientific criterion (Sce)	Subcriteria	Score	Given value
Integrity (Intg)	Site destroyed	0	0.50
	Low integrity	0.25	
	Medium integrity	0.50	
	Integrity up to 70%	0.75	
	Unaffected	1	
Representativity (Reprez)	Presence of vegetation	0	1
	Presence of conglomerates	0.25	
	Presence of sandstones	0.50	
	Presence of geomorphological processes	0.75	
	Composition of the geological bedrock	1	
Genesis (Gnz)	Common genesis	0	1
	Genesis involving a single factor	0.25	
	Genesis involving three factors	0.50	
	Genesis involving five morphogenetic factors	0.75	
	Genesis involving more than five morphogenetic factors	1	
Rarity (Rar)	Common site	0	0.25
	Site of local interest	0.25	
	Site of regional interest	0.50	
	Site of national interest	0.75	
	Site of international interest	1	

The scientific interest (Sce) (table 1), evaluated at 2.75 points, concerns aspects related to integrity, representativity, genesis and rarity. The first criterion, integrity, received a score of 0.50 points, reflecting a medium integrity. This is underlined by the merk left by the action of geomorphological, meteo-climatic and even anthropogenic processes which negatively affected the studied landform. In terms of the representativity of the researched site, the value given is 1 point, because the presence of the natural and anthropogenic processes made possible the degradation of the form due to the geological bedrock. Even the holes in the rock dug by the inhabitants and used as dwellings were possible due to the presence of the sandstones and conglomerates, types of rocks feasible for anthropogenic activities. Regarding the genesis of the Fortress Hill, there are several factors involved, such as geological, climatic, hydrological, geomorphological and biotic (including anthropogenic) ones. The value given to this factor of interest is 1 point. The site is mainly important for Cluj-Napoca City, having an impact on local development, for which it received a score of 0.25.

Table 2. Geomorphological value – the cultural criterion (Cult)

Cultural criterion (Cult)	Subcriteria	Score	Given value
Religious importance (IR)	Lack of religious buildings	0	0
	Presence of churches	0.25	
	Presence of monasteries	0.50	
	Presence of cathedrals	0.75	
	Presence of religious buildings and attractions	1	
Geohistorical importance (IG)	No importance	0	0.75
	Site of minor interest (geologically and historically)	0.25	
	Site of major interest (geologically)	0.50	
	Site of major interest geologically and historically	0.75	
	Prehistoric site	1	
Bibliographical importance (IB)	No importance	0	0.25
	Presence in books, studies	0.25	
	Presence in the university curricula	0.50	
	Presence in the high school curricula	0.75	
	Presence in the school study curricula	1	

Regarding the cultural criterion (Cult) (table 2), the value obtained is 1 point. In the analysis of the Fortress Hill, the historical importance is provided by the presence of the Habsburg fortress, built between 1715 and 1735 by the military garrison on the fifth terrace of Someș River, a human settlement called Cetățuia (Fortress). Therefore, in terms of the geohistorical importance of the studied site, the score given is 0.75 points, which reflects its major importance both from a geological and from a historical perspective. The location of the fortress on the steep hill was also possible due to the geological bedrock, consisting of sandstones and conglomerates. Regarding the importance of the site from a bibliographical point of view, the subject of the Fortress is approached in many books, studies, press articles, and so the value given is 0.25 points.

Table 3. Geomorphological value – The aesthetic and landscape criterion (Est)

Aesthetic and landscape criterion (Est)	Subcriteria	Score	Given value
Panoramic viewpoints (PB)	No panoramic viewpoints	0	1
	One panoramic viewpoint	0.25	
	Two panoramic viewpoints	0.50	
	Three panoramic viewpoints	0.75	
	More than five panoramic viewpoints	1	
Chromatic contrast (C)	No chromaticity	0	0.50
	Unimportant chromatic contrast	0.25	
	Medium chromatic contrast	0.50	
	High chromatic contrast	0.75	
	Intense chromatic contrast	1	
Artistic importance (ART)	No artistic importance	0	0.25
	Present in 5-10 media releases	0.25	
	Present in 10-15 media releases	0.50	
	Present in more than 20 media releases	0.75	
	Presence of the site in an art opera	1	

The aesthetic and landscape criterion (Est) (Table 3) reached the value of 1.75 points. This score has been calculated as a result of the analysis of three factors: panoramic viewpoints, chromatic contrast and artistic importance.

An analysis of these above-mentioned criteria is needed because they have a great relevance regarding the introduction of this geomorphological site in educational activities. This attraction provides numerous panoramic viewpoints for the researcher and for the visitor alike. These granted a special importance in terms of location for the military garrison, because the site provides an excellent visibility of the whole city. Even nowadays, the fortress is famous for the panoramic overview of Cluj-Napoca City, available for the visitor. The value given for this criterion is 1 point. The chromaticity reaches a medium level, as there is a contrast between the geological bedrock (in yellow-brown colours) due to the presence of clayish rocks, and the herbaceous vegetation, which is not of peculiar interest, but contributes to the development of chromatic contrast. The score given for the chromatic contrast is 0.50. The fortress is mainly interesting at local level, and is seldom presented at national or international level. There are some press articles in the local Cluj newspapers, reason for which the given score is 0.25, reflecting its presence in 5-10 media releases.

Table 4. The degree of use (V_{UTIL})

Assessed criterion	Subcriteria	Score	Given value
Visibility (VIZ)	Visible from a distance of less than 1 km	0	1
	Visible from a distance of 1 km	0.25	
	Visible from a distance of 3 km	0.50	
	Visible from a distance of 5 km	0.75	
	Visible from a distance of more than 10 km	1	
Accessibility (ACC)	Lack of any access road to the site	0	1
	Presence of a road to more than 1 km to the site	0.25	
	Presence of a road at 1 km from the site	0.50	
	Presence of a road at less than 500 m from the entrance to the site	0.75	
	Presence of several roads to the top of the site	1	
Risk typology (RSC)	Technological risk	0	1
	Climatic risk	0.25	
	Geological risk	0.50	
	Geomorphological risk	0.75	
	All of the above	1	

Assessed criterion	Subcriteria	Score	Given value
Infrastructure (INF)	Poor facilities	0	0.75
	Facilities at the periphery of the site	0.25	
	Modern facilities within the site	0.50	
	Facilities and services both at the entrance and within the site	0.75	
	Modern infrastructure both along the access routes, and within the site and in its surroundings	1	
Tourist flows (TUR)	Between 0 and 50 tourists/day	0	1
	Between 50 and 100 tourists/day	0.25	
	Between 100 and 150 tourists/day	0.50	
	Between 150 and 200 tourists/day	0.75	
	More than 200 tourists/day	1	
Visiting hours (H)	Between 10.00 and 14.00	0	1
	Between 10.00 and 16.00	0.25	
	Between 10.00 and 18.00	0.50	
	Between 10.00 and 20.00	0.75	
	No visiting hours (visit possible at any time)	1	

The degree of use (V_{UTIL}) (table 4) is characterized by several factors, such as: visibility, accessibility, risk typology, infrastructure, and tourism flows. As a result of the quantitative analysis, the total given score is 5,75 points. The first analysed criterion refers to visibility, an aspect which received the maximum score of 1 point, because the location of the fortress, namely the Fortress Hill, is visible from a distance of more than 10 km. Regarding accessibility, there is a road which leads to the basis of the site. The access on the slope may be performed only on foot, and there are stairs with the help of which one may reach the location of the fortress, at Belvedere Hotel / Restaurant and to the panoramic viewpoints. There are also several routes leading to the peak of the slope. The score given for this analysed criterion is therefore 1 point. Concerning the typology of the risks that exist in the study area, one remarks the presence of geological, geomorphological and climatic risks. The value given for this criterion is 1 point. The infrastructure received a score of 0.75, reflecting the arrangements and facilities that exist both at the foot of the hill, as well as within the site (Belvedere Hotel, the existence of rest areas, etc). The Fortress geomorphosite enjoys tourism flows that includes more than 200 tourists per day, a criterion which received 1 point. In the

category of tourists, one also includes students from other towns who choose the Fortress to hike on short trails to the panoramic viewpoints. It is an attraction which does not have visiting hours, and is therefore open to the public at any time, day or night, and therefore the score given for this is 1 point.

Table 5. Managerial aspects (V_{MNG})

Assessed criterion	Subcriteria	Score	Given value
Sustainable development (DEZ)	Site is missing from managerial projects	0	0.50
	Site is present in one development project	0.25	
	Site is present in two-three development projects	0.50	
	Site is present in protection projects	0.75	
	Site completely protected by law and closed for public	1	
Educational activities (EDU)	No educational activities performed	0	1
	Presence of school field trips	0.25	
	Presence of routes dedicated to pupils	0.50	
	Performance of school-related festivities	0.75	
	Performance of numerous educational activities	1	

The research made regarding managerial aspects (V_{MNG}) (table 5) resulted in assessing a score of 1.50 points. Concerning the sustainable development of the site, there were development projects made even by foreign researchers in 2008, which however did not come to life because of the economic problems during that period (the economic crisis). The score given for this criterion is 0.50 points. Taking into account the presence and integration of the site in educational activities, there are many activities that may be performed including this point of interest, such as: tourist trails, field trips with the specialized professors of the Faculty of Geography, Babeș-Bolyai University of Cluj-Napoca, or from other cities, to confront the reality in the field with the cartographic material, to fly drones to acquire real data from the field, etc. The given value for the educational activities is 1 point.

Table 6. The analysis of restrictive features (V_{AR})

Assessed criterion	Subcriteria	Score	Given value
Vulnerability to risks (VUL)	The site has no vulnerabilities	0	0.50
	The site has vulnerabilities but it is not affected	0.25	
	The vulnerabilities affect the site in a proportion of 50%	0.50	
	The site is partly destroyed	0.75	
	The site is totally destroyed	1	
Presence of risks that may affect tourism activities (RT)	Lack of risks	0	0.25
	Risk of landslides	0.25	
	Risk of degradation for the forms	0.50	
	Risk of collapse for the forms	0.75	
	Risk of total destruction for the site	1	
Inaesthetic elements (EI)	Lack of inaesthetic elements	0	0.75
	Natural inaesthetic elements	0.25	
	Degraded households	0.50	
	Presence of waste	0.75	
	Presence of industrial units and infrastructures	1	

Analysing the restrictive features (V_{AR}) (Table 6), we obtained a total value for this criterion of 1.50 points. The aspects regarding the vulnerability to risks received 0.50 points, because there are vulnerabilities affecting the site in a proportion of 50%. These vulnerabilities are caused by the presence of natural processes that currently affect and will continue to affect the researched site. The risks that have an impact on tourism activities are those related to the presence of landslides. A negative imprint on the geographical landscape resulted from the forced planning of the landform, which included the building of blocks of flats since the 1960s. As a result of concreting, phreatic waters were obstructed, a negative aspect for a landform developed on a geological bedrock made up by sandstones and conglomerates. This determined the hydration of clayish minerals, leading to the emergence of landslides. This criterion has therefore received 0.25 points. The presence of a high number of tourists had the notable effect of increasing the amount of waste, an aspect which is one of the inaesthetic elements, which received 0.75 points as a result of its analysis.

The total value of the Fortress geomorphosite by applying the above-mentioned mathematical formula is 3.56 points, and was acquired as a result of the assessment made according to the inventory sheet taken over from the studied methods, which suffered relevant changes, as we saw fit.

5. PROPOSALS

It is our opinion that this important site should be introduced in educational activities, because it has a high geomorphological and historical significance. In this study we propose two itineraries that may be taken into consideration by the schools or universities.

The first itinerary should be conceived as a local tourist route for the pupils of the schools in Cluj-Napoca City. This route may be achieved in two ways. First, it may be introduced as a part of a larger tour of Cluj-Napoca, which may include many other attractions (Mihai Viteazu Square, the Cathedral), but also the Fortress Hill. This city tour may be addressed to pupils in pre-university schools, within the projects entitled "Different School", but also to university students, at the beginning of the academic year. This might be a short trip guided by the tutor to show the new students, coming from all corners of the country, the importance and beauty of the city where they choose to study.

Also, the same route may be used for field trips by the students of the Faculty of Geography belonging to Babeș-Bolyai University of Cluj-Napoca. They should be guided by their specialized professors, to set up geomorphological and topographical maps, to confront the reality in the field with the cartographic material, and even to fly drones in order to acquire or update databases.

The second itinerary should take into consideration a longer trip (for about 2-3 days) to the sites that have a geological bedrock made up by sandstones and conglomerates. This itinerary may include sites in Cluj County, as well as in the neighbouring counties. A good example in this sense is Sălaj County, where there are many attractions developed on a geological bedrock consisting of sandstones and conglomerates (Stanii Cliţului, Grădina Zmeilor, Stânca Dracului, etc). As a result of this field trip, one may perform a comparative analysis between the visited attractions, concerning the strengths and weaknesses of the attractions (a SWOT analysis). The pupils or the students may propose new methods of protection for the sites, or they may be challenged to provide ideas regarding the future set up plans for the visited attractions.

6. CONCLUSIONS

The Fortress of Cluj-Napoca City represents a historical landmark of great importance because of the part it played in the development of the city, its military background, but also due to its geographical significance as highlighted by the suitability of the landform to the anthropogenic influence.

The methodology used in this research was helpful in underlining the powerful impact that the evolution of the fortress had on the geographical landscape and the social and educational activities, since the times of its building until nowadays. Also, according to the methodology, the inventory sheet of the Fortress geomorphosite has been created, highlighting the important aspects related to the geomorphology, the degree of use, the management, and also the restrictions of the studied landform.

The setting up of the tourist routes or of those made for educational purposes represents an important factor for the economic and educational sector. The historical importance, hand in hand with the geographical one, constitutes the basic foundation for the attraction of tourists.

The presence of the fortress within the geographical landscape of Cluj-Napoca City also had and still has a negative imprint, because of the hovels that were built along the slope, which greatly affected the vegetation and led to soil degradation. In more recent times, the blocks of flats which still exist at the foot of the hill are in constant danger due to the geological bedrock and the processes that led to the emergence of landslides in the past, and may possibly occur once again.

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THE DARK SIDE OF TOURISTIFICATION PHENOMENON – A SHORT POINT OF VIEW

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ABSTRACT. – The Dark Side of Touristification Phenomenon – A Short Point of View. Tourism is considered to be a socio-economic development engine worldwide, its importance being undeniable at international scale. Because tourism represents such a notorious activity and global phenomenon, new concepts inevitably arise that need further understanding and clarification. One of them is ***touristification*.** Browsing through related scientific literature, one can see that touristification concept is a complex process mainly used with a negative connotation to describe tourism's impact for a specific area and on a specific group of people, their daily activities on one hand, and on the environment on other hand. Touristification is given many meanings by scholars, from an "empty" concept to an element of analysis without an unanimously accepted definition, this short point of view trying to shed a little bit of light on the matter highlighting the negative impacts of this phenomenon that manifests in touristic hot-spots worldwide.

Keywords*: touristification, tourism impacts, touristic hot-spots, sustainability, environment.*

1. INTRODUCTION

In recent years the concept of touristification has attracted scholars' attention, generating pertinent discussions and debates (Cerdá-Mansilla *et al.*, 2022; Cheung & Yiu, 2022; Kim & Holifield, 2022; Tulumello & Allegretti, 2021;

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Sequera & Nofre, 2020; Jover & Díaz-Parra, 2020; Campos & Sequera, 2020; Calle, 2019; Freytag & Bauder, 2018; del Romero Renau, 2018). Despite this, the phenomenon of touristification and its impacts represent a topic remaining still little researched even if the dimensions of tourism sector is witnessing a continuous growth. It is important to mention from the start that the touristification concept is mostly used in the context of and related to urban tourism (a passive form of consumerism), but can easily be extrapolated to rural tourism, mountain tourism, especially post pandemic.

Scientific literature highlights a series of synonymous words or collocations for touristification according to Ojeda & Kieffer (2020): touristisation, tourismification, touristifying (in English), turistificación and turistización (in Spanish), mise en tourisme (in French). Nowadays the concept is more and more associated with tourism-phobia and gentrification (Almeida-García *et al.*, 2021; Frago, 2021; Ramos & Mundet, 2021; Torres-Outón, 2020; Jover & Díaz-Parra, 2020; Almeida-García, Cortés-Macías & Balbuena-Vázquez, 2019; Zerva *et al.*,2019; Blanco-Romero *et al.*, 2019; Perez-Garcia & Garcia Abad, 2018), which cannot be entirely correct because tourists do not settle down permanently. Before proceeding to look a little bit to the impacts generated, we tried to give some definitions from the specific literature.

There have been many attempts by scientists in order to define touristification, but with no unanimously accepted definition, because each one is given from a different point of view or analysis. Kwon *et al.* (2021, p. 3) indicates that "touristification entails a transformation of the economy, society, culture, landscape, and overall lifestyle as a result of the infiltration of tourist culture in a place of residence, because of the interplay between urban development and tourism development".

Woo *et al.* (2022, p. 67) document that touristification is "understood as the capacity of the destination to absorb tourism before the destination's residents feel negative impacts", describing also the residents' worries about the increased flow of tourists and tourism project developments in certain destinations. The research of Muselaers (2017, p. 12) refers to touristification as the level of transformation through tourism of a space "in which this space has shifted from its original state towards a tourist performed state". Ojeda and Kieffer (2020) explain in their paper that touristification triggers changes in the socio-economic components and dynamics of a territory's environment and landscape. In a similar way Torres-Outón (2020, p. 348) defines touristification as the process where "economic activities and traditional uses are replaced by activities and uses related to tourism", in accordance with Cocola-Gant (2018) and Hiernaux & Gonzalez (2014). Basically, tourism activities and their effects on the environment and culture contributed to the manifestation of touristification (Picard, 2003).

Others indicate that when a territory in general emerges into a touristic one because the choices made are oriented towards attracting visitors is called touristification (Rio Fernandes, 2011; Belhassen, Uriely, & Assor, 2014; Muselaers, 2017).

Taking all above mentioned in consideration, this short point of view brings to front that it is crucial to monitor the residents' perception (they are the most affected element, fact pointed later) and to shift the attention in developing and implementing policies that have the aim to minimize the negative impacts of tourism development and to enhance the benefits in a sustainable manner, more research being fundamental to gain more insight on the real impacts of touristification.

2. WHY TOURISTIFICATION REPRESENTS AN ISSUE?

The world as we know it has not changed its size and tourism exploded, but tourism is not evenly distributed worldwide (some places receive more tourists than others, destroying them and making them unavailable indefinitely). Nowadays it's easier than ever to travel, tourism being pretty affordable, facts that translate into multifaceted damages seen not only on residents, local economies, but on the environment as well. Scholars explain that touristification impacts have been studied in various contexts and can be divided in three major categories: economic, socio-cultural, and environmental ones, the most obvious negative consequence being seasonality (Figini & Vici, 2012; Almeida-García *et al.*, 2016; Muselaers, 2017).

If we talk about negative economic impacts, we notice that they affect the cost of living, the standard of living, the prices and offer of products, properties, or services, local businesses investments, taxes, and personal incomes. An eloquent example in this respect is the peer-to-peer (p2p) rental market — spearheaded by Airbnb, that has grown exponentially in almost every big European city, leading to tourists pushing out locals from these markets (Bondora.com; Sequera and Nofre, 2018).

In terms of socio-cultural impacts of touristification, we can see that the cultural heritage, the identities, values, beliefs, rituals, traditions, daily routines, social lives of residents, the intercultural communication are affected. An alarming fact is related to the increased rate of alcohol and drugs consumption, crimes, social conflicts, crowding of public facilities (Almeida-Garcia *et al.*, 2016), Ooi & Stober (2010) concluding that touristification damages and destroys the authenticity of a place inflicting staged authenticity. Basically everything is produced or performed for touristic purposes, becomes a commodity and

residents begin to feel like "strangers in their own community" (Harrill, 2004 as cited in Muselaers, 2017, p. 14). Another consequence of touristification is the degradation of historic places, and maybe the most known and emblematic example is the case of Venice, Italy, its historic centre "being so crowded of visitors that is no longer a place to live in, but only a place for tourists" (Bujalance, Barrera-Fernández & Scalici, 2019, p. 103).

When it comes to the environmental issues associated to touristification, the impacts can be seen both on the natural environment and the man-made one, because tourists regularly consume more resources and generate more waste than locals, making it extremely difficult for cities and tourist hot-spots to be sustainable. In terms of nature, all components are affected, facts translated into: air pollution, water pollution, soil contamination, waste, litter, noise pollution. Some research papers indicate that because tourism is not seasonal anymore, touristification generates a flow throughout the year which means more ecological pressure, as the ecosystem has no chance to renew its resources (Stausberg, 2011).

A synthetized overview of touristification negative impacts can be found in the research of Muselaers (2017) as shown in table 1:

Table 1. Negative touristification impacts

Economic impacts	Socio-cultural impacts	Environmental impacts
-Increased price of goods and services (cost of living) - Increased housing prices - Increased property taxes - Direct displacement (gentrification)	-Increased crime, alcohol and drugs rates/ violent incidents - Social conflicts - Commodification of culture - Threats to cultural heritage (rituals, beliefs, traditions) - Indirect displacement (gentrification)	- Noise and pollution (air, water, soil, waste) - Site degradation - Vandalism - Crowdedness - Traffic and parking problems - Indirect displacement (gentrification)

Source: Muselaers (2017, p. 21)

It is only fair to remark the fact that touristification has manufactured a world where cities and touristic hot-spots are now pleasing tourists in a problematic way. Driven by the profits and economic benefits that derive from the tourism industry, touristification represents a disturbing trend and leads to the destruction of some of the world's most coveted sites. Fortunately, things are starting to move and the wheels to end touristification are being set in motion worldwide aiming to ease the burden of this phenomenon.

3. WHAT WHEELS MUST BE SET IN MOTION IN ORDER TO KEEP TOURISTIFICATION UNDER SUSTAINABLE BOUNDARIES?

In order to keep under control this troubling trend that started or is on the verge of destroying well-known tourist destinations, actions must be taken ranging from individual to global level.

Sequera and Nofre (2018) underline the fact that many touristic cities have difficulties in tackling the negative impacts induced by touristification and do not have all the efficient tools to keep the phenomenon under control. But still there is some progress and governments worldwide are starting to battle in order to combat unhealthy amounts of tourists. Authorities are in the process of fighting Airbnbs against short term rentals which are a real threat to locals because of disloyal competition and results in forcing them out of the housing market (for instance, according to Bondora.com in 2019 there were near 60,000 listings for Paris, and 22,000 in Berlin on the platform).

Many municipalities are starting to restrict the number of cruise ships and implicitly the number of tourists (the city of Dubrovnik, Venice), others are shutting down indefinitely popular tourist areas in order to recover and heal from pollution and environmental damage caused by touristification. For instance, in 2018, Boracay, Philippines was closed to visitors for 6 months because the 6,400 daily tourists were too much to handle; while Maya Bay, Thailand, was closed for more than 4 months, being estimated that about 80% of the coral reefs around it have been destroyed due to pollution from litter, boats and sunscreen (The Guardian, 2018; Conde Nast Traveller, 2018). These are just a few examples that demonstrate how local governments are doing their best to balance the economic benefits of tourism with the problems they bring to the local ecosystems.

But tourists must help also in the process of stopping touristification, by making better choices when traveling or planning a vacation. So instead of going to places already threatened or damaged by tourism, one can choose other beautiful places which are deemed sustainable and can withstand the impact of tourism, like Cogne (Italy), Baiona (Spain), Bhutan, etc.

In terms of accommodation, a conscious choice would be supporting local business like hotels, inns, sharing homes with resident families, which provide all the needed amenities while helping them and gives in this way the full immersive experience of the visited place. The market is offering also an alternative to Airbnb, respectively Fairbnb (community powered tourism), founded in 2016, which accommodates sustainable home-sharing options across Europe. Their manifesto states that: “we work to connect conscious travellers with fair hosts to promote stronger, more sustainable and equitable communities all around the world” (Fairbnb, 2022).

How resources are used while traveling is lifesaving, because unfortunately tourists consume more than locals especially when it comes to water (careful choices can curb greatly individual consumption). To prevent plastic pollution and waste generation, tourists must travel with reusable items like water bottles, straws, reusable cloth bags, in order to eliminate the need for plastics and disposables. When purchasing food, a sustainable choice is to avoid big chain supermarkets and restaurants and to appeal to local producers and markets. These are just a few examples how to avoid consuming more resources when traveling.

To reduce the carbon footprint generated by flying to a destination (one international flight can emit an amount of carbon dioxide into the atmosphere as an average person in certain countries) and to counter the terrible negative environmental impact, carbon offsets can be purchased and once arrived at the destination public transportation, bikes instead of private cars, Uber, Cabify can be used.

4. FINAL REMARKS

Touristification is a global phenomenon that brings with it impacts at the economic, socio-cultural and environmental levels, the negative ones being the most obvious. Residents and local communities have to adapt and adjust to the changes induced by touristification, governments being the main actors in deciding how tourism should be regulated and controlled.

It is essential to understand touristification in all its complexity, fact that requires a new breakthrough approach in order to avoid the rift between locals and their tourist counterparts, to avoid conflicts, to be updated to all new developments (technological ones included), to have at hand monitoring tools and flexible tourism planning strategies and last, but not least, to always have in mind "that there is no such thing as waterproof planning" (Martins, 2020, p. 146). The best combo to mitigate touristification and to help create a healthy sustainable tourism industry is comprised of government actions and conscious tourism. These endeavours will have a deep impact on erasing many of the controversies caused by touristification nowadays, and designing a tourism that is sustainable for the decades to come.

Even if the concept is mostly used by scholars in the scientific literature related to urban tourism, for sure it can be extended to rural or mountain tourism and further research should be focused in those directions, this short point of view being intended to broaden the discussion scope on this topic.

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THE TOURISM INFRASTRUCTURE OF SĂLAJ COUNTY

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ABSTRACT. – The Tourism Infrastructure of Sălaj County. The paper represents the third part of a larger study concerning tourism in Sălaj County, taking into consideration the tourism infrastructure in the county. The paper analysed statistical data regarding the accommodation establishments and their capacity, available online from the National Institute of Statistics (TEMPO-ONLINE database) for a period of 33 years, between 1990 and 2022. The total number of accommodation establishments dropped from 23 in 1990 to 16 in 2007, but then increased significantly, reaching 127 accommodation units in 2022. Most of these recently emerged units, such as bungalows and guesthouses, have however a small capacity. Therefore, the evolution in terms of the total number of available beds in certified accommodation units has not been equally spectacular. There was the same decreasing trend, from 1922 beds in 1990, to 754 beds in 2008, followed by an increase, which nevertheless reached a maximal value of 1923 beds in 2016. Since then, the overall capacity has slightly decreased. Most of the beds are currently available in accommodation establishments located in towns (mainly in Zalău) and spa resorts, especially in hotels, hostels, and guesthouses. The general trend in recent years has been to improve the degree of comfort, which in Zalău gave rise to several 4-star hotels, in addition to the existent 3-star hotels. Recreational facilities are mainly available in the two spa resorts, Băile Boghiș and Bizușa-Băi, but there are some similar facilities in Zalău, Jibou and Șimleu Silvaniei, while most of the seats in public catering facilities are located in Zalău, Boghiș and Ip. The positive trend in terms of tourism infrastructure is expected to be maintained in the following years, as tourism is the economic activity most likely to be strategically important for the sustainable development of Sălaj County in the future.

Keywords: *Sălaj County, tourism infrastructure, accommodation units, recreational facilities, Romania.*

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1. INTRODUCTION

The tourism potential of Sălaj County, whose main attractive features made up the object of study for two previously published papers (Rusu *et al.*, 2020; Rusu *et al.,* 2021), is a part of the primary tourism supply which includes the whole range of material or non-material components belonging to the natural environment or created by man, and represents the fundamental factor in the emergence and development of tourism, in the absence of which tourism would not exist, because of the lack of its object of activity. On the other hand, the tourism infrastructure, with all its range of components, the quantitative and qualitative level of the services and their diversity, including the number and quality of the staff employed in the field, make up the secondary tourism supply (Dezsi, 2006). The tourism infrastructure or the tourism material resources account for the totality of assets and means that facilitate the tourism capitalization and operation of the attractive resources grouped in a certain territory, or the set of facilities and equipment providing accommodation, leisure, sporting activities, and so on (Cocean and Dezsi, 2009). It represents the decisive factor for the shaping of tourism as a concrete spatial phenomenon, as a result of the transformation of the attractive components into a capitalizable tourism product and the provision of the comfort necessary for the optimal development of a complete and complex act of tourism (Dezsi, 2006).

The provision of a proper setting for the development of recreational, curative, and cultural activities in Sălaj County, and to meet the tourism demand for all these, required the emergence, design and construction of a variable number of facilities providing accommodation, food, special transportation, leisure, spa treatment, and specific services, all generically named tourism reception structures with a function of accommodation (Răcășan, 2018; Romanian Government Decree no. 58/1998 regarding the organisation and development of tourism activities in Romania).

The accommodation establishments, equated with the tourism reception structures with a function of accommodation, represent the logistic support for the tourism activities and the necessary condition for the "attachment" of the tourism demand on the existing offer (Ciangă and Dezsi, 2007). At the same time, the accommodation infrastructure also represents a real indicator regarding the direction of tourism activities in a certain territory, constantly found in a relation of interdependence with the intensity of tourism flows and the emergence of new forms of tourism, as well as the permanent diversification and adaptation to the practice of some of the existent forms of tourism (Ciangă, 2007). The quantitative and qualitative features of their elements (size, comfort,

functionality, period of use, type or form of tourism serviced) allow for their classification into main accommodation establishments (such as hotels, motels, chalets, villas and inns) and secondary ones (Cocean and Dezsi, 2009).

The Romanian legislation in force identified and defined a number of accommodation unit types, classified according to certain methodological norms (Order of the president of the Tourism National Authority no. 65/2013 regarding the approval of the methodological norms for the issuing of classification certificates to tourism reception structures with function of accommodation and public food service, and of tourism licences). The following types are included: hotels, tourist villas, tourist and agro-tourism guesthouses, reception structures with accommodation on floating pontoons, maritime or fluvial boats, posessing all the comfort categories (classified between 1 and 5 stars, or 1 to 5 daisies in the case of guesthouses); apartment-hotels (between 2 and 5 stars); campings, camping-type cottages and tourist stops (between 1 and 4 stars); motels, hostels, bungalows, chalets, apartments and rooms to rent in family homes (classified between 1 and 3 stars); holiday villages (2 or 3 stars graded comfort).

2. METHODOLOGY, DATA AND MATERIALS

The present paper is the third part of a larger study concerning tourism in Sălaj County. The first two parts (Rusu *et al.*, 2020; Rusu *et al.*, 2021) considered the natural and anthropogenic tourism potential of the county, while this paper has in view the tourism infrastructure of the county. The relevant scientific literature has been carefully reviewed, taking into consideration both theoretical studies (Ciangă, 2007; Ciangă and Dezsi, 2007; Cocean and Dezsi, 2009) and applied studies that considered Sălaj County (C.C. Pop, 2008, 2011; Pîrvu and Gheorghe, 2014; C.C. Pop and C.D. Pop, 2015; Moigrădean, 2019; Benedek, 2021) or areas nearby (Dezsi, 2006; Răcășan, 2018). The relevant national legislation that had an impact on the development of tourism in Sălaj County has also been taken into account, as well as other strategic documents, such as the Development Strategy for Sălaj County between 2021 and 2027 (CMPG Consultancy, 2021).

The next step was the acquisition of statistical data regarding tourism infrastructure in Sălaj County. Most of the available online data regards the accommodation establishments and is provided by the two official sources of data in the field of tourism, the National Institute of Statistics (http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table) and the Tourism National Agency (https://turism.gov.ro/web/autorizare-turism/).

The main results of the study are based on the analysis and interpretation of the statistical data provided by these two sources. Because data are available only since 1990, the evolution of the tourism infrastructure has been assessed for a 33-year period between 1990 and 2022. The analysis focused on the main changes that occured in the structure and typology of accommodation establishments during this time period, and stressed the main current features of the tourism infrastructure in Sălaj County. The statistical data acquired from official sources had also to be checked in the field, because sometimes there are some discrepancies between the official sources and the reality in the field, not to mention the inconsistencies that exist between the different sources of official data, which eventually led us to use only one source of official data, that from the National Institute of Statistics (the TEMPO-ONLINE database), which seems more accurate and reliable.

3. RESULTS AND DISCUSSION

The accommodation units in Sălaj County are quite diverse from the point of view of structure, typology and size. Most of the tourism reception structures are found among those extant in Sălaj County: hotels, hostels, guesthouses, bungalows, cottages, chalets and villas.

The analysis of the evolution of accommodation units and tourism reception structures between 1990 and 2022 (the table below) reveals their significant increase in numbers and diversification after 2007.

Table 1. Dynamics of the certified accommodation units according to the type of structure between 1990 - 2000, 2001 - 2011 and 2012 - 2022

Type / Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Total	**23**	**22**	**20**	**19**	**20**	**20**	**20**	**20**	**18**	**25**	**17**
Hotels	10	11	9	6	6	6	6	6	5	5	5
%	43.5	50	45	31.6	30	30	30	30	27.8	20	29.4
Hostels	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Motels	-	-	1	2	2	2	2	3	2	2	2
%	-	-	5	10.5	10	10	10	15	11.1	8	11.8
Villas	3	2	2	2	3	3	3	2	2	2	1
%	13	9.1	10	10.5	15	15	15	10	11.1	8	5.9
Chalets	2	2	2	2	2	2	2	2	-	-	-
%	8.7	9.1	10	10.5	10	10	10	10	-	-	-

Guesthouses (urban)	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Agro-tourism guesthouses	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Camping sites	2	2	1	2	2	2	2	2	1	1	-
%	8.7	9.1	5	10.5	10	10	10	10	5.6	4	-
Bungalows	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Camps	-	5	5	5	5	5	5	5	4	4	3
%	-	22.7	25	26.3	25	25	25	25	22.2	16	17.6
Cottages	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Other units	6	-	-	-	-	-	-	-	4	11	6
%	26.1	-	-	-	-	-	-	-	22.2	44	35.3
Type / Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Total	**20**	**17**	**19**	**20**	**17**	**17**	**16**	**24**	**41**	**44**	**48**
Hotels	5	4	4	4	3	2	2	3	7	8	10
%	25	23.5	21.1	20	17.6	11.8	12.5	12.5	17.1	18.2	20.8
Hostels	-	-	-	-	1	1	1	1	1	1	1
%	-	-	-	-	5.9	5.9	6.3	4.2	2.4	2.3	2.1
Motels	2	2	2	1	1	1	1	-	-	-	-
%	10	11.8	10.5	5	5.9	5.9	6.3	-	-	-	-
Villas	1	1	1	3	3	3	3	2	3	3	3
%	5	5.9	5.3	15	17.6	17.6	18.8	8.3	7.3	6.8	6.3
Chalets	-	-	-	-	-	-	-	-	-	1	1
%	-	-	-	-	-	-	-	-	-	2.3	2.1
Guesthouses (urban)	2	2	3	3	3	4	4	4	8	12	12
%	10	11.8	15.8	15	17.6	23.5	25	16.7	19.5	27.3	25
Agro-tourism guesthouses	6	6	6	6	3	3	3	4	12	9	9
%	30	35.3	31.6	30	17.6	17.6	18.8	16.7	29.3	20.5	18.8
Camping sites	-	-	-	-	-	-	-	1	1	1	1
%	-	-	-	-	-	-	-	4.2	2.4	2.3	2.1
Bungalows	-	-	-	-	-	-	-	7	7	7	9
%	-	-	-	-	-	-	-	29.2	17.1	15.9	18.8
Camps	3	2	2	2	2	2	1	1	1	1	1
%	15	11.8	10.5	10	11.8	11.8	6.3	4.2	2.4	2.3	2.1
Cottages	1	-	1	1	1	1	1	1	1	1	1
%	5	-	5.3	5	5.9	5.9	6.3	4.2	2.4	2.3	2.1
Other units	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-

Type / Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total	**57**	**58**	**55**	**103**	**111**	**120**	**118**	**115**	**113**	**125**	**127**
Hotels	11	11	10	10	12	10	10	10	8	9	9
%	19.3	19	18.2	9.7	10.8	8.3	8.5	8.7	7.1	7.2	7.1
Hostels	1	1	1	1	2	2	2	2	2	2	2
%	1.8	1.7	1.8	1	1.8	1.7	1.7	1.7	1.8	1.6	1.6
Motels	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Villas	4	4	2	2	2	2	2	2	3	3	3
%	7	6.9	3.6	1.9	1.8	1.7	1.7	1.7	2.7	2.4	2.4
Chalets	1	1	1	1	1	1	1	1	1	1	1
%	1.8	1.7	1.8	1	0.9	0.8	0.8	0.9	0.9	0.8	0.8
Guesthouses (urban)	16	17	16	16	15	17	16	16	16	17	16
%	28.1	29.3	29.1	15.5	13.5	14.2	13.6	13.9	14.2	13.6	12.6
Agro-tourism guesthouses	12	12	14	20	26	35	34	31	30	40	43
%	21.1	20.7	25.5	19.4	23.4	29.2	28.8	27.0	26.5	32.0	33.9
Camping sites	1	1	-	-	-	-	-	-	-	-	-
%	1.8	1.7	-	-	-	-	-	-	-	-	-
Bungalows	9	9	9	50	50	50	50	50	50	50	50
%	15.8	15.5	16.4	48.5	45	41.7	42.4	43.5	44.2	40.0	39.4
Camps	1	1	1	1	1	1	1	-	-	-	-
%	1.8	1.7	1.8	1	0.9	0.8	0.8	-	-	-	-
Cottages	1	1	1	2	2	2	2	3	3	3	3
%	1.8	1.7	1.8	1.9	1.8	1.7	1.7	2.6	2.7	2.4	2.4
Other units	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-

Source of data: National Institute of Statistics (TEMPO-ONLINE database, 2022).

The statistical situation in the year 1990 reflects, to a certain degree, the situation of the accommodation establishments at the end of the socialist period. At that time, there were 23 tourism reception structures in Sălaj County, of which almost half, more precisely 10 (45.3%) were hotels, located predominantly in the urban areas (5 in Zalău and 1 in both Cehu Silvaniei and Jibou) and resorts (one in Ileanda commune, actually in Bizuşa-Băi, and one in Nuşfalău commune, actually in Băile Boghiş, which belonged to Nuşfalău then). There was one more hotel near Zalău, in Meseşenii de Jos.

The other accommodation units were represented by 3 villas, of which 2 in resorts (1 in Ileanda commune and 1 in Nuşfalău commune) and a third one in Bobota commune, 2 chalets (in Zalău and Şimleu Silvaniei), 2 camping sites (in Jibou and Nuşfalău – actually also in Băile Boghiş), and 6 other units, of

which 5 may be identified with the summer camps which emerged as a separate category since 1991 (2 in Zalău, and one in each of the communes of Nuşfalău, Sâg – the summer camp in Tusa, and Valcău de Jos).

Between 1990 and 2007 the trend was descending in terms of the total number of accommodation units, with some insignificant variations: the number of units decreased from 23 in 1990 to 18 in 1998 and only 16 in 2007, when the lowest number of units for the entire analysed period was reached. In 2007, in Sălaj County, out of the 10 hotels which had existed in 1990, there were only 2 – one in Zalău and another one in Ileanda commune (Bizuşa-Băi). On the other hand, there was already a more diversified offer: one youth hotel (later renamed hostel) in Zalău; one motel (in Boghiş) – this was the last time that a motel was registered in Sălaj County; 3 villas (2 in Zalău and 1 in Boghiş), cottages (the former camping site in Jibou), only one summer camp (in Tusa, Sâg commune), 4 urban guesthouses (3 in Zalău and one in Jibou) and 3 agro-tourism guesthouses (in the communes of Cuzăplac, Gâlgău and Ileanda).

This low number of tourism reception structures may be explained by the necessary adaptation to the demands of the tourism market, which was in an obvious decrease during the 1990s and the first part of the 2000s, when Romania was confronted with deep economic issues specific for the transition period from the centralised economy of the socialist period to the capitalist market economy, ending up with the accession to the European Union in 2007. On the other hand, the opening up of the borders and the abolition of visas for the Romanian citizens determined many Romanians to give up their domestic holidays, as they preferred to visit foreign countries, difficult to access or even "prohibited" before.

This period between 1990 and 2007 corresponded also with an important wave (or several waves) of Romanian external migration, especially to Western and Southern European countries. Mainly young people or young adults migrated, but some of them later returned with a consolidated financial situation, while some others financially helped their relatives who remained in Romania. This situation had multiple economic consequences, but in terms of tourism it generated the emergence of the first guesthouses and the gradual development of new forms of tourism, associated with cultural tourism and especially rural tourism, addressed mainly to people living in urban centres, in Romania or abroad, who wanted another sort of tourism experience.

As a result, the first guesthouses unoficially emerged even since the end of the 1990s, while officially they appeared in the data published by the National Institute of Statistics for the first time in 2001, divided into two categories: (urban) tourism guesthouses and agro-tourism guesthouses (only in rural areas).

Although Sălaj County is not among the counties that have a high number of rural tourists, the total number of guesthouses (including both categories) increased steadily from 8 (in 2001) to 59 (in 2022).

The (urban) tourism guesthouses represented a cheaper alternative to the hotels in urban areas. However, their number remained rather low, even if one may point out a significant increase from 2 in 2001 to 16 in 2012. Since 2012, their number remained more or less constant. They are located in the four urban centres of the county: 6 in Zalău, 4 in Șimleu Silvaniei, 3 in Jibou and 3 in Cehu Silvaniei, as of 2022. Therefore, they meet a good deal of the tourist demand in these towns, where the other types of accommodation units have either disappeared completely (Cehu Silvaniei and Șimleu Silvaniei) or have drastically been reduced (6 hotels, 1 hostel and 3 villas in Zalău, and cottages in Jibou).

The agro-tourism guesthouses experienced an even more important increase in numbers, but a little bit later than the urban guesthouses: from 6 in 2001 to only 9 in 2011, but then the process intensified, reaching a total of 43 rural guesthouses in 2022, an almost five-fold increase in 11 years. Even more, the urban guesthouses initially outnumbered the rural guesthouses in Sălaj County, but the situation has reversed since 2015, and in 2022 the number of rural guesthouses has been almost three times higher than the urban ones, because their number has continued to grow, while the number of urban guesthouses remained largely the same.

It is on one hand the merit of the investors located in the rural areas of Sălaj County, but also a reflection in reality of the gradual process of reorientation of the domestic and international tourism in Romania towards the rural areas, a "return to the origins" for many urban dwellers. One should also mention the succesful development models and the best practice taken over (and then implemented) by the people in Sălaj County from the neighbouring counties, which have a longer tradition in the fields of rural, cultural and ethno-religious tourism, such as Maramureș County – including both Maramureș Basin proper, as well as Lăpuș Land, Cluj and Bihor counties – with the development of tourism in Apuseni Mountains. European funds also played an important role in triggering the development of rural guesthouses.

An analysis of the territorial distribution of the rural guesthouses reveals their concentration in the Western Hills, the suburban areas of Zalău City, in Almaș-Agrij Basin and along the Someș Corridor. There is a high number of guesthouses (6) in Boghiș commune, providing an alternative accommodation to those coming to Băile Boghiș resort. In the area of the Western Hills, there are also guesthouses in Sărmășag (3), a large commune, also located on the European road E81, and one guesthouse in each of the communes of Camăr, Crasna, Horoatu Crasnei, Pericei, Plopiș and Valcău de Jos (as of 2022).

Also, there is an ever higher number of rural guesthouses in the areas close to Zalău, by far the largest town in the county. These guesthouses provide accommodation in addition to other services (food, organization of various events, and outdoor activities). They are located in the communes of Meseşenii de Jos (3), Românaşi (3), Hereclean (3), Crişeni (2), Mirşid and Dobrin. Some of them (in Românaşi or Hereclean) are located on or near the European road E81 (Cluj-Napoca – Zalău – Satu Mare) and count on a higher number of tourists, because of the large number of people in transit on the road. The future A3 motorway (in construction in 2022) might take away some of this transit tourists.

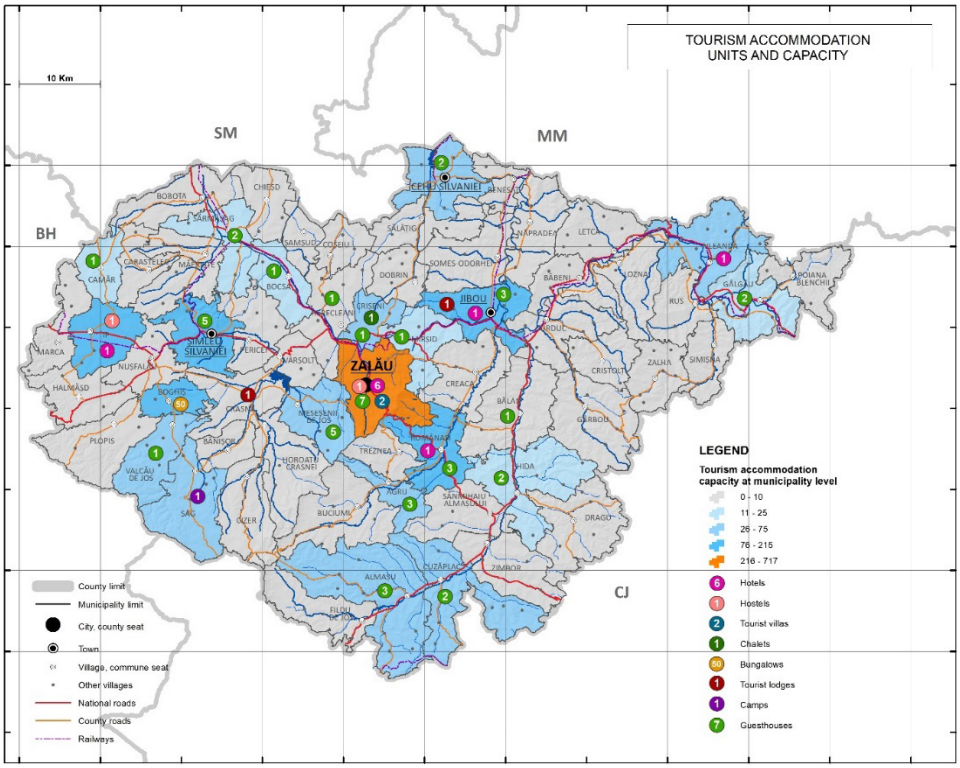

Fig. 1. Accommodation units and their capacity
at the level of local administrative units in Sălaj County.
Source: the authors, according to data provided by the National Institute of Statistics (TEMPO-ONLINE database, 2022).

The number of guesthouses has also increased in Almaş-Agrij Basin. They are located mostly in the southern part of the basin, in the communes of Almaşu (3), Buciumi (2), and Cuzăplac (2), as well as in Zimbor, Agrij, and Bălan

(one guesthouse each). Along the Someş Corridor, there are some communes that have had a low number of guesthouses in 2022, such as Gâlgău (2), Rus (1) and Năpradea (1). The guesthouses in Gâlgău and Rus also benefit from their location on or near the European road E58 (Dej – Baia Mare) or the county road leading to Lăpuş Land in Maramureş County. Outside these areas, there is only guesthouse in Cristolţ commune.

After 2007, the highest growth was registered in the case of the bungalow-type of tourist reception establishments. Bungalows had not existed in Sălaj County before 2008. They were recorded for the first time in 2008 in Boghiş commune (practically in Băile Boghiş resort) and their number increased from 7 (2008-2010) to 9 (2011-2014), and then there was a singificant leap, up to 50 bungalows in 2015. Since then, the number of bungalows remained constant, while the resort has received a new status on the tourism market and has become once again an element of reference for the spa tourism in the North-West part of Romania, competing with better known resorts such as Băile Felix (near Oradea) or Tăşnad (Satu Mare County), which also developed significantly in recent years.

The analysis of the dynamics of the number of beds in accommodation units in Sălaj County (table 2) reveals however a completely different image as compared to that of the tourist reception structures (accommodation establishments). In the case of the tourist reception units, their total number increased consistently by more than five times in 2022 compared to the 1990s or the period before 1990, which is partly reflected in the data concerning the year 1990. This is not the case of the total number of available beds in accommodation establishments.

Table 2. Dynamics of the number of beds in certified accommodation units according to the type of structure between 1990 – 2000, 2001 – 2011 and 2012 - 2022

Type / Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Total	**1922**	**1874**	**1642**	**1515**	**1477**	**1603**	**1406**	**1372**	**1237**	**1289**	**974**
Hotels	568	797	516	408	413	413	399	414	380	378	376
%	29.6	42.5	31.4	26.9	28	25.8	28.4	30.2	30.7	29.3	38.6
Hostels	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Motels	-	-	48	74	74	74	74	107	83	85	75
%	-	-	2.9	4.9	5	4.6	5.3	7.8	6.7	6.6	7.7
Villas	319	139	292	247	204	330	147	67	99	123	72
%	16.6	7.4	17.8	16.3	13.8	20.6	10.5	4.9	8	9.5	7.4
Chalets	67	67	67	27	27	27	27	27	-	-	-
%	3.5	3.6	4.1	1.8	1.8	1.7	1.9	2	-	-	-

Guesthouses (urban)	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Agro-tourism guesthouses	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Camping sites	166	166	14	54	54	54	54	52	40	40	-
%	8.6	8.9	0.9	3.6	3.7	3.4	3.8	3.8	3.2	3.1	-
Bungalows	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Camps	-	705	705	705	705	705	705	705	605	605	405
%	-	37.6	42.9	46.5	47.7	44	50.1	51.4	48.9	46.9	41.6
Cottages	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Other units	802	-	-	-	-	-	-	-	30	58	46
%	41.7	-	-	-	-	-	-	-	2.4	4.5	4.7
Type / Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Total	**1175**	**1028**	**1019**	**1044**	**1058**	**924**	**829**	**754**	**1263**	**1381**	**1509**
Hotels	379	344	344	338	295	139	138	162	452	521	635
%	32.3	33.5	33.8	32.4	27.9	15	16.6	21.5	35.8	37.7	42.1
Hostels	-	-	-	-	62	62	62	62	56	56	56
%	-	-	-	-	5.9	6.7	7.5	8.2	4.4	4.1	3.7
Motels	75	75	75	27	28	28	26	-	-	-	-
%	6.4	7.3	7.4	2.6	2.6	3	3.1	-	-	-	-
Villas	335	293	294	362	378	338	336	50	70	72	70
%	28.5	28.5	28.9	34.7	35.7	36.6	40.5	6.6	5.5	5.2	4.6
Chalets	-	-	-	-	-	-	-	-	-	18	18
%	-	-	-	-	-	-	-	-	-	1.3	1.2
Guesthouses (urban)	21	21	40	40	39	101	101	146	224	280	284
%	1.8	2	3.9	3.8	3.7	10.9	12.2	19.4	17.7	20.3	18.8
Agro-tourism guesthouses	52	52	52	63	42	42	42	62	189	162	162
%	4.4	5.1	5.1	6	4	4.5	5.1	8.2	15	11.7	10.7
Camping sites	-	-	-	-	-	-	-	100	100	100	100
%	-	-	-	-	-	-	-	13.3	7.9	7.2	6.6
Bungalows	-	-	-	-	-	-	-	56	56	56	68
%	-	-	-	-	-	-	-	7.4	4.4	4.1	4.5
Camps	299	243	200	200	200	200	110	102	102	102	102
%	25.4	23.6	19.6	19.2	18.9	21.6	13.3	13.5	8.1	7.4	6.8
Cottages	14	-	14	14	14	14	14	14	14	14	14
%	1.2	-	1.4	1.3	1.3	1.5	1.7	1.9	1.1	1	0.9
Other units	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-

Type / Year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Total	**1686**	**1723**	**1593**	**1710**	**1923**	**1918**	**1898**	**1797**	**1643**	**1836**	**1866**
Hotels	656	656	639	639	769	667	667	667	469	513	513
%	38.9	38.1	40.1	37.4	40	34.8	35.1	37.1	28.5	27.9	27.5
Hostels	70	70	70	70	135	135	135	135	135	135	135
%	4.2	4.1	4.4	4.1	7.0	7.0	7.1	7.5	8.2	7.4	7.2
Motels	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-
Villas	102	102	32	32	32	34	34	34	68	68	68
%	6	5.9	2	1.9	1.7	1.8	1.8	1.9	4.1	3.7	3.6
Chalets	18	18	18	20	20	20	20	20	20	20	20
%	1.1	1	1.1	1.2	1	1	1.1	1.1	1.2	1.1	1.1
Guesthouses (urban)	394	431	408	408	389	388	380	380	380	424	407
%	23.4	25	25.6	23.9	20.2	20.2	20	21.1	23.1	23.1	21.8
Agro-tourism guesthouses	214	214	294	364	401	499	487	423	433	538	585
%	12.7	12.4	18.5	21.3	20.9	26	25.7	23.5	26.4	29.3	31.4
Camping sites	100	100	-	-	-	-	-	-	-	-	-
%	5.9	5.8	-	-	-	-	-	-	-	-	-
Bungalows	68	68	68	108	108	108	108	108	108	108	108
%	4	3.9	4.3	6.3	5.6	5.6	5.7	6.0	6.6	5.9	5.8
Camps	50	50	50	45	45	43	43	-	-	-	-
%	3	2.9	3.1	2.6	2.3	2.2	2.3	-	-	-	-
Cottages	14	14	14	24	24	24	24	30	30	30	30
%	0.8	0.8	0.9	1.4	1.2	1.3	1.3	1.7	1.8	1.6	1.6
Other units	-	-	-	-	-	-	-	-	-	-	-
%	-	-	-	-	-	-	-	-	-	-	-

Source of data: National Institute of Statistics (TEMPO-ONLINE database, 2022).

Taking as a point of reference the total number of beds in 1990 (1922 available beds), one notices the same decreasing trend in the first two decades after the fall of the socialist regime in Romania. This time, the lowest number of available beds was recorded in 2008, when there were only 754 available beds in accommodation units across Sălaj County, a little bit more than one third compared to the numbers in 1990.

After 2008, there was indeed a significant increase of the total number of beds in accommodation units, but they reached their highest value in 2016, when there were 1923 beds available in accommodation units across Sălaj County, only one bed more than in 1990. This was also the maximal value recorded in the analysed period, because there was a slight decrease after 2016,

which reversed in 2021. However, the 1866 beds available in 2022 are less than those registered in 2016. If the increasing trend is maintained, one may expect the 2016 value to be overtaken in the coming years.

Although the total numbers registered at the beginning of the 1990s and those of the current years are quite similar, a more detailed analysis at the level of the types of accommodation establishments reveals a completely different situation.

In 1990, most of the available beds were provided in accommodation establishments quite different from those of today, mainly in summer camps for school and pre-school children (41.7%), hotels (29.6%) and tourist villas (16.6%), with a lower degree of comfort.

Especially after 2001, the emergence of guesthouses and later that of the bungalows (numerically important in Sălaj County), as well as the significant reduction of other types of accommodation establishments such as camps (which have disappeared completely since 2019) and villas, determined a change in the structure of the tourist reception units, with a growing weight of the establishments that have a lower accommodation capacity, better adapted to the demands of the tourist market.

For instance, in 1990, the 1923 available beds were distributed across 23 tourist reception units, resulting an average capacity of 83.6 beds / unit. The average was influenced by the large number of beds available in camps (usually above 100 beds).

By contrast, in 2022, the 1866 available beds were distributed across 127 tourist reception units, resulting an average capacity of only 14.7 beds / unit, almost six times lower than in 1990. In this case, the low capacity is influenced by the bungalows (108 beds in 50 units, resulting an average of about 2 beds / unit) and the agro-tourism (rural) guesthouses, which totalled 585 beds in 43 units, resulting an average of 13.6 beds / unit in their case. The urban guesthouses had a higher average capacity in 2022, 25.4 beds / unit, due to the fact that many of these guesthouses function with a higher threshold of efficiency, somehow similar to a small hotel.

Currently, most of the beds are available in accommodation establishments located in towns and spa resorts.

The dynamics of the accommodation units according to their degree of comfort and the provided services shows a gradual evolution from accommodation units with a low or average degree of comfort (1 to 3 stars) in the 1990s to accommodation units that have an average or high degree of comfort (3 or 4 stars) nowadays. Currently, there are several 4-star hotels in Zalău (Brilliant Plaza, Grand Hotel Baroc, Griff, Boutique Aquarel), as well as a few 3-star hotels (Severus, Royal, Porolissum, Brilliant Meseș, Aria by Brilliant). Most of the

urban guesthouses are also classified as 3-star, such as Cabana Brădet in Șimleu Silvaniei. Among the agro-tourism guesthouses, in rural areas, one may find even 4-star (or 4-daisy) guesthouses, like Kemsilvanum Fort Silvan in Camăr, but the majority have 3 stars (daisies) or less, and there are some guesthouses that are not (yet) classified at all.

The recreational and sporting tourism structures are not so well represented, given the existing potential of Sălaj County.

Important investments were made in Băile Boghiș spa resort in the 2010s, with significant results in terms of tourism activities, which improved considerably. The accommodation units increased in numbers, their capacity also grew, as well as the level of comfort, reflected in the better classification. The resort includes a partly covered swimming pool with thermal water, hydromassage and four artesian wells, an area reserved for treatment and cure, protected from the sun, as well as an area for children and teenagers, with slides. There are several types of accommodation units (including bungalows), adapted to meet the ever-increasing demands of the tourists, as well as a number of restaurants and bars. In 2022 the private company that ran the resort became bankrupt, but the activities will most likely continue.

In Bizușa-Băi resort, the situation has also improved significantly in recent years, due to the private investments made in terms of accommodation units, public food service and treatment centre. For the moment, there is only one hotel (Ceres, 2-stars), but there are plans for the rehabilitation of some of the former accommodation units (villas and cottages) to diversify the supply. There are also two swimming pools, one outdoors, and the other one indoors.

Some bathing facilities similar to those in resorts also exist in Jibou, Șimleu Silvaniei and Zalău. In Jibou, a private investor took over the former public baths and redesigned them. In addition, a guesthouse, a restaurant, cottages and a camping place were also built, together with sporting grounds and facilities, setting up a comprehensive spa resort. The buildings providing theraphy and treatment were also rehabilitated, in the same location. In Șimleu Silvaniei, there are bathing facilities in the place called "Broscărie", slightly outside the town. The thermal water contains sodium chlorite, bromine, iodine, and has therapeutic properties for people suffering from rheumatic, post-traumatic, neurological and dermatological diseases. The establishment is in private property and includes accommodation and camping facilities, a small lake for fishing enthusiasts, a restaurant and other recreational facilities. There are also public swimming facilities in Zalău, grouped in the area called "Tineretului", addressed mainly to the inhabitants of this city. There are three outdoor swimming pools, with different depths, according to age and swimming abilities. Investments have been made also in this area to increase the attractiveness.

Parks are properly designed and maintained in Zalău, where there are two larger parks, the City Central Park (4.5 ha), redesigned between 2007 and 2013 with European (Regional Operational Programme) funds, and Brădet Forest (19 ha), which is managed as a public park. By contrast, the other towns in the county are deficient in terms of green areas.

There is less data available regarding the tourist reception units providing public catering and food services. According to the data published in the "Sălaj County Development Strategy", in 2015 there were 50 units providing public food services, with a total number of 6700 seats, of which 2500 in Zalău, 1000 in Boghiș, 1000 in Ip, 600 in Românași, 500 in Șimleu Silvaniei, 300 in Jibou, and the remaining in Cehu Silvaniei, Bocșa, Crișeni, Cristolț, Mirșid and Sărmășag. Most of these are restaurants supplying Romanian or international food. There are yet very few specialized restaurants, providing wild game, fish or bio / eco food. Also, these restaurants rarely buy ingredients from local producers and seldom promote Sălaj-specific products, such as *țuica* (brandy) or Șimleu sparkling wine. In many places, especially in Șimleu Basin, underground cellars or basements may be designed as wineries for wine enthusiasts to taste and enjoy the local products.

4. CONCLUSIONS

The tourism infrastructure in Sălaj County has deeply changed since the end of the socialist period. Some types of accommodation units, such as summer camps, disappeared completely, while guesthouses have emerged since the end of the 1990s both in urban and rural areas, proving to be better adapted to the market demands. Their number therefore increased steadily, especially in rural areas, where European funds also triggered their appearance and development. Some rural guesthouses are located in villages along the main roads, providing a wide range of services to transit tourists. However, most of the beds are currently available in accommodation establishments located in towns and spa resorts, because the agro-tourism guesthouses (in rural areas) are usually family-run businesses that have a low accommodation capacity. By contrast, the urban guesthouses have a larger capacity, similar to a small hotel, and they rely not just on accommodation, but also on other services, such as public catering and the organization of events. They replaced the hotels and most of the other accommodation establishments in the smaller towns (Jibou, Șimleu Silvaniei and Cehu Silvaniei).

The hotels and hostels remain important in the largest town of the county, Zalău, where one finds a very diversified supply in terms of accommodation. The general trend in recent years has been to improve the

degree of comfort, giving rise to several 4-star hotels, in addition to the existent 3-star hotels. A 2-star hotel also exists in Bizușa-Băi, one of the spa resorts of the county, which would need some investments to regain its former glory. The other spa resort, Băile Boghiș, has numerous types of accommodation units (including bungalows), for all sorts of tourists. The investments made during the 2010s changed the face of the resort for the better, with the resulting growth in the numbers of tourists, but the private company running the resort became bankrupt in 2022, raising doubts and concerns regarding the future of Băile Boghiș. Some recreational and bathing facilities are also available in the towns of Zalău, Jibou and Șimleu Silvaniei, while most of the seats in public catering facilities are located in Zalău, Boghiș and Ip. Unfortunately, local products, like *țuica* (brandy) or Șimleu sparkling wine, are not always available in the restaurants and other public catering facilities.

The COVID-19 pandemic affected tourism activities in Romania (Rusu, 2022), but tourism infrastructure in Sălaj County proved to be resilient, and the number of accommodation establishments has even increased, with the resulting growth in terms of their overall capacity. The positive trend is expected to be maintained in the following years, as tourism is the economic activity most likely to be strategically important for the sustainable development of the county in the future.

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GEOGRAPHICAL AXES AND MOBILITY. CASE STUDY: CLUJ COUNTY

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ABSTRACT. – Geographical Axes and Mobility. Case Study: Cluj County. The movements of goods, people and information from one point to another have always represented important elements of human society. This mobility can take many forms from public transportation to private transportation or biking. The need of a developed transport system increased with the economic changes and growth of Cluj County, to satisfy the urban mobility. Moreover the direction for the expanding of this sector should be first of all sustainable, environmentally-friendly, a solution to decongest the traffic and must involve not only the government or the local authorities, but also the private and industrial sectors.

Keywords: *environmental, transportation axes, sustainability, green logistics.*

1. INTRODUCTION

The sustainability part of the transportation axes represents an important subject in mobility. According to Rodrigue *et al.* (2013), *"sustainable transportation is the capacity to support the mobility needs of people, freight and information in a manner that is the least damaging to the environment"*.

Cluj County is located in Transylvania, Romania with the county seat at Cluj-Napoca. It is bordered by Maramureș and Bistrița-Năsăud counties in the North-East, by Mureș County in the East, by Alba County in the South and by Bihor and Sălaj counties in the West.

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"Environmental axis is the space-time force line which may embody varied geographic territory, which is allowing the diagnosis and prognosis, in a space-temporally manner of geographic territory, which may embody varied geographic shapes and dimensions in accordance with the components' capacity of polarization. They are developed along valleys or in depressions or major traffic arteries. The axes represent the most important sector of an area or region towards which flows are concentrated and a heavy traffic is carried out" (C.C. Pop, 2016).

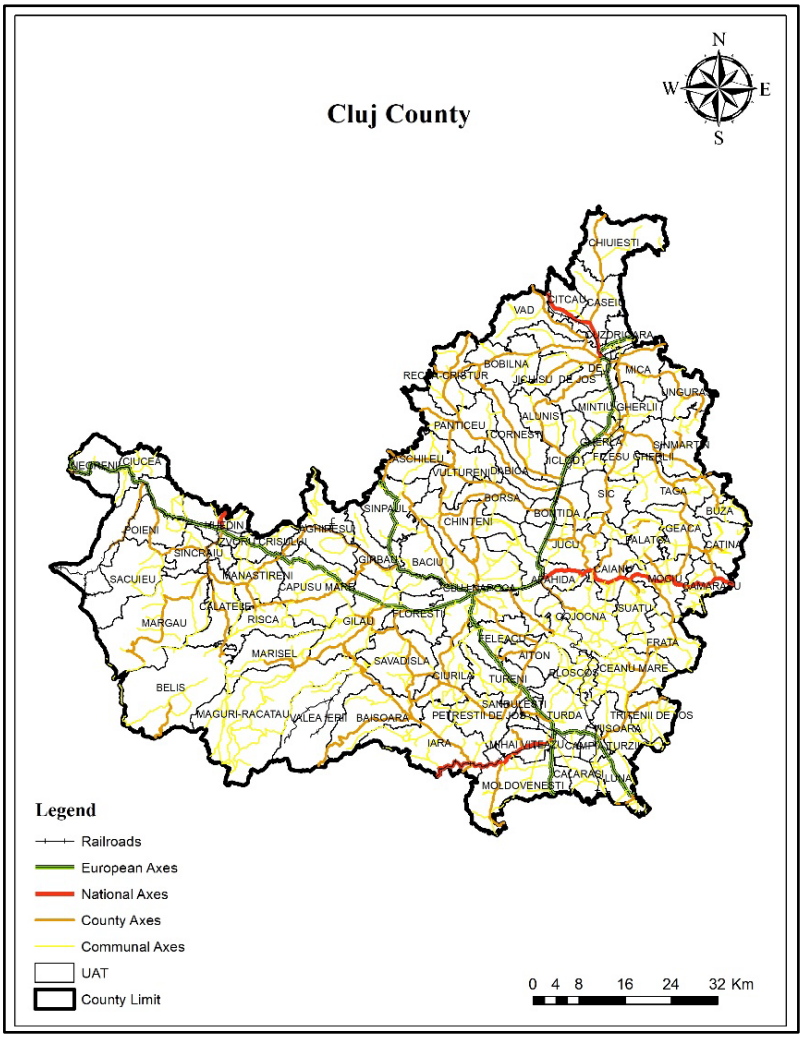

Fig. 1. Transport axes of Cluj County. *Source: the authors*

2. TRANSPORTATION SYSTEMS AND SUSTAINABLE DEVELOPMENT

"Mobility is fundamental to economic and social activities such as commuting, manufacturing or supplying energy. Each movement has an origin, a potential set of intermediate locations, a destination and a nature which is linked with geographical attributes. Transport systems composed of infrastructures, modes and terminals are so embedded in the socio- economic life of individuals, institutions and corporations that they are often invisible to the consumer. This is paradoxical as the perceived invisibility of transportation is derived from its efficiency" (Rodrigue *et al.*, 2013).

The transportation system has a lot of finacial benefits for the comunity but in the same time it makes a lot of damages to the environment. The transportation axes in Cluj County can be considered all the roads, railroads and ways of comunication and flows inside and outside the county. The enviromental and sustainable transportation axes are the systems that are beneficial also for the society, and are able to sustain themselves. They involve not only profits for the local authorities and government but also these systems do not harm or pollute the enviroment or at least the damage to the enviroment are at a low level.

The enviromental impact of the transportation axes involves many aspects, such as the transport modes themselves, the infrastructure, the energy supply system and the emissions. From the point of view of pollution, there are multiple kinds involve like air, noise pollution or damage to the ecological systems.The level of pollution is closely related to the population density. Moreover, the transport activities contribute to the enviromental problems starting from local, regional, national levels like gas emissions and smog to continental and global levels like climate change.

"Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Rodrigue *et al.*, 2013).

The implementation of a sustainable and ecological transportation system also depends on the economy both nationally and locally. From this point of view particularly, in reference to Cluj County, the city of Cluj-Napoca is the main economic centre and most developed city in the whole county and has a richer budget allowed for implementing the so-called "green transportation" than the rest of the cities, which are less developed.

The energy in regarding the transport system is important as it can be both the power source of pollution but also a non-pollutant solution at the opposite end. Clean energy refers to vehicles and trains that use electric energy from a battery or from a power source that does not harm the environment.

In the case of Cluj County, from the point of view of the energy used as a power source in transportation, at present mostly is unfortunately a source of pollution, especially on the main transportation roads which lead to the main attraction centre, Cluj-Napoca. The traffic congestions are mainly early in the morning when most of people go to work or school and in the afternoon when everybody returns home. Between these intervals the air pollution is higher, as mentioned before. The main power source for the cars or trucks which carry merchandise is still fuel like gasoline and there are few electric cars in the traffic.

The reason why electric cars are not so often found in the study area is mainly due to the lack of charging points across the whole county, but also due to the high prices of these types of cars.

For example, in Cluj-Napoca and its surroundings there are around 20 such charging points for electric cars, there are between 1 and 3 charging points in Huedin and Turda and none in the other cities of the county, Dej, Gherla and Câmpia Turzii.

The price is another reason for which electric cars are not so frequent, as mentioned before. As Romania is still a developing country, the annual income per capita is not as high as in the rest of the European developed countries, so even if the Romanian government supports a part of the financial costs and tries to encourage the population to buy electric cars, the financial help is not enough for all citizens to afford a new electric car. Indeed, buying an electric car has its long-term advantages especially when you live in a crowded city like Cluj-Napoca. The long-term benefits are especially financial, but there are also disadvantages like the absence of charging points in many cities of the county.

Other environmental-friendly solutions could be implemented in the train transportation, as this could represent the solution to decongest the traffic for the people who commute every day. It could be also a cheap solution from the point of view of prices for every person who is now commuting to work or school by car.

Unfortunately, the necessary infrastructure for speed trains does not exist and at present the railroads are still quite basic or in need of repairs and upgrading. They are also completely absent in some of the areas of the county. There is still work to do at regional level and also at country level, as there are still passenger or freight trains that run on diesel fuel, and this kind of fuel harms the environment by polluting the air by means of CO_2 emissions and other particles. The green energy and sustainable transportation system can also be implemented by using the bicycles or different means of transportation like electric scooters within the cities. From this point of view, Cluj-Napoca has implemented the necessary system, like bicycle track around the city, even if currently they do not cover the entire city. Regarding the rest of the cities or

settlements in Cluj County, these tracks are either missing entirely or they exist on small distances. Therefore, the population is not encouraged to use the alternative means of transport instead of the cars, nor are these types of transportation highly promoted in the region.

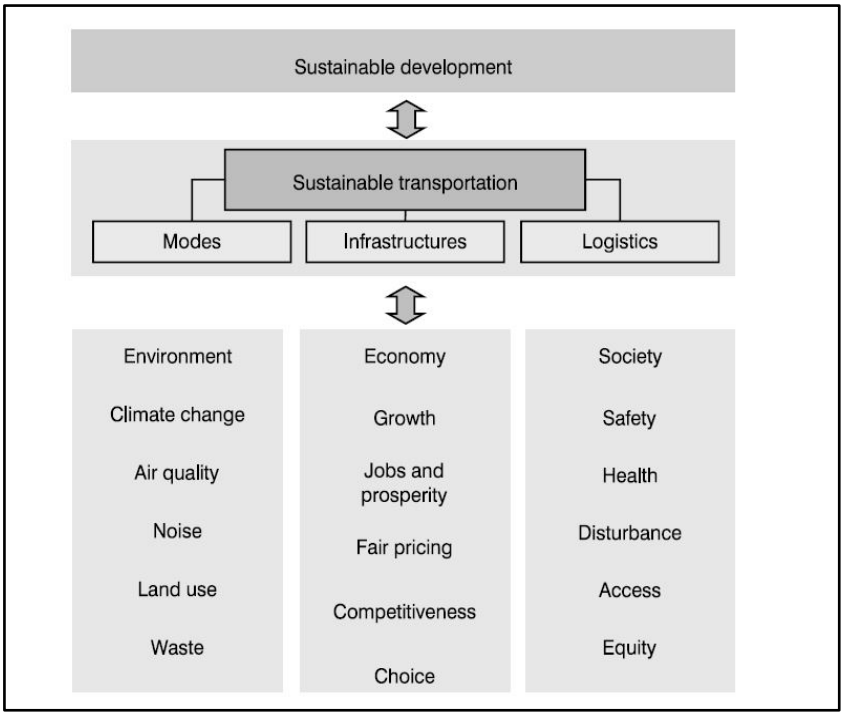

Fig. 2. Sustainable transportation. Source: Rodrigue, J-P., Comtois, C., Slack, B. (2013)

3. ENVIROMENTAL POLLUTION

Regarding the sustainable and environmental transport, the tendency is in general to focus on the passengers' systems of transportation, but freight transport is also important and has a high impact on the environment too. When the transportation topic involves the freight movements, it automatically refers also to logistics.

"Logistics is at the heart of the operation of modern transport systems and implies a degree of organization and control over freight movements that only modern technology could have brought into being. The process of designing and

managing the supply chain in the wider sense. The chain can extend from the delivery of supplies for manufacturing, through the management of materials at the plant, delivery to warehouses and distribution centers, sorting, handling, packaging and final distribution to point of consumption. A more fitted meaning consists in the set of all operations required for goods (material or nonmaterial) to be made available on markets or to specific destinations" (Rodrigue *et al.*, 2013).

The freight transportation system can also contribute to the pollution of the environment, so it is important that measures are taken also in this direction. So here it is involved the concept of *"green logistics which is supply chain management practices and strategies that reduce the environmental and energy footprint of freight distribution. They focus on material handling, waste management, packaging and transport"* (Rodrigue *et al.*, 2013). This concept is applied mainly in three different ways, as the production planning and product design, the materials management and the physical distribution. Mainly they refer to the development of products that have lower or no environmental impact, the logistics operations are performed in a safe and eco-friendly manner, recycling and ecological packaging.

In the case of Cluj County, it means that all the industrial factories where transport is essential for all kinds of products need to perform their logistic activities in a manner that does not affect the environment and recycling should be one of their main concerns. The Romanian law is pretty restrictive especially when it comes to the industrial sector. This mainly happened because Romania has a history when it comes to industrial pollution. In the 1990s, according to the BBC, one of the most polluted cities in Europe was Copșa Mică, where all the pollution came from the industrial sector. During the communist rule in Romania, factories opened up in this city in the 1970s, producing a high level of pollution, which affected even the population of Copșa Mică. Having this kind of black history in industrial pollution, Romania has focused on making the laws more severe when it comes to recycling and pollution in this segment. Nonetheless, all the factories that are still functioning in Cluj County have to obey the regulations and to be environmentally-friendly. This also involves their logistic operations at all levels.

As a result of increasing mobility demands for passengers and merchandise especially in Cluj-Napoca, the transportation activities are highly linked to the environmental problems. So in this case, the city of Cluj-Napoca and the settlements around it, such as Florești, Apahida, or Baciu receive the highest impact from the point of view of the environmental pollution caused by transport. These settlements together with Cluj-Napoca have indeed the highest population density in the whole county.

4. CONCLUSIONS

In conclusion, the infrastructure of Cluj County needs improvement at all levels and one of the major problems is the traffic congestion, while solutions can be found in sustainable and green transportation. The major issue here will be the economic challenges that the local authorities will need to face. Investments are needed so that the county will have an outstanding infrastructure in future.

The air and noise pollution will still remain a major concern and will need also improvements so that the sustainable transportation be implemented.

Good relationships between the citizens, the industrial sector, the private companies and the local authorities are also needed for a harmonious development of the transportation sector, which can be a factor of economic growth.

Environmental sustainability in terms of transportation will be the most difficult to implement in Cluj County, as it faces not only national regulations but also major economic investements and not only for local authorities, but also for the private sector like industrial transportation.

Sustainable development in the sector of transportation also means links between environment, economy and social progess. Transport in general needs to adapt rapidly to ongoing changes and to be cost-efficient simultaneously.

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THE TECHNOLOGICAL HAZARD – A FACTOR FOR MODELING THE INDUSTRIAL CULTURAL LANDSCAPE IN OCNA MUREŞ

Ileana-Cristina VASILIȚĂ-CRĂCIUN[1], Gabriel NICULA[1], Camelia-Ina GAVRA[2]

ABSTRACT. – The Technological Hazard – A Factor for Modeling the Industrial Cultural Landscape in Ocna Mureș. It is well known that an exploitable resource is a potential factor of social attraction and economic development Thus, concretely the salt resource present in the underground of Ocna Mureș facilitated its exploitation from the first moments of discovery and the construction of a specific industry with the technological evolution at global level and finding out the various possibilities of processing and capitalization. At the same time, it brings into question the transformations that have taken place within the local cultural landscape, in a fortuitous and irreversible way with the chained manifestation of a complex of unforeseen factors in the form of hazards. Therefore, the study in question presents technological hazard as an opportunity for the emergence and development of new cultural elements designed to open up other possibilities for capitalization.

Keywords: *Ocna Mureș, hazard, resource, anthropo-saline lakes, industrial cultural landscape.*

1. TECHNOLOGICAL HAZARD – CULTURAL LANNDSCAPE. GENERAL ASPECTS

According to the general understanding "cultural landscapes were formed as a result of human interference with the natural environment" (K. Boron, 2007, p. 135), during various historical periods, distinguished by particular

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characteristics. Each of them also reveals the progress through the quantitative and qualitative dimension of the cultural elements introduced in the landscape. Thus the cultural landscapes "are involved through accents of rhythmicity in a complex and vast plan related to either a historical scale, corroborated with a scale of human life" (F. Taillefer, quoted by I. Dincă, 2005, p. 74), or "by a scale derived from the intimate-genetic, evolutionary command of the conglomerate of cyber relations in which the parts of the landscape are included or even itself, subordinated to another matrix - the time" (Letter from the Quebec Landscape Council, quoted by I. Dincă, 2005, p. 74).

Thus, time is truly the element, often imperceptibly, that provides the framework for the development of the cultural landscape, the complexity of the latter being closely related to its size. It is obvious, however, that "man, as a superior, social being, has proved to embody the main factor of transformation of the natural landscape since its inception, by introducing new and new changes, temporary or permanent, in all components of the system" (Camelia-Ina Gavra, 2013, p. 46).

The various processes "shaped the cultural landscape, in which the mutual connections between the natural elements of the environment were changed as a result of human activity" (Wolski, quoted by K. Boron, 2007, p. 135). However, the modeling of the cultural landscape does not belong exclusively to the social component, as some phenomena such as natural or anthropogenic hazards can contribute decisively in this regard. The hazard itself is not limited to accidental, unpredictable manifestations but also involves changing the usual course of evolution of the cultural landscape, opening a new corridor of opportunity.

A conclusive example in support of the statement is the fortuitous evolution of the cultural landscape in Ocna Mureş, irreparably transformed by a natural hazard (floods) which implicitly triggered a technological hazard. Thus, "the phenomena of collapse and subsidence on the surface of the salt massif are the result of a very complicated hydrogeological and physico-geological process, which took place in close connection with the development of salt mining in the locality" (P. Marosi, 1959, p. 92).

The exploitation of the mentioned resource involved, since the incipient period of manifestation of the activity, the introduction in the landscape of the various characteristic elements, outlining a special character, imprinted by the industrial function of exploitation. Thus, the mentioned hazard, if we exclude the inconveniences of the need to change the method of exploitation, can be seen as a factor of diversification of socio-economically exploitable cultural elements. Overall, the process of evolution at the local level is natural to follow the general trends, consequently to highlight any opportunity, in order to increase local well-being.

2. OCNA MUREŞ. PHYSICAL-GEOGRAPHICAL CHARACTERISTICS

The local topography highlights the location of Ocna Mureş in a hilly and meadow area in the northeastern part of Alba County, on the left bank of the middle course of Mureş River. The homogeneity of the conformation of the local surface derives from a small set of landforms. Among them are the slightly fragmented hills and valleys, and the Mureş Corridor on the side, accompanied by the plethora of microforms (meadow segments, pronounced river terraces, etc.) built during the specific erosion.

The analysis of the graphical representation of the study area thus highlights the slight increase in altitude from the northern part that coincides with the meadow area, to the hilly surface with the maximum altitude in Gurguleu Peak (524 m) in the eastern area, followed by the Bantei Hills and the Nejoapa Peak.

The latitudinal and altitudinal geographical position implicitly imprints the general characteristics of the continental temperate climate, "the average multiannual temperature being 9.2 degrees C, while the precipitations amount to an average of 520 mm/year. The average values of temperature and precipitation betray the influence of the foehnization processes specific to the Mureş Corridor, located in the East part of the Apuseni Mountains" (V. Arghiuş, Al. Ozunu, 2005, p. 185).

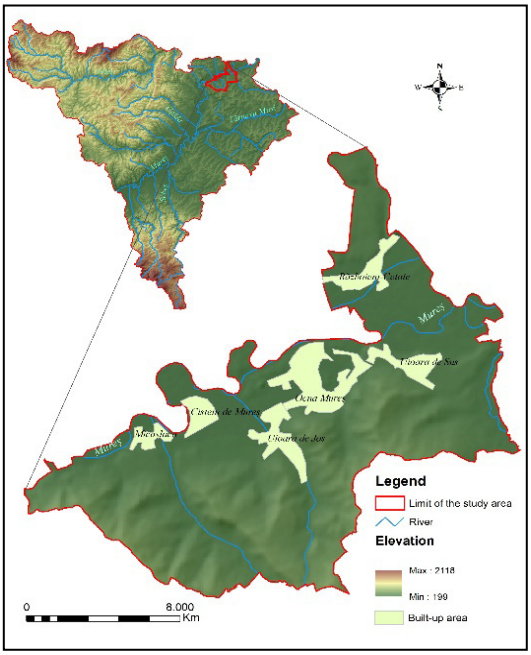

Fig. 1. Ocna Mureş City Map

Closely related to the environmental conditions described above, the soils have evolved in a relatively narrow range, starting with the alluvial ones, with a high degree of fertility in the Mureș meadow. "On the right bank of the river there are regosols (young soils, formed on loose deposits - sands, loess, clays, marls, etc.), the actual built-up area of the city lies on brown clay soils, and the hills on the left bank of the river are made of slate (compacted clay rock that divides itself into sheets)" (Roxana Aybuke Capar, 2017, p. 9).

At the same time, the field analysis of the environment highlights the existence of various spontaneous biogeographic elements, appropriate to the morphology and local climatic conditions. The flora is dominated by shrub species – blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), dog rose (*Rosa canina*) – and deciduous trees such as oak (*Quercus robur*), and walnut (*Juglans regia*). At higher altitudes there are mixture of pine conifers (*Pinus sylvestris*). Locally the meadow vegetation indicates the excess moisture of the soil.

The mentioned vegetal complex is implicitly the primary factor in the development of a specific fauna of the meadow, steppe and forest-steppe areas dominated by insects, birds and mammals adapted to the conditions.

3. THE TECHNOLOGICAL HAZARD – A MODELING FACTOR OF THE INDUSTRIAL CULTURAL LANDSCAPE

The considerable salt reserve, as an exploitable resource, has consistently played the role of attracting the social component, ensuring the economic sustainability of the area. "The resources of the underground have left their mark on this area since antiquity. The most important resource, exploited in Ocna Mureș, is the gem salt of very good quality, with a high purity and a NaCl content of about 89%; this is explained by the fact that when the salt deposit settled, the sedimentation happened to be done in several layers" (Al. Vigh, 2013, p. 27).

As a consequence of the fact that "the saliferous deposit is located in the middle corridor of Mureș River, in the sector included in the meadow terrace, at the absolute altitude of approximately 255 m" (V. Arghiuș, Al. Ozunu, 2005, p. 185), operation in the galleries was permanently subject to a double inconvenience, the considerable infiltrations from the groundwater and the possibility of flooding. In this sense, over time, various improvement works have been carried out to combat these inconveniences. Some are still visible in the form of dams and groundwater drainage channels.

The extraordinary magnitude of the 1913 floods materialized by flooding the galleries of the salt mine. Thus, a natural hazard triggered the production of a technological one, the penetration of Mureș water into the mine causing the inevitable dissolution of the salt walls and the collapse of the ceiling and finally the formation of specific anthroposaline lakes, as accidental cultural elements.

In this case it can be stated that the emergence of new cultural elements is due to a complex of factors of natural and anthropogenic origin, the technological hazard being the one that ultimately led to their construction. "In other words, the hazard signifies the causal conjuncture and the manifestation's spatio-temporal circumstances of the phenomenon and not the phenomenon itself, it represents the unpredictable but necessary chronotope of a causal network, likely to generate nonlinear energy discharges that objectify an extreme phenomenon and the causal matrix from which the phenomenon derives" (Mac, Petrea quoted by I. A. Irimuș, 2006, p. 223).

Although there is the opinion that the technological hazard "offers the possibility of a certain control in terms of the crisis, as well as the recovery after the accident" (Mihaela Licurici *et al*, 2013, p. 35), in this case the desired rehabilitation was not possible anymore. Adopting the way of exploiting the local resource with the help of wells meant expanding the range of specific cultural elements introduced within the cultural landscape. "In order to master and control the processes that take place in each category of landscape, it is necessary to know, through study, its current state, the need and the real possibility of improving its productivity and to be favorable for human existence and then the establishment of a permanent control system over the main processes that take place in the natural environment under consideration" (D. Teaci, 1983, p. 28).

Consequently, it is important to analyze the new cultural elements in the environment and to identify their role as a whole.

4. THE INDUSTRIAL CULTURAL LANDSCAPE IN OCNA MUREȘ

The industrial cultural landscape of Ocna Mureș is distinguished by specific elements. According to the classification criteria proposed by Glink C., Meyer H-H., Schottke Maja (2007), regarding the territorial form, elements belonging to three categories were identified (fig. 2).

1. *Point-shaped elements* that are represented in the landscape by the operating wells;
2. *Line-shaped elements* are highlighted by the railway but also by industrial access roads;

3. *Area-shaped elements* are visible within the landscape in the form of a sodium commodity plant, anthroposaline lakes, a railway station (especially for freight), as well as tailings dumps resulting from the exploitation and processing of salt.

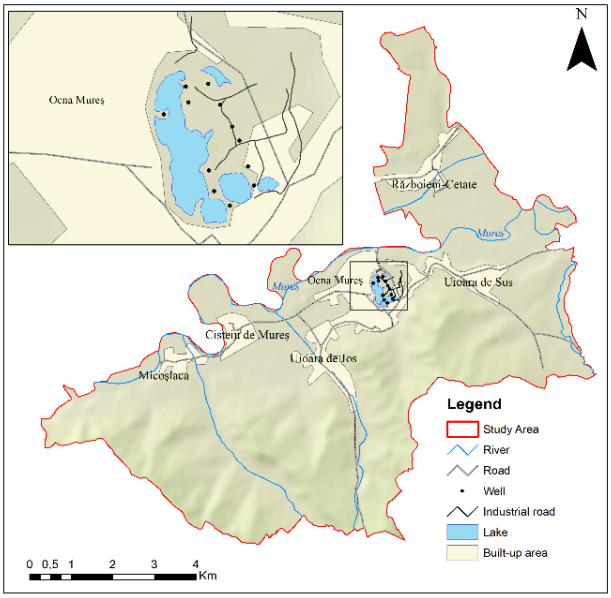

Fig. 2. Relevant elements of the industrial cultural landscape

1. Point-shaped elements

Being "the first salt deposit in the country where the new method of salt exploitation was applied in solution with the help of wells" (I. A. Irimuș, 2006, p. 223) involved the emergence of distinctive categories
of specific cultural elements in the shape of a point, the most evident ones being the salt exploitation wells, six spread over in the first extraction field, eight in the second field and seven in the third field. Although most are no longer functional, they are still preserved in the landscape, indicating the predominance of its technological character.

Considering that "the Ocna Mureș field has inexhaustible reserves for the exploitation with wells (23 billion tons), on both the south and north parts of the current exploitation, in the perimeter of Războieni locality" (M. Alexe, 2007, p. 22), it can be argued that cultural elements of this type can maintain their presence in the landscape for a period of time imposed by the continuity of exploitation.

Fig. 3. The salt exploitation wells

2. Line-shaped elements

They are indicated by the presence of industrial roads and railways, used for a similar purpose. The first ones were built in the form of a technological transport network, in order to facilitate the transport related to the industrial process, obviously connected to the usual road transport network. The technological roads are distinguished from the latter ones by the fact that they are mostly paved.

The railway that connects Ocna Mureș and Războieni, as the main railway junction located in the immediate vicinity of the city, reveals exclusively an industrial function, serving the transport of goods. Closely related to this, it is the existence of the bridge over the Mureș River built exclusively for this purpose.

Fig. 4. The bridge over the Mureș River

3. Area-shaped elements

The existence of salt in abundance has favored the emergence and development of an industry focused on the use of this raw material. Thus, the Sodium Plant was built in a relatively large perimeter within the urban area.

Closely related to industrial activity, tailings dumps are also identified as industrial elements in the form of an area, largely fixed by vegetation.

The relatively small building of the station is also part of the category of industrial elements.

Fig. 5. Building of the station

Another cultural element present is "the salt lake complex, materialized on the massif salt deposit Ocna Mureș, located on the left side of Mureș, about 10 km downstream from its confluence with Arieș, totaling an area of almost 18 ha" (M. Alexe, 2007, p. 100). According to the trends recorded over time, a "development of aquatic areas is expected, especially to the east, as the west has reached the limit of the salt massif" (M. Alexe, 2007, p. 113).

5. CONCLUSIONS

Concluding the brief analysis of the industrial elements that outline the industrial cultural landscape of Ocna Mureș, we can conclude that "it is a space shaped throughout the history of human activity, depicting the influences of civilization and natural elements" (B. Uojciech, B. Tadeusz, 2007, p. 125), being the eloquent expression of the way in which the chain of natural and technological hazards can shape the cultural landscape, opening new opportunities for evolution.

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ASSESSMENT OF GEOGRAPHY TEACHING-LEARNING PROCESS THROUGH GAME, IN PRE-UNIVERSITY EDUCATION

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ABSTRACT. – Assessment of Geography Teaching-Learning Process Through Game, in Pre-University Education. A general problem recognized in the educational process is the need to identify the manner in which the teacher, as the factor with the greatest influence on learning, increases the students' school performance. The creation of a tool in the form of an interactive website, using types of languages to improve an easy understanding of learning, the formation of specific competences and the students' enhanced motivation for study are the objectives of this study. This study evaluates the teaching-learning system through its own created game, using certain types of computer languages: HTML, CSS and JavaScript, from the perspective of measuring the impact of the effect on tests in the formative assessment sequence of students, compared to other teaching-learning methods. The experiment, observations, performance analysis and qualitative Google Forms questionnaires, suggested a high degree of student engagement and how game technology can facilitate teaching. As the results have shown that there is a strong difference between experimental and control groups, it indicates that educational play has had a positive impact on learning and increasing students' interest, confirming the advantages of learning through play. The teaching-learning model can be extended to use at national and international level.

Keywords: *teaching-learning through game; Geography; Google Forms; HTML computer language; CSS and JavaScript.*

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1. INTRODUCTION

Learning through play and the use of information and communication technologies (ICT) in the educational process are topics of interest to many studies.

There has been a number of research papers over the past six years addressing the use of ICT tools for learning, as well as their effects for students. Most studies show the advantages of using these applications and less their disadvantages. Glover's paper (2020) stands out in this regard, arguing that the tool "Google Forms helps stimulate conversations around basic concepts to improve learning and equip students with the technology and collaboration tools to prepare them for future professional contexts." Andrew (2019) investigated "student attitudes toward various language learning tasks in Google apps and explored the benefits of using Google apps as a collaboration tool". About the use of Google Forms as a blended docent learning initiative, Murphy's study (2018, p. 4) and Rejón-Guardia et al. (2019) stand out, in that the app allows "the student to be an active agent in the learning process", just like other Google applications. Liu and Lan (2016) "suggest that many Web apps (e.g. Google Docs) play a key role in improving student motivation and engagement."

In terms of the type of assessment, in most of previous research, Kahoot! Platform is predominant, since it has demonstrated a positive influence on students, creating a conducive environment for study (Iwamoto et al., 2017; Taylor and Reynolds, 2018; Wang and Tahir, 2020; Thomas et al., 2021).

Some studies also look at "the use of digital technology as indicated to be suitable for measuring and accepting e-learning tools" (Cheung and Vogel 2013; del Barrio García et al., 2015).

Learning through play has been tested and analyzed by several researchers, but lacking the in-depth quantitative and qualitative data for the realization of a general model of teaching-learning and objective assessment on an online platform, to be used in all three models of teaching-learning-assessment. Game-based learning motivates and engages in such a way that the learning process takes place without being aware of this fact and can be beneficial for the motivation and dynamics of the class (Sharples, 2002; Gee, 2003). It is also necessary to discover an appropriate methodological assessment plan, related to online and traditional teaching and learning practices, such as evidenced by the **"**online game science argumentation program (OGSA) for experiments – performance of learning and argumentation of the sciences**,** but time-consuming" (Lin, 2018).

Various research papers present various game models, highlighting the direction of improving the learning effect: "the learning and play performance of students in an educational game based on exercises with mixed methods" and "video games (Virtual Age, based on sound and design) facilitate students'

learning and understanding of biological evolution, their behavior influenced by score" (Cheng et al., 2015; Lin et al., 2019). A case study looks at "establishing an interactive virtual learning platform that connects all students together - blended learning - improving the learning performance of students' vocabulary through the use of synchronous and asynchronous games and activities" (Karaaslan et al., 2018).

Other research examined "students' learning outcomes through mixed methods and their learning experiences through playing a Serious Educational Game, as they learn more content" (Cheng and Annetta, 2012). Also in this regard, **"**new teaching methods are being designed that encourage students to be active participants in their own learning, based on the game (GBL) – the use of mobile phone applications to improve learning" (Elsherbiny and Al Maamari, 2020).

Other studies have provided a number of educational teaching and learning models experienced by university education. Thus, "interactive learning environments such as digital games (DGBL) were used to attract students' interest, based on the analysis of drawings, questionnaires, pre-test and post-test results, impact and interest" (Perini et al., 2017).

Another example is provided by Annetta et al. (2009), who researched the effectiveness of a multiplayer educational gaming application (Dr. Friction Multiplayer Educational Gaming) created by the teacher, using mixed methods and collecting results at pre-test and post-test.

Other studies have been identified the positive impact of learning through play: the work of Zaharias et al. (2017) "results in serious games being effective learning tools, demonstrating the positive impact on learning of the 2D and 3D educational game on Geography".

There are various concerns about the use of JavaScript. These refer to "creating dynamic and interactive websites to support the teaching-learning process of web programming with JavaScript and Java Server Pages, an assessment tool" (Jaimez-Gonzalez, 2019). Also, the JavaScript program is considered "an easy means of bringing interactivity and checking the answers to the educational, fast-to-learn, attractive web pages, highlighting the educational use and tests in the future of distance learning" (Krumm and Thum, 1998).

Regarding "increasing the performance of students after improving the teaching-learning-assessment methods, a specialized paper that studies "visible learning", a guide for teachers (Hattie J., 2012), stands out. A useful method for calculating the results of assessments on certain time intervals and on certain samples, is "calculating the size of the effect (d and r)" (Hedges and Olkin, 1985; Cohen, 1988; Lipsey and Wilson, 2001; Schagen and Hodgen, 2009; Rosenthal et al., 2000). These results of the size of the positive effect are consistent with previous results in the literature (for example Hattie, 2009).

At the opposite end, we find studies on the lack of motivation of students that can lead to reduced learning outcomes and an unpleasant atmosphere in the classroom (Liu et al., 2012), and boredom on the computer to a problematic behavior (Baker et al., 2010). Educational research has shown that students actively involved in the learning activity will learn more than passive students (Butler, 1992).

Although there have been many research studies on learning through play, few have referred to pre-university education, and the subject of geography. We thus consider this study appropriate, in order to highlight the importance that information and communication technology (ICT) has acquired in teaching, learning and evaluating geography, especially with the advent of the COVID-19 pandemic (Toma et al., 2021). This aspect is considered necessary as a means of motivation for students and teachers.

A study from Ireland provides substantial evidence of the negative psychosocial impact of SAH ("home schooling") perceived by parents and students and of the fact that students learned less during SAH (Flynn et al., 2021).

The usefulness of teaching situational geography stories in virtual reality and the value of using this teaching method can induce positive and negative emotions, as demonstrated in China (Yang et al., 2022).

The research performed aims to evaluate (quantitatively and qualitatively) the method of teaching-learning through play, with the method of Power Point presentation. At the same time, steps were taken to determine the students' opinions about the advantages and disadvantages of the implemented game and to use it in the future.

The aim is to identify optimal teaching methods in the current context of technological development.

2. MATERIALS AND METHODS

2.1. Research objectives

The hypothesis proposed to the study research is that a game developed through the JavaScript programming language and included in the teaching-learning sequence of geography would increase the volume of information and specific skills assimilated by students.

The overall objective of the research is to comparatively assess the teaching-learning-assessment of students through play, compared to another method of teaching-learning and the students' perspective through a questionnaire of their reflection about the implemented method.

This identifies the advantages, disadvantages and usability of the game. This objective took into account 4 specific objectives.

The first objective was to measure the level of previously acquired knowledge and specific skills through a formative assessment standardized with the Kahoot! interactive exercise by measuring the size of the effect on formative tests on the Kahoot! learning platform.

The second objective was to measure the level of acquired knowledge and specific competencies through a formative assessment standardized with the Interactive Kahoot! exercise during the game developed through JavaScript/Google Forms implemented teaching-learning tool by measuring the size of the effect on the formative tests.

The third objective was to measure the level of knowledge that students acquired after applying the implemented teaching-learning game by measuring the size of the effect on the tests on the Kahoot! learning platform.

The fourth objective was to learn the students' opinion about using the game tool in JavaScript as a teaching-learning technique by applying a feedback questionnaire in the Google Forms application.

2.2. The context of the research and the sample

The research was carried out within the pre-university education in the subject of geography, during 12 topics about the Hydrosphere, from four levels of study, representing the 5th, 6th, 9th and 10th grades, totaling a number of 373 students. For the experimental groups, Google Forms and the game developed with JavaScript as a teaching-learning method was used as a teaching-learning tool associated with the PowerPoint presentation (231 students) and for the control groups (142 students) only the PowerPoint presentation. The Google Forms questionnaire on students' perception of the two teaching-learning models was applied only to experimental groups.

The groups of students in the sample are intellectually homogeneous, but heterogeneous in high school specialization (mathematics, social sciences and philology profiles), have a predominantly visual learning style, studying Geography one hour a week from the common trunk.

A selection criterion was used to choose the classes that will participate in the learning experiment with the two comparative methods: two ISCED levels 2 and 3 in the classes with the lowest previous average (9th grade H, 10th D and 6th grade B) and two ISCED levels (international standard classification of education) 2 and 3 in the classes with the previous higher average (10th E and 9th C) and with approximately equal averages in classes 5th A and 5th B, but with insignificant differences in the score of the average between the classes of the two (experimental and control) groups before the experiment is conducted, from a minimum of two points for the 6th graders, to a maximum of 0.56 points in

the 10th grades. This situation makes it possible to support the fact that the dispersion of the two samples is homogeneous, as a prerequisite for the future experiment to be carried out optimally.

Regarding the variable "high school/middle school level profile", an equal number of students was selected for the two groups, 145 students for the "sciences" profile and 58 for the "humanities" profile, and an equal number of 28 students for the level of the 5th and 6th grades. Their attribution is symmetrical within the two groups, with a larger number of students in the experimental group to compare their own JavaScript web game created and the Google Forms tool associated with the PowerPoint presentation.

The reason for recruiting and selecting participants is to identify the degree of influence of the teaching-learning sequence through its own JavaScript-created game and the Google Forms tool simultaneously with the presentation in Microsoft PowerPoint in learning geography, starting from:

* The measurement of the level of knowledge previously acquired by the students;

* The implementation in the routing sequence of the teaching-learning of the method with their own JavaScript created game and the Google Forms tool associated with the presentation in Microsoft PowerPoint;

* The measurement of the level of knowledge acquired and the specific competences through a formative assessment;

* The measurement of the level of knowledge acquired by the students after the application of the implemented method of teaching;

* The students' opinion on the use of the Google Forms/JavaScript game tool associated with the presentation in Microsoft PowerPoint as tools of the teaching-learning method.

The sample size represents all the 373 students belonging to the classes that have the same teacher of Geography in the same educational unit, involving middle school and high school.

2.3. The tool used and the validation

The study used the following research methods and tools: analysis (collecting data on the conduct of teaching-learning-assessment within the classes), in order to assess the specific competences, performance and progress of students; the quantitative statistical method for calculating the magnitude of the effect for school acquisitions of expected progress; the survey method based on the questionnaire, using the Likert ordinal scale; the method of observing students' behaviour; the analysis of the products of students' activities; the experiment; the method of researching school documents; the test method and the comparative method. For the interpretation of data, we used statistical methods.

The tool used in teaching-learning students is the use of their own created game in JavaScript / Google Forms associated with the PowerPoint presentation. To evaluate the students' results, we used the formative test on the Kahoot! platform for the feedback sequence. The validation model used is the grid for interpreting the value of the effect size, according to Cohen (1988).

2.4. Model and procedure of research

a. The procedure for the experiment:

Cohen (1988) calculated the effect size in two ways: for the same level with the two evaluation moments – the previous one (pre-test) and during the implemented teaching-learning method with their own web created game in JavaScript and with the Google Forms tool associated with the Microsoft PowerPoint presentation (post-test), for experimental and control groups. The second way is for the same level as two other evaluation moments – during the implemented teaching-learning method with the JavaScript web game and the Google Forms tool and PowerPoint presentation.

The methodology used (within the experiment) to measure the results of the students in the three stages was achieved by testing the hypothesis of the magnitude of the studied effect, based on the quantitative statistical method of calculating the size of the effect for school acquisitions of the expected progress of the students per class during the research period, by using the SPSS program – *Statistical Package for the Social Sciences* (for the experimental and control classes, for the 5th and 9th grades) and Jasp and Jamovi (only for 6th grades and 10th grades, because the SPPS program did not calculate, as there was a single test to compare between the two groups).

So, the methodology used to test the assumption of the magnitude of the effect studied is the quantitative statistical method of calculating the magnitude of the effect on school procurement of the expected student progress by class during the research period using the Jasp program. Standard class deviation was calculated at all evaluations and effect size in tests (equation 1), in two ways: for the same class as the two assessment moments – one previously, and the other one during the implemented teaching-learning method using our game in JavaScript / the Google Forms instruments (equation 1, situation 1 and 2) and for the period of implementation of the teaching and learning method with our game in JavaScript / the Google formats tool, the second phase of research for different classes (equation 1, situation 3).

The effect size (d) is:

$$d = \frac{M\ (test\ 1) - M(test\ 2)}{(AS\ test\ 1 + AS\ test\ 2)/2} \qquad (1)$$

Where:

Situation 1 (the same class):

M (test 1) is the mean of the posttest (for the whole class); M (test 2) is the mean pretest (for the whole class); AS test 1 is the standard deviation of the posttest (for the whole class); AS test 2 is the standard deviation of the pretest for the whole class.

Situation 2 (the same class):

M (test 1) is the posttest mean, during the use of the implemented method (for the whole class); M (test 2) is the mean pretest previous (for the whole class); AS is standard mean deviation of the same class for the two moments of the assessment.

Situation 3 (different classes):

M (test 1) is the mean test for class with our game in JavaScript/the Google Forms tool (for the whole class); M (test 2) is the mean test for a class without Google Forms tool (the whole class); AS test 1 is the standard deviation class with Forms; AS test 2 is the standard deviation class without our game in JavaScript/ Google Forms tool.

In the post-research stage, we analysed the results of each class, thus comparing the teaching-learning method with our game in JavaScript/ the Google Forms tool, with the presentation PowerPoint method over the five weeks in the 9th and 5th grades and for one week in the 6th and 10th grades.

A further five week Kahoot! standardized game-type assessment in the 5th, 6th, 9th and 10th grades was also carried out to compare the progress or backsliding of students after the method implemented with our game in JavaScript/the Google Forms teaching-learning tool ceased to apply. The effect size has also been calculated for the next stage (equation 1, situation 4).

Situation 4 (the same class):

M (test 1) is the mean posttest during the usage of the implemented method (for the whole class); M (test 2) is the pretest, previous to method implementation (for the whole class); AS is the standard deviation of the whole class for the two moments of the assessment.

Students who used our game in JavaScript/the Google Forms tool method, received at the end a questionnaire stating its advantages and disadvantages and to what extent they agree to the re-use of this teaching-learning method during future classes.

Other working methods were the teaching-learning method and the survey based on the Google Forms questionnaire, the JavaScript web game and the graphical method of the results obtained with students by classes in the Microsoft Excel program.

Also, the experiment was carried out for a total of 373 students in middle school (5th and 6th grades) and high school (ninth and tenth grades).

The results are presented according to the specific objectives of the research, namely the performance achieved by the students compared between the three teaching-learning methods and the students' perception of teaching and learning based on their own web game created in JavaScript and the Google Forms tool/associated with the presentation in Microsoft PowerPoint.

b. The procedure for creating your own JavaScript web game

Making online games involved integrating requirements into web pages using certain types of computer languages: Hyper Text Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript.

HTML is a markup language that forms the structural basis of web pages. Through it we created and ordered the components of web pages. The other computer languages mentioned completed the project by stylizing and animating their component elements.

CSS is a computer tool necessary for editing HTML documents. It allows the implementation of the visual aspect characteristics of the component elements in a web page. In this case, CSS has provided an important help in stylizing and arranging objects in games for a visual effect as pleasant and attractive as possible. Without CSS, creating HTML pages is very difficult, the results on their design are often unsatisfactory.

For a good interaction it was necessary to use a programming language used in handling web pages, JavaScript. Through its specific codes, we were able to build and complete the applications we wanted. JavaScript allows animating, modifying, moving elements created in HTML, as well as changing CSS codes to change the appearance of graphic elements according to user action (Fig. 1).

```
<script>
var nrQ=0;
var nrTotal=18; //total questions
var corect=0; //total correct answers
var incorect=0; //total incorrect answers
var raspuns=4; //answers option (0,1,2 or 3)
var nrC=0;
var timp=30; //the number of minutes provided

var titlu=" LECȚIA 1-Hidrosfera" ; //lesson title
var capitol="<b>GEOSFERELE TERREI: HIDROSFERA</b>"; //chapter title
var tipLectie="Lecție dobândire de noi cunoștințe (de descoperire pe cale inductivă/deductivă) ";  //lesson type
var atitudini="<i>Respectarea unor reguli ....</i>";//responsible attitudes / connection to real life
```

Fig. 1. The first variables created to manage information in game development.
Source: the authors

Questions, answers, specific competences, performance standards and operational objectives were grouped together as separate matrices, the link between them being the order in which they were positioned. For example, the first question in the series of questions corresponds to the variants of the answer from the first element in the sequence of answers, the first element in the sequence of objectives, the first element in the string of performance standards and the first element in the skill sequence.

Syntax example:

const questions =[“Exercise 1”,0, “the location of the image file to be displayed”, “Image source:”];
const answers=[“answer1”,”answer2”,”answer3”,”answer4”];

In the given example, the first exercise is elemental in questions [0][0], and the correct saying is questioned [0][1], marked with 0, that is, the first variant of answer. If it was past 1, it meant that the correct answer was the second option. With the help of JavaScript, we were able to link the elements in these data strings to display the necessary information.

If the sixth exercise appears in the game, i.e. questions [5][0], the response variants displayed will be those from the answers [5], the performance standards displayed will be those from the standards [5], the specific competencies from the competencies [5], and the operational objectives from the objectives [5]. Of course, these names can be changed, but for a more correct understanding of the structure of the game, we used the names “questions”, “answers”, “competencies”, “standards”, “objectives”.

After completing the games, they were uploaded to an online server, from where they were accessed. It is necessary to purchase a web hosting package (hosting) and an internet domain for the operation of this website (www.hidrosfera-jocuri.com). The created devices will be accessible for the students, requiring only an internet connection.

The own created game model can also be used internationally, by setting in Google Chrome the translation of a desired foreign language (Fig. 2).

2.5. Data analysis

The study was divided into four stages of research. In the first stage, the results of previous formative assessments were analyzed by comparing the average obtained by level (classes) from seven and eight contents (pre-test results).

In the second stage, the results of the formative assessments were analyzed by comparing the score obtained per class to the one (grades 6th and 10th) and five (5th and 9th grades) contents about the Hydrosphere, during the comparison of the three teaching-learning methods.

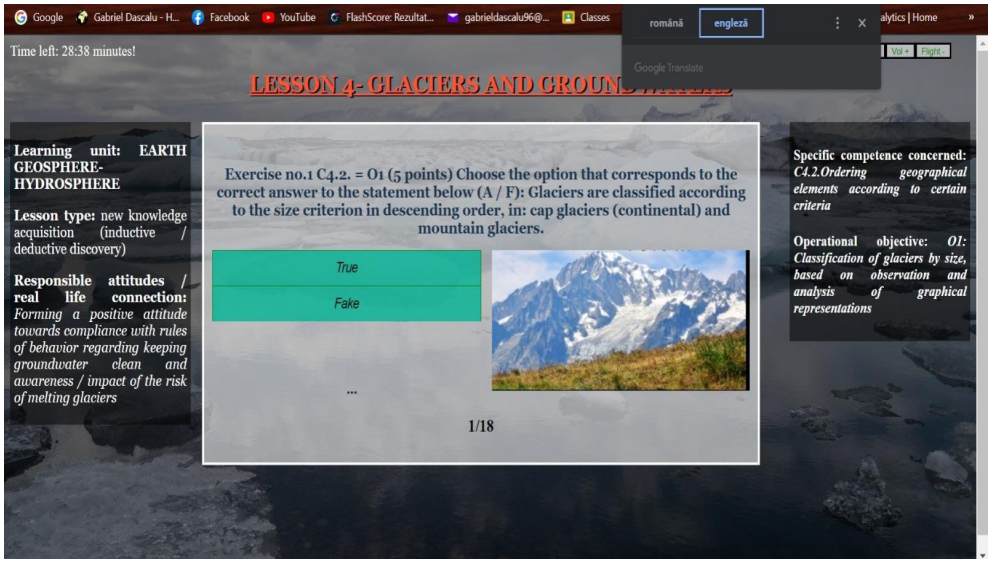

Fig. 2. Own created game model in Java Script in English by setting in Google Chrome the translation into a desired foreign language.
Source: the authors

For all 12 lessons, the number of questions in the game made was 18, with a working time limit of 30 minutes, with play buttons, pause and volume. The 18 items are of objective type, in which one is correct and the rest are fun, plausible, of the dual choice type: True / False and with multiple choices from 3 or 4 variants of answer. On the first background is the title of the lesson, the learning unit, the type of lesson and the responsible attitudes/connection with real life to be formed to the students. Then, on each image of the existing 18, a learning activity (exercise) with the number of the specific competence and the number of the proposed operational objective, the title of the lesson, the learning unit, the type of lesson, the play, pause and volume buttons, the specific competence targeted and the proposed operational objective is each put in place. The students choose the correct answer and will be shown whether the answer is right or wrong and the number of the question they are in. Students cannot move on to the next learning activity if they do not tick an answer. The last picture will show the resolution time, score and wrong detailed answers on

specific skills and operational objectives. The students will keep this last image as a screenshot and post it on Google Classroom in the theme category. The score obtained by the students is on average per class a score of over 90 points, which confirms the attention throughout the teaching-learning conduct sequence.

At all 3 stages presented, at the assessment sequence at the end of each class, all students received a Kahoot!! game with nine standardised questions on the specific competences and formulated according to the operational objectives of the lesson and a feedback question on the lesson taught by the teacher. As teaching-learning methods, the PowerPoint presentation associated with the Google Forms tool for 2 experimental classes (57 students), the PowerPoint presentation associated with the own created game in JavaScript programming language for 6 experimental classes (174 students) and only the PowerPoint presentation for the control groups (142 students) were used.

The data with the test results stored in Excel was converted to the ODS program and entered into the Jamovi program. The methodology used (within the experiment) to measure the students' results from the 3 stages was achieved by testing the hypothesis of the magnitude of the studied effect, based on the quantitative statistical method of calculating the size of the effect for school acquisitions of the expected progress of the students per class during the research period, by using the Jamovi program. The average difference was calculated in this program, SD, SE, p, at all assessments (Table 1) and the effect size of the tests (Cohen effect size), in two ways. The first way was for the same level with the two moments of assessment – the previous one (pre-test) and during the implemented method of teaching-learning with the JavaScript game and the Google Forms tool and PowerPoint presentation (post-test). The second way was for the same level with two other assessment moments – during the implemented teaching-learning method with the JavaScript game and the Google Forms tool and PowerPoint presentation (pre-test) and later – only with teaching-learning based on PowerPoint presentation (post-test).

In the fourth stage, the Google Forms questionnaire applied to students from the experimental groups was analyzed. It included 6 items, of which 2 questions were with an open answer, 1 question contained the Likert scale and 3 questions on demography.

The methodology used in testing the hypothesis of the size of the studied effect is the quantitative statistical method of calculating it for school acquisitions of the expected progress of the students per class, during the research period of the three teaching-learning models.

3. RESULTS

The results are presented according to the four specific objectives of the research, namely the performance achieved by students compared between the three teaching-learning models and the students' perception of teaching-learning based on JavaScript and the Google Forms tool.

In the second sub-stage, in the 5th and 9th grades, a minimum value of the average is noticed in the first lesson from an average of 7.65 (in the 5th grade) to 8.38/8.26 in the 9th grades, these progressing to the maximum values of the average of 9.05 at the lesson 5 in the 5th grade and 9.64 in the 9th grades. In the 6th grades, the average was 9.04 and in the two classes of the 10th grade (with JavaScript game associated with the PowerPoint presentation) there was an average of 8.66 and 8.22 respectively (with Google Forms tool associated with PowerPoint presentation).

According to the data obtained, none of the students obtained a score below 5 in the experimental groups. At the same time, it can be seen how, as the score progresses towards the maximum possible result, the control group tends to register decreasing values. In the 9-10 points category, the experimental group recorded values of 63.57%, more than half of the students, while the control group registered only 39.82% (table 1).

Table 1. The score obtained by the students in the experimental and control groups

	3 points	**4 points**	**5 points**	**6 points**	**7 points**	**8 points**	**9 points**	**10 points**
Percent students (%) Experimental group	0	0	0.59	4.72	9.84	21.25	35.43	28.14
Percent students (%) Control group	1.45	1.74	7.26	11.91	15.4	22.38	26.74	13.08

Source: the authors

Thus, the average obtained by the experimental group was 8.77 points, and that of the control group was 7.73 points, with a difference of 1.04 points between them.

The figures below show the evolution by classes and by experimental groups and control groups viewed comparatively.

Fig. 3 shows the pretest-posttest evolution of the experimental groups.

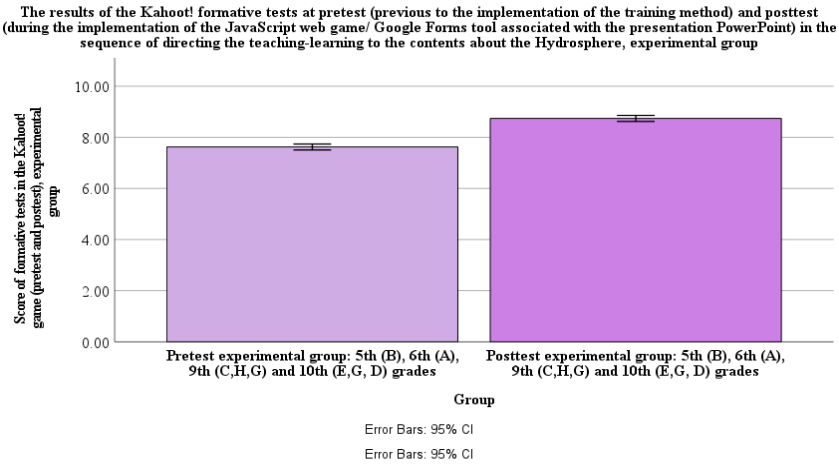

Fig. 3. Bar chart made in SPSS program – Results of the Kahoot! formative tests at pretest and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Hydrosphere (class level experimental group).
Source: the authors

In Fig. 4, the evolution of the experimental and control groups and by class may be noticed during the implementation of the methods (5th grades in Fig. 5, 6th grades in Fig. 6, 9th grades in Fig. 7 and 10th grades in Fig. 8).

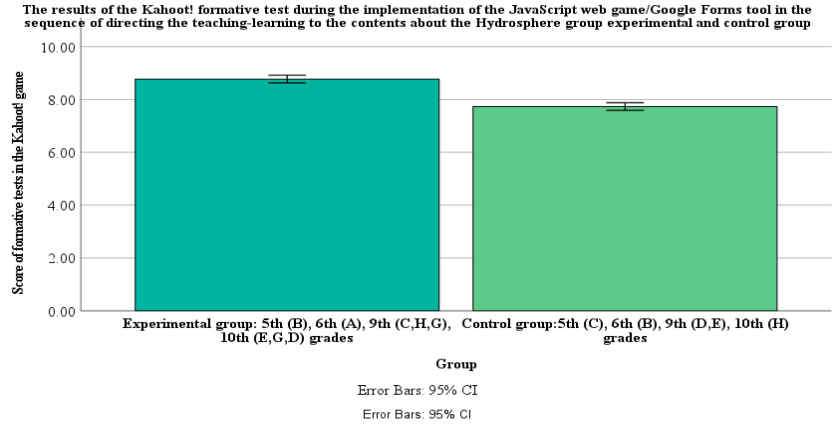

Fig. 4. Bar *chart* made in SPSS program – Results of Kahoot! formative tests before (pretest) and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Hydrosphere (experimental group and control group, by class level).
Source: the authors

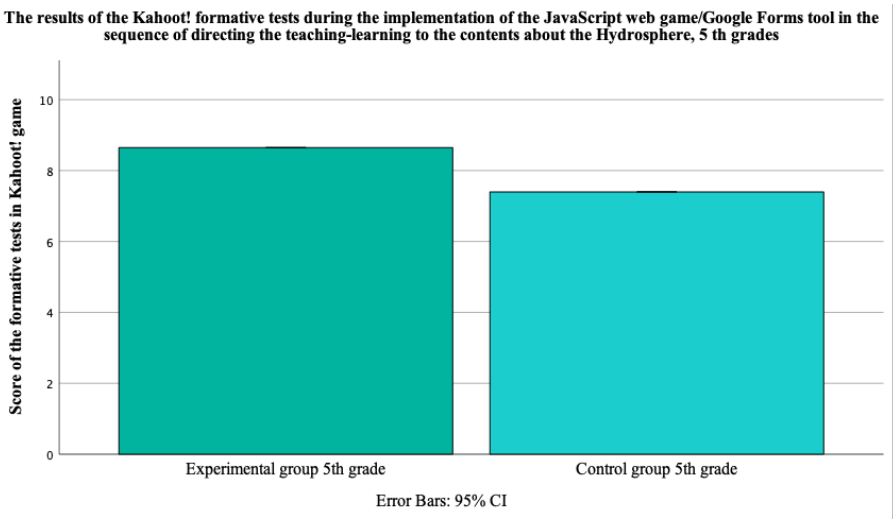

Fig. 5. Bar chart made in SPSS program – Results of Kahoot! formative tests before (pretest) and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Hydrosphere (experimental group and control group, 5th grades).
Source: the authors

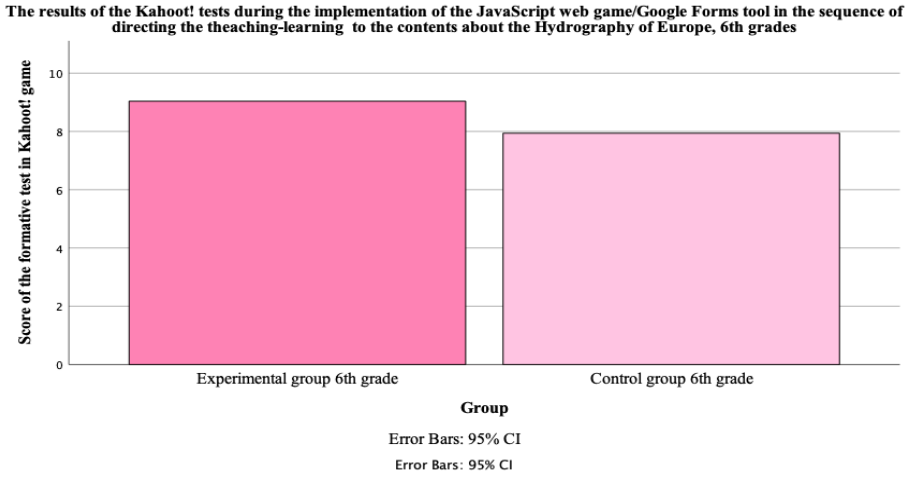

Fig. 6. Bar chart made in SPSS program – Results of Kahoot! formative tests before (pretest) and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Hydrography of Europe (experimental group and control group, 6th grades).
Source: the authors

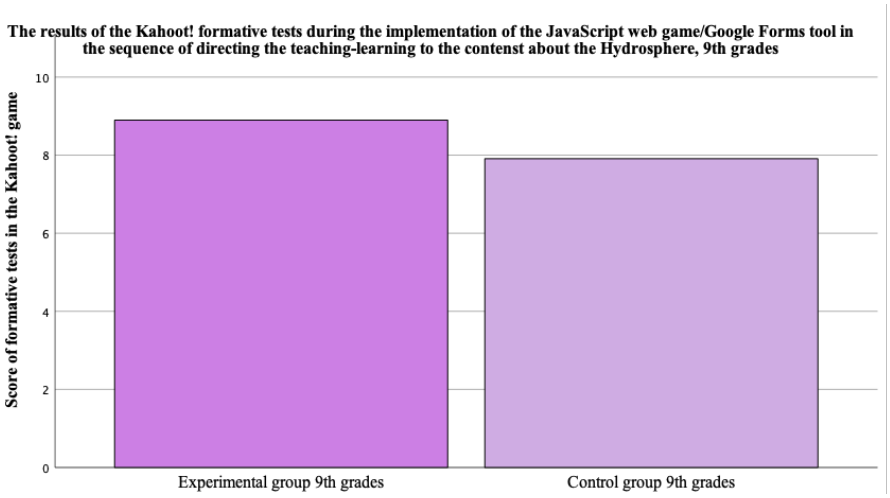

Fig. 7. Bar chart made in SPSS program – Results of Kahoot! formative tests before (pretest) and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Hydrosphere (experimental group and control group, 9th grades).
Source: the authors

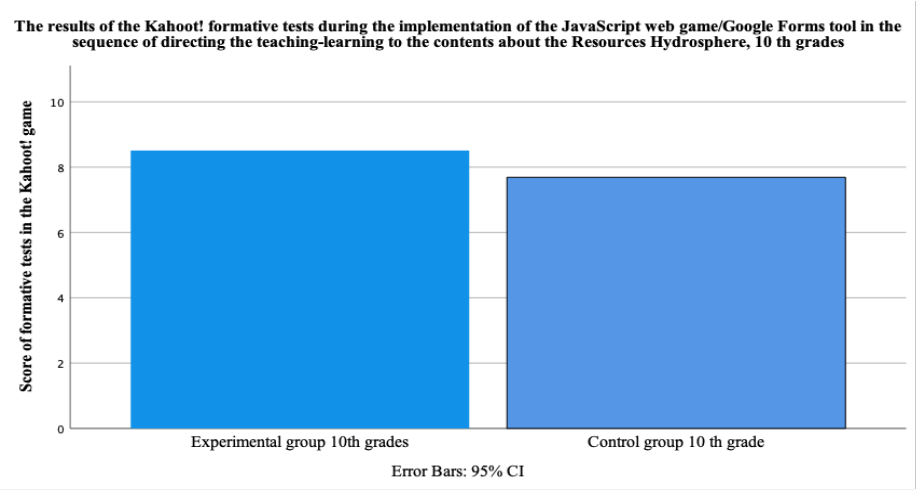

Fig. 8. Bar chart made in SPSS program – Results of Kahoot! formative tests before (pretest) and during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (posttest) related to the contents about the Resources of Hydrosphere (experimental group and control group, 10th grades).
Source: the authors

The value of the effect size obtained by class (***d***, Cohen) was obtained by calculating it from the experimental groups together with the control groups.

Thus, in the experimental classes, the size of the Cohen effect is very large, at 3.97 (manually calculated, according to Hattie formula) or 3.99 (calculated in Jamovi program) and p has values < 001 during the implementation of the teaching-learning of the method with the own created web game in JavaScript / Google Forms tool associated with the presentation in Microsoft PowerPoint, during the period of five lessons, compared to the subsequent period, when the value decreases.

At the same time, in the control groups, calculated in the Jamovi program, the size of the Cohen effect has an average value of 0.577 (calculated in the Jamovi program) and p has values of 0.332 during the implementation of the teaching-learning of the method using the JavaScript game, but not in these classes, for the period of five lessons, compared to the subsequent period when the value decreases.

A validation model of the variable used regarding the level of knowledge acquired and of the specific competences during the method implemented with the web game-type tool created by JavaScript / Google Forms tool and the presentation in Microsoft PowerPoint in the teaching-learning routing sequence, is another magnitude index of the effect: omega-squared (ω2), in equation 2 as follows:

$$\omega 2 = \frac{t^2-1}{t^2+n1+n2-1} = \frac{8.77^2-1}{8.77^2+(175+56)+142-1} = \frac{75.91}{448.91} = 0.169 \qquad (2)$$

In this case, *t* is the test average obtained by the experimental groups, *n1* is the number of students in the experimental group and *n2* is the number of students in the control group.

After calculating the index, its resulting value was 0.169. According to Cohen's recommendation, given that 0.17 is greater than 0.14, it indicates a strong association between the use of the own created web game in JavaScript / Google Forms tool and the amount of information assimilated by students. In this situation, the hypothesis can be confirmed with certainty, according to which, if in the process of teaching and learning geography, the web game tools created personally in JavaScript / Google Forms associated with the presentation of Microsoft PowerPoint are introduced, then the volume of information and specific skills assimilated by students increases.

All the results of the assessments, measured by the Cohen index (class average) reflect a higher level of knowledge for all experimental classes during

the application of the teaching-learning method based on the JavaScript web game and Google Forms tool, which are the subject of this research.

In the third stage, the results of the formative evaluations were analyzed by comparing the average obtained by level (classes) from five contents (pretest results, during the implementation of the three training methods) with the results obtained later (posttest, after applying the methods).

The results of the pretest (considered during the implementation of the three training methods) and posttest (considered the subsequent average) for the experimental groups and for the control groups are shown in Fig. 9 and Fig. 10.

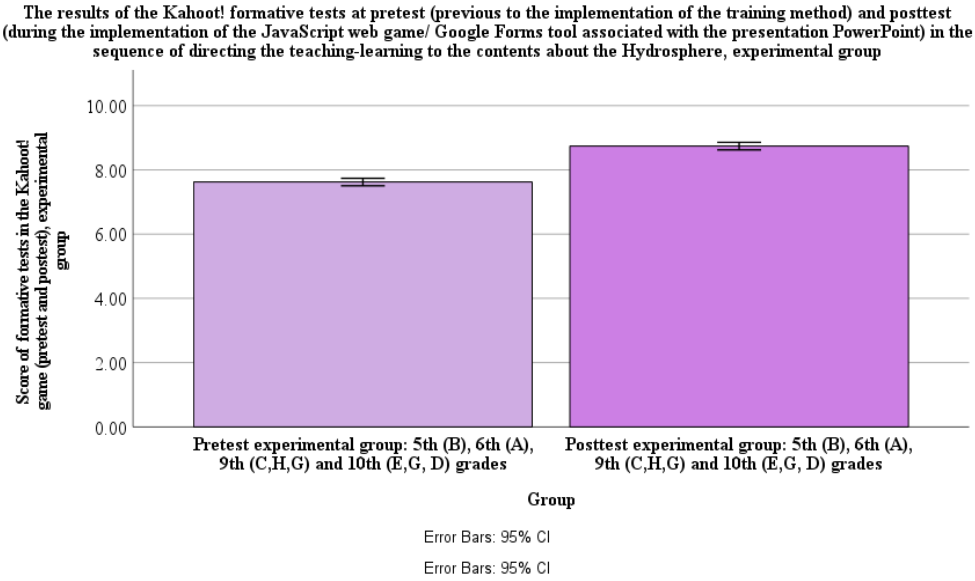

Fig. 9. Bar chart made in SPSS program – Results of Kahoot! formative tests during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (pretest) and after the implementation of the methods (posttest) related to the contents about the Hydrosphere (experimental group, by class level).
Source: the authors

All assessment results, as measured by the Cohen index (class average), reflect a higher level of knowledge for all experimental classes during the application of the teaching-learning method based on the JavaScript game and the Google Forms tool, which are the subject of the research *(Table 2).* The p-values of experimental groups during the implementation of the teaching-learning method with JavaScript tool and Google Forms is < 0.01.

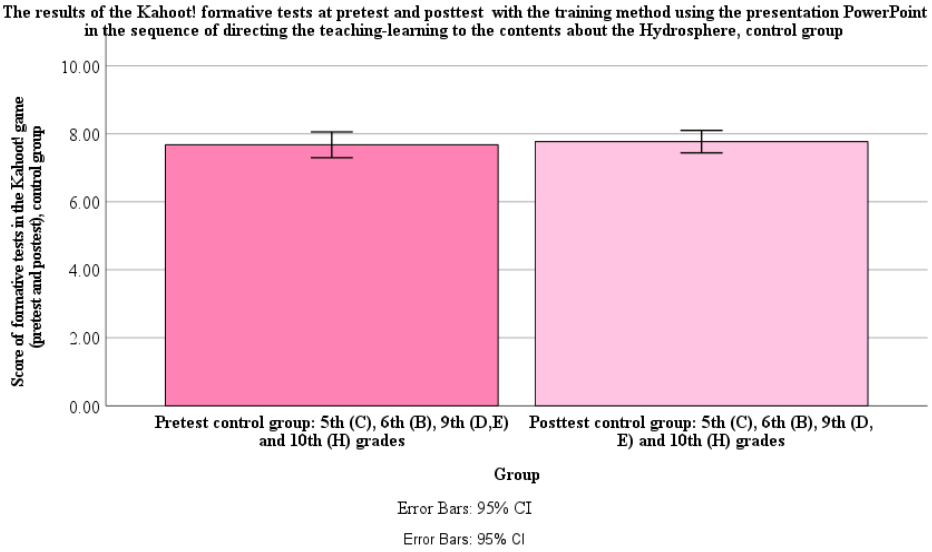

Fig. 10. Bar chart made in SPSS program – Results of Kahoot! formative tests during the implementation of the method with the JavaScript web tool and Microsoft PowerPoint presentation (pretest) and after the implementation of the methods (posttest) related to the contents about the Hydrosphere (control group, by class level).
Source: the authors

Table 2. The results obtained at the Kahoot! formative test related to contents about the Hydrosphere

Group of students	Pre-test (period of implementation of teaching-learning through play compared to the previous period)				
	Mean	**Mean difference**	**Std. Deviation/ AS**	**p**	**Effect size: Cohen's d**
Experimental groups with teaching-learning method with JavaScript game and Google Forms tool, associated with the PowerPoint presentation	8.77	1.04	0.239	< .001	3.99
Control groups with teaching-learning method with PowerPoint presentation	7.73	-1.04	0.249	0.332	0.577

Source: the authors

The pre-test average (five assessment tests), the average obtained during the JavaScript game and Google Forms tool implementation associated with PowerPoint presentation in the sequence of conducting learning-teaching related to Hydrosphere content (one/five assessment tests), and the post-test average (five assessment tests) are in Table 3.

Regarding the questionnaire applied to students to learn their opinion on the use of the game-type tool developed, a feedback questionnaire developed in Google Forms was also used. 204 students responded to this, of which male 51% and female 49%. When asked if they would still reuse the game type developed and the Google Forms tool as a form of teaching-learning, 81.6% of students checked the total agreement and 18.4 answered with partial agreement.

Table 3. Pre-test average (at five assessment tests). Average during JavaScript game and Google Forms tool implementation associated with PowerPoint presentation in the sequence of conducting learning-teaching related to Hydrosphere content (at one/five assessment tests). Post-test average (at five assessment tests)

Classes	**Pre-test average (five assessment tests)**	**Average during JavaScript game and Google Forms tool implementation associated with PowerPoint presentation in the sequence of conducting learning-teaching related to Hydrosphere content (one/five/ assessment tests)**	**Post-test average (five assessment tests)**
5th grade B (teaching method with JavaScript game and PowerPoint presentation)- experimental group	7.40	**8.5**	7.50
5th grade C (teaching method with PowerPoint presentation) - control group	*7.37*	*7.40*	7.57
6th grade A (teaching method with JavaScript game and PowerPoint presentation) - experimental group	8.09	**9.04**	7.54
6th grade B (teaching method with PowerPoint presentation) - control group	*8.07*	*7.94*	**7.71**
9th grade C (teaching method with JavaScript game and PowerPoint presentation) - experimental group	7.88	**9.06**	7.96
9th grade H (teaching method with JavaScript game and PowerPoint presentation) - experimental group	7.57	**9.03**	7.92

Classes	**Pre-test average (five assessment tests)**	**Average during JavaScript game and Google Forms tool implementation associated with PowerPoint presentation in the sequence of conducting learning-teaching related to Hydrosphere content (one/five/ assessment tests)**	**Post-test average (five assessment tests)**
9th grade D (teaching method with PowerPoint presentation) - control group	*7.73*	***8.10***	7.94
9th grade E (teaching method with PowerPoint presentation) - control group	*7.37*	***7.73***	7.76
10th grade E (teaching method with JavaScript game and PowerPoint presentation) - experimental group	8.15	**8.81**	8.17
10th grade D (teaching method with Google Forms tool and PowerPoint presentation) - control group	*7.59*	*8.22*	7.22
10th grade H (teaching method with PowerPoint presentation) - control group	*7.85*	***7.69***	7.56
5th grade B (teaching method with JavaScript game and PowerPoint presentation)- experimental group	7.40	**8.5**	7.50
5th grade C (teaching method with PowerPoint presentation) - control group	*7.37*	*7.40*	7.57
6th grade A (teaching method with JavaScript game and PowerPoint presentation) - experimental group	8.09	**9.04**	7.54
6th grade B (teaching method with PowerPoint presentation) - control group	*8.07*	*7.94*	**7.71**
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9th grade H (teaching method with JavaScript game and PowerPoint presentation) - experimental group	7.57	**9.03**	7.92
9th grade D (teaching method with PowerPoint presentation) - control group	*7.73*	***8.10***	7.94
9th grade E (teaching method with PowerPoint presentation) - control group	*7.37*	***7.73***	7.76
10th grade E (teaching method with JavaScript game and PowerPoint presentation) - experimental group	8.15	**8.81**	8.17
10th grade D (teaching method with Google Forms tool and PowerPoint presentation) - control group	*7.59*	*8.22*	7.22
10th grade H (teaching method with PowerPoint presentation) - control group	*7.85*	***7.69***	7.56

Classes	Pre-test average (five assessment tests)	Average during JavaScript game and Google Forms tool implementation associated with PowerPoint presentation in the sequence of conducting learning-teaching related to Hydrosphere content (one/five/ assessment tests)	Post-test average (five assessment tests)
5th grade B (teaching method with JavaScript game and PowerPoint presentation)- experimental group	7.40	**8.5**	7.50
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10th grade D (teaching method with Google Forms tool and PowerPoint presentation) - control group	*7.59*	*8.22*	7.22
10th grade H (teaching method with PowerPoint presentation) - control group	*7.85*	***7.69***	7.56

Source: the authors

4. DISCUSSIONS

In the proposed research we investigated the method of teaching-learning through play, based on the acquired scores compared to the formative assessment of the students. Based on the interpretation of their results, we

consider that the purpose of this study is to identify the most appropriate teaching-learning solutions for the future and to ensure specific competencies in the curriculum.

Creating a game that maintains the interest and attention of students during the teaching-learning sequence, which develops their specific skills and ensures school progress is necessary.

The results showed that students who benefited from their own play created by means of JavaScript and the Google Forms teaching-learning tool achieved better results with significant values, highlighting the students' school progress.

There were research papers that examined the effects of the game in the long term, focusing more on knowledge and less on the attitudes of students (Mondozzi and Harper, 2001).

The results obtained by the experimental groups reflect the fact that the positive influence factor is represented by the method of teaching-learning through play and the realization of the learning activities proposed for all students. The negative factor for the control groups is the lack of attention of some students during the class, with only a part of the students being asked for answers, thus highlighting the lower results.

We also identified other causes of lower results in both groups of students: lack of necessary technical equipment (video projector, permanent internet connection, etc.), the speed of students to tick the answers to the formative assessment of Kahoot! game type, the response time to questions, the different degrees of difficulty for the contents of the lessons studied.

The results obtained in this study have demonstrated the criteria for success, in terms of teaching-learning by using one's own game created by means of JavaScript language and the Google Forms tool, regarding the permanent assessment on the Kahoot! learning platform, which provides active participation among all students in a class and improves the quality of the instructive-educational process.

No disadvantages have been identified concerning this method used in the research we have carried out.

The best for the teaching-learning process is the performance of learning activities with all the students of the class, by using active-participatory methods and modern IT training means. The assessment must be permanent (formative) and agreed by the students, in the form of an interactive game. Thus, the quality of teaching depends on the tools provided in the school, on the students, on the professional training, on the needs of teachers and students, as we find in other studies (Almaia Ana et al., 2020; Gewin, 2020).

Also, the results obtained showed first of all that the choice of teaching-learning strategies and appropriate assessment tools by the teaching staff, develops a deep understanding of the information by the students, as evidenced by other scientific papers (Ruan et al., 2021).

The proposed methodological addition contributes to the completion of the practical approaches of the assessment tools and of the effective teaching-learning methods.

The study also has some limitations that need to be considered, but which could indicate potential future lines of research. One of the main limitations is the size and origin of the sample, therefore generalizations based on these results should be treated with caution.

Another limitation of the study may be the low content in curriculum while using the teaching-learning method with the Google Forms tool (one chapter for grades 5th and 9th and one lesson for grades 6th and 10th).

5. CONCLUSIONS

The answer to the study's research question *if a game developed through the JavaScript programming language is included in the sequence of geography teaching and learning, would it increase the volume of information and specific skills assimilated by students?* is positive. There is thus evidence of the progress of the proposed theory by means of the results obtained, through which the performed research affects the use of educational information systems.

The results obtained proved that teaching-learning based on this game improved the learning process of the students. The effectiveness of the method based on information technology may be underestimated by those who do not have it. At the same time, participatory methods of learning through discovery and assessment through play develop a responsible and motivational attitude towards learning, cognitive intelligence skills for students and improve the specific competences of students.

The study examined that Google Forms tool, Kahoot! learning platform, PowerPoint presentation, the own-created game developed with JavaScript have a positive effect on learning and assessment. In particular, these digital technologies energize the students, and for the teacher they represent motivating tools of the teaching activity. Also, the use of digital technology is suitable for measuring and accepting e-learning tools, as other research has shown (Joo et al., 2014).

The study demonstrates that the results obtained by students in the tests are significantly better for those who have used the two teaching-learning tools and can be recommended for ICT analysis in school education, as they allow the student to be an active agent in the learning process, along with other Google applications (Rejón-Guardia et al., 2019).

Compared to current research, one have learned that the development of the specific competences in the school curriculum for all students through their active participation and the optimal school progress of the students is mainly given by the degree of involvement of the students in the entire instructive-educational process, by the training and stimulation of all the students of a class during courses. We address the need to analyze the results of the permanent assessment, as teachers can properly implement the teaching strategies, in order to ensure the success of the students' learning.

The method does not induce a departure from the learning objectives of the content specific to the curriculum and does not require special digital skills.

The results obtained are in line with other research papers that show that games have positive influences on students' knowledge, learning and acquiring skills (Barab et al., 2005).

Investigating how gamification in learning environments can affect physical, cognitive, emotional, and social well-being is present in many international studies (Melo C. et al, 2020).

Possible future lines of research may be the application of the proposed teaching-learning method (the game created in JavaScript) in the context of students throughout several stages of the curricula, or in different geographical areas in order to achieve results which can be easier to generalise.

Author contributions

Conceptualization F.T.; Data curation F.T.; Formal analysis F.T. and D.C.D.; Funding acquisition -; Investigation F.T.; Methodology F.T., D.G. and D.C.D.; Project administration-; Resources F.T., D.G. and D.C.D.; Software F.T., D.G. and D.C.D.; Supervision F.T. and D.C.D.; Validation F.T., D.G., D.C.D., A.N., D.P., R.D.P. and M.M.; Visualization F.T., D.G. and D.C.D.; Roles/Writing - original draft F.T.; Writing - review & editing F.T. and D.C.D.. All authors have read and agreed to the published version of the article.

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THE GREAT ISLAND OF MINI-OCEANIA: MADAGASCAR AT THE CROSSROADS OF EMPIRES

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ABSTRACT. – The Great Island of Mini-Oceania: Madagascar at the Crossroads of Empires. Madagascar, though rich in natural resources, is one of the poorest countries of the world. The mostly accepted explanation relies in its colonial past, which has become almost a cliché for many African countries. The great powers and empires played a major role in the formation and the evolution of the states, and Madagascar is no exception. The inheritance of the past, good or bad, is a burden for any country, but the evolution of national states, their successes and failures, depend on many more factors than their recent history. The present situation of many developing countries is not enviable, especially taking into consideration their enhanced vulnerability to world economic problems and environmental challenges.

Keywords*: Austronesian, piracy, missionary, colonialism, imperialism, insularity, slavery, independence, republic, president, faction, crisis.*

In November/December 2008 I had the opportunity of participating at a study mobility in Madagascar, within the framework of a doctoral school project, financed by the Francophone University Agency (AUF) and axed primarily on the problem of agriculture and climate change. Everything went well with the project and with the trip, and after a couple of months we had the occasion to receive at Cluj-Napoca, within the same project, two doctoral students, then two of our colleagues from the University of Antananarivo.

But in the meantime serious events took place in Madagascar: on January 26th 2009 the Malagasy political crisis began, started by the manifestations of the opposition in the capital city, under the leadership of mayor Andry Rajoelina,

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which resulted in violence and casualties (dead and wounded), as a result of the intervention of the police and of the presidential guards. The final intervention of the army led to the resignation and escape from the country of president Marc Ravalomanana, the declaration of Rajoelina as an interim president on March 18th and the suspension of both chambers of the parliament on March 19th.

This was not the first political crisis in Madagascar since regaining independence in 1960. According to our colleagues from Antananarivo, besides the obvious social background of the manifestations, this was in fact fitting into a larger context of periodic riots and crises, triggered by a permanent political struggle between two big factions of the political elite, sustained from abroad: one pro-French, more conservative and also with a socialist-populist character, and the other pro-American, more liberal, more pragmatic and oriented to market economy.

1. MADAGASCAR, AN AFRICAN OR AN ASIAN COUNTRY?

Madagascar, the fourth largest island of the world, became inhabited relatively late. Though some sources claim that its first inhabitants could already have arrived around 2500 B.C. (in connection with early Austronesian and Dravidian migrations), there is no certain proof of permanent human settlements on the island before 600 A.D. According to linguistic evidence, the massive immigration from the islands of South-East Asia must have started after the beginning of the Iron Age in Indonesia (cca. 300 A.D.) and it ended before the Indian cultural influence on the languages of Austronesia (800 A.D.) (Fage, J.D., Tordoff, W., 2002).

As for the origins of the Malagasy people, there are a lot of controversies. According to the majority of the authors, the ancestors of the Malagasy came from the islands of Austronesia, but also from Melanesia, India, Sri Lanka, Persia, Arabia and Africa. The mostly divergent opinions concern the origins of dark skinned Malagasy. Some authors (Flacourt, Grandidier, Rusillon) claim an Asian origin, based on a dark spot on the skin characteristic for Asian newborn children. Others (Ferrand, Deschamps, Poirier, Vérin) sustain that the great majority of the Malagasy have an African origin and only a minority who came much later (in the 16th century) are from the islands of Indonesia. On the other hand, B. Rakotosamimanana says that Asian characteristics such as blood groups, fingerprints and palmprints coexist with African features in the great majority of Malagasy. This proves, if not a common Asian origin for all, at least a general ethnic mixture on the basis of their linguistic and cultural unity (Randriamamonjy, F., 2008).

The paths followed during the migrations had at least two patterns for the original travellers: the first one, following the ancient commercial route from the northern shores of the Indian Ocean through Sri Lanka, India, Persia, Arabia, East Africa and the Comoros Islands, while the second one, probably much less used but not impossible, took more than 6000 km directly through the Indian Ocean, taking advantage of the seasonal Monsoons and of several favourable ocean currents. These ancient settlers were neither travelling for pleasure nor for business: most of them were refugees, people trying to escape from death or slavery following the frequent local wars between the tribes or after the massive migrations between the Austronesian islands. This is why they took with them not only their wives and children, but also animals and plants from South-East Asia, which explains the general present spread of these species and crops on the whole of the Great Island.

There is a theory claiming that black Asians who reached Madagascar came from South India and the Malay Peninsula much ealier (about 2500 B.C.) than light skinned Austronesians, in the larger context of the invasions of Mongols and Caucasians to South Asia. Some oral sources mention several ethnies of dark skinned short people (similar to pigmies or negritos) like the Taimbalimbaly, Taindronirony, Kimosy and Kalanoro, who were hunter-gatherers living in the forests and caves and who probably preceded the *vazimba,* the earliest Austronesian settlers.

Another interesting hypothesis is the early presence of Jews in Madagascar. This was the conclusion of Étienne de Flacourt who had visited Isle Sainte Marie in 1652 and discovered some local customs (like circumcision and several taboos) that reminded him very much of those of ancient Jews, though they knew nothing about the period after King David, so they were supposed to have settled there before 1000 B.C. Though we know about Jewish traders (Radanites) travelling along the commercial routes of the Indian Ocean between the Middle East, India and China since ancient times, there is no proof that they had any reason to settle in Madagascar, even if they reached the island occasionally. However, their early presence on the island was a frequently mentioned hypothesis until the 20th century, based on which Nazi Germany planned the deportation of European Jews to Madagascar during World War II. (Not being able to solve it logistically because they had no control of the Indian Ocean traffic, on January 20, 1942, at the Wannsee conference the Nazis chose the Final Solution of exterminating the Jews in death camps).

From the linguistic point of view, the idioms presently spoken in Madagascar show closest similarities to those of three Austronesian ethnic groups: the Maanjan, who live in the upper basin of the Barito river in Kalimantan (Borneo), the Lom of the Bangka Island in Indonesia (East of Sumatra) and the

Bajau of the Riau Archipelago in the South China Sea. The Maanjan were pushed to migrate by the Bandjar Malay and set foot temporarily on Bangka Island, but later the Hindu invaders tried to enslave them, this is why the Maanjan and the Lom decided to migrate far westwards, using the ocean currents, finally reaching Madagascar. After the spread of Islam in the Middle East, some of the soon emerging islamic sects' members (Zeidites, Ismaelites, orthodox Sunnites from Bahrain and Persian Shiites of Shiraz in 975) became persecuted or threatened with extermination, which is why they also fled to East Africa and some of them to Madagascar. During the 14th and 15th centuries, shipwrecked Indians from the Malabar Coast took refuge on the Western and Southern coasts of Madagascar, later becoming dominant and founding local dinasties in the Southern Plateau of Madagascar. The dark skinned African migrants probably arrived in smaller groups, most of them as slaves and usually without their families, which explains the disappearance of their initial Bantu languages and their relatively fast assimilation by the Austronesian speaking Asians (op.cit.)

Madagascar has been thus known to Asian and African merchants well before the arrival of the Europeans to the island. A developed network of commercial exchanges was working since the early antiquity along the shores of the Indian Ocean, where slavery developed and was one of the main interests for commerce since the earliest of times, among other merchandises like cereals, live animals (especially horses), dry meat and fish, fruits, leather, silk, frankincense, pearls, porcelain, spices, sugar, salt, alum and other minerals. The commerce was dominated by Chinese, Malay and Indians in the eastern half of the Ocean and by Persians, Arabs and Africans in the western half (Kovács, Cs., 2021).

2. MADAGASCAR AND THE COLONIAL POWERS

The name Madagascar appeared for the first time in Europe in the memoirs of the famous Venetian traveller Marco Polo, who never reached the Great Island, but heard of it from Chinese and Arab merchants during his returning voyage from China through the Indian Ocean and Persia in 1292/1293.

The first Europeans who actually reached in 1500 the eastern coast of Madagascar were the sailors of captain Diogo Días (brother of Bartolomeo Días), who was a member of the expedition of several ships led by Pedro Álvarez Cabral, the presumtive first discoverer of the coast of Brasil. Diogo Días' ship was separated from the rest of Cabral's flotilla during a storm and continued its travel to India not following the Straight of Mozambique like the other ships, but East of Madagascar, finding the island by accident.

After 1500, more and more European, Arab and Indian ships approached Madagascar mainly for commerce, establishing comptoirs and occasionally taking away people into slavery. Many of the so called merchants of the Indian Ocean were as a matter of fact pirates, which is why the pejorative surname of Europeans in Madagascar today is *vazaha*, initially meaning *pirate*. Piracy was and still is in the region a favourite occupation among all sorts of illegal sailing warriors, the remoteness of the islands in this part of the world making them very appropriate shelters for all kind of outlaws. According to some sources (Defoe, D., Bucquoi, J., Exquemelin, A.O., 2021), there was even a utopian primitive egalitarian society, founded by pirates on Ile Sainte Marie (Nosy Boraha) and named the *Republic of Libertalia,* though no reliable other sources confirm this ever existed in the reality.

The most important innovations coming from Europeans at the beginning were the attempts to conclude treaties with the local political powers in order to establish trading centers and to acquire land for agriculture, mining and future colonisation. The most important agreements between European travellers and local political powers until the end of the 18th century were (Randriamamonjy, F., 2008):

1. An agreement signed on March 8, 1642 between Adrien Van der Stel, the Dutch governor of Mauritius Island, and the king of Antongil, ceding Nosy Mangabe (a small island in the Bay of Antongil) to the Netherlands. No further evolution of this agreement is known.
2. In 1642, French settlers started to set foot at Manafiafy, in the Anosy province, on the south-eastern coast of the Island. One year later, 70 colonists led by the protestant Jacques Pronis built a fortress which was later named Fort Dauphin. In the same year, Pronis proclaimed the Ile Sainte Marie a French possession.
3. In 1645, English sailors under the leadership of captain Smart made an unsucessful attempt to establish a colony in Saint Augustine Bay, on the western coast of Madagascar.
4. Between 1665 and 1668, François Martin built a fortified settlement at Fenoarivo (a couple of miles from the west coast, up the Onilahy River), named Fort Gaillard, which was soon destroyed by hostile Malagasy.
5. In 1732, an agreement between the French captain D'Hermite and the king Ramasarahika of the Sakalava people, ceding Nosy Mangabe to the King of France.
6. On July 30, 1750, princess Betia, daughter of king Ratsimilaho, probably not understanding the full meaning of the deal, signed an agreement ceding Isle Sainte Marie to France.

The Island became thus a target for all kind of businessmen and adventurers, more or less representing some European governments and attempting to establish commercial partnerships and founding settlements for colonisation or slave trade. Portuguese merchants established first peaceful contacts in 1613 with Tsiambany, a local Anosy king who claimed to have ancestors in Mecca and in Mangalore in India and whose capital was Fanjahira. Tsiambany made an agreement with Paulo Rodrigues da Costa, written by himself in Malagasy with Arabic characters, by which he agreed among others to send his son Andrianjerivao to the Portuguese viceroy of Goa, to study and to be baptized.

The first French ship arrived to Anosy coast in 1527. The next known one brought François Cauche who departed from Dieppe in 1638 and explored the eastern coast of the island. He was already there in 1642, when the first settlers, employed by the Compagnie d'Orient, came to Saint Luce (Manafiafy) and established their colony under the self-proclaimed governor Jacques Pronis. Because of the unhealthy climate they chose to move one year later to a higher point situated on Toalankaro peninsula, where they built the fort later baptized Fort-Dauphin (present Tolanaro), honouring the French heir to the throne (later king Louis XIV). In the name of the company Pronis also took possession of the Bay of Antongil, Anosiboraha (Ile Sainte Marie) and Ile Bourbon. At first Pronis established good relations with the locals, marrying one of their women, but in 1646 a mutiny broke out because of frustrations and jealousies of the settlers, who accused Pronis of favouring his wife's relatives on the expense of the Company. As a result, Pronis exiled 12 men to the neighbouring Ile Bourbon (future La Réunion), where they were the first settlers and remained until 1649 led by Jean Leclerc des Roquettes (op.cit.).

In 1647 the shareholders of the Compagnie d'Orient sent to Fort-Dauphin Étienne de Flacourt who fired Pronis and replaced him as governor. Flacourt arrived to Madagascar in December 1648 and remained on the island until 1655, during which he explored the southern part of the island. He also brought with him missionaries sent by Vincent de Paul. In the meantime, the company went bankrupt and relations with the locals deteriorated, so Flacourt had to use canons to overcome a massive revolt. He finally left the island in February 1655, replaced by Pronis, who came back from France, but died one year later. The next governor, Urbain Souchu de Rennefort, stayed only a few months at Fort Dauphin, after which the colony entered into a long phase of decay. More and more settlers chose to repatriate, until massacres by the Antanosy tribe finally made the last settlers to leave in September 1674 and take refuge on Ile Bourbon.

Though the French were not able to come back to Fort Dauphin until 1736, the French king still claimed his rights on the island, promulgating several orders (in 1719, 1720 and 1725) according to which the French East India Company was authorized to found new settlements in Madagascar. In 1736 two new missionaries arrived who started learning Malagasy but left the island after only a couple of months. In 1766 Fayd'herbe de Maudave, named by Louis XV commander of the island of Madagascar, arrived to Fort Dauphin to restart the previously abandoned colony but, after a short period of prosperity, because of the rivalry with the merchants of Ile de France (Mauritius) and Ile Bourbon, he was forced to leave in 1770.

One of the most famous adventurers who arrived to Madagascar in 1774 was a Polish-Hungarian nobleman, count Maurice Benyovszky, who had recently escaped from a forced labour camp in the Kamchatka Peninsula. Benyovszky had also a mandate from the French king to found a colony, which he did in the vicinity of the Bay of Antongil. He established such a good relationship with the locals that he was proclaimed "Mpanjaka Be" (Great King) and he made serious efforts in order to get his colony recognized, not just in France, but also in England and America (he made a travel to Baltimore in 1784). He was probably involved in the slave trade too but, unfortunately, he wasn't so successful in establishing good relations with his proximal French neighbours of Ile de France, who were jealous of his success. This is why he was finally killed by French soldiers sent by governor François de Souillac during a siege in 1786 (Balázs, D., 1983, Jókai, M., 2012).

The last attempt to revive the colony of Fort Dauphin was made by François Fortuné Joachim Albrand, who was also administrator of Ile Sainte Marie. In 1819 he persuaded De Freycinet, governor of Ile Bourbon, to send Annibal de Grasse with four soldiers to rebuild the comptoir. In 1825 the warriors of Radama I conquered Fort Dauphin, but they let the settlers leave the colony unharmed. Ile Sainte Marie (Nosy Boraha) was ceded in 1750 by the king of Betsimisaraka to the Kindom of France in a treaty, but the French colonists were slaughtered two years later. The French returned only in 1818, when they founded a penal colony on Ile Sainte Marie.

In the meantime, the political situation within the island of Madagascar changed significantly. During the reign of Andrianampoinimerina ("the King that Imerina was waiting for") (1787-1810), the smaller kingdoms of the central plateau, inhabited mainly by the Imerina nation, were unified following a long series of local wars. His son Radama I (1810-1828) extended his domination to almost the whole island and was the first King of Madagascar recognized by European powers. In 1817 Radama signed a treaty negotiated by James Hastie that granted him a formal alliance with the British crown. Radama invited the first Europeans to enter his kingdom and he encouraged the London

Missionary Society envoys to establish schools and to teach the nobles and potential military and civil service recruits. They also introduced Protestant (Anglican) Christianity and taught literacy using the Bible translated into Malagasy. Radama was at the same time an admirer of Napoleon Bonaparte and drew upon European structure and tactics to modernize his army, which was led by French and British generals.

Radama I's successors continued the subjugation of the island to Merina hegemony, so that by the 1890s more than two thirds of the island were under the control of Antananarivo. The Sakalava, however, never accepted Merina rule and in the 1840s some of their chiefs actually concluded treaties of "protection" with French officers. These were the treaties upon which France laid claim to the north-western territories of Madagascar (Hardyman, J., Mutibwa, P. M., 1985). After Radama I's premature death in 1828 a short interlude of inner coflicts followed, after which his wife, princess Ramavo was crowned queen of Madagascar as Ranavalona I (1828-1861). Her long reign was characterized by a further reinforcement of the central power and domestic authority of the Kingdom of Imerina over subjugated provinces and the effort to preserve the sovereignty of Madagascar. To achieve this, she often entered into conflicts with European diplomats and missionaries, while persecuting the newly converted Christians. In 1835 she forbade the practice of Christianity among the Malagasy and soon nearly all foreigners were forced to leave the country (Randriamamonjy, F., 2008).

The Jesuits first came to Madagascar in the early 17th century from Goa. Two centuries later, in the 1840s the Jesuit superior general François Roothan sent six French Jesuits from Lyon to help the effort to evangelize the nation. In 1861 the French established the first Catholic mission, which quickly became a rival of the Protestant Church. The Catholic Church of Madagascar is organized today in 5 archdioceses and 21 dioceses.

Norwegian missionaries arrived first in Madagascar in 1866, when they founded the first Lutheran church in Betafo in the central region of the island. The American Lutheran mission began work in the south-west in 1888. The former missions were unified in 1950 under the name Malagasy Lutheran Church.

In the second half of the 19th century rivalry in Africa and the Western Indian Ocean between the French and British continued, but before the construction of the Suez Canal, France and the United Kingdom signed in 1862 an agreement concerning the future division of East Africa. According to this, the British recognized the priority of French interests in Madagascar, the Comoros Islands and the Straight of Mozambique, while the French ceded Zanzibar and the eastern coast of Africa to the British Empire (Fage, J.D., Tordoff, W., 2002). With the opening of the Suez Canal (1869), the strategic significance of Madagascar declined, especially from the British point of view.

Queen Ranavalona I's successor in 1862 was her son Rakotondradama, known as king Radama II, a pro-European who signed treaties with both France and Great Britain but who was murdered a year later during a rebellion of the army. He was followed on the throne by his wife Rasoherina, who negotiated and signed new agreements with France and Great Britain and initiated diplomatic relations with the United States too.

The next monarch of Madagascar was Ramasindrazana, crowned as queen Ranavalona II (1868-1884), former wife of king Radama II and sister of Rasoherina, who died in 1868. She was baptized into the Protestant religion next year, together with the prime minister Rainilaiarivony, who was chief commander of the army and divorced his wife in order to marry the queen, as the custom required (Randriamamonjy, F., 2008). The Protestant Church of England earned a privileged status in Madagascar and as an instrument of British influence became a rival of the Catholic Church, sustained by France. As the latter had territorial claims in and around the Big Island, queen Ranavalona II sent diplomatic missions in 1882/1883 not only to France, but to Great Britain, Germany and the United States to clarify the position of the kingdom in this matter, but unfortunately without any result.

Queen Ranavalona died on July 12th, 1883. She was followed on the throne by Razafindrahety, a 22-year-old princess who was crowned two days later as Ranavalona III and who was to become the last queen of Madagascar. She immediately confirmed Rainilaiarivony as prime minister and his government too.

The first Franco-Hova War began in 1883 when the French navy as intimidation started the bombardment of Malagasy coastal cities: Ambodiamdiro (May 7), Anorontsanga (May 15) and Mahajanga (May 16). As a result, riots broke out in Antananarivo. 92 French citizens were banned from the capital and the rest of them went under the protection of the army. Arrived at Tamatave on May 31, admiral Pierre launched an ultimatum, claiming the immediate cession of the Malagasy territories situated North of the 16th parallel (op.cit.).

The Berlin conference of 1884/1885, though didn't directly concern Madagascar, sealed the fate of the Great Island too by fixing the future spheres of interest of the European powers in Africa. Among others, at the "Congo Conference" (as it later became known) they had also agreed new ground rules for European occupation of Africa's coastline. Henceforth, any state wanting to claim African lands on any part of the coastline was required to notify in advance other states signing the Berlin agreement to enable them to make known any claims of their own. Furthermore, to be valid, all future claims had to be supported by "effective occupation" (M. Meredith, 2014, p. 394).

Effective occupation was exactly what the French intented to do in Madagascar, once they had green light from the other European powers. Admiral Galiber continued to claim all territories North of the 16th parallel on the basis of the more than dubious agreement made in 1841 with queen Tsiomeko and king Tsimiharo of the Sakalava people. After a new rejection, admiral Miot restarted the bombardment of the ports of Madagascar: Mahanoro (May 17), Vohémar (November 5) and Diégo Suarez (December 1884). However, the French didn't have at the moment enough forces to occupy the ports and a tropical cyclone damaged three of their vessels, so one year later (December 1885) they signed the Peace Treaty of Tamatave which put the French in a position of controlling Madagascar's foreign affairs and gave them permission to occupy the port cities of Tamatave and Diego Suarez.

On August 5th 1890 the British recognized the French protectorate of Madagascar in return for British control over Zanzibar (previously exchanged with Germany for Heligoland Island). This agreement didn't stop the British colonel Shervington in 1894 to sell 7000 rifles and ammunition to the Malagasy government. They were soon going to need them, as in December 1894 the French started the full invasion of Madagascar (second Franco-Hova War) by occupying the cities of Tamatave (11 December 1894) and Majunga (14 January 1895), where General Duchesne, leading a French expeditionary corps of 15000 soldiers, soon landed. After heavy losses due mainly to disease, the French arrived on September 29 to Ambohidempona (near the present site of the University of Antananarivo) and the next day they started the bombardment of the Rova (Royal Palace) in the capital city (Randriamamonjy, F., 2008). A year later the Malagasy monarchy was abolished and Madagascar became a French colony. A rebellion known as Menalamba broke out in early 1896, but it failed to drive out the French. It was supressed with great brutality, so that by 1900 most of the island had been "pacified" (Hardyman, J., Mutibwa, P. M., 1985). The colonial regime abolished in 1896 slavery in Madagascar (about 500000 slaves were freed), but also introduced in 1901 the discriminative legal system of the *indigenat*, in order to control the individual and social life of the natives by severe administrative and punitive measures (Blanc, G., 2022).

Like all French colonies, Madagascar played an important role in the war effort during World War I: 46000 men were mobilized (putting Madagascar among the first colonial recruiters compared to its total population) of whom 41355 soldiers were enlisted, 20425 were sent to the theater of war, and 2471 perished. Malagasy troops participated in battles on the Western front, and also on the Balkan theater of operations (Jennings, E.T., 2017).

In the 1930s, Nazi Germany developed the Madagascar Plan, making the island a potential site for the deportation of Jews, but the plan never materialized.

During World War II, after the German occupation of France in June 1940, the colonial government of Madagascar followed the collaborationist regime of Vichy, until May 1942, when the British navy and army occupied the ports and then the whole island (Operation "Ironclad") in order to prevent a possible Japanese or German invasion. As a result of the vehement protests and pressure from General De Gaulle, in January 1943 the British ceded the civil administration of Madagascar to the authority of the Free French government, while maintaining the military occupation until the end of the war (De Gaulle, C., 1956).

Though officially Madagascar was "pacified" by 1900, especially by the brutal measures of general Gallieni, anticolonial resistance never ceased on the island. As a result of colonial repression, more than 100000 Malagasy (from a total population of cca 3 million) were killed between 1897 and 1947. After 1945 the colonial administration, strongly compromised during the war, never could regain full control over Madagascar. As a result, a massive revolt (the Malagasy Insurrection) broke out in March 1947, to which the French Army (here mainly African soldiers from the other colonies) responded by a bloody repression, causing tens of thousands of victims by summary executions, deportation, torture and burning of villages.

An overseas territory (territoire d'outre-mer) between 1946 and 1958, Madagascar became an autonomous republic on October 10th, 1958, within the French Community. The first president, Philibert Tsiranana was elected on May 1st, 1959. Finally, on June 26th, 1960, Madagascar became an independent republic.

3. CONFLICTS OF THE POST-COLONIAL ERA

The first Malagasy Republic reamained strongly attached to France by bilateral cooperation agreements, while its economy was substantially aided by the former colonial power. The dependance from France, perceived as neocolonial exploitation, eventually led to the fall of president Tsiranana in 1972, replaced by an army general, Gabriel Ramanantsoa, former prime minister, until 1975, when after a period of new demonstrations, riots and political instability, Didier Ratsiraka, a captain of the navy, was declared president and chief of the government. Ratsiraka proclaimed the Democratic Republic of Madagascar (the second Malagasy Republic), of marxist inspiration, establishing a political system on the Cuban model, with the unique party AREMA (Avantgarde of the Malagasy Revolution) and relying mainly on the Eastern block for the functioning of the economy. Though not a typical socialist country, Madagascar became an active member of the non-aligned movement and in 1976 expelled the French military still stationed in the country, followed by the suspension of diplomatic relations with France and the introduction of a new currency, the Malagasy Franc.

Like in many other developing countries, the Socialist experiment proved to be a total failure and in 1990, after the fall of the marxist regimes in Europe, the government was forced to admit the access of private investors, not least in order to cease the famine affecting ever larger parts of the country. After new riots and political instability, a new Constitution was adopted in 1993 (the third Malagasy Republic), followed by the election of Albert Zafy as president. However, the economic and political liberalization didn't produce the expected growth, so a new crisis and a deep conflict between the president and the parliament resulted in the destitution of Zafy and the election of Norbert Ratsirahonana as interim president.

In 1997 a surprising chain of events (which will seem to repeat itself several times in the next decades) resulted in the reelection as president of the formerly failed admiral, Didier Ratsiraka, this time sustained by the French government. A short period of economic stability (until 2001) followed, during which Madagascar's average annual growth rate was 4.3%. After a long political turmoil that put the country on the verge of civil war, the former mayor of Antananarivo Marc Ravalomanana was elected president in 2002, then reelected in 2006. In 2007 the Constitution was amended by referendum, permitting the president to rule by decree in case of emergency or catastrophe. At the same referendum, English was proclaimed the third official language, the administrative organisation of the country was modified (replacing the six autonomous provinces by 22 regions) and the separation between the state and the church was suspended. The latter measure was severely criticized by the Catholic Church, taking into consideration that Ravalomanana was at the same time vice president of the Reformed Church of Madagascar.

4. CONCLUSIONS

The theory according to which rival factions of the elite supported by foreign powers are permanently fighting for power and periodically shifting each other at the top functions of the country is well known and very familiar to the smaller countries, including Romania, where pro-Ottoman, pro-Russian, pro-Austrian, pro-German, pro-French and pro-British cliques fought and changed each other during centuries. Nevertheless, it would be exagerated and unilateral to consider the small countries just toys in the hands of the great powers.

The role of the local elites is always important in the evolution of nation states. The appearance and the fight for political power of the local bourgeoisie is essential in the formation of modern nations. The problem with the African coutries is that there was no bourgeoisie when they became colonies, the great

majority of them being in the stage of feudal or pre-feudal development. The appearance and the spread of the colonial systems was mainly based on the cooperation of the local elites, whether it started with the slave trade or by any kind of trade. The local potentates had usually no scruples in selling into slavery or mercilessly exploiting their subjects when they saw advantages for themselves and later the colonial regimes were primarily based on the cooperation of these elites, whether the colonists were Portuguese, Spanish, British, French, German or Italian. Part of these elites survive until today and represent the link between the new nation states and their former colonist countries. They are still dominating the countries' political systems and their main goal is to maintain their privileges, even if this means exploiting the masses of poor people, being involved in corruption and electoral fraud or imposing dictatorships by force.

Though we cannot generalize for every African country, Madagascar is no exception from this sad pattern, it is just more complex then the rest of the former colonies. On the one hand, the ethnic structure of Madagascar, formed by 18 standard ethnic groups, is dominated by the Merina at least since the political unification of the island in the late 18th/early 19th centuries. On the other hand, slavery was a common practice until precolonial times. Though it was rather functioning as a feudal system of exploitation, its consequences are still visible today, manifested in rivalries and resentments even inside the local communities. However, former slave owners are not always rich people nowadays, on the contrary: sometimes former slaves became dominant groups during and after the French colonisation, like in the case of Betapho (Graeber, D., 2007).

There is a significant contrast between the living standards of rural and urban areas, most of the former being characterized by extreme poverty, while in the cities, not very rich either, there is a visible layer of nouveau riches who can afford almost European consuming patterns. These contrasts cause deep frustrations which, associated to the endemic corruption and indifference of the political leadership, represent a permanent hotbed for political turmoil, errupting explosively in periodic uprisings, coups d'état and revolutions, while the economic and social situation of the masses doesn't change at all or sometimes even worsens. A relative calm was characteristic for the capital and its surroundings in 2008 (while I was travelling there), but as it came out later, it was just the silence before the storm. Violent demonstrations, illegitimate power structures, disease (malaria, plague outbreaks in 2014 and 2017, then Covid in 2020), catastrophic floods caused by tropical storms or extended droughts in other regions, even locust invasions and famine were frequent if not chronic symptoms of Madagascar's crisis in the last decade, aggravated by a demographic explosion which seems to be uncontrolled (the total population raised from 18.6 million in 2000 to more than 28 million in 2022) and has an increasing impact on the environment.

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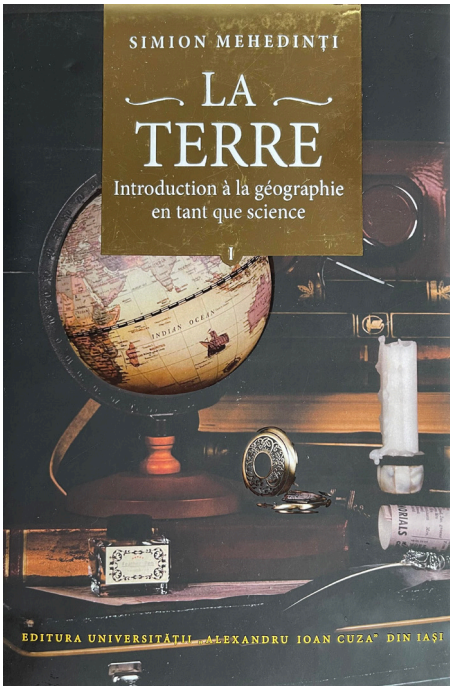
(RECOMMENDED CITATION)

BOOK REVIEW

Mehedinţi, Simion, 2022, *La Terre : introduction à la géographie en tant que science*, vol. I[er], édition et traduction par Corneliu Iaţu, Iaşi, Editura Universităţii «Al. I. Cuza», 2022, Iaşi, 525 p.



Symbolisme de la couverture du premier volume.

Nous signalons la parution récente du premier volume du traité de géographie signé par le savant Simion Mehedinţi dans la traduction française de Corneliu Iaţu, professeur des universités à Iassy. L'éditeur et traducteur de cette œuvre fondamentale a exaucé ainsi le vœu du Maître des géographes roumains, qui n'avait pas eu le temps de voir concrétiser son souhait. Dans son « Avant-propos » à l'édition française, le prestigieux académicien Alexandru Ungureanu constate: «*Il manquait* [...] *une traduction de* La Terre... *dans une langue internationale, traduction qui introduit cette valeureuse essence de la pensée géographique dans le champ universel de la spécialité et qui peut élargir considérablement l'accès direct au livre*» (p. 15). L'académicien conclut en exprimant son appréciation pour les efforts du traducteur et de l'éditeur et en soulignant l'utilité d'une telle démarche : « *C'est le remarquable géographe Corneliu Iaţu, de l'Université de Iassy, qui s'est chargé de cette tâche exigeante, avec la responsabilité adéquate à la haute valeur de l'original. Le résultat se trouve*

maintenant à la disposition du grand public, et pas seulement d'un lectorat universitaire et, avisé, qui pourra apprécier la qualité et la fidélité de la traduction, autant que l'originalité, la modernité et même l'accessibilité du texte proprement dit » (*idem*).

Sa traduction dans une langue de grande diffusion internationale introduit l'œuvre capitale de Simion Mehedinți dans le circuit mondial des idées appartenant aux sciences de la géonomie. Cela non seulement assure l'accès de la communauté géographique mondiale à un texte essentiel, avec ses méthodes de recherche, d'analyse et de synthèse propres, mais démontre également la vision intégrative du chercheur roumain dans son approche de la géographie en tant que science, vision cristallisée grâce à ses études dans deux écoles de géographie de premier rang, française et allemande. C'est sur leur terreau fertile que Mehedinți s'est développé spirituellement et qu'il a parfait ses connaissances dans le domaine. Par son actualité et son approche toujours actuelle, l'ouvrage est aujourd'hui encore un instrument utile dans l'approfondissement de l'étude de la géographie.

Né à Soveja (département de Vrancea) et issu d'une famille nombreuse avec onze enfants, Simion Mehedinți, bien que voué à une carrière cléricale, a suivi sa propre vocation et a choisi les cours de la Faculté des Lettres de l'Université de Bucarest, où il a eu pour mentor Titu Maiorescu et où il obtiendra son diplôme en 1892. Une année plus tard, il a obtenu une bourse de la part de la Société royale roumaine de géographie pour poursuivre des études doctorales à l'étranger.

Afin de parfaire ses études, il a choisi les cours de plusieurs grands géographes enseignant dans des centres universitaires français et allemands réputés. Il a pris ainsi contact avec les idées, les méthodes et les géographes de deux des écoles de géographie les plus avancées de l'époque et a commencé à forger ses propres conceptions. En 1899, il a soutenu sa thèse de doctorat, *Die kartographische Induktion*, à l'Université de Leipzig. Revenu en Roumanie, il a été nommé professeur à la première chaire de géographie du pays, créée en 1900 à l'Université de Bucarest. C'est là qu'il a déroulé jusqu'en 1938 une prodigieuse activité didactique, scientifique, culturelle, civique et administrative. Il s'est fait remarquer comme professeur des

Corneliu Iațu, professeur des universités, traducteur et éditeur du volume.
(crédit photo : SGR Vrancea)

universités, comme auteur de nombreux manuels universitaires et d'une longue série de livres, dont le traité *Terra. Introducere în geografie ca ştiinţă* [La Terre: introduction à la géographie en tant que science] (vol. I et II, Bucarest, 1930), comme auteur de curricula scolaires et de manuels pour le lycée, comme conférencier prolifique, comme participant à un grand nombre de conférences, comme initiateur et organisateur de 21 des 22 congrès nationaux des enseignants de géographie, autant d'occasions de diffuser les connaissances, théories, idées et pratiques pédagogiques les plus récentes dans l'enseignement de la géographie. Ce n'est pas un hasard si le chercheur a présenté son volume aux géographes réunis au Congrès des enseignants de géographie déroulé à l'été 1931 au Lycée «Unirea» de Focşani (département de Vrancea). Tout cela fait que son statut de savant et de créateur de l'école roumaine de géographie est unanimement reconnu.

Dans « *Terra* » [La Terre], Simion Mehedinţi expose sa conception originale concernant la géographie en tant que science, en tant qu'objet unitaire à «deux faces» – la nature et la société – qu'il envisage avec des méthodes de recherche propres. Sa démarche, logique et unitaire, est argumentée de façon pertinente, les idées, la conception, la définition et les énoncés qui la sous-tendent restant valables encore aujourd'hui. Grâce à ces qualités, l'ouvrage est véritablement un « classique ». Considéré lors de sa parution une synthèse scientifique avancée, le volume n'a pas pu être traduit par l'auteur lui-même dans une langue de diffusion mondiale, même s'il le souhaitait. Son vœu est maintenant accompli. Ce traité, dont les idées, les définitions et la méthodologie utilisée pour aborder la géographie sont pérennes, s'avérant valables même un siècle après la parution, a été traduit et édité dans une langue de grande circulation par M. Corneliu Iaţu, professeur à l'Université de Iassy, qui, ce faisant, a exaucé le vœu testamentaire de Simion Mehedinţi. L'éditeur confesse que son travail est un hommage à la mémoire du savant et, en même temps, l'accomplissement d'un devoir que la géographie roumaine avait envers son *magister*.

Un regard global sur ce qui se passe dans le monde nous permet de circonscrire ce fait à l'aide de cet énoncé que plusieurs millénaires ont confirmé : « *La terre n'est point avare, elle rend ce qu'on lui prête* »!

Simion Mehedinţi choisit comme exergue de cet ouvrage exposant sa conception sur la géographie, son objet et ses méthodes de recherches propres, une phrase du philosophe allemand Immanuel Kant « *L'idée est architecturale ; elle crée la science*» (*Physische Erdkunde*, Einleitung).

Un choix inspiré, qui lui a permis de présenter ses idées originales sur la géographie en tant que science, ainsi que les méthodes et les principes qui sont à la base de la recherche sur les géosphères qui composent le tout qu'est la Terre.

Le volume porte une double dédicace. L'une pour le roi roumain Charles I^{er} : « *À la mémoire* ***du roi Charles I^{er}****, fondateur de la Société roumaine de Géographie/Dévotion*». L'autre pour ses professeurs les plus chers : « *Aux maîtres* ***Friedrich Ratzel, Ferdinand von Richtofen*** *et* ***[Paul] Vidal de la Blache****/Hommages respectueux*». On comprend le respect

de l'auteur pour le roi de Roumanie, ce dernier ayant fondé en 1875 la Société roumaine de géographie en tant que section de l'Académie roumaine, société appelée par le Souverain à approfondir la connaissance du pays et à promouvoir cette discipline scientifique en Roumanie. En 1897, la Société a été reconnue par le Parlement et, par le Décret royal 588/1897, a reçu le statut de « *société personne morale et établissement d'utilité publique* ». En 1915, après quarante ans d'activité, la Société a sollicité le haut patronage du roi Ferdinand I[er], qui le lui a accordé. Elle est ainsi devenue la Société royale roumaine de géographie. Cette pratique consistant à dédicacer des ouvrages scientifiques au souverain du pays était courante en Roumanie et constituait une preuve de reconnaissance, de respect de la hiérarchie sociale et du fort esprit civique des auteurs. De nos jours, cette pratique de la reconnaissance semble tombée en désuétude et remplacée chez nous par le règne de la vulgarité, de la bêtise, de la tromperie et de la grossièreté. Nous pouvons reprendre sans hésitation les propos de Dan. C. Mihăilescu: «Beauté, grâce, harmonie, noblesse, c'est-à-dire tout ce que nous avons perdu»! (dans la préface de l'ouvrage de Zoe Cămărăşescu, *Amintiri* [Souvenirs], Bucarest, Editura Ponte, 2011). La reconnaissance comme sentiment et comme geste à connotations sociales n'a pourtant pas totalement disparu de notre environnement, puisque, voilà, l'école de géographie de Iassy, grâce aux voix et aux écrits de certains de ses représentants les plus prestigieux, a exaucé le souhait du grand Mehedinţi ! D'ailleurs, c'est une des écoles de géographie les plus sensibles de Roumanie, une école caractérisée par une attitude de respect et de collégialité envers ses membres et non seulement…

La version française du premier volume garde la structure de l'édition princeps, ayant donc trois parties et treize chapitres précédés par une « *Introduction* ». Plus exactement :

Première partie : L'objet de la géographie ; Définition de la géographie;

Deuxième partie – La méthode de la géographie : Méthode de recherches géographiques ;

Troisième partie : Les moyens de la recherche géographique – L'observation géographique: Conditions de l'observation géographique; Quelques règles d'observation sur la carte et dans la nature; La description – Qualités de la description géographique; Description complète: hologénique et holochronique; La description caractéristique; Description explicative; Description analytique et synthétique; Les moyens de la description géographique; Conditions de la description cartographique; Catégories géographiques: Catégories statiques; Catégories dynamiques.

Chaque chapitre est accompagné d'une liste bibliographique intitulée « Notes ».

La qualité typographique et graphique de l'édition française est exceptionnelle : le format est adéquat et pratique pour le lecteur, le texte de la couverture et le symbolisme de la conception graphique sont en harmonie avec le thème du volume, le papier est de bonne qualité, le support cartographique repris de l'édition originale – esquisses, graphiques, diagrammes et cartes – sont claires et lisibles.

La présentation et le lancement du volume en français ont eu lieu lors de la Conférence annuelle de la Société roumaine de géographie, organisée du 2 au 5 juin 2022 à Focșani. Par cette belle coïncidence, on a voulu, à plus de 90 ans de la parution de l'original, rendre hommage au savant Simion Mehedinți.

Pour conclure, je recommande vivement cet ouvrage qui s'adresse à un large public francophone et qui est le fruit de la vision intégrative de Simion Mehedinți et de la détermination du traducteur-éditeur. En accomplissant un vœu testamentaire, ce dernier introduit le volume dans le circuit mondial des idées, démontrant ainsi que l'étude de la géographie en Roumanie est bien enracinée et a des résultats remarquables.

Étant donné aussi la qualité typographique impeccable, nous avons devant nous un ouvrage qui enrichit ceux qui le lisent, le comprennent et appliquent ses principes.

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STUDIA UBB GEOGRAPHIA, LXVII, 1-2, 2022 (p. 143-148)
(RECOMMENDED CITATION)

BOOK REVIEW

Weil, Alois; Căsap, Gabriel, 2022, *România: hârtii de valoare istorice*, vol. 1-*Bănci*, Editura Alma Mater, Cluj-Napoca, 515 p.

De curând a văzut lumina tiparului impozantul volum sus-amintit, primul dintr-o serie care va cuprinde mai multe tomuri, despre care autorii menționează: *„Această lucrare se dorește a fi o incursiune în fascinanta lume a «hârtiilor de valoare românești». Tematica propusă încearcă să trezească interesul cititorului pentru economie, educație financiară, educație antreprenorială, artă grafică și nu în ultimul rând pentru diversitatea culturală a acestor meleaguri"* (coperta IV).

Volumul beneficiază de *„Cuvânt înainte"*, semnat de academicianul Vasile Puşcaş, care mărturisește: *„am lecturat cu mare interes acest volum de istorie a dezvoltării instrumentelor pieței de capital din România"* (p. III), trecând apoi în revistă câteva lucrări de referință din domeniu, ale unor prestigioși economiști și istorici români și străini, precum Virgil Madgearu, Mihail Manoilescu, Ștefan Zeletin, Fernand Braudel, Michel Beaud ș.a.

Remarcând *„apetitul sincronizării noastre cu etapele evoluției capitalului în Occident"* (p. IV), autorul concluzionează: *„volumul editat cu pasiune, dăruire și competență de Alois Weil și Gabriel Căsap […] este o încurajare pentru antreprenorii români de azi și de mâine să participe activ la circuitele complexe ale capitalului contemporan, dar și pentru cetățenii care ar dori să-și dezvolte cultura pieței moderne și educația financiar-bancară"* (*idem*).

Volumul masiv, în format A4, cu coperți cartonate, bogat ilustrat, textul în limbile română, engleză și germană, cuprinde o *„Introducere"* și trei capitole, respectiv: *„Despre societățile pe acțiuni"* (cap. 1); *„Societatea pe acțiuni în România"* (cap. 2); un extins capitol 3: *„Sistemul financiar românesc"* (cap. 3.1.); *„Bănci din Transilvania, Banat, Crișana și Maramureș"* (cap. 3.2.); *„Bănci din Muntenia, Oltenia și Dobrogea"* (cap. 3.3.), cu subcapitolele *„Bănci din București"* (3.3.1.) și *„Bănci din teritoriu"* (3.3.2.); *„Bănci din Moldova"* (3.4.); *„Bănci din Basarabia"* (3.5.) și *„Bănci din Cadrilater"* (3.6.).

La sfârșit, volumul cuprinde ca anexă *„Lista băncilor"* menționate în volum, o *„Bibliografie selectivă"* și un util instrument de cunoaștere biografică, *„Despre autori"*, aspect de multe ori neglijat. Lucrarea, realizată în condiții tipografice de excepție, cuprinde un număr impresionant de reproduceri ale *„hârtiilor de valoare istorice"* din spațiul geografic românesc apărute de-a lungul timpului, din impresionanta colecție

Alois Weil, care constituie elementul atractiv major al lucrării.

Introducerea, deşi extinsă doar pe două pagini, este bogată în idei, autorii justificând demersul lor publicistic. Ei pleacă de la explicarea denumirii *„hârtii de valoare istorice"* al cărei sinonim german este *„Historiche Wertpapiere"*, definesc publicul ţintă şi reliefează valenţele educativ-formative ale lucrării.

Hârtiile de valoare istorice, în principal acţiunile emise de societăţile pe acţiuni de pe cuprinsul spaţiului geografic românesc, acoperă un interval de timp cuprins între 1860-1947 (1948), având o evoluţie şi caracteristici proprii, datorate diferitelor administraţii sub care s-au aflat teritoriile româneşti şi, ulterior, după unificarea lor, până la dispariţia societăţilor emitente, consecinţă a cataclismelor social-politice de după al II-lea Război Mondial, după ce România a intrat în sfera de influenţă sovietică: etatizarea Băncii Naţionale a României, la 28 decembrie 1946; abolirea abuzivă a regimului constituţional legal al României, la 30 decembrie 1947; naţionalizarea mijloacelor de producţie, la 11 iunie 1948. Furia proletcultistă faţă de spiritul antreprenorial ce s-a instaurat odată cu implementarea comunismul în România de către URSS, s-a materializat în anihilarea acestui instrument de practică financiară burgheză, element indispensabil de progres social-economic, inclusiv a hârtiilor de valoare şi a altor instrumente de capitalizare – împrumuturi de stat, înscrisuri funciare, obligaţiuni, cote părţi, părţi sociale, certificate etc., care au devenit caduce şi... *„piese de muzeu"*, în cel mai fericit caz, când nu au fost arse. Cu timpul, ele au devenit „raritäţi" nepreţuite, colecţionate prin pasiunea, sârguinţa şi sacrificiul unora ca Alois Weil.

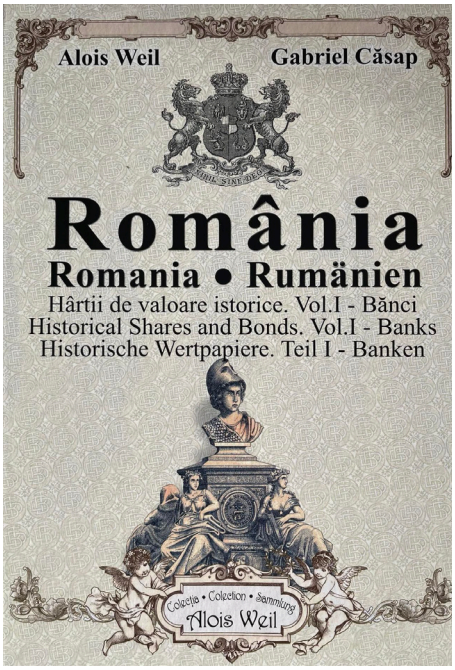
Hârtiile de valoare istorice fac dovada eforturilor acumulării capitalului autohton de pe cuprinsul spaţiului cultural românesc.

Colecţia Alois Weil, care cuprinde *„aproape 4000 de hârtii de valoare istorice distincte*" (p. 2), a dobândit începând cu anul 2019, anul constituirii societăţii culturale „Colecţia Alois Weil", o funcţie cultural-educativă majoră prin *„valorizarea şi patrimonializarea"* lor, respectiv *„includerea lor în lucrări de specialitate, prezentări şi expoziţii, dar şi colaborarea între colecţionari din Europa şi comunitatea ştiinţifică, precum şi colaborarea cu instituţii locale, naţionale şi internaţionale"*! (*idem*).

În cadrul acestui ambiţios demers, s-a înscris realizarea expoziţiei din anul 2019 din cadrul Bibliotecii Universitare „Lucian Blaga" din Cluj-Napoca, cuprinzând o selecţie de *„hârtii de valoare istorice"* din Transilvania, vernisată cu ocazia lansării volumului *„Societăţi pe acţiuni româneşti în Austro-Ungaria. Hârtii de valoare istorice. Colecţia Alois Weil"*, al autorilor Alois Weil, Gabriel Căsap şi Ion Chirescu (Editura Art Design, 2019, Bucureşti). Ea s-a bucurat de prezenţa unui numeros public şi de inimoase luări de cuvânt ale Preşedintelui Academiei Române, academician Ioan-Aurel Pop, a directorului Institutului de Istorie „George Barițiu" din Cluj-Napoca, academician Ioan Bolovan, a directorului Bibliotecii Centrale Universitare „Lucian Blaga", conf. univ. dr. Valentin Orga etc. Exponatele au fost donate de Alois Weil bibliotecii, intrând astfel în patrimoniul ei.

Iată că pasionatul colecţionar şi exeget al trecutului economic al spaţiului cultural românesc, promotor al imaginii României în lume care este Alois Weil, publică acum o nouă lucrare care

deschide seria unei colecţii mai vaste, volumul I fiind dedicat hârtiilor de valoare emise de bănci din toate provinciile geografico-istorice româneşti.



Simbolistica copertei I a volumului *România: hârtii de valoare istorice*.

În capitolul 1, *„Despre societăţile pe acţiuni”*, autorii fac o succintă prezentare cu caracter general a societăţilor pe acţiuni din lume, punctând evoluţia lor în decursul secolelor XIV-XVIII-XX, iar în cel de-al doilea, *„Societatea pe acţiuni în România”*, ei trec în revistă etapele apariţiei, cristalizării şi dezvoltării instrumentelor de acumulare şi de sporire a capitalului în dezvoltarea capitalistă din spaţiul geografic românesc, cu exemplificări sugestive, imagistice, respectiv hârtii de valoare istorice, unele dintre ele azi mari rarităţi!

Capitolul 3, cel mai extins, face referire la *„sistemul financiar românesc”*, respectiv la băncile din România, după criterii evolutive şi regionale. Sunt prezentate casele comerciale străine care au precedat pe cele autohtone, apoi începutul activităţii bancare autohtone şi crearea sistemului de creditare de factură capitalistă autohtonă. Sunt prezentate societăţi pe acţiuni de pe tot eşichierul taxonomic, de la Banca Naţională până la cele mai mici structuri de credit locale/regionale, apărute ca urmare a eforturilor de constituire şi de consolidare a capitalului autohton prin emiterea de acţiuni, instrument eficace în industrializarea şi modernizarea României. În demonstrarea acestor eforturi, autorii au selectat hârtii de valoare istorice ale unor bănci şi institute de credit şi de economie, adevărate opere de artă grafică prin: calitatea înaltă a graficii, simbolistica explicită a elementelor grafice conţinute, a desenelor minuţios elaborate, cromatică, caracterele înscrisurilor, mesajul textelor, elementele de sigilografie (ştampile), a timbrului sec etc., autorii declarând: *„Criteriile care au stat la baza selecţiei ţin de importanţa regională sau naţională a unor societăţi pe acţiuni, accentul fiind pus şi pe gradul de decorativitate a pieselor. În cadrul designului, al compoziţiei grafice, tematica românească a pieselor este diversă şi bogată, cu puternice influenţe autohtone.*

Predominant, în compoziţia grafică a acţiunilor româneşti se regăsesc simboluri agrare, care fac trimitere la ocupaţiile tradiţionale ale românilor. Chenare elaborate, inspirate din tradiţia culturală românească, motive populare prezente pe costumele şi covoarele ţărăneşti...” (p. 2).

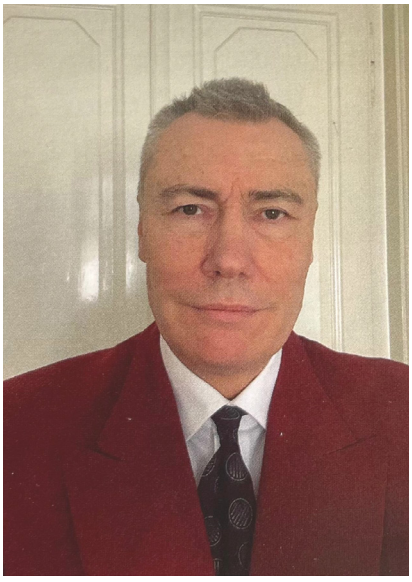
Adevărate opere de artă grafică şi tipografică, acţiunile în sine sunt creaţii ale unor artişti precum Nicolae Grigorescu, Nicolae Vermont, Costin Petrescu etc., ele regăsindu-se constant ca obiecte de artă *„în cataloagele celor mai importante case de licitaţii din întreaga lume"* (*idem*), afirmă autorii în cunoştinţă de cauză.

Lecturarea volumului, împreună cu „amprentele" sale imagistice, este facilă, plăcută, recreativă şi… surprinzătoare totodată, prin volumul mare de acţiuni prezentate care surprind plăcut pe cititor, care se convinge, dacă mai este nevoie, că România nu vine din fum…, că ea are un trecut minunat, iată, şi din această perspectivă!

Lectura volumului ne duce, vrând-nevrând, în trecut, în urmă cu multe decenii, înspre care privim cu nostalgie, pentru că avem dovada materială al unui instrument financiar complex şi funcţional al modelului burghez de acumulare al capitalului, dar şi în mod creativ şi fertil, fiindcă ne oferă calea de urmat în sporirea capitalului autohton, desigur adaptabil contextului contemporan.

Lecturarea volumului ne oferă o perspectivă transistorică asupra efervescenţei acumulării capitalului în spaţiul geografic românesc, care poate fi o lecţie şi model deopotrivă! Volumul reuneşte şi conjugă în mod fericit istoria economică şi financiară cu arta, oferind posibilitatea creionării în imaginarul geografic al cititorului inteligent harta-puzzle a fenomenului acumulării capitalului autohton în vederea consolidării capitalului românesc în procesul propăşirii ţării. Ar fi fost utile – dar suntem convinşi că autorii au în vedere acest fapt în realizarea volumelor următoare – o serie de hărţi, grafice şi diagrame care să reflecte intensitatea manifestării fenomenului, structura capitalului pe sectoare economice şi, în cadrul lor, pe domenii de activitate, mărimea capitalului social, răspândirea teritorială şi importanţa instituţiilor emiţătoare (locală, regională, naţională, internaţională) etc.

Lucrarea are şi atribute de valoare adăugată ridicată, cu referire la un patrimoniu material, cu atât mai mult cu cât, datorită cataclismelor social-politice de după al II-lea Război Mondial, când România, în contra-voinţa sa, a intrat în



Alois Weil
(n. 9 aprilie 1961, Arad).

sfera de influenţă sovietică, regimul totalitar instaurat a stopat şi apoi a distrus cu ostentaţie acest instrument de practică economică capitalistă. Cu ce preţ? Este suficient să amintesc dificultatea formării unei noi clase antreprenoriale româneşti după 1990, clamată atât de des de specialişti, sau a consolidării capitalului românesc, mai ales după o serie

de „tunuri" financiare de tipul falimentării Băncii Albina de la Cluj, a F. N. I. etc. etc., care n-au fost chiar întâmplătoare, ţinând cont de proximitatea unor vecini binevoitori...

Dar cine este acest inimos, harnic, patriot colecţionar şi exeget, generos donator, care este Alois Weil? Aflăm că s-a născut la 9 aprilie 1961 la Arad, este de profesie inginer agronom, absolvent al Facultăţii de Agronomie din Timişoara. Specialistul horticol este dublat de un pasionat bibliofil, preocupat de istorie, în special de istorie economică, care, cu perseverenţă şi sacrificii, a întocmit cea mai reprezentativă colecţie de hârtii de valoare istorice pentru teritoriul actual al României (p. 514).

Domnia sa provine dintr-o veche familie arădeană de horticultori, bunicul său înfiinţând în anul 1921 o seră pentru cultivarea florilor, pasiune dusă mai departe şi de tatăl său; la mijlocul anilor 1930, familia Weil avea o florărie care funcţiona în palatul Neuman din Arad. Imediat după al II-lea Război Mondial, familia Weil, respectiv bunicii şi tatăl său copil, a fost deportată vreme de şapte ani în URSS.

La reîntoarcerea pe plaiurile natale din România, bunicii au reluat activitatea horticolă până la decesul bunicului (1978), activitatea fiind preluată şi dezvoltată după 1990, de fiul său, tatăl lui Alois Weil, care, la rândul său i-a transmis-o şi fiului, colecţionarul şi autorul cărţii de faţă. După 1990, afacerea horticolă a familiei s-a dezvoltat, Alois Weil continuând activitatea înaintaşilor săi, completată în mod fericit de hobby-ul său şi, iată, a studiului hârtiilor de valoare istorice din spaţiul cultural românesc.

Fire nevăzute – opinăm noi – leagă agronomia – ştiinţa şi lucrul solului, de pasiunea colecţionării şi a cercetării hârtiilor de valoare istorice emise pe cuprinsul pământului românesc. Parafrazându-l pe Rudolf von Ihering, *„solul e tot poporul"*!, idee lapidară dar atotcuprinzătoare care, în opinia noastră, reprezintă chintesenţa rolului pământului strămoşesc, care ne hrăneşte pe toţi cei care ne-am născut pe el, de orice etnie am fi! Iar cea germană, din care face parte Alois Weil, a fost una de ispravă. Prin inteligenţă şi muncă asiduă, ea a făcut să rodească, a echipat şi locuit de o manieră fericită pământul acesta care, într-un final fericit, a ajuns să fie al României! Să nu uităm că, cu o singură excepţie, unirea tuturor românilor a fost privită cu simpatie de minorităţile care trăiau la noi. În discursul rostit la 18 decembrie 1919 în Adunarea Deputaţilor din Parlamentul României, Rudolf Brandsch, fruntaş al saşilor transilvăneni, declara: *„Noi, reprezentanţii liberi aleşi ai naţiunii germane din România Mare, la intrarea noastră în Adunarea Constituantă, ne simţim datori a reînnoi declaraţia solemnă că ne-am alipit statului român prin liberă hotărâre şi vrem să-i aparţinem ca cetăţeni credincioşi sub sceptrul dinastiei sale, în deplină loialitate"!* (Ciobanu, Vasile, 2001, *Contribuţii la cunoaşterea istoriei saşilor transilvăneni 1918-1944*, Editura Hora, Sibiu, p. 67). Urmând această logică, avem de-a face cu un colecţionar minunat, dublat de dorinţa de a face cunoscut lumii întregi eforturile locuitorilor spaţiului geografic românesc pentru acumularea capitalului necesar propăşirii lor economice şi sociale. Ţinutului natal, Arad, Alois Weil împreună cu Gabriel Căsap şi Ion Chirescu i-au dedicat o altă lucrare

monografică: *„Istorie economică arădeană. Societăți pe acțiuni. Hârtii de valoare istorice. Colecția Alois Weil"* (vol. I-II, Editura Art Design, București).

Suma summorum, recomand cu căldură acest volum cu largă adresabilitate, rod al pasiunii colecționarului-autor Alois Weil și al istoricului Gabriel Căsap, care demonstrează subliminal că România nu vine din fum, de nicăieri, că are și în acest domeniu, al efortului de concentrare al capitalului financiar autohton, realizări remarcabile. Dacă luăm în calcul și aspectul grafic-artistic, avem dovada materială peremptorie a unei identități specifice inconfundabile, pe care ne-au lăsat-o înaintașii. Iată că Alois Weil și colegii săi, Gabriel Căsap și Ion Chirescu, au prezentat-o și o prezintă și în cazul de față publicului larg cu profesionalism și acribie științifică. Cum ne raportăm noi, geografii, la acest trecut economic? Prin cunoașterea și promovarea a tot ceea ce a fost valoros și identitar sub acest aspect, în spațiul românesc.

În această lume globalizată, cu fel și fel de crize care se succed rapid, și care pe mulți îi ia pe nepregătite, fie ei oameni sau chiar țări, ținând cont de locul nostru în acest colț al Europei și fiindcă am invocat aspecte identitare ale spațiului geografic românesc, fie-mi permis să închei cu îndemnul lui Ioan Bianu, relatat de Dumitru Cristian Amzăr (1906-1999), un fabulos gânditor, din păcate mai puțin cunoscut.

Acesta relatează că student fiind la Filosofie la Universitatea din București, a participat în toamna anului 1928 *„la solemnitatea închiderii cursului"* magistrului cu ocazia pensionării sale. Dar să-l lăsăm pe Dumitru C. Amzăr să descrie desfășurarea evenimentului, poate va reverbera în câteva conștiințe vii ale lectorilor acestei recenzii: *„Solemnitatea a avut loc în cea mai încăpătoare sală de cursuri a Universității noi, amfiteatrul «Vasile Pârvan», plin până la refuz. Cuvântărilor și elogiilor de rigoare le-a răspuns sărbătoritul, cu ochii în lacrimi. Bianu nu era nici orator, nici savant; darul lui a fost acela de mare gospodar al cărții, al cărții românești în special. De aceea, el a strălucit, nu prin vorbă și scris, ci prin faptă. Nu-mi mai aduc aminte de cursul cuvântării sale, dar a încheiat cu relatarea unei scene din ultimele zile ale lui Timotei Cipariu, la care el a fost martor, și scena aceea mi-a rămas și-mi va rămâne pentru totdeauna vie în minte, ca și când aș fi trăit-o eu însumi. Simțindu-și sfârșitul apropiat, spunea Ion Bianu către sfârșitul propriei lui vieți, Timotei Cipariu și-a chemat la el pe cei mai buni și mai dragi dintre foștii prieteni și elevi. Ca un rămas-bun și abia ținându-și lacrimile și suflarea, el a deschis pe masa de lucru o hartă mare a vechii Dacii și a înconjurat-o încet cu mâna, ca și când ar fi vrut să pipăie pentru ultima oară fiecare hotar al Țării, începând de la Turnu-Severin, urcând pe Tisa, coborând pe Nistru și ajungând, pe Dunăre, din nou la Turnu-Severin. «ASTA ESTE; EU AM VISAT-O, VOI S-O VEDEȚI AIEVEA!»; iar bătrânul Bianu, printre lacrimi și suspine reținute, s-a întors către harta României Mari, care atârna pe peretele din spatele catedrei, și, schițând același gest, a adăogat: «ASTA ESTE; EU AM VĂZUT-O; VOI S-O PĂSTRAȚI!»"* (Amzăr, Dumitru Constantin, 1953, *Testamentul lui Ion Bianu*, în Buletinul Bibliotecii Române, An I, nr. 1, pp. 25-26, 1953, Freiburg im Breisgau).

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