STUDIA UNIVERSITATIS
BABEŞ-BOLYAI

UNIVERSITATEA BABEŞ-BOLYAI
BABEŞ-BOLYAI TUDOMÁNYEGYETEM
BABEŞ-BOLYAI UNIVERSITÄT
BABEŞ-BOLYAI UNIVERSITY
TRADITIO ET EXCELLENTIA

GEOGRAPHIA

2/2023

STUDIA
UNIVERSITATIS BABEŞ-BOLYAI
GEOGRAPHIA

2/2023

ISSN (print): 1221-079X
ISSN (online): 2065-9571; ISSN-L: 1221-079X

Published by Babeş-Bolyai University

EDITORIAL BOARD OF

STUDIA UNIVERSITATIS BABEŞ-BOLYAI GEOGRAPHIA

EDITORIAL OFFICE: Clinicilor no. 5-7, 400006 Cluj-Napoca, Romania
http://studiageographia.geografie.ubbcluj.ro/

YEAR **Volume 68 (LXVIII) 2023**
MONTH **December**
ISSUE **2**

PUBLISHED ONLINE: 2023-12-30
PUBLISHED PRINT: 2023-12-30
ISSUE DOI: 10.24193/subbgeogr.2023.2

S T U D I A
UNIVERSITATIS BABEŞ-BOLYAI
GEOGRAPHIA

2

CONTENT/ SOMMAIRE/ INHALT/ CUPRINS

BOOK REVIEW

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 5-35)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.01

IDENTIFY APPROPRIATE VARIABLES THROUGH SCENARIO PLANNING PERSPECTIVE FOR CREATIVE TOURISM IN IRAN

Mir Najaf MOUSAVI[1], Kamran Jafarpour GHALEHTEIMOURI[2,3], Nazanin Zahra SOTOUDEH[4], Mohammad Reza Amiri FAHLIANI[5]

ABSTRACT. Identify Appropriate Variables Through Scenario Planning Perspective For Creative Tourism In Iran. This study explores the major factors affecting the creative tourism market in Iran and their potential to drive national and regional development in the long run. The study employs the MicMac and Scenario Wizard software to identify the variables and their relationships and influence on each other. The study finds that communication infrastructure is a general factor that affects all guest communities, while others are specific to capital attraction from Middle Eastern countries. These include improving political relations with these countries and digital advertising and marketing of Iran's development. This study aimed to investigate the effectiveness of a new teaching methodology on student performance in mathematics. The methodology involved a combination of interactive lectures, group discussions, and hands-on activities. A quasi-experimental design was used, with one group of students receiving the new methodology and a control group receiving traditional teaching methods. The study was conducted over the course of one semester with pre- and post-tests administered to both groups. The results showed a significant improvement in the performance of the experimental group compared to the control group. The experimental group had a mean post-test score of 87.5, compared to the control group's mean score of 76.2. The influence graph shows the relationships between the variables and

[1] *Urmia University, Department of Geography and Urban Planning, Urmia, Iran, e-mail: m.mousavi@urmia.ac.ir*
[2] *Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia Kuala Lumpur, Jalan Sultan Yahya Petra, Kuala Lumpur, Malaysia*
[3] *Department of Geographical Sciences, Faculty of Geography and Urban Planning, Kharazmi University, Human Sciences building 4th floor, Tehran, Iran, e-mail: space.kamran@gmail.com*
[4] *Razi University, Kermanshah, Iran, e-mail: nzsetoudeh@yahoo.com*
[5] *Shahid Chamran University of Ahvaz, Ahvaz, Iran, e-mail: amiri_reza88@yahoo.com*

how they influence one another, and the spatial structure of the direct driving forces of creative tourism development in Iran is indicated at a rate of 25%. This research offers insights and recommendations for policymakers, tourism practitioners, and scholars interested in the development of creative tourism in Iran. These findings suggest that the new teaching methodology can be an effective way to improve student performance in mathematics. Further research could explore the impact of this methodology on other subjects and in different settings.

Keywords*: Foresight, Tourism planning, Creative tourism, MicMac, Scenario Wizard*.

1. Introduction

Creative tourism combines current tourism resources centered on "creativity" with elements of living art and culture to offer visitors authentic experiences (Richards & Wilson, 2006). By actively participating in creative processes, tourists can develop their creative potential and skills, contributing to the development of economic, social, and cultural conditions in the destination where they are presented. Creative resources have greater stability and dynamism than tangible cultural products, enabling tourist destination cities to develop innovative products quickly and gain a competitive advantage (Yozcu & Icoz, 2010; Hung et al., 2016; Remoaldo, 2020). Therefore, creative tourism has greater potential than traditional cultural tourism in terms of adding value and allowing destinations to innovate new products relatively quickly (Richards & Wilson, 2006). Creative tourism is heavily reliant on the active participation of tourists, who interact and create the entire experience, actively learning about their surroundings and using this knowledge to develop their skills (Richards & Wilson, 2006).

According to Osman and Sentosa (2013), tourism is a significant and rapidly growing industry that contributes greatly to the economic growth of countries and local communities. Moreover, Rahimi et al. (2015) suggest that tourism has become a powerful tool for improving the quality of life and shaping the world in terms of communication, political and cultural benefits, and international effects. As the tourism industry shifts from traditional to creative tourism, creative tourism initiatives are becoming a new model of cultural tourism that harnesses economic, social, and cultural dynamism in areas that attract specific markets (Richards, 2011; Richards & Raymond, 2000; Richards & Wilson, 2007; Gato et al., 2020).

Creativity is heavily influenced by diversity within socio-cultural contexts. Cultural diversity is particularly important for accelerating and strengthening creative processes and activities. However, in the modern era, globalization and the desire to associate with global brands has led to a reduction in diversity and differentiation among destinations, which is a significant feature that distinguishes them. Cities and tourist destinations' attempts to distinguish themselves and appear on global tourism maps have often resulted in the opposite effect. This is because they rely on dictated and similar strategies, such as the creation of symbolic structures, the exclusion of cultural heritage, the holding of large-scale events, and the adoption of a theme-based approach. Consequently, cultural tourism has become repetitive and led to the emergence of similar tourism destinations with identical tourism products worldwide. According to Richards and Raymond (2000), creative tourism requires the destination itself to be more creative in designing "institutional" experiences rather than relying solely on tourists' creativity. Destinations need to consider their creative aspects and provide a unique incentive for creative tourists to visit. Each location has the potential to provide unique combinations of knowledge, skills, physical, social, and spatial capital to adapt specific locations for specific creative activities. The handicraft sector is particularly adept at using creativity to overcome limited available resources and attract potential customers (Philis, 2009; Ghalehteimouri et al., 2020).

As competition in the tourism industry intensifies, suppliers are introducing more practical features to distinguish their products. Unique experiences are highly valued, and only those who can invest in meeting tourist demand will be able to succeed in this competitive market. Creative tourism experiences are primarily developed from a supply perspective, with little research conducted on tourists' perceptions of these experiences (Tan et al., 2014). However, Maisel (2009) discovered that many tourists prefer small, intimate, and personalized experiences. Moreover, Tan et al. (2013) investigated the concept of "creativity" in tourism and found that a creative experience requires knowledge in social, cultural, or environmental aspects.

However, creative tourism may be the key to unlocking this potential. Iran's cultural and artistic diversity, along with its originality in creative industries, are contributing factors that can be leveraged to develop creative tourism. Due to a lack of necessary infrastructure, Iran is unable to compete effectively in industrial age tourism markets that rely on large-scale commercial facilities. As a result, it is being proposed that Iran positions itself as a creative tourism destination, emphasizing its cultural and artistic offerings based on its unique needs and capabilities. By capitalizing on areas of cultural diversity, multiple subcultures, rich historical backgrounds, and high-quality handicrafts,

tourism can become a valuable source of additional income for Iran. The potential economic benefits of creative tourism are significant, including the potential to increase the GDP and strengthen the national economy in the long run. The aim of this research is to introduce a new strategic approach, utilizing futures studies, to plan creative tourism in Iran. The study is divided into two stages, with the first identifying key factors and driving forces, and the second designing possible future scenarios using strategic management and futures research methodologies, and utilizing MicMac and Scenario Wizard software applications. The objectives of the study are as follows:

1. Identification of key factors and driving forces affecting the development of creative tourism in Iran.

2. Creating planning based on scenario planning according to Iran's conditions.

2. Theoretical foundations of the research

2.1. Tourism development

Tourism is a vital source of economic growth for many countries as it drives infrastructure development and investment while providing economic benefits (Asaker et al., 2014; Fletcher & Archer, 1991). Countries worldwide have come to rely heavily on the tourism industry as a significant contributor to economic activity and growth planning (Dogru et al., 2020). The tourism industry creates job opportunities and contributes to regional and national socioeconomic functions, such as income diversification and reducing economic inconsistency (Holjevac, 2003). In developed countries, developing the tourism industry can lead to new export, foreign exchange, and job opportunities while reducing income disparity. In developing countries, tourism expansion can promote long-term development and a more equitable distribution of income at the national level, closing the gap created by the inequitable distribution of financial resources in the past century (Morab et al., 2018).

2.2. Creative tourism

Creative tourism has emerged as a response to the increasing prevalence of mass cultural tourism and the desire of travelers to have more active participation in their travel experiences. Over the years, the range and scope of activities associated with creative tourism have broadened, leading to a shift in definitions. Nevertheless, the original definition provided by Greg

Richards and Crispin Raymond in 2000 remains fundamental in the field. It states that "tourism provides visitors with the opportunity to unleash their creative potential through active participation in courses and learning experiences that are characteristic of the holiday destinations where they are undertaken" (Duxbury & Richards, 2019). Richards (2011) argues that creative tourism can take various forms and involve different types of creativity, with some being more active than others (Fig. 1).

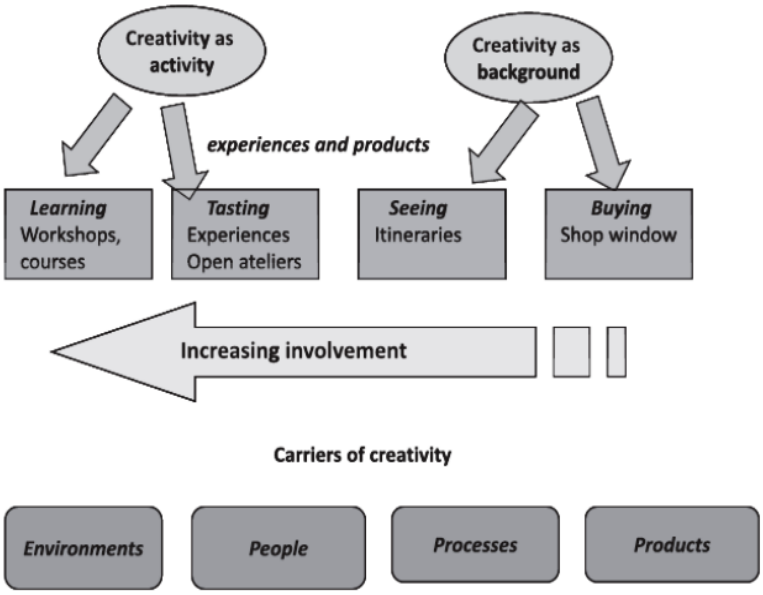

Fig. 1. Creative tourism models.
Source: Richards (2011, p. 1239)

According to Richards and Wilson (2006), there are three types of creative development strategies: creative seeing, creative spaces, and creative tourism. Creative shows can act as hubs in creative networks and establish a direct link between creativity and tourism. Creative spaces are oriented towards production and consumption functions (Richards, 2011). As mentioned previously, creative tourism offers several advantages over cultural tourism. These include the following: a) Creativity is a scarce commodity that is only accessible to a few individuals and can easily add value; b) It enables the destination to quickly innovate its products and distinguish itself from other

destinations; c) Creative resources are typically more sustainable and renewable than tangible resources; d) Creativity is usually more mobile than tangible cultural products; and e) Creativity results in the creation of value by both tourists and destinations (adapted from Richards & Wilson, 2006).

2.3. Strategic planning of creative tourism based on the scenario writing approach

Dewey's instrumentalism ideology, formulated in 1929, posits that people are constantly connected to and influenced by their environment. This philosophy formed the basis of Bertalanffy's (1962) system theory, which asserts that understanding the linkages and interactions within a system is crucial to gaining insight into it. Real systems, according to Bertalanffy, interact with their surroundings, adapt to them, and evolve over time. In line with the systems theory present in the literature on management science and organizational development (Katz and Kahn 1978; Scott 1961; Thompson 1967), organizations are viewed as systems composed of interconnected components, such as people and processes. It is proposed that the elements within a system interact with one another to achieve a specific objective (Kast & Rosenzweig, 1972).

As the world becomes more complex and chaotic, entire systems can evolve and become increasingly complex. Systems thinking recognizes that events in complex systems are separated by both distance and time, implying that small catalytic events can have significant impacts on the system as a whole (Senge, 1990).

Strategic tourism planning is a process aimed at optimizing the benefits of tourism while balancing the quality and quantity of supply with the appropriate level of demand. This framework provides direction for any tourism organization or destination and emphasizes quality, efficiency, and effectiveness (Edgell et al., 2008). To ensure the desired quality of tourism products and bring the greatest benefits to the local community or tourism destination, countries need to have a clear understanding of the location, process, and path to achieving their future tourism sector goals (Johnson et al., 2008). Appropriate strategic planning sets aside short-term profit-driven goals and instead focuses on many key features of the future that are more beneficial and favorable to society as a whole.

In recent years, the research of the future has gained popularity as a new field of knowledge that expands the possibilities of what the future may hold. Rather than relying on linear and predictable planning for a single future, this knowledge explores the vast and unknown possibilities of human and

technological advancements, opening up new horizons for humanity. As a result, planning has shifted from simply following the past or predicting the future to actively building and creating the future (Mehdizadeh, 2010).

2.4. Iran and its tourism

The tourism industry is rapidly evolving and transforming in the postmodern era, similar to other manifestations of this era. However, the tourism industry in Iran faces obstacles such as the complicated process of obtaining licenses and inconsistencies between the private and public sectors, hindering its progress. Meanwhile, in other dynamic countries, natural, historical, and cultural resources have reached saturation, and tourism planners are seeking new attractions to respond to the expanding market demand (Maleki and Amiri Fahliani, 2019).

Iran, historically known as Persia, is one of the largest countries in the Middle East, with a vast heritage and rich local culture dating back over 7,000 years. It boasts 13 cultural sites and 9 intangible heritage sites on the UNESCO World Heritage List, as well as unique geographical features such as the Alborz and Zagros mountain ranges, vast deserts, high plateaus, fertile plains, the Persian Gulf, and the Caspian Sea, resulting in diverse climates, plants, and animals (Nematpour et al., 2020). Despite its potential for developing the tourism industry, Iran has not fully capitalized on this opportunity due to its mono-product oil-based economy, neglecting other sectors.

Given Iran's high dependence on oil revenues, the non-renewability of fossil fuels, and their sharp price fluctuations, there is an urgent need to shift toward using alternative resources and break free from a mono-product economy. As tourism has become one of the top industries in the world and Iran has great potential in this regard, developing the tourism industry can be a viable alternative to oil revenues (Abedi and Sedaghat, 2019; Movahed and Jafarpour Ghalehteimouri, 2019).

3. Methodology

This study is an applied research project that utilizes the descriptive-analytical method. It is also an exploratory-analytical study based on innovative futures research methods that employ both quantitative and qualitative models. To collect the required data, the researchers employed both documentary and survey methods, and the statistical population consisted of tourism experts located in Shiraz. The collected data were analyzed using the structural analysis method, which is used to analyze the relationships between variables, especially in large systems with multiple dimensions. To perform the structural analysis,

the researchers utilized MicMac software, which is specifically designed to describe a system's main components through matrix relations. The software outputs in the form of tables and graphs can help us understand the dimensions and relationships of the system and how it may function in the future (Naimi and Pourmohammadi, 2016).

In general, structural analysis involves three steps. The first step involves extracting variables/factors. Although this step does not typically have a formal and standard structure, it is crucial to the process. The second step involves determining the relationships between the variables, with an emphasis on linking variables and describing their interrelationship networks. The third step involves identifying the driving forces (Rabbani, 2012). To systematically analyze a set of variables and describe their interrelationships, we need to conduct cross-impact analysis, which is a popular method used to analyze the interrelationships between current variables (Nematpour & Faraji, 2019). This type of analysis is crucial for discovering a system's future nature and behavior.

In this section, the study was conducted on a statistical population of tourism experts, out of which 30 experts were selected using purposive sampling. The data collection process utilized both desk-based and field methods. The desk-based method involved examining the theoretical foundations and background of the subject, while the field method involved completing an open-ended questionnaire to gather relevant data.

The questionnaire design involved four steps. In the first step, 41 effective factors were extracted using the Delphi method and environmental scanning. In the second step, the questionnaire was adjusted pair-wise and provided to experts to score from 0 to 3 based on the relationships between the factors. The third step involved designing another questionnaire to extract the possible situations for each factor's future. Finally, another pair-wise questionnaire was designed for the experts' final weighting of the scenarios.

To determine the key variables affecting creative tourism in Iran, the components and effective factors were identified using previous studies in this field, a combination of foreign and local studies. Table 1 displays the demographic characteristics of the experts in the study area.

Table 1. Demographic characteristics of tourism experts

Field	Total number of respondents	**Education level**			**Gender**		**University professor**	
		Bachelor	Master	PhD	Male	Female	Yes	No
Tourism	30	-	16	14	18	12	17	13

3.1. Cross impact analysis

To implement and analyze the cross-impact driving forces, the following steps were taken:

Step 1: Experts were consulted to determine the importance of the driving forces and key factors affecting tourism during infectious diseases.

Step 2: A Cartesian map was drawn to depict the correlation of cross impacts. The map, shown in Figure 2, uses the y-axis to represent the communication logic of the degree of dependence and the x-axis to represent the influence values. Driving forces are divided into four categories in this map:

- First zone: Driving forces and waves that are strongly influenced by other factors and whose occurrence depends on other driving forces. These have high uncertainty.
- Second zone: Driving forces that have two-way influence, meaning that they both influence and are influenced by other driving forces.
- Third zone: Neutral driving forces and waves that neither influence nor are influenced by other driving forces.
- Fourth zone: Driving forces and waves that influence other driving forces.

The Cartesian map provides a clear understanding of the interrelationships among driving forces and their levels of influence (Naimi and Pourmohammadi, 2016).

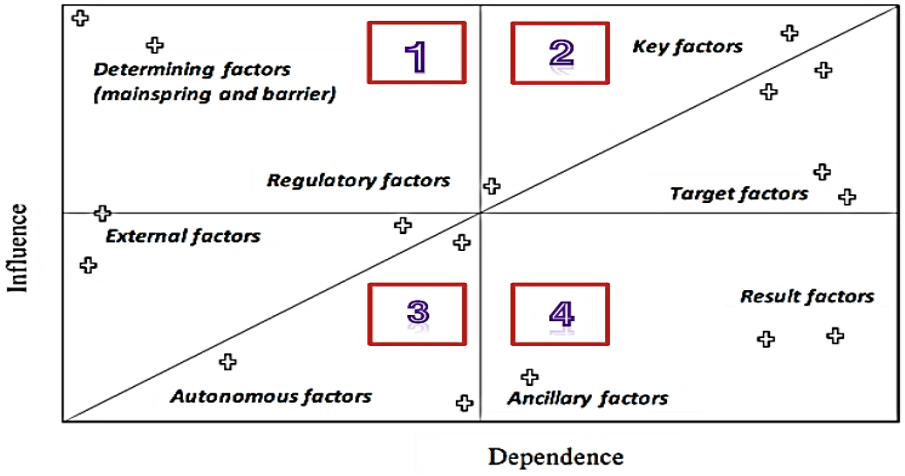

Fig. 2. Coordinates of the cross-impact analysis of driving forces.
Source: the authors

Step 3: Uncertainties are driving forces that are more influential than other driving forces. In other words, their probability of occurrence is highly dependent on the occurrence of other driving forces. The driving forces were divided into three categories to determine the uncertainties: i) driving forces and waves that influence but are not influenced by the key variables of creative tourism in Iran (certain driving forces); ii) driving forces and waves that are influenced a lot and whose probability of occurrence depends on the occurrence of other driving forces (uncertainties); iii) driving forces and waves that are highly influenced and are very important in key variables (critical uncertainty) (Naimi and Pourmohammadi, 2016).

3.1.1. Structural analysis

The cross-impact analysis method is used in structural analysis. This is a primary cross-impact analysis technique that includes both direct and indirect relationships (Cabrera et al., 2002). Structural analysis can be defined as a system composed of a collection of related items. This system's variables contain a network that must be analysed using interrelationships between variables using a cross-correlation matrix to determine the system's future evolution trend (Nematpour et al., 2020).

The structural analysis seeks to identify key variables (overt or covert) in order to solicit participants' and stakeholders' perspectives on a system's complex and unpredictable aspects and behaviours. In general, structural analysis consists of three steps: 1) variable/factor extraction 2) establishing relationships between variables, and 3) identifying key variables (Javanshiri, 2019).

3.1.2. Structural analysis via MicMac software

This software was created to simplify the process of performing structural analysis using a cross-impact matrix for classification. Variables are rated on a scale of 0 to 3 based on their relationships with other variables. If there are n variables identified, the relationships between them form an n × n matrix. This matrix can be represented as a graph that shows the direction and degree of influence of each variable on the others. The software also has the ability to extract and rank key factors based on the topology of the variables. To perform structural analysis using MicMac software, there are six steps: 1) understanding the system and assessing its stability or instability, 2) identifying indirect influences between variables, 3) identifying main factors and driving forces, 4) gaining a comprehensive understanding of the system and avoiding partial analysis, 5) identifying destabilizing factors, and 6) measuring the influence of the system's main stages to identify the environment. The cross-impact analysis of variables can be visualized using graphs that are divided into four areas. These areas show the degree to which driving forces are influenced by other driving forces, as well as how much they influence others.

The output of the cross-impact analysis model depicts the relationships between the variables. MicMac software can convert relationships into special graphs, allowing for easy analysis of the relationships and system structure. In general, the software's matrices and output graphs fall into two categories: the matrix of direct impacts of variables and related graphs, and the matrix of indirect relationships between variables and related graphs. If the initial matrix specifies the potential relationship between the variables, the matrix software also provides the potential direct relationship between the variables and the matrix of potential indirect relationships between the variables (Zali and Mansouri, 2015).

3.1.3. Scenario writing using Scenario Wizard software

The Scenario Wizard software is a powerful tool for performing complex scenario analysis. It allows for the selection of key factors and the classification of each factor into various situations. These situations are presented to development experts as a matrix for all key factors. The questionnaire used in this software contains items that are scored on a range of -3 to 3, indicating both positive and negative impacts. The central question of the questionnaire is, "If situation A1 of key factor A occurs in the future, what impact will it have on the occurrence or non-occurrence of situation B2 of key factor B?" The answers to these questions are then analyzed within the software using the CIB1 analytical technique, which aims to optimize and ensure the reliability of scenarios.

3.2. Research method process

The structural method is a powerful tool for analyzing complex systems with multiple dimensions, by analyzing the relationships between variables using both qualitative and quantitative data. Among the many software applications available for implementing structural analysis, MicMac stands out as one of the best. The software facilitates cross-matrix calculations, and generates tables and graphs that aid in understanding system relationships and predicting future trends. Developed by Michel Godet, the method consists of three steps: examining the variables, analyzing the relationships between the variables, and identifying the key variables. This approach has been widely used in futures research due to its flexibility and ability to handle large amounts of data (Rabbani, 2012; Godet, 2000).

3.2.1. Research variables and indicators

The key variables for measuring the development of creative tourism were extracted according to the theoretical foundations of the research, reviewed by tourism experts, and the most important variables were extracted from them (Table 2).

- Identifying the key variables affecting the development of creative tourism in Iran

The Delphi method was used with a panel of experts to identify the initial variables affecting the development of creative tourism planning. First, a panel of specialists, experts, and executors involved in tourism was selected. Next, they were questioned using different methods to extract their opinions about the subject under study. Finally, after screening the variables, 41 variables were selected as the primary variables affecting tourism development, as shown in Table 2.

Table 2. Indicators and sub-indicators of the study

	Indicator	Sub-indicator	Variables' symbol
1	Economic	1. Investment in handicrafts	Var1
		2. Attention to foreign investment in Iran	Var2
		3. Investment in e-tourism	Var3
		4. Investment in medical tourism	Var4
2	Socio-cultural and historical potential	1. Promoting the creative potential of local communities	Var5
		2. Cultural attractions	Var6
		3. Various types of handicrafts	Var7
		4. Existence of various rituals and traditions	Var8
		5. Existence of various traditional and local types of food	Var9
		6. Religious attractions	Var10
		7. High degree of hospitality of the Iranian people	Var11
3	Infrastructural	1. Paying attention to experience-based accommodations	Var12
		2. Considering the reconstruction of historical monuments	Var13
		3. Promoting public health in tourist places	Var14
		4. Various accommodation centers	Var15
		5. Greater attention to road trip accommodation facilities	Var16
4	Organizations and policies	1. Specialized management in tourism	Var17
		2. Building international trust to attract foreign tourists	Var18
		3. Political instability in the Middle East	Var19
		4. Lack of coordination among organizations	Var20

	Indicator	Sub-indicator	Variables' symbol
		5. Influence of the government's foreign policy on attracting international tourists	Var21
		6. Incentive policies for foreign investment	Var22
		7. Facilitating entry for foreign tourists	Var23
		8. Sustainable cooperation of organizations involved in foreign tourism	Var24
		9. Government's attention to the development and attraction of tourism as a generator of capital	Var25
5	Environmental	1. Existence of a variety of climates	Var26
		2. Existence of various natural monuments	Var27
6	Technology and information	1. Paying attention to creative advertising in tourism	Var28
		1. E-commerce in the tourism and hotel industry	Var29
		2. Participation in and support of research programs and projects and dissertations about creative tourism	Var30
		3. Using new advertisements in identifying the target markets	Var31
7	Providing services	1. The possibility of ordering a previously experienced product in the future and the sustained seller-tourist relationship	Var32
		2. Using skilled and experienced guides and leaders	Var33
		3. Existence of tours and travel agencies	Var34
8	Management policies	1. Branding by making creative concepts	Var35
		2. Considering the citizens' talent for artistic creativity	Var36
		3. Paying attention to traditional cultural and artistic ctivities	Var37
		4. Paying greater attention to festivals and cultural events	Var38
		5. Manpower training	Var39
		6. Comprehensive plan for tourism development	Var40
		7. Employing specialized personnel in tourism organizations	Var41

4. Results

4.1. Identifying the key variables based on cross-impact analysis

To identify the key variables influencing creative tourism in Iran, we conducted a thorough review of relevant studies and interviewed experts, including those from universities and tourism institutions in Iran. We collected a total of 56 variables and narrowed them down to 41 after filtering and categorizing them based on expert panel feedback. These variables were then matched through a 41 × 41 cross-impact matrix and evaluated using the MicMac technique and cross-impact analysis. Our results showed that 72.51% of the variables influenced one another, with 1,219 evaluable relationships in Iran's creative tourism matrix.

Of these relationships, 37.89% showed zero influence, 34.94% had weak influence, 34.04% had moderate influence, and 31% had strong influence on each other. Our study also used statistical indicators with double data rotation, which had a 100% desirability and optimization, indicating high validity and response rates. We validated our structural analysis using expert opinions and provided a general analysis of the system environment. Finally, we examined the mutual influence of the variables, their ranking, and displacement to identify driving forces and key effective factors.

Table 3. Initial analysis of cross-impact matrix data

Country	Matrix dimensions	Number of replications	0	1	2	3	Total	Filling degree
Iran	41	2	462	426	415	378	1219	72.51

The data from the MDI-based cross-impact matrix show that most variables have an important role in improving relations in the Iranian tourism development system. However, only some have the greatest impact on the system and are regarded as key variables (Table 4).

Table 4. Direct impact and dependence of variables

	Variable's role	Variable's symbol	Variable	MDI	
				Direct impact	Direct dependence
1	Two-way	Var31	Using new advertisements in identifying the target markets	326	338
2	Two-way	Var2	Paying attention to foreign investment in Iran	322	336
3	Influencing	Var24	Sustainable cooperation of organizations involved in foreign tourism	205	330
4	Influencing	Var17	Specialized management in tourism	305	326
5	Influencing	Var14	Promoting public health in tourist places	305	322
6	Influencing	Var26	Existence of a variety of climates	303	321
7	Influencing	Var39	Manpower training	301	317
8	Two-way	Var34	Existence of tours and travel agencies	297	284
9	Influencing	Var19	Political instability in the Middle East	295	280
10	Influencing	Var41	Employing specialized personnel in tourism organizations	292	276
11	Influencing	Var11	High degree of hospitality of the Iranian people	288	267
12	Influencing	Var13	Considering the reconstruction of historical monuments	284	255
13	Influencing	Var21	Influence of the government's foreign policy on attracting international tourists	282	255
14	Influencing	Var28	Paying attention to creative advertising on tourism	280	251
15	Two-way	Var4	Investment in medical tourism	280	149

	Variable's role	Variable's symbol	Variable	MDI	
				Direct impact	Direct dependence
16	Influencing	Var15	Various accommodation centers	280	248
17	Influencing	Var18	Building international trust to attract foreign tourists	278	246
18	Two-way	Var10	Religious attractions	267	242
19	Influencing	Var27	Existence of various natural monuments	265	242
20	Influencing	Var7	Various types of handicrafts	263	230
21	Two-way	Var30	Participation in and support of research programs and projects and dissertations about creative tourism	259	227
22	Influencing	Var16	Greater attention paid to road trip accommodation facilities	238	225
23	Regulatory	Var20	Lack of coordination among organizations	236	223
24	Two-way	Var33	The possibility of ordering a previously experienced product in the future and the sustained seller-tourist relationship	235	221
25	Regulatory	Var3	Investment in e-tourism	234	213
26	Two-way	Var36	Considering the citizens' talent for artistic creativity	230	213
27	Influenced	Var1	Investment in handicrafts	221	207
28	Regulatory	Var25	Government's paying attention to the development and attraction of tourism as a generator of capital	213	204
29	Regulatory	Var5	Promoting the creativity potential of local communities	205	196
30	Regulatory	Var6	Cultural attractions	203	193
31	Influenced	Var8	Existence of various rituals and traditions	201	188

	Variable's role	Variable's symbol	Variable	MDI	
				Direct impact	Direct dependence
32	Autonomous	Var12	Paying attention to experience-based accommodations	199	188
33	Autonomous	Var37	Paying attention to traditional cultural and artistic activities	196	185
34	Autonomous	Var29	E-commerce in the tourism and hotel industry	188	171
35	Influenced	Var38	Greater paying attention to festivals and cultural events	167	168
36	Influenced	Var32	The possibility of ordering a previously experienced product in the future and the sustained seller-tourist relationship	163	158
37	Autonomous	Var22	Incentive policies for foreign investment	150	154
38	Autonomous	Var9	Existence of various traditional and local types of food	142	150
39	Autonomous	Var23	Facilitating entry for foreign tourists	133	149
40	Autonomous	Var40	Comprehensive plan for tourism development	125	145
41	Autonomous	Var35	Branding by making creative concepts	112	143

Table 4 highlights 16 variables among the 41 studied that were identified as influential variables. These variables include sustainable cooperation among organizations involved in foreign tourism, specialized management in tourism, promoting public health in tourist places, the existence of a variety of climates, manpower training, political instability in the Middle East, employing specialized personnel in tourism organizations, high degree of hospitality of Iranian people, considering the reconstruction of historical monuments, the influence of the government's foreign policy on attracting international tourists, attention to creative advertising in tourism, various accommodation centers, building international trust to attract foreign tourists, the existence of various

natural monuments, various types of handicrafts, and greater attention to road trip accommodation facilities. These variables are considered input variables that exert more influence than being influenced, and they are located in the northwestern part of the dispersion map. These variables are crucial in controlling the system's stability and are therefore regarded as key and determining variables in the system's behavior.

The next type of variables in the graph are two-way variables that both influence and are influenced by other variables. These variables can be divided into two categories: risk variables and target variables. Among the studied variables, 7 variables from different groups were identified as two-way variables. These variables include: using new advertisements in identifying the target markets, paying attention to foreign investment in Iran, existence of tours and travel agencies, investment in medical tourism, religious attractions, participation in and support of research programs and projects and dissertations about creative tourism, the possibility of ordering a previously experienced product in the future and the sustained seller-tourist relationship, and considering the citizens' talent for artistic creativity. Two-way variables both influence and are influenced by other variables to a large extent and any action on them will lead to the reaction of other variables.

Regulatory variables are located around the center of gravity of the chart and sometimes act as secondary leverage variables (weak target variables and weak risk variables). In the influence graph of variables affecting creative tourism in Iran, lack of coordination among organizations, investment in e-tourism, government's attention to the development and attraction of tourism as a capital generator, and promoting the local communities' creative potential are among cultural attractions. These variables influence slightly but are influenced highly.

The next variable type is result variables or those influenced by other variables. These variables in the graph are located southeast of the influence plan. They influence highly but are influenced slightly. In the present study, investment in handicrafts, the existence of various rituals and traditions, greater attention to festivals and cultural events, and the possibility of ordering a previously experienced product in the future, and the sustained seller-tourist relationship were regarded as result variables.

The last variables identified in the graph are autonomous variables. These variables have a low influence on and from other variables and are located in the southwestern part of the variable dispersion map. Autonomous variables of this study are paying attention to experience-based accommodation, paying attention to traditional cultural and artistic activities, e-commerce in the tourism and hotel industry, incentive policies for foreign investment, the existence

of various traditional and local types of food, facilitating entry for foreign tourists, comprehensive plan for tourism development, and branding by making creative concepts. Such variables do not cause any reaction in other variables.

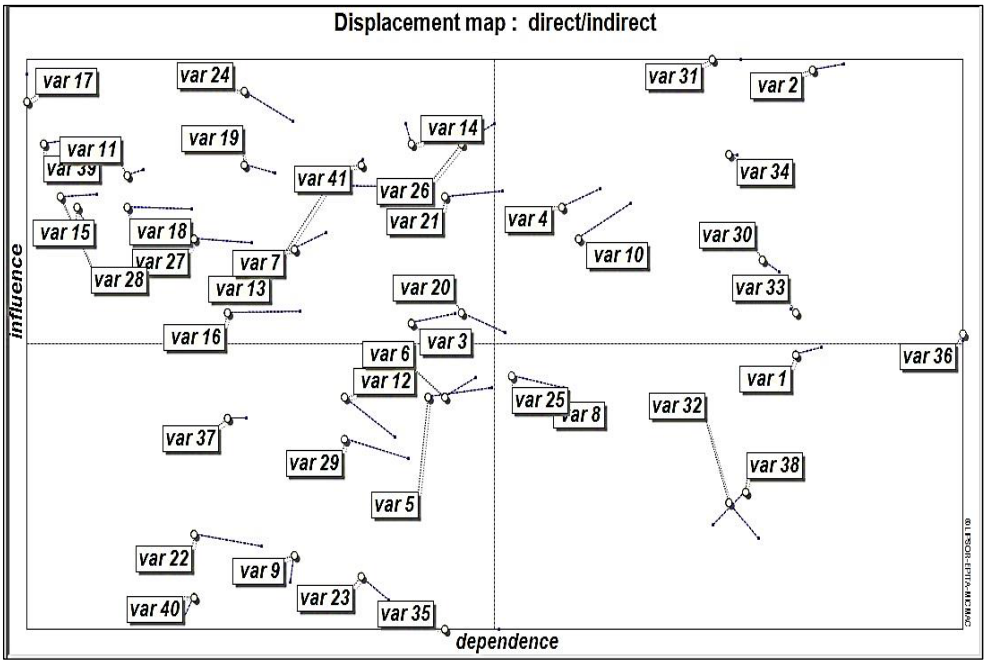

Fig. 3. Influence and dependence of variables.
Source: the authors

The direct or indirect dependence of the variables identified in the MicMac software was analyzed in five coverages: 5%, 25%, 50%, 75%, and 100%. The coverages show the weak, moderate, and strong relationships between the variables (Figs. 4 and 5). The influence graph shows the relationships between the variables and how they influence one another. This graph is denoted by red and blue lines. This graph includes measurements of very weak influence, weak influence, moderate influence, relatively strong influence, and very strong influence. The red lines denote the strong influence of factors on each other, while the blue lines (with a different thickness) show moderate to weak relationships. Fig. 5 indicates the spatial structure of the direct driving forces of creative tourism development in Iran at a rate of 25%. These are the most important indicators in the spatial structure of Iran's creative tourism development system.

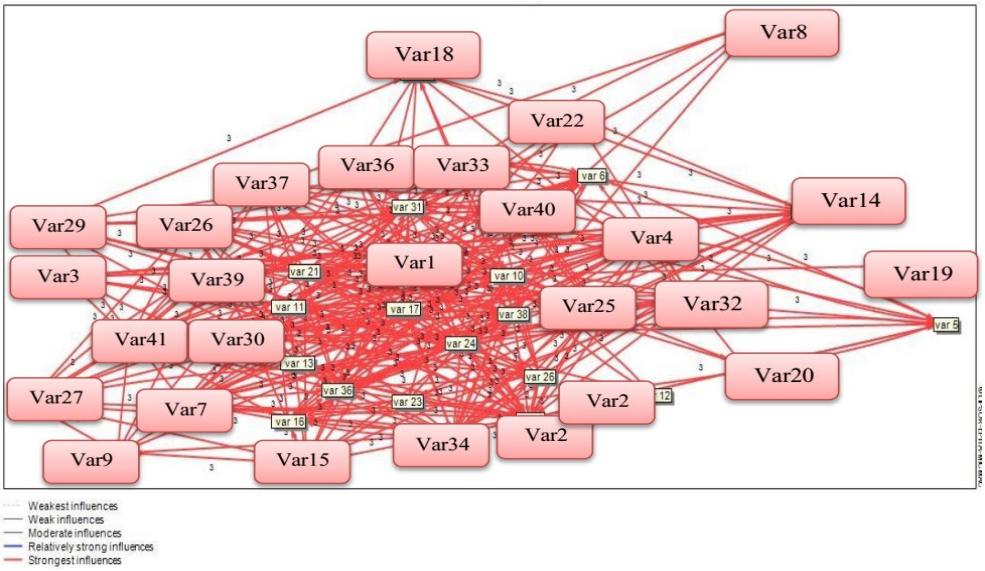

Fig. 4. Spatial structure of direct indicators of tourism development at rates of 25%.
Source: the authors

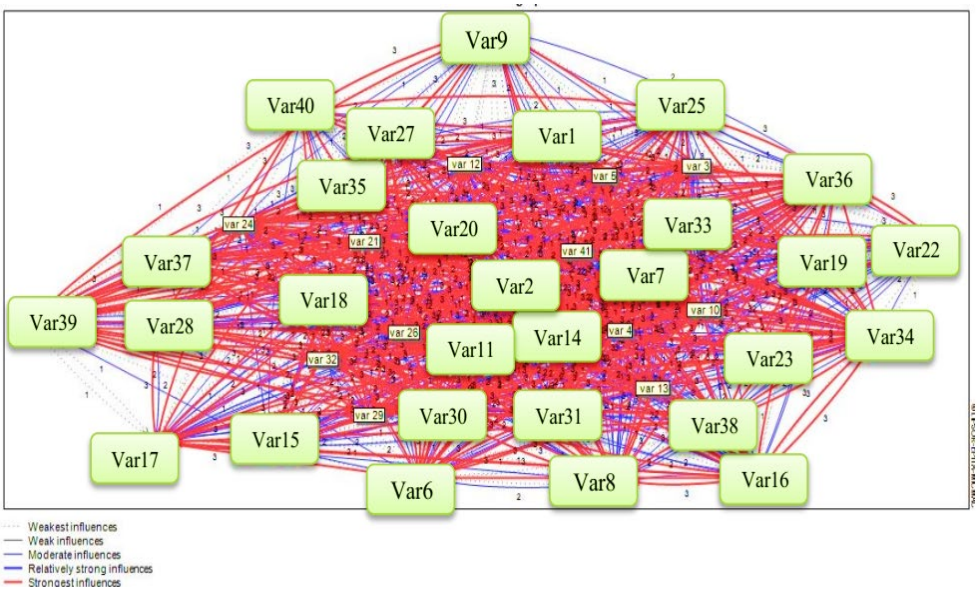

Fig. 5. Spatial structure of direct indicators of tourism development at rates of 100%.
Source: the authors

4.2. Creating compatible scenarios based on CIB

Scenario planning can also be effective in helping us understand the key challenges facing tourism destinations, such as sustainability, which is the main focus of global tourism research (Connell & Page, 2008). After identifying the key factors to achieve the goals and promote creative tourism in Iran, various situations are conceivable. These outcomes are critical in planning for the future of creative tourism. For this reason, a concise analysis of the future conditions involves developing scenarios. By defining scenarios, we do not mean to choose only one preferred future and wish to find the possible future to adapt; rather, the main intention is to make strategic decisions that are reasonable and practical enough for "all possible futures".

Once the cross-impact analysis structure is completed and driving forces are identified, scenario assumptions must provide a coherent configuration of each descriptor's dual role in influencing both the source and target to avoid contradictions and conflicts. When developing the questionnaire for the key driving forces, it is crucial to ensure internal consistency in the generated scenario matrix by selecting descriptive variables that are not preferred over other variables from the same descriptor that are induced by the combined effects of other descriptors.

To create possible scenarios from the 10 key driving forces identified by the cross-impact algorithm, a matrix of key descriptors was made with rules coded in the CIB method, and then presented to experts for further evaluation. Considering the foresight of the key factors, a 30 x 30 matrix was created using the following concept: "If there is a change in the preparation and implementation of the plan for each of the three situations, how will it affect the process of achieving the goals of creative tourism?" These scenarios were developed based on progressive judgments, relationships, and interactions of structured components and processes, providing insight into the future of creative tourism.

After adjusting the key descriptors with the rules coded in the CIB method, the experts were once again asked to examine the key variables (descriptors) by formulating a 30x30 matrix. This matrix considered the effect that any changes to the descriptive variables would have on the growth and development of Iran's creative tourism system. Based on the judgments, relationships, and interactions of the variables and processes, scenarios were designed as strategic driving forces for the future development of national creative tourism. Table 5 provides an overview of the study descriptors and their specific variables.

Table 5. Possible situations of descriptors

Variable	Uncertainty	Situation	Situation description		
A	Using new advertisements to identify the target markets		A1	A2	A3
			Paying attention to the development of new advertising in identifying goals	Continuing the current trend and indifference to the current situation	Disregard for and further reduction of new advertisements in identifying creative tourism goals
B	Paying attention to foreign investment in Iran	B1	Increasing paying attention to and paving the way for foreign investment in Iran		
		B2	Continuing the current trend of foreign investment		
		B3	More neglect of investment and foreign capital inflow		
C	Sustainable cooperation of organizations involved in foreign tourism		C1	C2	C3
			More attention and organized cooperation of institutions involved in foreign tourism	Continuing the current trend and irregular relations among tourism organizations	Reducing the attention to building friendly relations and sustainable cooperation of institutions involved in foreign tourism
D	Specialized management in tourism	D1	Paying attention to specialized tourism management in the country's macro policies		
		D2	Continuing the current unfavorable trend		
		D3	Complete disregard for the role of specialized management in advancing the goals of creative tourism in the country		
E	Promoting public health in tourist places		E1	E2	E3
			Greater attention to the quality of public health in tourist places	Continuing the current trend and paying little attention to public health	Further reduction of attention to the health of public places of creative tourism

Variable	Uncertainty	Situation	Situation description		
F	Existence of a variety of climates	F1	Increasing the attention to the four-season climate in attracting creative tourists to the country		
		F2	Continuing of the current trend in paying attention to the four-season climate in Iran		
		F3	Complete disregard for this important variable in attracting creative tourists		
G	Manpower		G1	G2	G3
			Investment in manpower training	Continuing the current trend	Reduced attention to investment in manpower in relation to creative tourism
H	Efficient tours and travel agencies	H1	Greater attention to tours and travel agencies in improving their quality and their role in attracting more creative tourists to the country		
		H2	Continuing the current unfavorable trend		
		H3	More reduction in the quality of tours and travel agencies and a greater reduction of tourists		
I	Political instability in the Middle East		I1	I2	I3
			Paying attention to the development of friendly relations with neighbors	Continuing the current trend and reducing the friendly relations	Lack of paying attention to friendly relations and greater tension in relations with neighbors
J	Employing specialized personnel in tourism organizations	J1	Investment in the training and employment of specialized forces in tourism in tourism organizations		
		J2	Continuing the current trend and paying little attention to specialized forces in tourism		
		J3	Paying less attention to the training and employment of capable forces in tourism in relevant organizations		

The next step involved assessing the impact of X situation of the X descriptor on the Y situation of the Y descriptor, based on expert interviews and literature review, considering only direct impacts. This process resulted in a cross-impact matrix generated in the Scenario Wizard software. The model comprised 30 possible situations for the 10 key variables (descriptors) that affect the development of creative tourism in Iran.

The Scenario Wizard presented five scenarios that were strongly compatible with each other. The results indicated a high probability of these five scenarios occurring in the future of creative tourism development in Iran. These scenarios were identified based on specific characteristics, with the first scenario being the driving scenario with ideal and favorable conditions. The second and third scenarios had appropriate and moderate conditions, while the fourth and fifth scenarios were critical and unfavorable, making them unsuitable for the development of creative tourism.

Table 6. Scenarios with strong stability in the future of creative tourism development in Iran

Factor / Scenario		Scenario No. 1	Scenario No. 2	Scenario No. 3	Scenario No. 4	Scenario No. 5
Factor 1	Using new advertisements in identifying the target markets	A1	A2	A3	A3	A3
Factor 2	Paying attention to foreign investment in Iran	B1	B3	B3	B3	B3
Factor 3	Sustainable cooperation of organizations involved in foreign tourism	C2	C2	C2	C3	C3
Factor 4	Specialized management in tourism	D1	D2	D3	D3	D3
Factor 5	Promoting public health in tourist places	E1	E2	E3	E3	E3

Factor / Scenario		Scenario No. 1	Scenario No. 2	Scenario No. 3	Scenario No. 4	Scenario No. 5
Factor 6	Existence of a variety of climates	F1	F2	F2	F3	F3
Factor 7	Manpower training	G1	G2	G2	G2	G2
Factor 8	Existence of tours and travel agencies	H1	H2	H2	H2	H2
Factor 9	Political instability in the Middle East	I2	I2	I3	I3	I3
Factor 10	Employing specialized personnel in tourism organizations	J1	J1	J2	J3	J3

Source: Authors' calculations (2020)

The scenarios have more unfavorable situations than favorable ones. Of the surveyed situations, 18% are optimistic, 20% are static, and 62% are pessimistic.

5. Conclusion and Discussion

Strategic planning is a versatile tool that can be tailored to suit different circumstances and objectives. Its effectiveness, however, can be diminished by significant discrepancies between predicted and actual outcomes. Traditional planning methods, which rely on rigid predictions, are unable to accommodate unexpected events, making them obsolete. Scenario planning, on the other hand, allows for the exploration of alternate futures by utilizing quantitative and qualitative categories. It encourages new ways of thinking and acting (Daniali and Sharifzadegan, 2019; Ghalehteimouri et al., 2021).

In the 21st century, creativity is the driving force behind industry, economy, urban development, and social life. Development strategies that emphasize creativity provide a new avenue for unique experiences and play a crucial role in changing lifestyles and expressing identities. These strategies invest in place branding by focusing on participation in local creative economies. This process involves the transfer of tourism resources from tangible culture to intangible

culture and creativity, leading to the emergence of creative tourism. This model transforms intangible culture and heritage into marketable goods. By reshaping traditional tourism products, creative approaches create new tourism experiences that promote creative consumption (Bastenegar et al., 2017, p. 103). Political systems and the efforts of government and other stakeholders in the tourism industry can contribute to the development of the tourism sector. Countries that rely heavily on tourism may invest more effort in generating revenue, thus contributing to the growth of their tourism industry.

This study aimed to develop a favorable model for the development of creative tourism in Iran. The study utilized 41 variables, the MicMac futures study model, cross-impact analysis, and Scenario Wizard software. The effective variables were selected based on a 41×41 and 41-variable matrix, and the results were calculated by assigning weights to the variables (ranging from zero to P). By evaluating the 41 key factors using direct and indirect methods, the study identified the key factors that had the greatest impact on creative tourism in Iran. Ten variables were identified as key variables in Iran's creative tourism system, and possible scenarios were developed from these 10 key variables using the cross-impact algorithm.

According to these classifications and the mental influence of experts, the final list of the identified key variables is as follows:

- Var 31: Using new advertisements to identify the target markets
- Var 2: Paying attention to foreign investment in Iran
- Var 24: Sustainable cooperation of organizations involved in foreign tourism
- Var 14: Specialized management in tourism
- Var 14: Promoting public health in tourist places
- Var 26: Existence of a variety of climates
- Var 39: Manpower training
- Var 34: Existence of tours and travel agencies
- Var 19: Political instability in the Middle East
- Var 41: Employing specialized personnel in tourism organizations

Based on the CIB analysis, this study identified five different scenarios for the future of Iran's creative tourism development. Scenario 1 was found to be the most desirable as it covered all the important factors for developing creative tourism in Iran, while Scenarios 2 and 3 had stable features but were unsuitable for designing strategies. On the other hand, Scenarios 4 and 5 were found to have inappropriate and critical features that could negatively impact the future of creative tourism in Iran, especially if the country faces boycotts or continues to have strained foreign relations with other countries.

The study highlights the importance of effective interaction among the key factors to achieve the comprehensive goals of the future of creative tourism in Iran. By evaluating the impact of different variables and their priorities, tourism planners can make low-risk decisions and develop realistic and credible strategies, goals, tactics, and action plans for the future of creative tourism.

The study suggests that the government's serious determination to lift sanctions and pave the way for foreign investors can stimulate the development of creative tourism in Iran. It also emphasizes the need to reduce tensions with neighboring countries and establish foreign relations based on mutual recognition and respect to attract foreign investment and stimulate the growth of the tourism industry, including creative tourism.

Overall, this study provides a valuable insight into the key factors and scenarios that can influence the future of creative tourism in Iran. It highlights the need for systematic recognition of these influences to make informed decisions and develop effective strategies for the sustainable development of creative tourism.

5.1. Practical concepts and limitations

This study aimed to identify the major factors affecting the creative tourism market in Iran and their implications for national and regional development strategies in the long run. While some of these factors are general and relate to all guest communities, others are specific to attracting capital from Middle Eastern countries, such as improving political relations and digital advertising and marketing. However, there are limitations to the study that need to be acknowledged. The MicMac software was used to analyze the direct and indirect dependence of the identified variables in five coverages, which showed the weak, moderate, and strong relationships between the variables. The influence graph, denoted by red and blue lines, showed the relationships between the variables and how they influenced each other. The spatial structure of the direct driving forces of creative tourism development in Iran at a rate of 25%, which are the most important indicators in the spatial structure of Iran's creative tourism development system.

The first limitation is the difficulty in ensuring the accuracy of the results since predictions and recommendations cannot be judged until the future arrives. Measuring realistic threats and evaluating the vulnerabilities and consequences of new pandemics are challenging tasks. To minimize this limitation, the study attempted to make the horizon of futurism as realistic as possible.

The second limitation is that it is impossible to experience and test the future in the present, making any idea potentially unscientific. To address this limitation, the study avoided making predictions with no rational roots and relied on logical reasoning from experts to support its findings.

Another limitation is the lack of previous similar local studies, which could have provided a valuable point of reference. Additionally, the study was limited by the lack of experts with specialized knowledge about the subject under study. The accuracy of the structural analysis results depends on the rankings of experts and elites in the study, which can be biased if the panel is dominated by one area of expertise. Therefore, a multidisciplinary team should be considered. Furthermore, the extensive definitions of the variables make estimating the time for the development process difficult, and the estimation process is highly intuitive because experts deal with an uncertain future.

In conclusion, while this study identified major factors affecting the creative tourism market in Iran and their implications for development strategies, there are limitations to its findings. Future studies should aim to address these limitations and build on the insights provided by this research to support the sustainable growth of the creative tourism market in Iran.

On behalf of authors this paper has not contained any sources of conflict of competing interests.

REFERENCES

1. Abedi, S., & Sedaghat, M. (2019), *Determining the Components of Economic Development of Iranian Tourism with Emphasis on Climate Change*, Quarterly Journal of Environmental Economics and Natural Resources (EENR), 3 (7). DOI: 10.22054/EENR.2020.12489
2. Assaker, G., Hallak, R., Vinzi, V. E., & O'Connor, P. (2014), *An empirical operationalization of countries' destination competitiveness using partial least squares modeling*, Journal of Travel Research, 53 (1), p. 26-43. DOI: https://doi.org/10.1177/0047287513481275
3. Bastenegar, M., Hasani, A., & Khakzar Befruee, M. (2017), *The Design of Creative Tourism Conceptual Model*, Journal of Tourism and Development, 6 (2), p. 81-108. DOI: 10.22034/JTD.2020.110411
4. Connell, J., & Page, S. J. (2008), *Exploring the spatial patterns of car-based tourist travel in Loch Lomond and Trossachs National Park, Scotland*, Tourism Management, 28 (3), p. 561–580. DOI: doi.org/10.1016/j.tourman.2007.03.019

5. Daniali, S., & Sharifzadegan, M. H. (2019), *Strategic Urban Development Planning Based on Scenario writing Approach (Case Study: Qazvin City)*, Journal of Geographical Engineering of Territory (JGET), 3 (6). URL: http://www.jget.ir/article_105903.html
6. Dogru, T., Suess, C., & Sirakaya-Turk, E. (2020), *Why do some countries prosper more in tourism than others? Global competitiveness of tourism development*, Journal of Hospitality & Tourism Research, 45 (1), p. 215-256. DOI: https://doi.org/10.1177/1096348020911706
7. Duxbury, N., & Richards, G. (2019), *Towards a research agenda for creative tourism: Developments, diversity, and dynamics*, in: Duxbury, N., & Richards, G. (eds.), *A research agenda for creative tourism*, DOI: https://doi.org/10.4337/9781788110723.00008
8. Fletcher, J. E., & Archer, B. H. (1991), *The development and application of multiplier analysis*, Progress in Tourism, Recreation and Hospitality Management, 3, p. 28-47.
9. Gato, M. A., Costa, P., Cruz, A. R., & Perestrelo, M. (2020), *Creative tourism as boosting tool for placemaking strategies in peripheral areas: Insights from Portugal*, Journal of Hospitality & Tourism Research, 1096348020934045. DOI: 10.1177/1096348020934045
10. Ghalehteimouri, K. J., Mousavi, M., Hekmatnia, H., & Kashkouli, A. B. (2020), *Providing a comprehensive model of inter-sectoral coordination with the express purpose of the creative city realization: Case study of Yazd city*, UXUC-User Experience and Urban Creativity, 2 (2), p. 22-41.
11. Ghalehteimouri, K. J., Shamaei, A., & Ros, F. B. C. (2021), *Effectiveness of spatial justice in sustainable development and classification of sustainability in Tehran province*, Regional Statistics, 11 (2), p. 52-80.
12. Gholami, M., Rastegar, M., Abdellahi, A., Mirjafari, R. (2015), *Identification and Prioritization of Tourism Development Strategies in Shiraz Applying SWOT technique and ANP model*, Geography and Environmental Sustainability, 5 (2), p. 83-97. URL: https: / /ges.razi.ac.ir/article_405.html
13. Godet, M. (2000), *The art of scenarios and strategic planning: tools and pitfalls*, Technological Forecasting and Social Change, 65 (1), p. 3–22. DOI: https://doi.org/10.1016/S0040-1625(99)00120-1
14. Holjevac, A. I. (2003), *A Vision of Tourism and the Hotel Industry in the 21st Century*, Hospitality Management, 22. DOI: https://doi.org/10.1016/S0278-4319(03)00021-5
15. Hung, W.-L., Lee, Y.-J., & Huang, P.-H. (2016), *Creative experiences, memorability and revisit intention in creative tourism*, Current Issues in Tourism, 19 (8), p. 763-770. DOI: https://doi.org/10.1080/13683500.2013.877422
16. Isler, T. (2008), *"Where Bed Taxes Go"*, Meetings and Conventions, February 1. URL: http://www.meetings-conventions.com/News/Features/Where-Bed-Taxes-Go/?p=2
17. Javanshiri, M., Anabestani, A. A., & Sojasi Qeidari, H. (2020), *Analysis and Foresight of Physical Developments of Rural Settlements in the Suburbs of Mashhad Metropolis*, Scientific Quarterly of Spatial Planning, 10 (2). DOI: 10.22108/sppl.2020.120020.1443

18. Lee, J., & Lee, H. (2015), *Deriving strategic priority of policies for creative tourism industry in korea using AHP*, Procedia Computer Science, 55, p. 479-484. DOI: https://doi.org/10.1016/j.procs.2015.07.018
19. Maisel, E. (2009), *Bridging the artist-tourist gap*, in: Wurzburger, R., Pratt, S. and Pattakos, A. (eds.), *Creative Tourism. A global conversation*, Sunstone Press, p. 171-182.
20. Maleki, S., & Amiri Fahliani, M. R. (2019), *The Interrelationship between Strategic Management and Tourism in the Age of Globalization*, Quarterly Journal of Strategic and Macro Policies, 8 (4). DOI: 10.32598 / JMSP.7.4.8
21. McGehee, Nancy G., Fang Meng, and Yodmanee Tepanon (2006), *Understanding Legislators and Their Perceptions of the Tourism Industry: The Case of North Carolina, USA, 1990 and 2003*, Tourism Management 27 (4), p. 684–94. https://doi.org/10.1016/j.tourman.2005.02.008
22. McKercher, B., & Du Cros, H. (2002), *Cultural tourism: The partnership between tourism and cultural heritage management*, Routledge, New York.
23. Mehdizadeh, J. (2019), *Scenario Planning, a New Step in Strategic Planning*, Journal of Urban Planning, 32. URL: https://www.magiran.com/paper/915859
24. Movahed, A., & Jafarpour Ghalehteimouri, K. (2019), *The importance of the concept and meaning of place in tourism geography*, Journal of Tourism, Hospitality and Environment Management, 4 (16), p. 1-9.
25. Morab, Y., Heidari, O., & Salehi, E. (2015), *Strategic Analysis of the Role and Function of Tourism in Regional Development (Case Study of Maragheh)*, Studies of Urban Structure and Function, 5 (16). DOI: 10.22080/SHAHR.2018.2016
26. Nematpour, M., Khodadadi, M., & Rezaei, N. (2020), *Systematic Analysis of Development in Iran's Tourism Market in the Form of Future Study: A New Method of Strategic Planning*, Futures, 2020.
DOI: https://doi.org/10.1016/j.futures.2020.102650
27. Osman, Z., & Sentosa, I. (2013), *Mediating Effect of Customer Satisfaction on Service Quality and Customer Loyalty Relationship in Malaysian Rural*, International Journal of Economics, Business and Management Studies, 2 (1), p. 25-37.
28. Rabbani, T. (2012), *Application of Future Research Approach and Strategic Thinking in Urban Development Planning*, Master's Thesis in Geography and Urban Planning, University of Tehran, Iran. URL: https://ut.ac.ir/fa/thesis/31070
29. Rahimi, M., Mardali, M., Daha, E., & Fallahzadeh, A. R. (2013), *Creative City (Theoretical and Indicative Foundations)*, Knowledge of the City, 196, p. 36-39. URL: http://journals.miau.ac.ir/article_3087.html
30. Remoaldo, P., Matos, O., Freitas, I., Gôja, R., Araújo Alves, J., Ribeiro, V., Pereira, M. & Xavier, C. (2020), *An international overview of certified practices in creative tourism in rural and urban territories*, Journal of Hospitality & Tourism Research, 46 (8), p. 1545-1573.
31. Richards, G. (2009), *Tourism development trajectories – from culture to creativity? Tourism research and marketing*, in: Asia-Pacific Creativity Forum on Culture and Tourism, Barcelona, Jeju Island, p. 3-5.
32. Richards, G. (2011), *Creativity and tourism: The state of the art*, Annals of Tourism Research, 38 (4), p. 1225-1253. https://doi.org/10.1016/j.annals.2011.07.008

33. Richards, G. (2016), *The challenge of creative tourism*, Ethnologies, 38 (1-2), p. 31-42. DOI:10.7202/1041585ar
34. Richards, G. W. (2011), *Cultural tourism trends in Europe: a context for the development of Cultural Routes*, in: Impact of European Cultural Routes on SMEs' innovation and competitiveness, p. 21-39, Council of Europe Publishing.
35. Richards, G., & Raymond, C. (2000), *Creative tourism*, ATLAS News, 23, p. 16-20. URL: https://www.researchgate.net/publication/254822440_Creative_Tourism
36. Safaeipour, M., & Jafari, Y. (2021), *Analysis of the Situation of Creative Tourism Components in Tabriz Metropolis as the Tourism Capital of Islamic Countries*, Journal of Applied Research in Geographical Sciences, 21 (60). DOI: 10.52547/jgs.21.60.107
37. Tan, S. K., Kung, S. F., & Luh, D. B. (2013), *A model of 'creative experience' in creative tourism*, Annals of Tourism Research, 41, p. 153-174. DOI: https://doi.org/10.1016/j.annals.2012.12.002
38. Tan, S. K., Luh, D. B., & Kung, S. F. (2014), *A taxonomy of creative tourists in creative tourism*< Tourism Management, 42, p. 248-259. DOI: https://doi.org/10.1016/j.tourman.2013.11.008
39. Witt, S. F., & Moutinho, L. (1994), *Tourism marketing and management handbook*, Prentice Hall.
40. Yozcu, Ö. K., & İçöz, O. (2010), *A model proposal on the use of creative tourism experiences in congress tourism and the congress marketing mix*, PASOS. Revista de Turismo y Patrimonio Cultural, 8 (3), p. 105-113. DOI:10.25145/j.pasos.2010.08.038

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 37-57)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.02

SEEKING ECONOMIC BALANCE: SPATIAL ANALYSIS OF THE INTERACTION BETWEEN SMART SPECIALISATION AND DIVERSIFICATION IN ROMANIAN MOUNTAIN AREAS

Alexandru-Sabin NICULA[1,4], Veronica ȚARAN-BACIU GEORGESCU[2], Emanuela-Adina NICULA[3], Matei DOMNIȚA[3], Bogdan-Nicolae PĂCURAR[4]

ABSTRACT. Seeking Economic Balance: Spatial Analysis of the Interaction Between Smart Specialisation and Diversification in Romanian Mountain Areas. This research article delves into the intricate relationship between smart specialisation and economic diversification within the unique context of Romanian mountain regions. As regions characterized by their geographical isolation and distinctive socioeconomic challenges, mountain areas in Romania stand as vital territories where balanced economic development is crucial. In this study, we employ a comprehensive spatial analysis to explore how the European Union's concept of "smart specialisation" and the imperative for diversification intersect within these mountainous areas. The investigation combines both qualitative and quantitative methods, utilizing spatial data and GIS techniques. Findings reveal the intricate interplay between smart specialisation and diversification efforts, highlighting the necessity for adaptable policies that respond to the unique challenges and opportunities present in Romanian mountain areas. The study also offers recommendations for policymakers, emphasizing the importance of custom-tailored approaches that consider the geographic, social, and economic idiosyncrasies of these regions. Ultimately,

[1] *"Costin C. Kiriţescu" National Institute for Economic Research / School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, 13 Septembrie Avenue, 13, Sector 5, 050711, Romanian Academy House, Bucharest, Romania, e-mail: sabin.nicula@ince.ro*

[2] *Doctoral School of Economics II, Bucharest University of Economic Studies, Piața Romană 8, 010375, Bucharest, Romania, e-mail tbaciuveronica@yahoo.com*

[3] *Mountain Economy Center / "Costin C. Kiriţescu" National Institute for Economic Research, Romanian Academy, Petreni St., 49, 725700, Vatra Dornei, Romania, e-mail emanuela.nicula@ce-mont.ro*

[4] *Centre for Research on Settlements and Urbanism, Faculty of Geography, Babeş-Bolyai University, Clinicilor St. 5-7, 400006, Cluj-Napoca, Romania, e-mail pacurarbogdan@ymail.com*

this research article contributes to a deeper understanding of the complex relationship between regional development strategies and the specific needs of mountainous territories. By shedding light on the practical implications of smart specialisation and diversification in Romanian mountain areas, it offers valuable insights for policymakers, researchers, and practitioners working towards sustainable and balanced economic growth in similar regions worldwide.

Keywords: *smart specialisation, diversification, regional development, economic growth, mountain areas*

1. Introduction

Smart specialization and diversification are two crucial concepts that have a pivotal role in regional development and economic growth. Rather than acting as "antagonists" in the grander scheme of regional development, smart specialization and diversification have the ability to be applied in tandem and are able to successfully complement each other despite their apparent defining features.

In response to these challenges, the European Union has introduced smart specialization strategies as a means to stimulate economic growth in the most disadvantaged regions. Smart specialization strategies are designed to encourage regions to identify and invest in their distinctive competitive advantages. These strategies, officially called Research and Innovation Strategies for Smart Specialisation (RIS3) were introduced as a tool to achieve a paradigm shift in the structure of regional innovation policies as reported by Hassink and Gong (2019).

According to Balland et al. (2019, p.1252): "at the core of this development strategy is smart specialization, a vision of regional growth possibilities built around existing place-based capabilities", aspect sustained also by the work of McCann and Ortega-Argilés (2015), Foray, David & Hall (2009, 2011), Barca (2009). Leaving from the assumption that different regions around Europe are confronting themselves with the diversification dilemma, Balland et al. (2019) indicate that it is mandatory to develop innovating, intricate technologies that leverage their existing local capabilities. They also appealed to these insights to establish a policy framework for intelligent specialization, emphasizing the possible advantages and drawbacks for regions when they pursue competing diversification strategies. The concept of smart specialization originated from the notion that European Union regions possess distinct economic and institutional frameworks that influence their potential for future development, as suggested by Kroll (2015).

Primarily formulated by Foray in 2015, smart specialization comprises two distinct connotations: the conceptual and the policy strategy one (Hassink and Gong, 2019) and "represents an explicit, place-based and place-sensitive approach, emphasizing prioritization and selectively through non-neutral, vertical policies aiming at diversified specialization" (Hassink and Gong, 2019, pp. 2058-2059, Boschma, 2014).

Despite the fascinating soaring academic interest in the smart specialization concept which has many positive characteristics (Buyukyazici, 2023; Balland and Boschma, 2021; Balland et al., 2019; Asheim, 2019; Fellnhofer, 2018; Radosevic et al., 2017; Foray, 2015; Aprahamian and Correa, 2015; Boschma, 2014) there is also the reverse side that focuses on seeing things through a critical lens. In this respect, Hassink and Gong (2019, p. 2049) point out, among other things, that "smart specialization is a confusing concept, as what it really means is diversification", is not "a brand-new policy instrument", "structurally weak regions might be less likely to benefit from smart specialization" and "more rigorous measurements of smart specialization are still needed". Some authors, even if overall are sympathetic to most of the elements of smart specialization, indicate that the strategy was formulated within a remarkably brief time frame (Foray, 2015) and consequently, there has been limited time between its conceptualization and actual implementation (Hassink and Gong, 2019). Other findings show that there is an increasing conceptual ambiguity and lack of clarity within the framework of smart specialization because under its umbrella there are a lot of related terms such as: diversification, regional branching, relatedness, variety (Whittle and Kogler, 2020; Balland et al., 2019; Hassink and Gong, 2019; Boschma, 2017; Montresor and Quatraro, 2017; Asheim, Grillitsch and Trippl, 2017), in particular, the failure to distinguish between specialization and diversification has been posing difficulties. Therefore, important critical questions arise, fact highlighted by Hassink and Gong (2019), such as: what unique insights does the smart specialization concept provide when compared to these alternative concepts? What justifies the push for all regional economies to intensify their specialization when, in certain instances, diversification might be the superior strategy? That needs to be addressed in future research.

There has been a long debate whether an economy ought to be diversified or highly specialized (Hoover, 1948; Richardson, 1969; Quigley, 1998; Beaudry and Schiffauerova, 2009) as for instance localization economies have been found to be a force for specialization, not diversification, while for an economy to add new activities it needs to be able to draw easily from a shifting array of inputs, a diversified economy being able to do this better than specialized one (Kemeny and Storper, 2015). Jacobs (1969) wrote that our ancestors did not expand their own economies much by doing more of what they had been doing

already. They actually expanded their economies by adding (diversifying) new kinds of work, similarly to what we are currently and should be doing. Half a century later, Crespo et al. (2017) stated that, rural as well as urban areas cannot perform everything and anything at the same time, first they must aim to *specialize* and second they must be *smart* about it in order to focus and promote those economic spheres in which they can develop a unique knowledge base, hence strive towards a *smart specialization*.

However, some suggest that "smart" specialisation should be aimed at preserving some, if not all, existing specialisations in addition to gaining new ones. For instance, Nomaler and Verspagen (2023) declared that countries or even regions should diversify into activities that are related to their current set of activities, thus bringing the concept of diversification to the forefront of regional development research and pairing it with the novel smart diversification frame of reference. Both lines of thought are placed-based and place-oriented and, at the same time, smart specialization does not exclude diversification. It does not reinforce already locally strong activities nor does it engage in blind and baseless diversification into what is "cool" at that moment. In other words, rather than blindly replicating best practices found elsewhere, regions may smartly choose their new domains of specialisation based on their already existing strengths and diversify starting from that point (Crespo et al., 2017). In fact, diversification may be crucial in order to reduce future economic shocks and move economies towards a more sustainable growth, such as the case put forward by Callen et al. (2014) and Al-Roubaie (2018) when discussing oil-based economies.

Our research endeavour focuses on the complex relationship between smart specialization and economic diversification in Romanian mountain regions, which encompass roughly one third of the entire territory of the country and is overwhelmingly represented by the Carpathian range. Because of increased geographical isolation as well as an idiosyncratic social and economic climate, punctuated by moderately troubled urban areas and an expansive yet lagging rural hinterland, this analysis aims to show the duo's relationship with sustainable and balanced regional economic growth as well as their geographical representation and expression in above mentioned areas. The importance of our research approach resides from the fact that "each region should identify transformation priorities that reflect and amplify existing local structures and competences, and thus produce original and unique competitive advantages" (Foray, 2015, p. 2). Also, there is one idea that stands out above all others in this discussion, that is the concept of region, of geographic location, and the scientific literature on regional diversification and specialisation is in need of more geographic wisdom (Boschma, 2017). Thusly, we believe that this makes

our scientific endeavour, our focus on the mountain regions of Romania and the practical implications of smart specialisation and diversification in this heterogenous natural, social and economic system, more pivotal than ever.

2. Smart specialization and diversification: a short introduction and clarification

Smart specialization/specialisation (the scientific literature uses both forms for the same syntagm) was developed in 2008 by a group of experts as a policy instrument rapidly gained popularity on the policy audience, especially within Europe (Foray, David and Hall, 2011). The same authors indicate that the concept is not new at all and the novelty lies in the analytical depiction of the phenomenon, providing a handful of insights and directions for policymaking.

Morgan (2013) and Santoalha (2019) find that smart specialization comprises three distinct challenges: conceptual, operational and political; the first refers to the meaning of the concept; the other encompass translating it into a strategy and applying it to a specific territory.

Balland et al. (2019, p.1252) delved into the topic, scrutinizing it from all angles, and their reference study which gained worldwide acclaim with extensive citations highlighted that: "the goal of smart specialization is not to make the economic structure of regions more specialized (i.e., less diversified), but instead to leverage existing strengths, to identify hidden opportunities and to generate novel platforms upon which regions can build competitive advantage in high value-added activities".

Smart specialization represents arguably the most significant endeavour in the history of orchestrated, supranational innovation strategies aimed at enhancing economic growth through diversification. Therefore, smart specialization embodies a novel industrial policy seeking to foster the development of new pathways and economic diversification, surpassing the confines of a narrowly defined regional innovation strategy (Asheim, Grillitsch and Trippl, 2017).

In the smart specialization approach, the term "smart" pertains to the method of identifying domains of competitive advantage, known as "entrepreneurial discovery". However, the focus is not solely on the role of traditional entrepreneurs, leading to a policy that goes beyond individual entrepreneurial projects such as firm formation. As highlighted in discussions on smart specialization, the term "entrepreneurial" is broadly defined to encompass all actors, including individual entrepreneurs, organizations (such as firms and universities engaged in intrapreneurship, knowledge-based entrepreneurship, and spin-offs), and agencies

(such as technology transfer offices and public development agencies) that possess the capability to discover domains ensuring both existing and future competitiveness (Asheim, Grillitsch and Trippl, 2017).

McCann and Ortega-Argilés (2015, p.1292) have the opinion that: "the original smart specialization concept assumes that context matters for the potential technological evolution of innovation systems (knowledge ecology)", Weidenfeld (2018, p. 2) noting that: "the smart specialisation agenda tends to focus on science and high technology-related industries, it has neglected low-tech industries such as tourism".

It is obvious by now that one cannot talk about smart specialization without bringing the diversification concept to the front, even if the literature indicates that there is a lacking distinction between the two concepts (Hassink and Gong, 2019; Hassink and Lagendijk, 2001).

Weidenfeld (2018) refers to diversification as being an economic growth strategy, alongside with innovation, and means the expansion of a product or a sector into a new market instead of specializing in a single product.

The literature on regional diversification asserts that regions expand into new activities that are connected to their existing endeavours, leveraging and combining local capabilities in the process (Boschma, 2017; Rigby, 2015; Neffke, Henning and Boschma, 2011).

The concept that new technology emerges from pre-existing ideas has revived discussions regarding the advantages and disadvantages of regional diversity (Balland, Rigby and Boschma, 2015; Essletzbichler, 2015). Frenken, Van Oort, & Verburg (2007), propose that the crucial factor is not just the overall diversity of sectors across regions but rather the degree to which elements of that diversity are interconnected. Balland et al. (2019) observed that the relatedness has a positive impact on technological diversification within regions. While diversifying into intricate technologies poses challenges for numerous regions, it becomes more feasible when these technologies are closely related to the existing knowledge base of the region. Moreover, regions tend to experience more growth when they specialize in complex technologies that are linked to the existing technologies in that region.

Boschma (2017) mentions some critical aspects that led to ongoing debates concerning diversification with focus on: capabilities, related and unrelated diversification, geographical wisdom, identifying the agents that propel the process of regional diversification. In this respect, Tanner (2014) agrees that it is very important to know what capabilities matter most in regional diversification, Isaksen and Trippl (2014) stress about examining the factors that facilitate both the regional diversification of a more related and a

more unrelated type, Xiao, Boschma and Andersson (2016) reflect upon the uncertainty of what type of diversification prevails in certain regions as compared to other regions, Binz, Truffer and Coenen (2014) call out for a multi-scalar approach when assessing the importance of local and non-local capabilities.

Table 1. Smart Specialisation vs Diversification in scientific literature

Literature highlights	
Smart specialization means	Diversification means
o An influential policy strategy (Hassink and Gong, 2019); o "...the deployment and variation of innovative ideas in a specialised area, that generate knowledge about the future economic value of a possible direction of change" (Foray, 2015, p. 25); o It is grounded in existing structures and associated potential diversification opportunities, with a focus on strengthening local connections (a place-based approach), fostering the development of innovative ideas, and promoting entrepreneurial initiatives (McCann and Ortega-Argilés, 2013); o Diversified specialization (Asheim, Grillitsch and Trippl, 2017) or smart diversification (Balland et al., 2019; Piirainen, Tanner and Alkærsig, 2017; Boschma and Gianelle, 2014); o Diversified specialization involves focusing on areas of existing or potential competitive advantage, thereby distinguishing a region or nation from others (Asheim, Grillitsch and Trippl, 2017).	o An economic growth stratregy (Weidenfeld, 2018); o "…the expansion of a product or a sector into a new market rather than specialising in a single-product" (Weidenfeld, 2018, p. 4); o Developing new growth ways "... whereby new activities develop out of existing ones, but the scope and outcome are fundamentally affected by technological and cognitive constraints" (Boschma and Gianelle, 2014 p. 1); o "…process whereby new industries emerge from technologically related or unrelated industries in regions, where existing competences are recombined as new economic activities" (Weidenfeld, 2018, p. 9);

Even if smart specialization is described as a process of related diversification, Santoalha (2019), Asheim, Grillitsch and Trippl (2017) notice that smart specialization can lead to either related or unrelated diversification, contingent on the regional strategy employed. Additionally, Fagerberg & Shrolec (2016) express scepticism regarding a smart specialization strategy exclusively focused on pursuing a related diversification path. Nevertheless, consensus exists among several authors that smart specialization fundamentally involves diversification.

After diving deep into scientific literature about the two concepts the general conclusion is that smart specialisation is intricately linked and strongly associated to the idea of diversification and it is basically a strategy for economic diversification.

3. Data and Methods

To identify smart specialisation or diversification we used two indicators: the main company economic activity, represented by its main NACE code (Nomenclature of Economic Activities) and the number of employees. NACE is the European standard classification of productive economic activities. NACE presents the universe of economic activities partitioned in such a way that a NACE code can be associated with a statistical unit carrying them out (European Commission, 2023). Like most European countries, Romania uses a NACE code consisting of four digits, each representing a different level of specificity. Each digit progressively narrows down the classification of economic activities, from broad sections to specific classes. This hierarchical structure allows for standardized and detailed categorization of economic data depending on the study scope.

To identify the main economic activities and indicators for our study, we used company data published on the Ministry of Finance website. According to order no. 1420/2021 regarding the publication of public information on the server of the Ministry of Finance (Ministry of Finance, 2021), registration data about all companies can be found on the ministry website. Along with these data, the balance sheets from the last 6 years can be seen or downloaded. Each company has the balance sheets available on the web with the following information: Current Assets, Stocks, Claims, Prepayments, Debts, Advance Income, Provisions, Capital, Paid-Up Subscribed Capital, Heritage of Royalty, Net Turnover, Total Turnover, Total Expenditure, Profit, Loss, Average Number of Employees, Type of Activity.

There is no integrated freely accessible database with Romanian company data at the moment, so we had to use web scraping techniques to gather these data. Web scraping involves using computer software to extract information from websites, mimicking human browsing behaviour and enabling faster and more accurate data gathering compared to manual methods (Lawson, 2015). We used a Python script to access these freely available data, gather the relevant entries and organize it. For this study, we only used the balance sheet for year 2021 because we do not focus on the evolution of the economy at the moment but on its distribution over different sectors. Using automated web scraping we downloaded 138114 companies in the mountain area and we used these as the main data for our study. We got the Name, Address, NACE, City, County, Fiscal code, Turnover, Profit and Employee numbers for each of these companies in the study area and stored it in a SQL table for easy processing, filtering and querying.

According to Modral (2021) the key areas to consider when it comes to measuring growth are Turnover growth, Employee growth and Market share. We used two ways to analyse the significance of a business in the economic landscape, based on turnover and the number of employees. This data may be enough to draw some conclusions regarding economy diversity or specialization but we need each company's location to be able to identify diversified or concentrated zones.

However, the study area has some geographic specificity that makes location very important to the economic development. In the digital era, spatial information holds significant value and is considered crucial in various contexts. Among the different methods to obtain spatial data, interpreting addresses stands out as the simplest approach since addresses serve as the primary means for location description. The process of converting addresses into geographic coordinates is known as geocoding, which represents a fundamental operation in geographic information systems (GISs) (Longley et al., 2005). Geocoding plays a vital role in enabling the integration and analysis of spatial data.

For this study, we geocoded the locality from the address of each company to link the companies to their corresponding administrative divisions. Once all the companies are located, we can use this location data along with the NACE code and the metrics from the balance sheet to examine economic characteristics in the area. The whole process of gathering and processing the data can be seen in the figure 1.

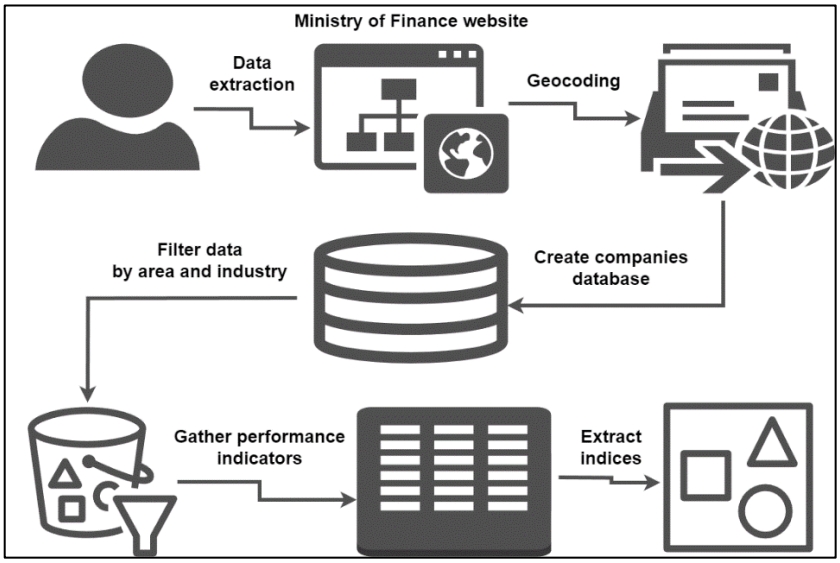

Fig. 1. Data workflow.
Source: the authors

The approach to identify specialization is the Herfindahl-Hirschman Index (HHI), which is a commonly accepted measure of market concentration. HHI is a mathematical concept which represents the sum of the squared ratio of market share of each firm competing in a market. The formula can be seen in the following figure (US Dept Justice, 2023):

$$\mathrm{HHI} = \sum_{i=1}^{n} (\mathrm{Si})^2$$

where:
$\mathrm{HHI} = \mathrm{Herfindahl} - \mathrm{Hirschman\ Index}$
$\mathrm{Si} = \mathrm{Market\ share\ of\ the\ i} - \mathrm{th\ industry\ in\ the\ economy}$

The HHI takes into account the relative size distribution of the firms in a market. It approaches zero when a market is occupied by a large number of different activities of relatively equal size and reaches its maximum of 10,000 points when a market is controlled by a single firm. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases (US Dept Justice, 2023). The U.S. Department of Justice considers a market with an HHI of less than 1,500 to be a competitive

marketplace, a HHI of 1,500 to 2,500 to be a moderately concentrated marketplace, and a HHI of 2,500 or greater to be a highly concentrated marketplace. We extrapolated the calculation of the HHI on whole economic branches (NACE codes) instead of firms. The formula applies to any metric that can define the market share. One of the main metrics that defines a company size is turnover and we decided to use this metric for calculation. Using turnover, the market share can be defined as (U.S.Department of Justice, 2023):

$$S_i = T_{ij}/T_i$$

where:
T_{ij} is Turnover for the jth NACE code of the economy within the territorial unit i
T_i is the total turnover within the territorial unit i

The turnover for each specialization was calculated by summing the turnovers of all companies having the same NACE code. The turnover for a territorial unit was calculated by summing all the turnovers of all companies in that territorial unit. The other metric that defines a company is the number of employees and we decided to use this metric for a parallel calculation. Using number of employees, the market share can be defined as (U.S. Department of Justice, 2023):

$$S_i = E_{ij}/E_i$$

where:
E_{ij} is the number of employees for the jth NACE code of the economy within the territorial unit i
E_i is the total number of employees within the territorial unit i

The number of employees for each specialization was calculated by summing the number of employees from all companies having the same NACE code. The turnover for a territorial unit was calculated by summing the number of employees from all companies in that territorial unit. The results of these calculations can be seen in the next section. A specialized economy refers to an economic structure predominantly focused on a single industry or a limited range of interconnected industries. Such economies often exhibit a high level of concentration and specialization within specific sectors. The specialization may be based on natural resource endowments, comparative advantages, or deliberate policy choices.

4. Results and Discussions

The markets of the vast majority of the administrative-territorial units located in the mountain areas of Romania, both rural and urban, appear to be moderately concentrated when it comes to the Herfindahl-Hirschman Index, especially in terms of turnover, and to a lesser extent, employees. It also becomes clear that there is a higher concentration, both in manpower and certain industries, in the western sectors of the Romanian Carpathians, as clusters of administrative-territorial units which share such a characteristic emerge in the Apuseni heartland and outlying regions as well as Haţeg Basin, Banat (mountain region part) and Poiana Ruscă Mountains. Such areas encompass former logging, mining and heavy industries, which have long concentrated the workforce in that area. Concentration also seems to dominate those urban and rural areas with easy access and lower altitudes such as basins or river valleys penetrating mountain ranges.

Based on turnover we notice that the specialized and diversified localities are relatively even distributed with some small concentrations of specialized economies. We can take into account an entire county as an area of discussion because Romania used to have counties dedicated to a single economic branch (industrial, agricultural, extractive, complex product production). There are some concentrated economy areas, in counties where the main economy is focused on industry or agriculture (see Table 2). The most concentrated economies are in the Mehedinţi, Tulcea, Caraş-Severin, Covasna and Vrancea counties with a HH Index over 3000.

The most diversified economies are in the Vâlcea, Cluj, Neamţ, Harghita and Prahova counties. These fall into the middle range (neither diversified nor specialized) so we cannot talk about a significant diversification. What we notice here is that diversification increases with the size of the economy in the main counties as the top 5 most diversified counties are the most developed from the list.

Based on the number of employees we notice that the specialized and diversified localities are relatively even distributed with some small concentrations of specialized economies (see Table 2). The most concentrated economies are in the Mehedinţi, Timiş, Caraş-Severin, Hunedoara and Vrancea counties with a HH Index over 2500. The most diversified economies are in the Harghita, Bacău, Prahova, Bihor and Cluj counties. These fall into the middle range (neither diversified nor specialized) so we cannot talk about a significant diversification. Cluj is the only county which falls into the specialized economy category. However, all these counties are at the edge of the mountainous area and the localities taken into account do not reflect the entire county economy as lots of localities from these counties fall outside the mountain area.

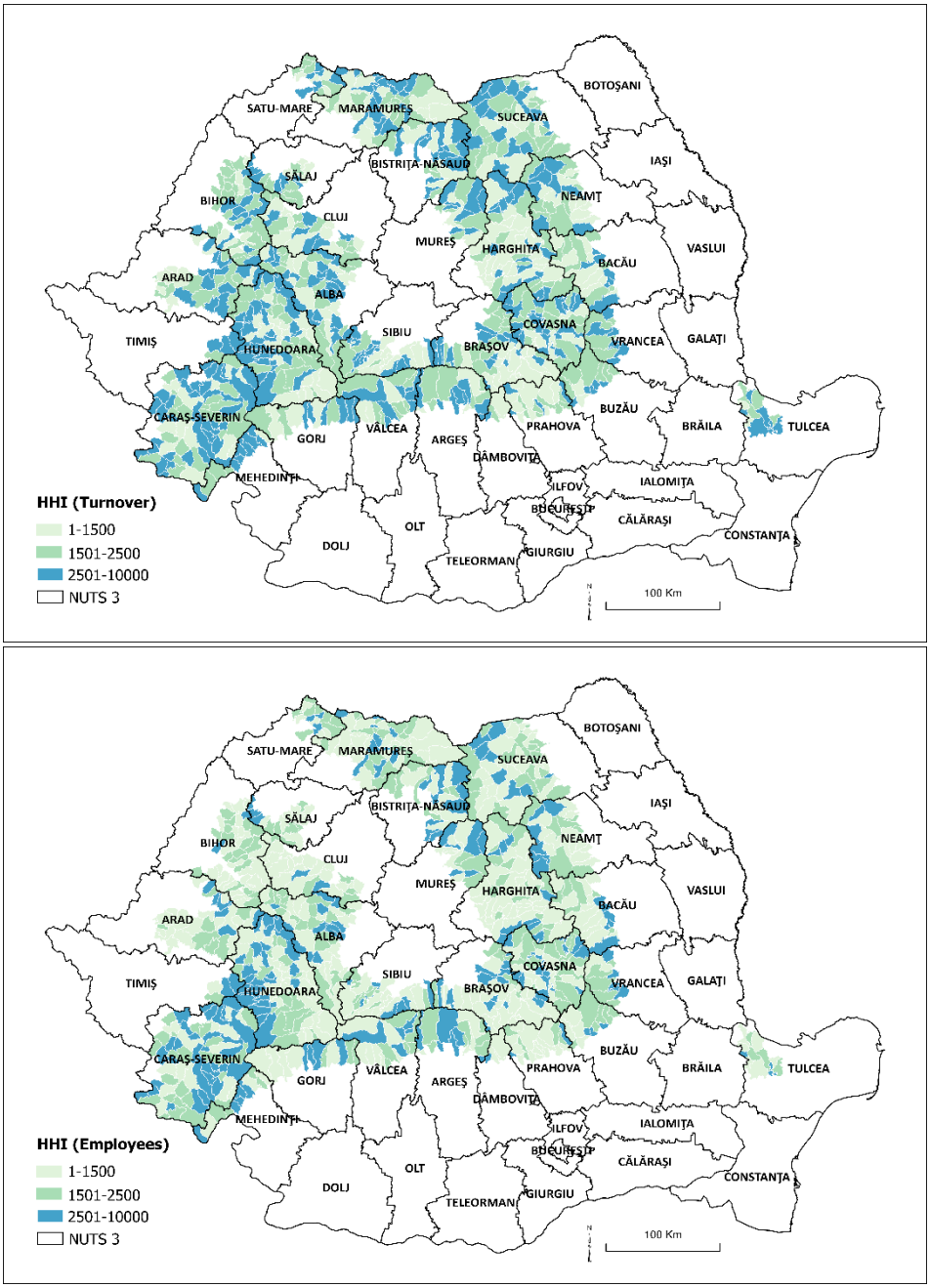

Fig. 2. HH Index based on turnover (up) and employees (down) in mountainous LAU 2 units.
Data source: Ministry of Finance (2021)

Table 2. Mean HH Index for turnover and employees in counties
(from most concentrated to most diversified)

County	HH Index Turnover	County	HH Index Employees
Mehedinți	4617.74	**Mehedinți**	3385.84
Tulcea	3424.66	**Timiș**	2958.74
Caraș-Severin	3216.76	**Caraș-Severin**	2778.59
Covasna	3118.94	**Vrancea**	2769.40
Vrancea	3014.92	**Hunedoara**	2667.93
Timiș	2960.53	**Covasna**	2487.36
Arad	2902.49	**Mureș**	2412.62
Bistrița-Năsăud	2835.05	**Argeș**	2300.45
Hunedoara	2834.39	**Gorj**	2263.80
Argeș	2818.29	**Tulcea**	2234.40
Gorj	2739.26	**Arad**	2222.71
Buzău	2734.22	**Bistrița-Năsăud**	2122.64
Satu Mare	2700.92	**Vâlcea**	2098.19
Alba	2609.96	**Sibiu**	2077.56
Mureș	2601.28	**Satu Mare**	2033.83
Sălaj	2571.10	**Buzău**	1945.43
Dâmbovița	2528.95	**Brașov**	1935.35
Sibiu	2520.28	**Alba**	1922.56
Suceava	2499.40	**Dâmbovița**	1872.78
Bacău	2403.48	**Sălaj**	1800.52
Brașov	2386.17	**Maramureș**	1787.27
Maramureș	2327.66	**Suceava**	1755.95
Bihor	2261.64	**Neamț**	1744.41
Vâlcea	2250.24	**Harghita**	1716.73
Cluj	2198.49	**Bacău**	1652.81
Neamț	2159.29	**Prahova**	1569.09
Harghita	2139.31	**Bihor**	1509.71
Prahova	2128.83	**Cluj**	1315.91

Table 3. Smart specialisation and diversification according to turnover and number of employees in selected local administrative units

TURNOVER	**SMART SPECIALISATION**	**DIVERSIFICATION**
2500 – 10,000	Ciudanoviţa (CS), Igneşti (AR), Lelese (HD), Tomeşti (AR), Bulzeştii de Sus (HD), Sviniţa (MH), Podeni (MH), Bârsăneşti (BC), Tureni (CJ), Reci (CV)	Ştefeşti (PH), Pestişu Mic (HD), Vârfurile (AR), Corbu (Harghita), Chişindia (AR), Mărişel (CJ), Conop (AR), Bughea de Sus (AG), Şuncuiuş (BH), Bogdan Vodă (MM)
1500 – 2500	Ciclova Română (CS), Jijila (Tulcea), Orşova (MH), Romuli (BN), Bătrâni (PH), Bucureşci (HD), Sălişte (SB), Bicaz-Chei (NT), Vatra Moldoviţei (SV), Bicazu Ardelean (NT)	Băile Tuşnad (HR), Meteş (AB), Baia de Criş (HD), Gilău (CJ), Vălişoara (HD), Crasna (GJ), Tulnici (VN), Valea Mare Pravăţ (AG), Racşa (SM), Sălištea (AB)
1 – 1500	Berzasca (CS), Porumbacu de Jos (SB), Măgeşti (BH), Ghimbav (BV), Boroşneu Mare (CV), Slănic-Moldova (BC), Veţel (HD), Mihăileni (HR), Sasca Montană (CS), Uricani (HD)	Bătrâna (HD), Piatra-Neamţ (NT), Sibiu (SB), Alba Iulia (AB), Săcele (BV), Petroşani (HD), Baia Mare (MM), Sfântu Gheorghe (CV), Reşiţa (CS), Floreşti (CJ), Câmpulung Moldovenesc (SV)
EMPLOYEES	**SMART SPECIALISATION**	**DIVERSIFICATION**
Less than 1500	Vaţa de Jos (HD), Micfalău (CV), Drajna (PH), Lazuri de Beiuş (BH), Chiojdu (BZ), Voineasa (VL), Mărtiniş (HR), Marga (CS), Leordina (MM), Păltinoasa (SV)	Ponor (AB), Piatra-Neamţ (NT), Reşiţa (CS), Sibiu (SB), Floreşti (CJ), Odorheiu Secuiesc (HR), Săcele (BV), Sfântu Gheorghe (CV), Braşov (BV), Deva (HD)
1500,1 – 2500	Băiuţ (MM), Dalboşeţ (CS), Chichiş (CV), Vintileasca (VR), Valea Ierii (CJ), Roşia (BH), Negrileşti (VR), Rebrişoara (BN), Corbu (HR), Bistra (MM)	Corbeni (AG), Şuncuiuş (BH), Archiş (AR), Bratca (BH), Racoş (BV), Baia de Arieş (AB), Asău (BC), Brăduţ (CV), Sarasău (MM), Sânzieni (CV)
2500,1 – 10,000	Ciudanoviţa (CS), Bulzeştii de Sus (HD), Bătrâna (HD), Cireşu (MH), Blandiana (AB), Igneşti (AR), Lelese (HD), Tomeşti (HD), Buchin (CS), Reci (CV)	Mărişel (CJ), Lupac (CS), Ribiţa (HD), Lisa (BV), Remeţi (MM), Ciuruleasa (AB), Şanţ (BN), Poian (CV), Sărmaş (HR), Bicazu Ardelean (NT)

Source: the authors

5. Limitations of the study

The first limitation that we must consider is the HH index's sensitivity to scale. As explained, the HHI's increase is characterized by an inverse correlation with the quantity of enterprises in a specific area and is significantly influenced by the magnitude discrepancy among these enterprises. Due to the fact that mountainous areas are mainly rural and rural areas don't usually have a large number of companies, a more specific analysis should consider the economic context and factors influencing each locality. A second noteworthy constraint is the HHI's disregard for non-market activities. All the conclusions above are based on the premise that market activities and for-profit entities constitute the principal catalysts propelling the economy. However, in some rural regions the economy is often characterized by the prevalence of non-market or informal economic activities of considerable significance. These activities include various forms of subsistence agriculture and sale of agricultural products - a very common practice in rural areas. They also include manual labor or different unregistered home-based businesses that may have an important contribution to the local economy given the small dimensions of these rural economies.

Another limitation that applies in areas where the economy is more complex is the fact that the HHI assumes homogeneity of products within industries. In reality, industries may produce a variety of goods or services with differing characteristics, and the index may oversimplify the diversity within an industry.

6. Conclusions

The research results regarding the economies in the mountainous areas of Romania bring to the forefront a series of relevant findings regarding economic concentration and diversification in these specific regions. The study focuses on analysing economic data (NACE rev.2, turnover and number of employees) from the administrative-territorial units in the mountainous areas and highlights several key aspects. The conclusions emphasize a moderate economic concentration in most administrative-territorial units in these mountainous zones, concerning both turnover and the number of employees, in accordance with the Herfindahl-Hirschman Index. Additionally, a higher concentration is observed in both labour force and certain industries in the western sectors of the Romanian Carpathians. These areas previously hosted centres for logging, mining, and heavy industries, significantly influencing the labour force concentration in those regions. Furthermore, it is noted that urban and rural areas situated in

easily accessible areas and at lower altitudes, such as basins or river valleys penetrating the mountain ranges, also exhibit a higher degree of economic concentration. A detailed analysis of economies across different counties reveals diverse patterns. Specialized and diversified economies appear relatively evenly distributed, with some small concentrations of specialized economies. Counties with the most concentrated economies are Mehedinți, Tulcea, Caraș-Severin, Covasna, and Vrancea, while those with more diversified economies are Vâlcea, Cluj, Neamț, Harghita, and Prahova. However, the most diversified counties do not indicate significant diversification, and one remarks that diversification increases with the size of the primary economies in these counties, which also happen to be the most developed on the list.

These findings underscore the importance of understanding economic patterns in mountainous areas and suggest that policies tailored to the geographic, social, and economic specifics of these regions could be more effective in promoting balanced and sustainable economic development. Integrating these findings into regional development strategies could provide a stronger framework for guiding economic policies and promoting economic diversification and sustainability in mountainous areas, not only in Romania but also in similar regions globally.

7. Final remarks

- **Interconnectedness of Smart Specialisation and Diversification**: The study reveals the intricate relationship between the European Union's smart specialisation strategies and the necessity for economic diversification within Romanian mountain areas. It emphasizes the need for a coordinated approach to achieve balanced economic growth.
- **Significance of Spatial Analysis**: Utilizing qualitative, quantitative methods, and GIS techniques, the study highlights the importance of spatial analysis in comprehending the economic landscape of mountainous regions. It underscores the integration of geographical data into economic development strategies.
- **Need for Tailored Policies**: Findings stress the requirement for adaptable policies that cater to the unique challenges and opportunities in Romanian mountain areas. The study suggests that uniform policies are inadequate and urges policymakers to consider the specific geographic, social, and economic characteristics of these regions.
- **Policy Recommendations**: Policymaker guidance focuses on tailored approaches addressing the distinct features of mountainous territories.

Recommendations likely encompass targeted initiatives, infrastructure development, skill-building programs, and fostering local industries and resources.

❖ **Contributions to Regional Development Understanding**: This research contributes to a deeper understanding of the complex relationship between regional development strategies, such as smart specialisation, and the specific needs of regions like Romanian mountain areas. This understanding is vital for global policymakers, researchers, and practitioners striving for sustainable economic growth in similar regions.

❖ **Stakeholder Value**: The study's insights hold significance for various stakeholders involved in regional development, including policymakers, researchers, and practitioners. It provides practical implications for implementing smart specialisation and diversification strategies in similar mountainous regions worldwide.

In essence, this study establishes a foundational understanding of how regional development strategies intersect with the distinctive challenges and opportunities found in Romanian mountain areas. It emphasizes the necessity for adaptable policies tailored to specific regions and offers valuable guidance for sustainable economic growth in similar territories across the globe.

Acknowledgment

This work was supported by the project "The Development of Advanced and Applicative Research Competencies in the Logic of STEAM + Health"/ POCU/993/6/13/153310, project co-financed by the European Social Fund through The Romanian Operational Programme Human Capital 2014-2020".

R E F E R E N C E S

1. Al-Roubaie, A. (2018), *Linkages creation and economic diversification: The case of Muslim countries*, in SHS Web of Conferences, Vol. 56, p. 01001, EDP Sciences.
2. Aprahamian, A., & Correa, P. G. (eds.). (2015), *Smart specialization in Croatia: Inputs from Trade, innovation, and productivity analysis. Directions in development – countries and regions*. The World Bank, Washington DC.
3. Asheim, B. T. (2019), *Smart specialisation, innovation policy and regional innovation systems: What about new path development in less innovative regions?* Innovation: The European Journal of Social Science Research, 32, 8–25. DOI:10.1080/13511610.2018.1491001.

4. Asheim, B., Grillitsch, M., & Trippl, M. (2017), *Smart specialization as an innovation-driven strategy for economic diversification: Examples from Scandinavian regions*. In Advances in the theory and practice of smart specialization, pp. 73-97, Academic Press.
5. Balland, P. A., & Boschma, R. (2021), *Complementary interregional linkages and Smart Specialisation: An empirical study on European regions*, Regional Studies, 55(6), p. 1059-1070.
6. Balland, P. A., Rigby, D., & Boschma, R. (2015), *The technological resilience of U.S. cities*, Cambridge Journal of Regions, Economy and Society, 8(2), 167–184. DOI:10.1093/cjres/rsv007.
7. Balland, P.A., Boschma, R., Crespo, J. and Rigby, D.L. (2019), *Smart specialization policy in the European Union: relatedness, knowledge complexity and regional diversification*, Regional Studies, 53 (9), pp. 1252-1268. DOI: 10.1080/00343404.2018.1437900.
8. Barca, F. (2009), *An agenda for a reformed Cohesion Policy: A place-based approach to meeting European Union challenges and expectations*, Independent report prepared at the request of the European Commissioner for Regional Policy, Danuta Hübner, European Commission, Brussels.
9. Beaudry, C., & Schiffauerova, A. (2009), *Who's right, Marshall or Jacobs? The localization versus urbanization debate*, Research Policy, 38(2), p. 318-337.
10. Binz, C., Truffer, B., & Coenen, L. (2014), *Why space matters in technological innovation systems—Mapping global knowledge dynamics of membrane bioreactor technology*, Research Policy 43(1), p. 138-155.
11. Boschma, R. & Gianelle, C. (2014), *Regional branching and smart Specialisation Policy*, in JRC Technical Reports; Joint Research Centre, Institute for Prospective Technological Studies, Seville, Spain.
12. Boschma, R. (2014), *Constructing regional advantage and smart specialisation: Comparison of two European policy concepts*, Scienze Regionali, 13, p. 51–68. DOI:10.3280/SCRE2014-001004.
13. Boschma, R. (2017), *Relatedness as driver of regional diversification: A research agenda*, Regional Studies, 51(3), p. 351-364.
14. Buyukyazici, D., (2023), *Skills for smart specialisation: Relatedness, complexity and evaluation of priorities*, Papers in Regional Science, DOI:10.1111/pirs.12756.
15. Callen, M. T., Cherif, R., Hasanov, F., Hegazy, M. A., & Khandelwal, P. (2014), *Economic diversification in the GCC: Past, present, and future*, International Monetary Fund.
16. Crespo, J., Balland, P.A., Boschma, R., & Rigby, D., (2017), *Regional Diversification Opportunities and Smart Specialization Strategies*, European Commission, Brussels.
17. Essletzbichler, J. (2015), *Relatedness, industrial branching and technological cohesion in US metropolitan areas*, Regional Studies, 49, p. 752–766. DOI:10.1080/00343404.2013.806793.
18. Fagerberg, J. & Shrolec, M. (2016), *Explaining regional economic performance: the role of competitiveness, specialization and capabilities*, Papers in Innovation Studies, 2016/2.

19. Fellnhofer, K. (2018), *Visualized bibliometric mapping on smart specialization: A co-citation analysis*, International Journal of Knowledge-based Development, 9, p. 76–99. DOI:10.1504/IJKBD.2018. 090502.
20. Foray, D. (2015), *Smart specialisation: Opportunities and challenges for regional innovation policy*, Regional Studies Association, Routledge, Abingdon.
21. Foray, D., David, P. A., & Hall, B. (2009), *Knowledge economists policy brief n 9*, European Commission, Brussels.
22. Foray, D., David, P. A., & Hall, B. H. (2011), *Smart specialisation: from academic idea to political instrument, the surprising destiny of a concept and the difficulties involved in its implementation*, Integration Process in the New Regional and Global Settings, 269.
23. Frenken, K., Van Oort, F. G., & Verburg, T. (2007), *Related variety, unrelated variety and regional economic growth*, Regional Studies, 41(5), p. 685–697. DOI:10.1080/00343400601120296.
24. Hassink, R., & Gong, H. (2019), *Six critical questions about smart specialization*, European Planning Studies, 27(10), p. 2049–2065. DOI:10.1080/09654313.2019.1650898.
25. Hassink, R., & Lagendijk, A. (2001), *The dilemmas of interregional institutional learning*, Environment and Planning C, 19, p. 65–84. DOI:10.1068/c9943.
26. Hoover, E. M. (1948), *The location of economic activity*, McGraw Hill, New York.
27. Isaksen, A. & Trippl, M. (2014), *Regional industrial path development in different regional innovation systems: A conceptual analysis*, Papers in Innovation Studies 2014/17, Lund University, CIRCLE.
28. Jacobs, J. (1969), *The city. The economy of the cities*, Random House, New York.
29. Kemeny, T., & Storper, M. (2015). *Is specialization good for regional economic development?*, Regional Studies, 49(6), p. 1003-1018.
30. Kroll, H. (2015), *Efforts to implement smart specialization in practice – Leading unlike horses to the water*, European Planning Studies, 23(10), p. 2079–2098. DOI:10.1080/09654313.2014.1003036.
31. Lawson, R. (2015), *Web Scraping with Python*, Packt Publishing Ltd.
32. Longley, P., Goodchild, M.F., Maguire, D.J., and Rhind D.W. (2005), *Geographic information systems and science*, John Wiley and Sons, New York.
33. McCann, P., & Ortega-Argilés, R. (2013), *Transforming European regional policy: A results-driven agenda and smart specialization*, Oxford Reviev of Economic Policy, 29, p. 405–431.
34. McCann, P., & Ortega-Argiles, R. (2015), *Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy*, Regional Studies, 49(8), p. 1291-1302. DOI:10.1080/00343404.2013.799769.
35. Ministry of Finance (2021), *OMF no. 1420 privind publicarea pe serverul Ministerului Finanțelor a informațiilor cu caracter public*, Monitorul Oficial al României, Partea I, no.1108 of 22.11.2021 – last accessed on 17.06.2023, https://mfinante.gov.ro/documents/35673/1120722/OMF1420_MO1108.pdf.

36. Modral, E. (2021), *Measuring business growth: The how, when and why of KPIs* https://www.innovateukedge.ukri.org/blog/Measuring-business-growth-how-when-and-why-KPIs#
37. Montresor, S., & Quatraro, F. (2017), *Regional branching and key enabling technologies: Evidence from European patent data*, Economic Geography, 93(4), p. 367-396.
38. Morgan, K. (2013), *The regional state in the era of smart specialization*, Ekonomiaz, 83, p. 102– 125.
39. NACE rev. 2 - European Commission – last accessed on 17.06.2023 https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF.
40. Neffke F., Henning M. & Boschma, R. (2011), *How do regions diversify over time? Industry relatedness and the development of new growth paths in regions*, Economic Geography, 87(3), p. 237–265.
41. Nomaler, Ö., & Verspagen, B. (2023), *Related or unrelated diversification: What is smart specialization?*, arXiv preprint arXiv:2303.14458.
42. Piirainen, K. A., Tanner, A. N., & Alkærsig, L. (2017), *Regional foresight and dynamics of smart specialization: A typology of regional diversification patterns*, Technological Forecasting and Social Change, 115, p. 289–300. DOI:10.1016/j.techfore.2016.06.027.
43. Quigley, J. M. (1998), *Urban diversity and economic growth*, Journal of Economic Literature, 12(2), p. 7-138.
44. Radosevic, S., Curaj, A., Gheorghiu, R., Andreescu, L., & Wade, I. (eds.) (2017), *Advances in the theory and practice of smart specialization*, Academic Press, London.
45. Richardson, H. W. (1969), *Regional Economics*, Praeger, New York.
46. Rigby, D. (2015), *Technological relatedness and knowledge space. Entry and exit of US cities from patent classes*, Regional Studies, 49 (11), p. 1922-1937.
47. Santoalha, A. (2019), *Technological diversification and smart specialisation: The role of cooperation*, Regional Studies, 53(9), p. 1269-1283.
48. Tanner, A.N. (2014), *Regional branching reconsidered: Emergence of the fuel cell industry in European regions*, Economic Geography, 90 (4), p. 403-427, DOI: 10.1111/ecge.12055.
49. The United States Department of Justice HERFINDAHL-HIRSCHMAN INDEX https://www.justice.gov/atr/herfindahl-hirschman-index - last accessed on 17.06.2023.
50. Weidenfeld, A. (2018), *Tourism diversification and its implications for smart specialisation*, Sustainability, 10 (2), 319.
51. Whittle, A., & Kogler, D. F. (2020), *Related to what? Reviewing the literature on technological relatedness: Where we are now and where can we go?*, Papers in Regional Science, 99(1), p. 97-113.
52. Xiao, J., Boschma, R., & Andersson, M. (2016), *Regional diversification: the differentiated role of industry relatedness over sectors and regions*, working paper.

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 59-74)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.03

ANTHROPOGENIC HAZARDS AND THEIR IMPACT UPON THE HISTORICAL CULTURAL LANDSCAPE IN ROȘIA MONTANĂ AREA

Gabriel NICULA[1], Camelia-Ina GAVRA[2], Ileana-Cristina VASILIȚĂ-CRĂCIUN[3]

ABSTRACT. Anthropogenic Hazards and Their Impact upon the Historical Cultural Landscape in Roșia Montană Area. The cultural landscape is a result of the continuous human actions of satisfying the communities' various needs and the response of the natural system, in its attempt to balance its components in relation to the modelling factor - the human society. Thus, the cultural landscape displays the imprint of the infinite possibilities of the human and natural joint manifestation, sometimes hazards bringing their own contribution to the shaping of the cultural landscape. Hazards, whether natural or anthropogenic, are unforeseen phenomena in terms of space or time of their manifestation, and most often have considerable negative consequences. In particular, anthropogenic hazards, which are directly or indirectly related to human activities, appear mainly as a manifestation of the resilience of natural elements in the cultural landscape, as a complex system. Thus, major interventions, such as mining in Roșia Montană area (an activity that had been lasting for over 2000 years) in relation to the unpredictable evolution of the social, economic, technological and political context (on local, national and global level) have favoured the manifestation of some unforeseen events with a negative connotation such as: complex pollution, depreciation of the living standards (in Roșia Montană area mostly due to the cessation of mining activities), demographic aging, etc. The complex analysis of these implications in the above mentioned area allows us to outline an eloquent assessment of the present state of the local cultural landscape and to identify the opportunities of systemic resilience. These include: the awareness of the planning, protection and conservation of the local historical cultural landscape as a primary need, restoration of the cultural landscape

[1] *Romanian Academy, Cluj-Napoca Branch, Geographic Research Center, Republicii Street, 9, Cluj-Napoca, Romania, e-mail: gabriel.nicula@academia-cj.ro*
[2] *e-mail: camelia.gavra@yahoo.com*
[3] *Romanian Academy, Cluj-Napoca Branch, Geographic Research Center, Republicii Street, 9, Cluj-Napoca, Romania, e-mail: ileana.vasilita@academia-cj.ro*

(through the aesthetic rehabilitation of degraded cultural elements), the implementation of projects that target the sustainable development of Roșia Montană, as a source of identity and sustainable development, the tourism conversion of activities, etc.

Keywords: *Roșia Montană, cultural landscape, historical cultural landscape, anthropogenic hazards, mining, gold deposits.*

1. Introduction

Over time, people, in order to fulfil various needs, have used their creativity to enrich the environment with various cultural products. And so, "the constant interaction between human intervention and the natural environment, throughout time/history" (Latif Gürkan Kaya, 2002, p. 55), outlined the so-called *cultural landscapes*. Nature and the social factor (people) have adjusted to each other, the technological advance tilting the balance visibly in favour of people.

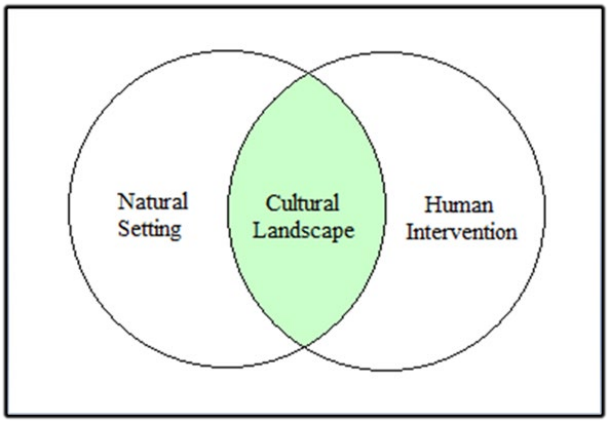

Fig. 1. The Cultural Landscape
Source: O'Hare (1997, in Latif Gürkan Kaya, 2002, p. 55, with annotations)

Thus, the resulting landscapes "are the work of people and a more complex work than an edifice or object, because it is collective. The action of nature is intertwined with the action of people, which implies a continuous effort to direct the transformations of a territory" (Hărmănescu Mihaela, 2015, p. 75).

At the same time, in this context, the culture highlights the human activities practiced according to traditions, perpetuated throughout the generations along with the various general trends of universal culture.

The various cultural elements, introduced into the landscape over time, define in particular the historical periods of the landscape's formation and implicitly generally outline the social evolutionary trajectory. Thus, "the elements and structures of a cultural landscape are historical if, for economic, social, political or aesthetic reasons, they no longer appear, would not be created or continue in the current way, i.e., if they come from an ended historical era. […] LVR, online" (Büttner, Th., 2006, slide 8). According to the same author, the historical cultural landscape can therefore be defined as "a section of the current cultural landscape that is strongly influenced by historical, archaeological, or cultural-historical elements and structures".

It can be stated, in this context, that man can bring value to the cultural landscape by capitalising on the resources related to the function(s) of the cultural landscape. Usually the historical functions are those that hold a special value due to their uniqueness and intrinsic significance.

We have presented above the particular relevance of the human factor in shaping the landscapes. We should certainly mention the analysis of the importance of natural elements in the above-mentioned systemic structure. These elements provide general support for the existence of the social component, being modelled according to needs. The natural elements ensure a dynamic systemic balance, especially when human intervention gives way to resilience. The major changes in the cultural landscape have always depended on the natural-cultural dualism. Successively, but in different proportions, the two categories of elements have acted more meaningfully and they have imprinted various directions of evolution. At this point, we can take into consideration hazards - whether natural or anthropogenic - as distinct modelling phenomena, and discuss their major impact and special force of intervention in cultural landscapes.

According to DEX (1975, p. 393), hazard is defined as an "unforeseen, unexpected event", while I. Mac and D. Petrea (2002, p. 15), consider it as "the source of an extreme event with energy discharge at a moment and on a scale that is difficult to predict". The same authors (2002, p. 15) further emphasise that "the event whose major significance is to interrupt a linear evolution trend sums up the hazard and the (extreme) phenomenon arising from it". The hazard is undoubtedly "harmful to the anthropogenic component, and its negative connotations are due to exceeding the existing safety measures for each individual community" (Gh. Roșian, 2011, p. 174). In particular, "the hazards induced by the creative processes of man, manifest in an extremely discrete manner, but lead to serious and irreversible transformations" (I. Mac, D. Petrea, 2002, p. 18), with major implications in optimal manifestation of the cultural landscape and its functions.

The present study aims to bring into the analysis the historical cultural landscape of the commune of Roşia Montană, created by major anthropogenic interventions, especially those of mining (with a duration of over 2000 years), but also of the unpredictable evolution of social, economic, technological and political events (local, national and global) which favoured the manifestation of unforeseen events with a negative connotation in terms of various types of hazards such as: complex pollution, cessation of mining activities, depreciation of the standard of living, demographic aging, etc.

2. Methodological Aspects

The natural and anthropogenic factors have shaped the cultural landscape related to the territory of Roşia Montană for a very long time. In order to study their variety and complexity, we have employed a complex research methodology, which is meant to highlight specific anthropogenic interventions, especially the mining activities and the related hazards.

The complexity of the phenomena required the use of both traditional, established methods (specific to a wide range of research fields) and means of research more specific to the study of the cultural landscape. Detailed analysis of the elements and phenomena identified through bibliographic documentation and observation (as traditional methods). The synthesis of the relevant information acquired also by means of field research was equally useful.

As specific means of research, the method of the *Register of the components of the cultural landscape*, provides relevant information about the cultural elements, such as details about their properties, structure, functions. In addition, the ECOVAST Method succeeds the recording of the elements of the cultural landscape on various layers, which, in an integrative way, outlines and individualises the analysed space[4].

According to ECOVAST, "at the base of the amphora are the rock (the geological surface), the climate and the hydrography along with the shape of the land (from a morphological point of view). The second layer includes vegetation, fauna and the anthropogenic component. Its upper layer incorporates the features induced by [...] human settlements, as well as other specific features induced by human activity, for example industry, tourism, etc. The upper layer also includes the historical features along with the researcher's associations and feelings" (Camelia-Ina Gavra, 2013, p. 61).

[4] ECOVAST Method = European Council for the Village and Small Town, presented in the *Landscape Identification guide. A guide to good practice (2006)*, in the form of the *Landscape Amphora*

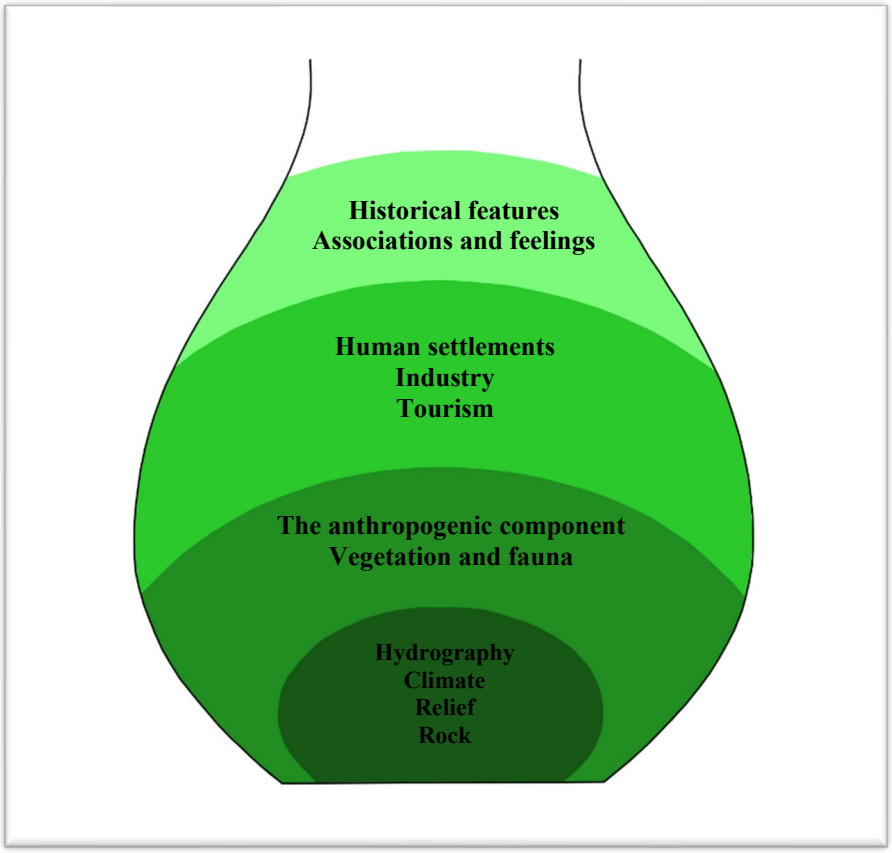

Fig. 2. Landscape Amphora.

Source: ECOVAST - European Council for the Village and Small Town (2006)

3. Roşia Montană Commune. Territorial Framework

Topographically, the settlement "Roşia Montană - the old Alburnus Maior, later Rubeo Flumine, Verespatak, Goldbach, Rotbach, Roşia de Munte - is located in the Metaliferi Mountains" (V. Apostol, Şt. Bâlici, 2012, p. 31), a space rich in "gold and silver deposits that integrate into the large mining region of the Apuseni Mountains, known in the geological and geographical literature as the "gold quadrilateral" Brad-Săcărâmb-Zlatna-Roşia Montană" (T. Morariu, Octavia Bogdan, A. Maier, 1980, p. 38).

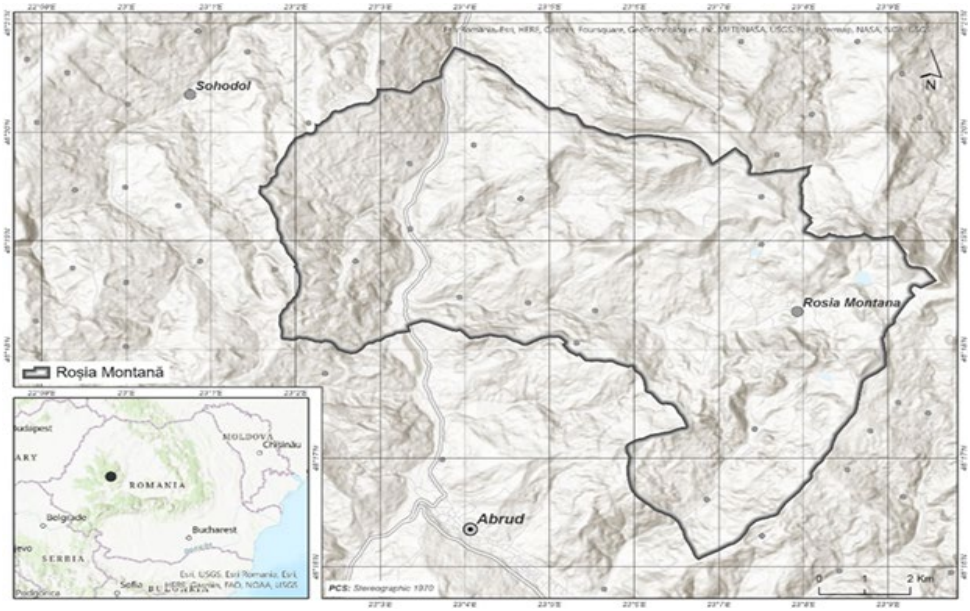

Fig. 3. Map of Roșia Montană.
Source: the authors

The commune is formed by 16 villages with a relatively small number of inhabitants spread over several scattered villages and hamlets. These villages are: Corna, Bunta, Dăroaia, Gura Roșia, Coasta Henții, Curături, Cărpiniș, Soal, Vârtop, Gârda Bărbulești, Iacoștești, Ignațești, Bălmoșești, Țarina, Blideşti and Roșia Montană, the latter with the function of administrative center.

The relief is visibly subordinated to its two main genetic factors. First, the volcanic and magmatic phenomena that generated various specific observable landforms, while the second is the fluvial and pluvial erosion, manifested over time. Together, they shaped the previous landforms, also creating erosional forms and sedimentation. We can notice mamelons and volcanic plateaus, but also hills, torrential bodies, valleys or small depressions created by erosion.

Without a trace of doubt, "volcanic landforms dominate Roșia Montană on the south, east and north sides through the massifs of Tile (918 m), Cetate, Cârnic (1087 m), Ghergheleu (1157 m), Rotunda (1187 m), Brădeţel (1011 m), Ghipele (1050 m) and Dealul Coltău (1094 m)" (A. Sântimbrean, H. Bedelean, Aura Bedelean, 2009, p. 22). Some, such as Piatra Corbului and Piatra Despicată, can be seen prominently in the landscape "as volcanic hills, modified by human activities" (N. Ciangă, Cristina Bolog, 2012, p. 184).

Due to the level differences of 700-800 m and the different hardness of the rocks, erosion has contributed intensively to shaping the terrain's morphology (A. Sântimbrean, H. Bedelean, Aura Bedelean, 2009, p. 23) and also to outline the two main valleys, that of Abrud and that of Arieș.

From a geological point of view, we can see here a considerable diversity, the complex telluric phenomena replacing various "metamorphic rocks, Mesozoic ophiolites, Neogene magmatic rocks, Mesozoic and Quaternary sedimentary rocks" (S. Duma, 2012, p. 38) etc.

The latitudinal and longitudinal geographical position gives the local temperate continental climate characteristics specific to the mountainous landforms with low altitudes. Thus, "the annual average temperature at Roșia Montană weather station is 5.4°C. The monthly average values range between 15.4°C in July and – 3.8°C in February. Average temperatures below 0°C are specific to the months of December, January, February and March. The monthly average of maximum daily temperatures varies between 19.9°C in August and -0.4°C in January, while the monthly average of minimum daily temperatures were between 12.1°C in August and – 10.7°C. in February. Because of their low values, including summer months, the air temperature may not have an important role in the dispersion of the pollutants in the area" (F. Moldovan, Adina-Eliza Croitoru, I. H. Holobâcă, 2012, p. 101). In terms of precipitation, (according to the same authors, p. 103) "the rainiest month is June, 98.6 mm, while the driest month is February (38.2 mm). The amounts are much more important in the warm half of the year (April-September). In the same period, there is a higher probability of acid rain to occur".

The dominant winds are those of the western circulation, specific to the temperate zone in the northern hemisphere, implicitly determined by the latitudinal position of the analyzed territory.

Field research reveals the existence of water resources, at the surface or underground, in various forms. A surface drainage network with upper basin characteristics is formed mainly by Roșia, a tributary of the Arieș River, flowing from east to west. In turn, Roșia Valley is fed by several streams, temporary torrents and "groundwater resulting from gold mining" (Sorana Olaru-Zăinescu, 2006, p. 8). Groundwater is currently exploited on a large scale by means of wells integrated into the commune's households or by springs used for livestock.

The lakes, called "tăuri", are also notable. They have an anthropogenic character, being built in the past as an integral part of the technological process of obtaining the gold ore. One example is Tăul Mare (Fig. 4) as a reference resource.

Fig. 4. Tăul Mare.
Source: the authors

The relief and the climate have shaped the evolution of the vegetation formed by mixed forests (of beech, hornbeam, fir, spruce) and coniferous forests alongside meadows with specific plant associations or meadow vegetation within the valleys. In isolated areas, at low altitudes, the presence of oak can be observed sporadically.

The fauna is linked to the vegetation area, and includes species that are listed as protected. Some of these mammal species are: "the lynx (*Lynx lynx*), the fox, the wolf (*Canis lupus*), in the forest areas; the otter (*Lutra lutra*) near the ponds; many bat species (*Myotis blythii, M. daubentonii, M. myotis*) due to the large mine galleries that make up a favourable environment for their development; fish and amphibians (*Triturus vulgaris, Titurus alpestris*) in the ponds. There are also birds: storks (*Cioconia nigra*), hawks (*Accipiter nisus*), eagles (*Aquila pomarina*), falcons (*Falco subbuteo*), little owls (*Athene noctua*), woodpeckers (*Dendrocopos minor, Dendrocopos major*), hoopoes (*Upupa epops*), swallow (*Hirundo rustica*), thrush (*Turdus philomelos*); many insects, reptiles (*Lacerta agilis, Vipera berus*)" (V. Gligor, 2012, p. 122).

4. Landmarks in the History of the Cultural Landscape of Roșia Montană

The petrographic variety, and implicitly that of the underground resources, facilitated the development of appropriate activities. According to the existing archaeological evidence, mining has been practiced since the Antiquity, the intensity of exploitation increasing with the technological advance and culminating in the specific exploitation on an industrial scale.

From a historical point of view, the chronology of this activity is distinguished by "three significant periods: Antiquity, with the vast system of Roman exploitations; The Middle Ages, with the traditional type of exploitation, and the modern period, characterized by technological development" (S. Duma, 2012, p. 37).

The intensive and prolonged exploitation of gold resources represented the overwhelming factor of outlining, shaping and imprinting the function of the cultural landscape, respectively the mining one. This activity found its echo in various aspects of the local society, "putting its mark on a number of aspects related to the evolution of the commune, such as its structure and its urban fabric, architecture, ethnography, economic and spiritual life, and of course on the natural environment of this mountain region" (****Studiu de condiţii iniţiale ...,* pp. 13-14).

We can assert that the varied cultural elements (especially those related to the exploitation of local resources), which "accumulated successively over the natural features, and shed light on the long history and local culture in the generic form of a cultural landscape" (Ileana-Cristina Vasiliţă-Crăciun, 2015, p. 49), represent a benchmark in this regard.

4.1. History of mining - an ancient occupation

Inhabited since ancient times, Roșia Montană has a long history of exploitation of the main local resource, in various forms and processes, according to the spatio-temporal context. Thus "the antiquity of mining is lost in the mist of the Iron Age, when the Scythians and Dacians were the first inhabitants of these lands, extracted gold and silver from the alluvium of Mureș and Arieș rivers" (A. Sântimbrean, H. Bedelean, 2004, p. 16).

Precious deposits continued to attract interest from various populations and brought social and economic development, "the Roman period marking the first mention of the existence of Roșia Montană (under the Roman name of Alburnus Maior) in the year 131, date mentioned on the Roman wax

tablets discovered in the Roman galleries in the area. They contain "banking" related contracts and transactions. The name Alburnus Maior appears on six of the twenty-five recovered tablets" (Alina Albu *et al*, 2007, p. 39).

Later, during the Middle Ages, the area recorded a considerable evolution in the general exploitation technique, through the frequent use of gunpowder by the "German colonists [...], the stones being removed with black powder" (Sântimbreanu and Bedelean, quoted by S. Duma, 2012, p. 38).

The post-war period marks the end of private exploitation. "The process of nationalization, started in 1948, and the fact that the state had total control over gold led to an industrial exploitation of gold only underground. In the 1970s, open-pit mining replaced underground mining. It led to the destruction of a large part of the underground system of galleries, including those from the Roman period, and brought a homogeneous character of life in Roșia Montana, which lost its status as a city" (N. Ciangă, Cristina Bolog, 2012, p. 183).

Although mining ceased in 2006, the extremely long mining activity generated, over time, a mining cultural landscape through the permanent addition of specific cultural elements.

4.2. The defining elements in the history of the cultural landscape of Roșia Montană

Through the long continuity and intensity of exploitation, the ancient occupation of mining has created, developed and perpetuated the specific cultural landscape, which is, nowadays, valued and exploited in the economic benefit of the local society.

The special value of the analysed space is therefore conferred by a cultural landscape defined by the existence of rich historical elements that shed light on various specific eras in the local social evolution.

The *old houses* complex, visible near the central square, reveals elements of architecture belonging to the 18th and the 19th centuries, among which medallions and variously ornamented columns, stone walls and gates are easily noticeable, all pointing towards the social prosperity of the periods of their construction.

The number and variety of the *churches* induce the idea of the vast spread of the religious factor in society and at the same time highlight the ethnic and religious mixture caused by the existence of precious resources, as a factor of attraction for various populations.

Observations in the field led to the identification of some remarkable places of worship such as the Greek-Catholic Church dating from 1741, and the Old Orthodox Church built in 1781, with a bell tower over 31 m high. Also worth

noting is the Unitarian Church built in 1796, the Protestant Church, built after 1800, and the Roman-Catholic Church built in 1866 on the site of an old church burned down during the 1784 uprising led by Horea, Cloșca and Crișan. It houses the precious Icon of the Virgin Mary adorned with black pearls, given by Empress Maria Theresa.

As elements related to mining, the many galleries dating from various historical periods, are remarkable. They are visible "essentially in four sites [...] linked by underground galleries that cross the village of Roșia Montană. Mount Cârnic is an exceptional site in Europe due to its wealth of galleries dating back to the Roman era. In order to maintain and remind the mining tradition of the commune, there is a museum dedicated to the mining activity, with a small part of the Roman and modern gallery set up for public access" (Sorana Olaru-Zăinescu, 2006, p. 26).

Fig. 5. Roman gallery (Mining Museum, Roșia Montană).
Source: the authors

Archaeological excavations at the *Alburnus Maior Citadel*, located on the Citadel Hill, revealed various dwellings, tombs, mining tools, and inscriptions in Greek and Latin, languages widely used in antiquity. These historical cultural elements are real evidence of the complexity of local social life and connections with neighbouring regions.

The *stamp mills*, currently visible in the specific local museum, proved their usefulness in the process of extracting the gold ore in close correlation with the pit lakes that ensured the necessary water stock during the active summer.

The *pit lakes* can be territorially identified as belonging to the Roșia and Corna hydrographic basins, "the vast majority of which are currently drained, appearing in the cultural landscape in the form of drained lacustrine basins covered by specific vegetation, difficult to distinguish compared to those still active. Few in number, the pit lakes occupying larger areas managed to maintain their water through the input from rains or rivers. Ex. part of this lacustrine category are Tăul Mare, Țarina, Brazi, Anghel, Corna, Tzapului, Gauri, Cartus" (Camelia-Ina, Gavra, p. 179). Currently, the original mining function has been converted into a tourist one, as the pit lakes are used for recreation or fishing.

The *quarry* is a cultural element that appeared following the surface mining of gold ore. It has various shapes and sizes according to historical time and specific extraction methods. "For example, the Cetate quarry stands out in particular, as a relict element; alongside stand similar elements from the Cârnic, Orlea and Jig massifs. Also, in the Piatra Corbului sector, the Roman exploitation sites, dug with the help of fire, (impressive due to their dimensions)" (Ileana-Cristina Vasiliță-Crăciun, 2015, p. 50).

Fig. 6. Cetate Quarry.
Source: the authors

Based on the territorial identification of the main cultural elements within the local cultural landscape and their analysis, we can assert that the existence of gold resources constituted an essential factor for social consolidation and growth. Their continuous exploitation in various ways required the development of a specific and complex mining cultural landscape whose elements can be exploited for tourism today to increase the local socio-economic well-being.

5. Anthropogenic Hazards and Repercussions Within the Historical Cultural Landscape. Conclusions

The long-term or large-scale exploitation of resources causes various systemic transformations, some of which involve the appearance of considerable changes in its dynamics. In this sense, anthropogenic hazards, considered as unforeseen events with negative connotations related to human activities, can represent factors that induce imbalances in the local cultural landscape.

In particular, recently "the historical landscape of the area has been constantly assaulted by the open pit exploitation of the Cetate and Cârnic massifs [...] significant parts of the two massifs have been destroyed, together with traces of the greatest importance for historical mining. More than the damage and, locally, the destruction of the cultural heritage of the Roşia Montană site, this exploitation continues to put in danger the natural environment" (****Plan de management ...*, partea I, p. 49).

Technological hazards are "related to the collapse of mine galleries, to underground explosions, to the instability of tailing dams, to the discharge of settling ponds and to pollution with dangerous materials" (D. Tanislav, Andra Costache, 2007, p. 106). The local historical course of Roşia Montană has known each of these phenomena, some being countered by rehabilitation, protection or conservation measures, as is the case with tailing dams, others perpetuating themselves without any countering anthropogenic intervention, as is the case with ponds loaded with polluting substances, of surfaces affected by erosion, torrentiality or landslides, of rivers polluted by contamination with "waste waters" (Albu Alina *et al*, 2007, p. 14), and of "soil surfaces loaded with heavy metals (Cu, Zn, Pb, Mn, etc.)" (Albu Alina *et al*, 2007, p. 17).

"The metallogenic activity was particularly intense here, affecting almost entirely the volcanic structure" (V. Ianovici, M. Borcoș, M. Bleahu, D. Patrulius, M. Lupu, R. Dimitrescu, H. Savu, 1976, pp. 457, 458); it led to the existence of considerable resources, intensively exploited, which is why "in Roșia Montană we see the mixture of complementary natural and human factors that must be interpreted to understand and conserve the site" (Mitchell, 1986; Rackham, 1986 cited by J. R. Akeroyd, 2012, p. 107).

The objective research of the elements belonging to the historical cultural landscape of Roșia Montane through positive connotations and negative features contributes to the detection of potential problems and the identification of strategies to follow. In this sense, the diagnostic analysis highlights significant aspects, useful in the design and implementation of the valorisation, protection and conservation actions of the cultural landscapes in the researched area.

Table 1. Diagnostic (SWOT) analysis of the cultural landscape in Roșia Montană

Strengths (positive internal aspects)	**Weaknesses (internal negative aspects)**	**Opportunities (positive external conditions)**	**Threats (external negative influences)**
- the wide spread of the industrial cultural landscape (mining), in the area; -representative historical cultural landscape; - the existence of some inherited cultural elements (e.g. various archaeological remains - related to gold mining, dating from the Dacian, Roman, medieval and up to the present day); - the existence of unique cultural elements (waxed tablets); - the quality of gold that can be exploited (economically), planned, protected and/or conserved.	-insufficient perception and development of the cultural value of the historical landscape; - the disappearance of the vestiges of traditional mining; -lack/reduced actions regarding the protection of representative cultural elements; - the degradation or disappearance of some cultural elements as a result of their abandonment; - particularly low (tourist) exploitation of the cultural landscape; - ignorance of the existence of the cultural landscape (due to lack of promotion); - abandoning the principle of continuity (in architecture, local economy, etc.).	- awareness of the planning, protection and conservation of the cultural (historical) landscape as a primary need; - the restoration of the cultural landscape (through the aesthetic rehabilitation of degraded cultural elements); - the development of rural, cultural, ecotourism, scientific tourism, which integrates landscape elements into the attractive offer; - projects that support concerns for the quality of landscapes and the sustainable development of the characteristic elements of Roșia Montana, as a source of identity and sustained development; - preservation of a millennial cultural landscape.	- the degradation of the cultural landscape as a result of anthropogenic activities, especially mining; - potential dangers following some activities (industrial/mining), translated into anthropogenic hazards; - the uniformity of the cultural landscape (as a result of the increasingly prominent manifestation of globalization and implicitly interchangeability); -replacing the local cultural landscape with one (degraded) devoid of cultural value following the implementation of aggressive mining projects.

Source: Camelia-Ina Gavra, 2013, p. 225, with annotations.

REFERENCES

1. Akeroyd, J. R. (2012), *The Botanical and Anthropogenic Landscape of Roșia Montană*, in: Roșia Montană in Universal History, Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca.
2. Albu Alina, Satmari Alina, Despi Alina, Albu, B., Aatmari, l., Cengher, P., cu sprijinul d-lui E. Cornea (2007), *Strategie Alternativă pentru o Dezvoltare Durabilă în Roșia Montană.*
3. Apostol, V., Bâlici, Șt. (2012), *Roșia Montană: An assessment of the cultural heritage,* in: Roșia Montană in Universal History, Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca.
4. Büttner, Th. (2006), *Verwilderndes Land – wuchernde Stadt? Die Zukunft der Kulturlandschaft. Zum Kulturlandschaftsbegriff – seine Herleitung und Verwendung in Theorie und Praxis*, Universität Kassel. (Source: http://www.naturathlon.eu/fileadmin/MDB/documents/service/perspektivekultur_buettner.pdf., last accessed on 01.03.2022).
5. Ciangă, N., Bolog Cristina (2012), *Tourism-Coordinate of a Long-Term Sustainable Development in the Roșia Montană Area*, in: Roșia Montană in Universal History, Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca.
6. Duma, S. (2012), *The Impact of Mining on Environment at Roșia Montană*, in: Roșia Montană in Universal History, Editura Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca. (The author states: ,,The present article was published in Analele Universității din București. Geografie, 2008, pp. 75-88, under the title *Gold and Environment at Roșia Montană. Realities and Perspectives*).
7. Gavra, Camelia-Ina (2013), *Peisaje culturale în Munții Metaliferi*, Editura Risoprint, Cluj-Napoca.
8. Gligor, V. (2012), *Natural Reserves and the Biodiversity of Roșia Montană Area*, in Roșia Montană in Universal History, Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca.
9. Hărmănescu, Mihaela A. (2015), *Patrimoniu și peisaj rural. Strategii de integrare și promovare*, Edit. Muzeul Literaturii Române, București.
10. Ianovici, V., Borcoș, M., Bleahu, M., Patrulius, D., Lupu, M., Dimitrescu, R., Savu, H. (1976), *Geologia Munților Apuseni*, Edit. Academiei RSR, București.
11. Kaya, Latif Gürkan (2002), *Cultural landscape for tourism*, - Online available at: https://dergipark.org.tr/tr/download/article-file/40137.
12. Mac, I., Petrea, D. (2002), *Polisemia evenimentelor geografice extreme,* in: Riscuri și catastrofe, Edit. Casa Cărții de Știință, Cluj-Napoca.
13. Moldovan, F., Croitoru, Adina-Eliza, Holobâcă, I.-H. (2012), *General Climate Conditions in Roșia Montană Area*, in: Roșia Montană in Universal History, Presa Universitară Clujeană/Cluj University Press, Cluj-Napoca.
14. Morariu, T., Bogdan, Octavia, Maier, A. (1980), *Județul Alba*, Edit. Academiei RSR, București.

15. Olaru-Zăinescu, Sorana (2006), *Dezvoltare durabilă alternativă mineritului la Roşia Montană, Analiza resurselor şi elemente de strategie,* Asociaţia Alburnus Maior.
16. Roşian, Gh. (2011), *Geomorfologia Mediului,* Edit. Presa Universitară Clujeană, Cluj-Napoca.
17. Sântimbrean, A., Bedelean, H. (2004), *Roşia Montană Alburnus Maior, Cetatea de scaun a aurului românesc*, Ediţia a II-a, Editura Altip, Alba.
18. Sântimbrean, A., Bedelean, H., Bedelean Aura (2009), *Aurul şi argintul Roşiei Montane*, Ediţia a II-a, Editura Altip, Alba Iulia.
19. Tanislav, D., Costache, Andra (2007), *Geografia hazardelor naturale şi antropice*, Edit. Transversal, Târgovişte.
20. Vasiliță-Crăciun, Ileana-Cristina (2015), *Peisajul cultural industrial și necesitatea protejării sale. Studiu de caz: Roșia Montană*, Geographia Napocensis, IX, nr. 2, Casa Cărţii de Ştiinţă, Cluj-Napoca.
21. ***ECOVAST, 2006: (European Council for the Village and Small Town), Landscape Identification guide. A guide to good practice. (Source: http://ecovast.org/papers/good_guid_corr_e.pdf, last accessed on 15.11.2022).
22. ***Dicţionarul explicativ al limbii române, DEX, (1975), Edit. Academiei Republicii Socialiste România, Bucureşti.
23. ***Raport pentru evaluarea impactului asupra mediului: *Studiu de condiții inițiale asupra patrimoniului cultural.* Întocmit de: STANTEC CONSULTING (Source: https://www.rmgc.ro/Content/uploads/uploads_eia/impactul-potential/cultura-patrimoniu/04.9-Studiu-de-conditii-initiale-asupra-patrimoniului.pdf, last accessed on 02.09.2022).
24. ***Partea I, *Plan de management pentru Patrimoniul Arheologic din zona Roşia Montană*, S.C. Roşia Montană Gold Corporation S.A. - Raport la studiul de evaluare a impactului asupra mediului. (Source: https://www.rmgc.ro/Content/uploads/uploads_eia/impactul-potential/cultura-patrimoniu/Plan-de-management-al-patrimoniului-cultural-Arheologie.pdf, last accessed on 14.09.2022).

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 75-81)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.04

ASSESSING THE ATTRACTIVITY AND ACCESSIBILITY OF THE ROMANIAN AIRPORTS

Voicu BODOCAN[1], Andrei-Cătălin BRISC[1]

ABSTRACT. Assessing the attractivity and accessibility of the Romanian airports. The research examines the changing dynamics of Romanian airports within the framework of European air transport deregulation and the subsequent "open skies" policy. A basic accessibility assessment method was applied, which involved weighting destinations according to their relative significance. The results highlight the dominance of certain airports and the limited competition for global hubs. The study concludes by emphasizing the need for detailed airport analysis to develop an attractiveness model specific to Eastern-Central Europe, incorporating economic, geographic, demographic, political, and infrastructure factors.

Keywords: *accessibility, weighting, ranking, competition, airport.*

Introduction

The completion of deregulation in Europe in 1993 and the adoption of the "open skies" policy prompted a reorganization of air transport networks. Following their accession to the European Union, Eastern countries transitioned from a capital city-centric structure to a decentralized polycentric model. The competition among regional airports, particularly in terms of accessibility, connectivity, and centrality, reshaped the hierarchy and created varied opportunities, significantly impacting regional development.

[1] *Babeş-Bolyai University, Faculty of Geography, 400006 Cluj-Napoca, 5-7 Clinicilor Street, e-mail: voicu.bodocan@ubbcluj.ro*

Beyond their classical role as transit points, airports have become complex entities and play an increasing role in the regional and global transportation network, serving as hubs that connect people and businesses across the world, or as destinations for tourism and investment, impacting regional economic development. Airport attractivity is a critical concept in the air transport industry and is related to factors that make a particular airport valuable to airlines, passengers, and businesses, both from the aviation industry and other air transport-sensitive activities. The elements of airport attractivity have an important role in influencing decisions related to passenger choice in a multi-airport region (MAR), route planning, or partnerships among airliners. Thus, airport competitiveness relies upon this attractivity derived from costs and time of ground accessibility, transit time and passenger experience in terminals, operational efficiency as concern delays or cancellations, and type of airline companies, but the most important element is connectivity with important regional and global airports.

With rising incomes of the emergent economies, such as Romania's, the increase in tourist traffic and the need to be linked to the main command centers of the world economy, lower-ranking cities, through the airports that serve them, have initiated new connections based on regional and global air transport. If a few decades ago, there was merely one international airport gateway in Romania, the desire to connect to the global economy, the appetite for tourist travel, and the need for ethnic traffic, determined an opening of Romanian airports to European destinations through direct connectivity, without intermediate layovers. This fact was possible after the liberalization of air transport and the adoption of the open-skies policy at the level of the European Union and through the development of point-to-point networks of low-cost airlines. Economic growth in certain regions attracted also traditional network companies, which enhanced their regional relevance and integrated corresponding airports into global air transport networks. In such conditions, air travel became affordable for more and more people and the air transport market has increased several times in quite a short period (5.6 million available seats in 2013 and 15.6 million in 2022).

The paper discusses the concept of air transport accessibility, defining it as the capacity of a location to be reached from or provide access to other locations (Reynolds and McLay, 2006). In this paper, we will make an assessment of the Romanian airport's attractivity based on different techniques used in air transport literature, to develop, in subsequent research, a new indicator to quantify airport attractivity specific to Eastern-Central Europe that may be applied to other regions with similar network characteristics and taken into consideration by decision-makers in regional planning.

Literature overview on airport attractivity

The academic interest in air transport analysis has attracted many specialists from different sectors such as management, policy, economy, geography, and sociology of air travel. In a systematic literature review on transportation in more than one thousand papers from the ISI Web of Science Database, Ginieis *et al* (2012), identified airports as the second theme indexed as "air transportation". Within airports theme, attractivity, and competitivity is one of the major subjects both for professionals and academics.

The literature encompasses several studies related to attractiveness, with most relying on mathematical modeling based on criteria that define attractiveness. Thus, Burghouwt & de Wit (2005) analyze connectivity and wave system structures in airline hubs, while Malighetti et al. (2008) explored the concept of indirect connectivity as self-help hubbing and developed an index of connectivity in their study. Focusing on the behavioral aspects of travelers, Hess & Polack (2005) and de Luca (2012) utilized logit models to analyze the impact of variables like access time and flight frequency on traveler choices. Teixeira and Derudder (2021) used the Huff model based on attractiveness and distance variables in MAR, while Morton & Mattioli (2023) developed in a similar region a spatial interaction model based on characteristics of the origin, attractivity of the airport services, and intervening opportunities. Reynolds and McLay (2006) used available seats and available seat miles for ranking the attractivity and connectivity of European airports, and accessibility was measured according to the weight of the destination.

Together, these studies form a mosaic of research in the air transport and transportation modeling domain, providing valuable insights into the multifaceted nature of attractivity and connectivity, traveler behavior, economic influences, destination ranking, and overall transport competitiveness. It is worth noting that other attractiveness indicators exist, such as infrastructure quality, operational efficiency, and environmental sustainability.

Assessing connectivity and accessibility

To assess the attractiveness of an airport, we focus on accessibility and connectivity, which are fundamental attributes of a transportation network. Connectivity is evaluated from the accessibility standpoint, specifically measuring direct connectivity, which represents the passenger traffic between pairs of routes in a point-to-point network. While indirect connectivity has been considered by some researchers (Burghouwt and Reddondi, 2013), we focus on

direct connectivity for this analysis. Airport accessibility is viewed as a measure of its ability to serve as a gateway to other destinations rather than its physical accessibility via ground transportation.

We evaluated the attractiveness of eight airports in Romania with available data provided by Eurostat (routes Data), through the lens of connections and the number of seats available (PAS-DEP, passenger available seats for departures) on regular flights to airports in the European Union. British airports were also considered because connections with those airports were established before Brexit and also, for comparison reasons, with the year 2013.

As in the study of Reynolds and McLay, we ranked the destination airports by two methods and measured accessibility by involving the number of seats available. Destination quality was obtained by ranking all airports in the network in relation to the most transited European airport from the network, and attractivity to the most transited Romanian airport. A higher importance score indicates that the destination airport is more important and that it should be given more weight in the accessibility calculation.

The reference years are 2013 and 2022, which correspond to post-crisis periods, the first financial and the second, pandemic. Available seats for departures were taken into account, although some studies considered available seat kilometers, where longer flights determine a different hierarchical position of the airports in question. In our case, the flights are regional, with no regular air transport services to other continents (except for a few in the Middle East).

We thus used the weight-based available seats to rank the airports in the region, 53 in number, to which there were regular flights from 8 Romanian airports in 2022 (46 and 7 respectively, in 2013). Ranking airports according to attractiveness and accessibility would require a detailed analysis of each airport, which depends on the specific data and research objectives. However, this analysis should take into account the criteria mentioned above to rank airports according to their importance in the respective region or country.

Results

To evaluate the attractiveness of airports, we examined metrics derived from available seat numbers, the number of destinations served, and airport rankings. London Luton Airport (LTN) ranked highest in terms of overall destinations in 2022, while Bucharest Henri Coandă International Airport (OTP) topped the list for Romanian-origin airports. Among European destinations, only three - Luton, Charleroi (CRL), and Bologna (BLQ) - have direct connections to all Romanian airports considered. Bergamo (BGY) follows with seven connections, and Dortmund (DTM), Dublin (DUB), and Barajas (MAD) each have

six connections. In 2013, München Franz Josef Strauß Airport (MUC) was the most prominent destination, followed by Vienna International Airport (VIE), highlighting the significance of the Lufthansa Group. Bucharest (OTP) was the dominant domestic airport, and no other regional airport offered connections to all European destinations.

Except for München (MUC) and Frankfurt International (FRA), there is no competition for global hubs, like London Heathrow (LHR) and Gatwick (LGW), Paris Charles de Gaulle (CDG), Amsterdam Schiphol (AMS), or Copenhagen Kastrup (CPH), revealing the dominance of low-cost carriers.

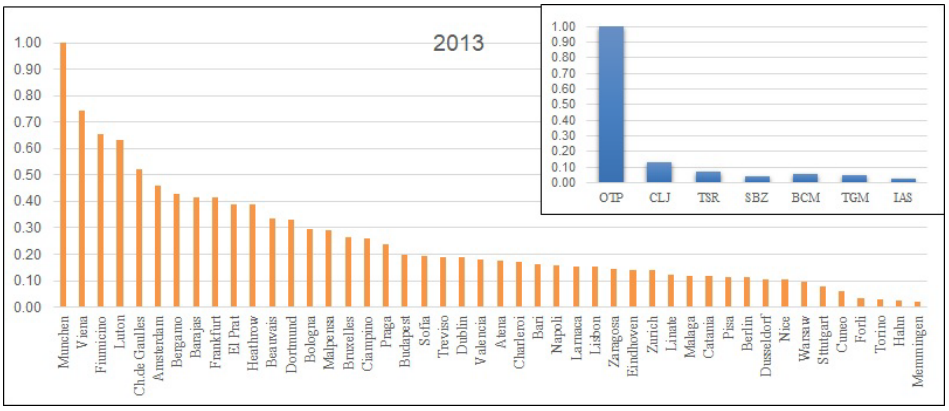

Fig. 1. Weights of the European destinations and accessibility index for Romanian airports in 2013.
Source: the authors

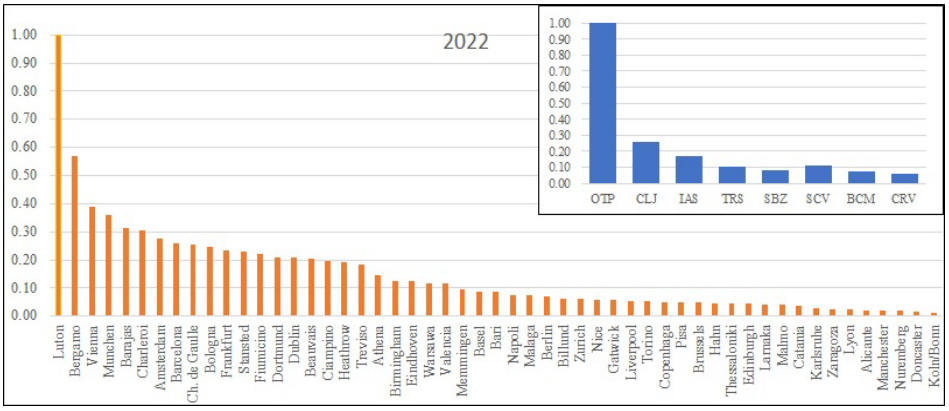

Fig. 2. Weights of the European destinations and accessibility index for Romanian airports in 2022.
Source: the authors

Bucharest's airport (OTP) stands out as the most accessible and attractive airport in Romania, surpassing all regional airports in this regard. Other airports only managed to achieve similar performance in the absence of direct routes from OTP. For instance, Cluj-Napoca International Airport (CLJ) showed minor competition with OTP in 2013, but increased in 2022. Craiova airport (CRV), a new entrant, is the lowest ranked airport.

Genuine competition among airports can only be observed when the accessibility index exceeds 0.5, which is rare and limited to specific destinations. For example, CLJ's accessibility index surpassed 0.5 for destinations like Dublin, Beauvais (BVA), Eindhoven (EIN), Valencia (VLA), Basel (BSL), Billund (BLL), and Larnaca (LCA). Similarly, Iași International Airport (IAS) surpassed 0.5 for Luton, and Suceava International Airport (SCV) surpassed 0.5 for Bergamo.

When considering a more stringent accessibility index of 0.8, combined with a maximum access time of two hours, true competition emerges among regional airports. This scenario is evident in cases like Cluj-Napoca-Sibiu (SBZ)-Timișoara (TSR) and Iași (IAS)-Bacău (BCM).

Conclusions

As incomes have increased in many communities, disposable income for travel has grown significantly over the past decade. This economic improvement, along with the temporary migration of Romanians abroad and the recent influx of foreign workers, has directly or indirectly contributed to increased connectivity and air traffic between Romanian airports and those in the European Union.

What is remarkable, is the incipient decentralization of air traffic, with the growing importance of some regional players like Cluj-Napoca (CLJ), Iași (IAS), or Suceava (SCV) and the competition among airports with overlapping catchment areas.

Ranking airports according to attractiveness and accessibility would require a detailed analysis of each case. Regarding the development of an attractiveness model for airports in Eastern Europe, it should take into account specific economic, geographic, demographic, political, and infrastructure data and particularities of the region. Mathematical modeling of an airport's attractiveness is a technique that can be used to better understand the factors that contribute to an airport's attractiveness, even if there are exogenous variables that can limit the models used.

REFERENCES

1. Burghouwt, G., de Wit, J. (2005), *Temporal configurations of European airline networks*, Journal of Air Transport Management, 11, Issue 3, 85-198.
2. Burghouwt, G., Redondi, R. (2013), *Connectivity in Air Transport Networks: An Assessment of Models and Applications*, Journal of Transport Economics and Policy, 47, 35-53.
3. Ginieis, M., Sánchez-Rebull, María-Victoria, & Campa-Planas, F. (2012), *The academic journal literature on air transport: Analysis using systematic literature review methodology*, Journal of Air Transport Management, 19, 31-35.
4. Hess, S., Polak, J. W. (2005), *Mixed logit modelling of airport choice in multi-airport regions,* Journal of Air Transport Management, 11, Issue 2, 59-68.
5. de Luca, S. (2012), *Modelling airport choice behaviour for direct flights, connecting flights and different travel plans*, Journal of Transport Geography, 22, 148-163.
6. Maertens, S. (2012), *Estimating the market power of airports in their catchment areas – a Europe-wide approach,* Journal of Transport Geography, 22, 10-18.
7. Malighetti, P., Paleari, S., Redondi, R. (2008), *Connectivity of the European airport network: "Self-help hubbing" and business implications*, Journal of Air Transport Management, 4, Issue 2, 53-65.
8. Morton, C., Mattioli, G. (2023), *Competition in Multi-Airport Regions: Measuring airport catchments through spatial interaction models*, Journal of Air Transport Management, 112.
9. Reynolds-Feighan, Aisling, McLay, P. (2006), *Accessibility and attractiveness of European airports: A simple small community perspective*, Journal of Air Transport Management, Volume 12, Issue 6, 313-323.
10. Teixeira, F.M., Derudder, B. (2020), *Spatio-temporal dynamics in airport catchment areas: The case of the New York Multi Airport Region*, Journal of Transport Geography, 90.

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 83-94)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.05

ANALYSING THE CAPACITY OF THE URBAN ROAD TRANSPORT NETWORK USING A DYNAMIC ASSIGNMENT MODEL IN THE BISTRIȚA - TÂRGU MUREȘ GEOGRAPHICAL AXIS

Alexandru Marius TĂTAR[1]

ABSTRACT. Analysing the Capacity of the Urban Road Transport Network Using a Dynamic Assignment Model in the Bistrița - Târgu Mureș Geographical Axis. Network capacity in a transportation system becomes an important measurement for transport planning and management because it addresses its capability to satisfy an efficient network traffic flow reducing the inefficiency of congestion phenomena. This work provides a discussion of road urban transport network capacity including existing definitions in literature and the validation of new measurement methods. The study explores some of the properties of network-wide traffic flow relationships in a large-scale complex urban street network using real-time simulated results obtained from a dynamic traffic assignment model, periodically updated by data from radar sensors through rolling horizon technics. The basic variables used in the methodology, such as network flows and speeds, are characterized using a network model calibrated in the urban area of the geographical axis Bistrița-Târgu Mureș. For a comprehensive yet simple analysis, equations, and graphs are utilized to resume the obtained results related to different days and several time intervals of the day. The focus of sustainable urban transportation development lies in realizing the untapped capacity potential of the existing road network and enhancing its operational efficiency without expanding its physical footprint. To quantify the supply capacity of road networks in mountainous cities, this paper converts the problem of solving the capacity of road networks into the problem of solving the minimum cut set in road networks from the perspective of road network capacity, using the idea of the auxiliary diagram method in graph theory. This procedure proved to be suitable for investigating the properties of

[1] *Babeș-Bolyai University of Cluj-Napoca, Faculty of Geography, Doctoral School of Geography, e-mail: alexandrumarius232@gmail.com*

network-level traffic flow relationships and concluding remarks include suggestions for further research in this highly promising area.

Keywords: *Traffic-flow relation, Intelligent Transport System, Dynamic assignment model, Road urban transport network, road network capacity, Geographic Axis Bistrița - Tg. Mures*

1. Introduction

A. Capacity

Capacity is an effective factor for evaluating traffic conditions and measuring a network's performance. The proper definition and quantification of network capacity have been topics of debate among researchers for decades. This concept was introduced by Ford and Fulkerson (1956), who developed an algorithm for the network maximum flow problem. Iida (1972), Asakura and Kashiwadani (1993), and Akamastu and Miyawaki (1995) extended that notion and proposed different programming approaches to estimate the capacity of a road network. Yang *et al*. (2000) introduced the concept of "reserve capacity" defined as ''the maximum common multiplier that can be applied to a given O–D matrix subject to the flow on each link not exceeding its capacity when the multiplied O–D matrix is assigned to the network by some equilibrium model'' (Yang et al., 2000). More recently, Daganzo and Geroliminis (2008) used variational theory to develop analytical expressions for the capacity of a street with blocks of diverse widths and lengths with no turns.

B. Network traffic theory

The origins of network traffic flow theory can be traced to the 1960's. Smeed (1966, 1968), Thomson (1967), Wardrop (1968), Godfrey (1969), and Zahavi (1972) were among the first studies to explore macroscopic relations of vehicular traffic in a network.

These methodological approaches dealt largely with the development of macroscopic models for arterials, which were later extended to general network models, and today highly spread thanks to the current extraordinary availability of real-time traffic data from sensors, floating car data and traceable personal mobile devices.

Accordingly, the evaluation of capacity at the network level has been receiving considerable attention more recently (Mahmassani *et al.*, 1984, 1987, and Williams *et al.*, 1987, 1995).

C. Actual urban networks, networks, capacity

However, actual urban networks are more complex. For highly idealized networks (completely homogenous and redundant) with slow-varying demand, Daganzo and Geroliminis (2008) suggested that if homogeneity conditions hold, these networks maximize their total flow for any given number of vehicles in the network. This can be referred to as ''theoretical capacity'' because it only depends on network structure and control and is independent of O–D patterns.

Nevertheless, in real-world urban networks, likely, the required homogeneity conditions do not hold. More practically, network capacity can be defined as the ''observed'' maximum network flow. This suggests that the observed maximum flow in networks tends to be lower than the theoretical capacity confirming the results of Knoop *et al.* (2013).

The maximum flow varies over time on a given road link and is influenced by various factors that have especially to deal with congestion. Accordingly, in the context of networks, capacity is the complex measurement of the maximum amount of data that may be transferred between network locations over a link or network path. Because of the number of intertwined measurement variables and scenarios, the actual network capacity is rarely accurate.

Currently, models and methods for calculating road network capacity include the cut-set method, the traffic distribution simulation method, the space–time consumption method, and linear programming.

As early as the 1950s, (Ford and Fulkerson, 1956; Beckmann, *et al.*, 1956) proposed the network maximum-flow problem for calculating road network capacity based on capacity, and the cut-set method was used to analyze road traffic problems.

The main idea of the cut-set method is to use the maximum-flow minimum-cut theorem to calculate road network capacity, which more accurately reflects the intrinsic relationship between the physical structure of road networks and traffic demand. Subsequently, Masuya and Saito (1989) utilized network flow cut-set theory to determine the capacity of a road network. Siregar, Agah, and Arifin (2015) evaluated the impact of two-way road medians, investigated the adjustment factor for road capacity calculation based on the median type, and validated the results.

Starting from these remarks, this paper aims to initiate a discussion on the definition and quantification of urban transport network capacity, providing a talk of existing definitions in the literature and the validation of new measurement methods.

This study explores some of the properties of network-wide traffic flow relationships in a large-scale complex urban street network using simulated results obtained from a dynamic traffic assignment model.

D. Network model analysed

Using a calibrated network model of the Bistrița-Târgu Mureș urban area, the traffic flow relationships are explored, focusing on the effect of traffic congestion on network capacity. The remainder of the paper is as follows. After a review of network capacity definitions in the general context of transportation, the second section discusses the methodological approach used to explore and subsequently calibrate network-wide traffic flow relationships. The third section presents the case study and describes the network simulation specifications.

The fourth section shows the modelling results, indicating the effects of congestion on network capacity. The last section concludes the paper by summarizing the main findings and specifying directions for future research. Travel times or costs per origin-destination pair for each route in the geographical axis studied.

Origin–destination (OD) flow models estimate the number of vehicles in a given transportation network that are travelling between origins and destinations within a specific time interval (Bauer *et al.*, 2018). Such estimations answer questions related to traffic congestion and evaluate the performances of theoretical models (Ben-Akiva *et al.*, 1998) and accessibility measures of public transport in urban areas (Benenson et al., 2011). OD flows can be estimated by traffic simulation from the travellers' daily or weekly activity programs (Horni *et al.*, 2016).

2. Materials and methods

A. Theoretical concept

The concept of transport infrastructure capacity is complex. The nominal capacity of most transport terminals and infrastructure is the traffic they can handle within a time frame and normal conditions in terms of reliability. It is jointly defined by static and dynamic considerations (Rodrigue, 2020):

- Static capacity refers to the infrastructure and available land as bigger terminals, or larger roads (more lanes) have conceptually more capacity. Static capacity cannot be easily changed without expanding the facility or the infrastructure, which tends to be capital-intensive and requires additional land. This can be a complex proposition in areas of limited land availability (or high land cost);
- Dynamic capacity relates to superstructure, labour, and technology, which can be improved upon. For instance, a more efficient terminal operation strategy can increase its physical throughput and capacity without resorting to additional land. The dynamic capacity of a road system can also be improved with a better synchronization of traffic lights. The intensity and density of utilization are improved with more efficient superstructure and management.

Dynamic modelling is used in the analysis of the study. Dynamic traffic assessment methods were developed as an evolution of "traditional" static assessment. Dynamic models can be used to produce forecasts of traffic patterns, traffic variations and variations in congestion levels. Such models can be successfully used to forecast traffic flows to better adapt traffic policies to real situations on the ground. These models can also be used for prediction and control (e.g., for traffic operators) as well as for on-line control. Dynamic models are an alternative to static models in combination with traffic demand models or temporal models. As a modelling technique, like static modelling, dynamic modelling allocates several trips to specific periods within network route matrices, resulting in time-varying traffic flows. Trip matrices are usually defined as the number of trips in an hour or quarter of an hour.

The dynamic traffic pattern shows how traffic flows through the links in the network. Unlike static models, dynamic models take into account not only the quantity of traffic but also the quality of traffic, taking into account its evolution over time.

A dynamic traffic model produces the following results:

- Travel times or costs per origin-destination pair on each route;
- Levels of variation over time of traffic flow on each route;
- Variations over time of travel times, flows, and speeds by link;
- Combined results (total kilometres travelled on the network; total time travelled on the network, etc.).

B. Analysis of the Dynamic Capacity Evaluation System of Bistrița-Târgu Mureș

B.1 Technical characteristics

Table 1. Structure Geographical axis of road transport under analysis

Geographical axis zone	*Communication ROAD*	*Distance (km)*	*Travel time*
a. Bistrița-Tg. Mureș	DN15A/E578	91.4 Km	1 h 39 min
b. Bistrița – Tg. Mureș	DJ 173	94.4 Km	1 h 24 min
c. Bistrița- Tg. Mureș	DN 15 E	105 km	2 h
d. Bistrița-Tg. Mureș	DJ 154 A/DJ154J	115 km	2 h 20 min
e. Bistrița-Tg. Mureș	DJ 151/DC16	120 km	2h 25 min+min înt

Source: *the author*

Table 2. Organisation of Geographical Axis Zone

Zone type	Number of axis	Geographical axis	type of transport
a.	2	Bistrița-Tg. Mureș	car
b.	3	Bistrița-Râciu-Tg. Mureș	car
c.	3	Bistrița-Reghin-Tg. Mureș	microbus
d.	4	Bistrița-Breza-Glodeni -Tg. Mureș	microbus
e.	30	Table 3	bus

Source: *the author*

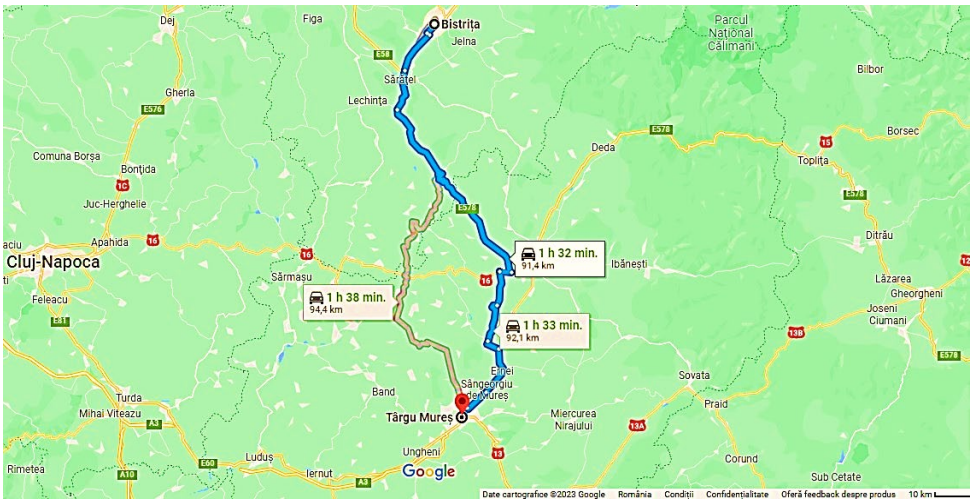

Fig. 1. Location of the Geographical Axis Zone Bistrița-Târgu Mureș distance travelled by personal vehicle.
Source: https://www.google.com/maps

Fig. 2. Geographical axis Bistrița-Târgu Mureș by public bus transport
Source: https://www.autogari.ro/Transport/Bistrita-TarguMures

Panel 1. Zone E: Connecting axis of bus transport

BISTRIȚA-SĂRATA-SĂRĂȚEL-HERINA-TONCIU-LECHINȚA-SÂNGEORZU NOU-BRĂTENI-SĂLCUȚA-SÂNMIHAIU DE CÂMPIE-ZORENI-BUDEȘTI–TÂGU-SĂRMĂȘEL-SĂRMAȘU-BALDA-MIHEȘU DE CÂMPIE-RAZOARE-SAULIA DE CÂMPIE–MASTICASEȘI–LEURINTA–GRĂBENIȘU DE CÂMPIE–DRACULEA BANDULUI-BAND-TIPTELNIC-BERGHIA-SÂNTIOANA DE MUREȘ-NAZNA-SÂNCRAIUL DE MUREȘ-TG. MUREȘ

Source: the author

C. Geographical Axis Assessment System for Road Transport

The research of the Geographical Axis Assessment System for road transport is based on the theory presented by Smeed (1966), who considered the number of vehicles that can accommodate it and defined N as the number that can use a single road. Several investigations were carried out and some results emerged, finding a fairly precise relationship between the amount of traffic N on a road and the traffic speed v between intersections.

This relationship is expressed as where N is the number of cars using the road per hour, w is the width of the road (in kilometres), and v is the average speed of traffic (in kilometres per hour). In the formula stated by Smeed following the NAg analysis, the number of geographical axes composing the system increases, the number between the two geographical axis increases, and the N and W value also grows.

The variable NAg depends on the value of the parameters N and W.

Panel 2. Formula

N- number of cars using the road per hour W- width of the road (in kilometres) NAg-number of geographical axis V-traffic speed between the axis
N÷W+NAg - 2*V

Source: the author

3. Results and discussions

A. Formula application

We applied the five directions of the geographical axis illustrated in Table 1.

Worksheets 1 and 2 analysed the route travelled by car.

Sheet 1

Geographical axis zone	Communication ROAD	Distance (km)	speed	number of geographical axis
a.	DN15A/E578	91.4 Km	55 km/h	2
N÷W+NAg - 2* V	2÷91.4+2-2*55=47.7-110=62.3			

Source: the author

Sheet 2

Geographical axis zone	Communication ROAD	Distance (km)	speed	number of geographical axis
b.	DJ 173	94.4 Km	65 km/h	3
N÷W+NAg - 2* V	3÷94.4 +3-2*65=34.46-130=95.54			

Source: the author

Worksheets 3 and 4 analysed the route travelled by microbus.

Sheet 3

Geographical axis zone	Communication ROAD	Distance (km)	speed	number of geographical axis
c.	DN 15 E	105 km	70 km/h	3
N÷W+NAg - 2* V	3÷105+3-2*70=38-140=102			

Source: the author

Sheet 4

Geographical axis zone	Communication ROAD	Distance (km)	speed	number of geographical axis
d.	DJ 154 A/DJ154J	115 km	70km/h	4
N÷W+NAg -2* V	4÷115+4-2*70=32.75-140=107			

Source: the author

Worksheet 5 analysed the route travelled by bus.

Sheet 5

Geographical axis zone	Communication ROAD	Distance (km)	speed	number of geographical axis
e.	DJ 151/DC16	120 km	75 km/h	30
N÷W+NAg -2* V	30÷120+30-2*75=34-150=116			

Source: the author

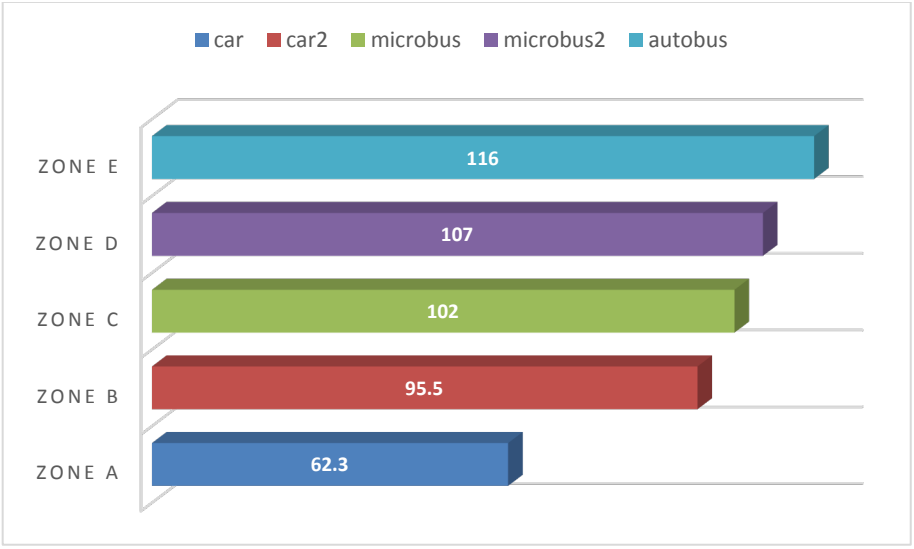

Fig. 3. Difference in road transport flow dynamics along the geographical axis.
Source: the author

B. Impact analysis

The dynamics of road transport flows increase with the diversification of the number of axes that the road transport network comprises.

The results presented by the graph in Figure 3 show that the diversification of the transport axis increases the transmission capacity.

Zone E shows the highest branching which means the connecting axes between two main geographical axis capacity in structure is higher than in Zone A.

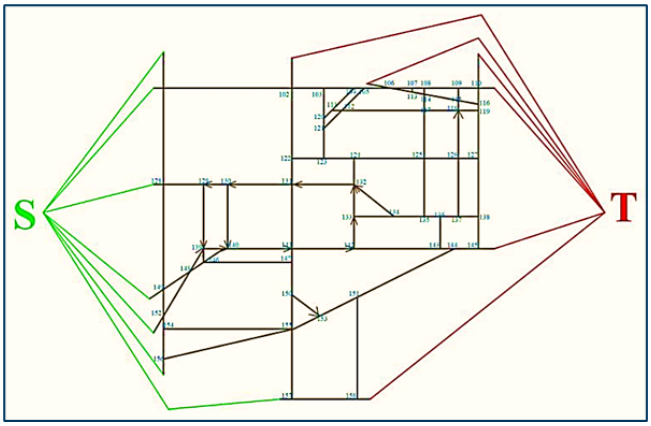

Fig. 4. Road transport network under construction zones a. and b. between two geographical axis S and T. *Source: the author*

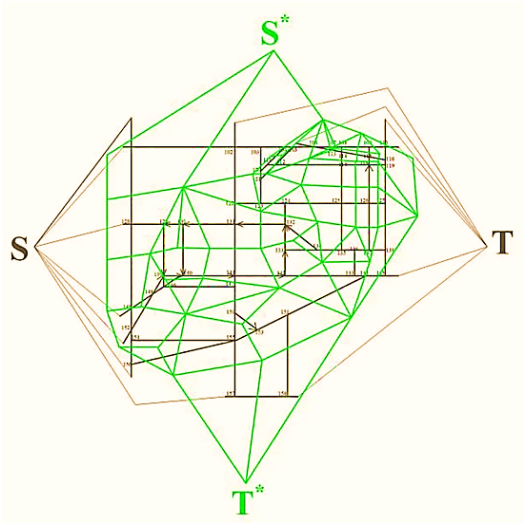

Fig. 5. Road transport network located under construction zones c., d. and e. between two main geographical axis S and T and two supporting secondary axes. Transport capacity is high, increasing fluctuation in road transport capacity. *Source: the author*

5. Conclusion

Network capacity in a transportation system becomes an important measurement for transport planning and management because it addresses the question of whether or not the system has adequate ability to handle continuing economic surges and traffic congestion. In transportation, capacity has traditionally been measured at individual elements of the network, such as links and nodes, however, these measures do not constitute the network capacity. Therefore, recent studies in the literature have suggested well-defined relationships between network-wide average flow, density and speed exist for urban networks.

In this context, this work provides a discussion of road urban transport network capacity including existing definitions in literature and the validation of new measurement methods. The study explores some of the properties of network-wide traffic flow relationships in a large-scale complex urban street network putting forward an innovative approach dealing with comprehensive data mining and analysis from different sources of data (radar sensors and floating car data) including real-time traffic estimations provided by a dynamic assignment simulation model.

The basic variables used are traffic flows and travel speeds characterized using a network model calibrated in the geographical axis.

For a comprehensive yet simple analysis, equations and graphs are utilized to resume the obtained results related to different days and several time intervals. It was noticed that the network behaves differently depending on the traffic context and the corresponding flow-speed relationships were obtained for congested and uncongested conditions.

It is intended that the relations derived from this study are calibrated for our own traffic data set, but it is well conceivable that they can better describe datasets of other countries, with similar characteristics in terms of network topology and transportation attitude.

Further research needs to be conducted to investigate the temporal and spatial stability of the proposed. Moreover, to account for the heterogeneity of congestion, alternative traffic measures using trajectories might be examined in future studies.

REFERENCES

1. Akamastu, T., Miyawaki, O., (1995), *Maximum network capacity problem under the transportation equilibrium assignment*, Infrastr Plann Rev, 12, p. 719–729.
2. Asakura, Y., Kashiwadani, M., (1993), *Estimation model of maximum road network capacity with parking constraints and its application*, Infrastr Plann Rev, 11, p. 129–136.

3. Beckmann, M., McGuire, C.B., Winsten, C.B. (1956), *Studies in the Economics of Transportation*, Yale University Press, Yale, CT, USA, 266 p.
4. Bauer, D., Richter, G., Asamer, J., Heilmann, B., Lenz, G., Kölbl, R. (2018), *Quasi-Dynamic Estimation of OD Flows from Traffic Counts Without Prior OD Matrix*, IEEE Trans. Intell. Transp. Syst., 19, p. 2025–2034.
5. Ben-Akiva, M., Bierlaire, M., Koutsopoulos, H., Mishalani, R. (1998), *DynaMIT: A simulation-based system for traffic prediction*, Proceedings of the DACCORD Short Term Forecasting Workshop, Delft, The Netherlands, February, pp. 1–12. Available online: http://www.es.lancs.ac.uk/cres/daccord/workshop.html, last accessed on 24 September 2023.
6. Benenson, I., Martens, K., Rofé, Y., Kwartler, A. (2011), *Public transport versus private car GIS-based estimation of accessibility applied to the Tel Aviv metropolitan area*, Ann. Reg. Sci., 47, p. 499–515.
7. Daganzo, C.F., Geroliminis, N. (2008), *Existence of urban-scale macroscopic fundamental diagrams: some experimental findings*, Transp Res BMeth, 9, p. 759–770.
8. Ford, L.R., Fulkerson, D.R., (1956), *Maximum flow through a network*, Can J Math, 8, p. 399–404.
9. Godfrey, J.W., (1969), *The mechanism of a road network*, Traffic Engineering and Control, 11 (7), p. 323-327.
10. Horni, A., Nagel, K., Axhausen, K.W. (2016), *The Multi-Agent Transport Simulation MATSim*, Ubiquity Press, London, UK.
11. Knoop, V., Hoogendoorn, S., van Lint, J.W.C. (2013), *Impact of traffic dynamics on macroscopic fundamental diagram*, Transportation Research Board, 92nd Annual Meeting, Washington DC, No. 13-0595.
12. Iida, Y., (1972), *Methodology for maximum capacity of road network*, Trans Jpn Soc Civ Eng, 205, p. 147–150.
13. Mahmassani, H.S., Williams, J.C., Herman, R. (1984), *Investigation of network-level traffic flow relationships: some simulation results*, Transportation Research Record: Journal of the Transportation Research Board, No. 971, p. 121-130.
14. Mahmassani, H.S., Williams, J.C., Herman, R. (1987), *Performance of urban traffic networks*, Proceedings of the 10th International Symposium on Transportation and Traffic Theory, Elsevier Science Publishing, p. 1-20.
15. Rodrigue, J.-P. (2020), *The Geography of Transport Systems*, Routledge, New York, 456 p.
16. Smeed, R.J. (1966), *Road capacity of city centres*, Traffic Engineering and Control, 8 (7), p. 455-458.
17. Thomson, J.M. (1967), *Speeds and flows of traffic in central London: 2. Speed-flow relations*, Traffic Engineering and Control, 8 (12), p. 721-725.
18. Wardrop, J.G. (1968), *Journey speed and flow in central urban areas*, Traffic Engineering and Control, 9 (11), p. 528-532.
19. Yang, H., Bell, M.G.H., Meng, Q. (2000), *Modelling the capacity and level of service of urban transportation networks*, Transp Res Part B-Meth, 34(4), p. 255–275.
20. Zahavi, Y. (1972), *Traffic performance evaluation of road networks by the α-relationship*, Parts I and II, Traffic Engineering and Control, 14 (5, 6), p. 228-231, 292-293.

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 95-138)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.06

VIRTUAL REALITY IN DESTINATION MARKETING: THE WHY, THE WHO AND THE WHEN

Sergiu Grigore PRODAN[1], István EGRESI[2]

ABSTRACT. Virtual Reality in Destination Marketing: The Why, The Who and The When. Virtual reality (VR) is one of the fastest growing areas in information and communication technologies. Starting with the 1990s, the technology has also been successfully employed in tourism. Among other purposes, VR is used in tourism to provide a more effective marketing of a destination than classical means such as (paper) brochures. While the literature on the use of VR in destination marketing has been steadily growing, it is still scarce and fragmented. The main objective of this study is to better understand how could VR be used to improve the marketing of tourism destinations. To gather data for this study an experiment was used: participants were invited to take an online virtual tour of a very popular landmark in Paris, and then fill out a questionnaire in order to share their experience. The data from the 89 questionnaires collected were then processed using SPSS. The results have shown that almost all of our respondents were satisfied with their VR experience. Moreover, the VR experiment has improved the users' image of and satisfaction with the destination. This, in turn, has positively influenced their intention to visit or re-visit the destination and to recommend it to others. The study also found that some socio-demographic groups (female, older than 25 years) may be more suitable targets for destination marketing using VR than others. Finally, we learned that, although the use of VR is effective for destination marketing both before and after tourists visit the site, the technology may be more useful in improving the image of the destination when applied before the physical visit.

Keywords: *virtual reality, virtual tourism, destination marketing, destination image, user satisfaction.*

[1] *Babeş-Bolyai University, Faculty of Geography, 5-7 Clinicilor Street, Cluj-Napoca, Romania, e-mail: sergiu.grigore.prodan@stud.ubbcluj.ro*

[2] *Babeş-Bolyai University, Faculty of Geography, Center for Research on Settlements and Urbanism, 5-7 Clinicilor Street, Cluj-Napoca, Romania, e-mail: istvan.egresi@ubbcluj.ro*

Introduction

Virtual reality (VR) is one of the fastest growing areas in information and communication technologies (ICT). The technology dates back to the 1960s and since then it has been adopted by many industries (Berg & Vance, 2017), including tourism, in the 1990s (Williams & Hobson, 1995). During the COVID-19 pandemic, the VR technology was especially useful because it allowed a user to experience a destination without physically traveling there (Wei, 2019). However, application of VR in tourism did not stop when the COVID-19 pandemic ended. On the contrary, many scholars agree that VR is set to become even more prevalent in tourism in the following years (Guttentag, 2010; Tussyadiah et al., 2018; Mura, Tavakoli, and Sharif, 2017; Jayawardena, 2019) to the point that it may determine future trends in tourism development (Yung & Khoo-Lattimore, 2019; Mohanty, Hassan, and Ekis, 2020; Huang et al., 2016).

So far, the technology has been applied especially by museums (Thomas & Carey, 2005; Navarrette, 2019; Han, tom Dieck, and Jung, 2018; He, Wu, and Li, 2018), heritage sites (Marasco et al., 2018) and theme parks (Wan et al., 2007), areas in which a number of scholarly studies have demonstrated that the use of VR technology could encourage physical visitation (Thomas & Carey, 2005; Guttentag, 2010; Dewailly, 1999).

Impressed by the tremendous growth of ICT applications in tourism, some researchers even stated that virtual tourism has the potential for replacing traditional tourism (Martins et al., 2017). While we and others (Sussman & Vanhegan, 2000) do not share this sentiment, it is clear that virtual tourism could be a sustainable alternative to physical travel especially in areas that enjoy some form of protection, such as heritage sites and sensitive natural areas where it is necessary to limit the number of visitors (Tussyadiah et al., 2018), in places that are dangerous to visit and/or inaccessible (Verma et al., 2022) or in situations when certain population segments are limited in their movement by age, disability or financial problems (Guttentag, 2010; Lu et al., 2022).

VR applications have the ability to change the way tourists experience destinations (Verma et al., 2022; Lin et al., 2020). In this sense, the biggest strength of this technology is that it allows potential tourists to visualize the spatial environment of their target destination which could provide them with rich information in the planning stage (Berger et al., 2007; Guttentag, 2010). For example, a study financed by Priceline in 2016 has found out that "almost half of Millennials would use a VR headset to preview a destination they are planning to travel to" (quoted in Gibson & O'Rawe, 2017). In so doing, VR could also serve an educational purpose (Griffin & Muldoon, 2022; Zarzuela et al., 2013; Han et al., 2018), thus enhancing the destination visitation experience of tourists

(Moorhouse, tom Dieck, and Jung, 2018). However, not all scholars agree with this view. For example, Cabello et al. (2011, p. 1) noted that "using virtual world technologies as a new means of information for potential tourists is a big challenge where the methods, goals and needs still need to be exactly identified".

From the industry and destination management perspective, VR has been used in six main areas (Guttentag, 2010): planning (Wei, 2019), destination management and marketing (Williams & Hobson,1995; Guttentag, 2010; Huang et al., 2016; Moorhouse, tom Dieck, and Jung, 2018; Griffin et al., 2017, Lu et al., 2022; Subawa et al., 2021; Akhtar et al., 2021; Vishwakarma, Mukherjee, & Datta, 2020), heritage preservation (Dewailly, 1999; Marasco et al., 2018), entertainment (Wan et al., 2007), accessibility and education (Griffin & Muldoon, 2022; Zarzuela et al., 2013; Han, tom Dieck, and Jung, 2018).

Of these, the most popular area among researchers has been marketing (e.g., Guttentag, 2010; Huang, Backman, Backman, & Moore, 2013; Tussyadiah et al., 2018; Yung & Khoo-Lattimore, 2019). A review study by Yung & Khoo-Lattimore (2019) established that 28.28% of all scientific studies on the application of VR in tourism have been published in this area. Using VR as a marketing tool for destinations makes sense because, unlike in other industries, in tourism, one cannot test the product before buying it (Roughhead, 2017; Flavian, Ibanez-Sanchez, & Orus, 2021; Israel, Zerres, & Tscheulin, 2019). VR technology provides potential tourists with rich data in 3D form about the destination advertised thus reducing the perceived risks and allowing the customer to make an informed decision (Cheong, 1995). Moreover, besides offering potential tourists a virtual image and more contextual information about the destination, VR technologies also promise users an immersive, interactive, vivid and enjoyable experience (Fan, Jiang, and Deng, 2022).

A number of studies have already demonstrated that VR could provide a more effective marketing of a destination than classical means such as (paper) brochures (Wan et al., 2007). Consequently, a growing number of hotels, restaurants, travel agencies and tourism destinations started including virtual tours as part of their marketing strategies (Guerra, Pinto, and Beato, 2015). However, a marketing strategy using VR is not without risks and challenges. For example, a study by Tussyadiah et al. (2018) questions the effectiveness of using VR in destination marketing. Similarly, Abrash (2016) has shown that, in spite of increased use of VR in destination marketing, the strategy had very little impact on potential tourists' decision making. Moorhouse, tom Dieck, and Jung (2018) explained that this may be because tourism marketers lack the knowledge on how to apply the VR technology in order to influence users' travel decisions. Other reasons why the technology is not yet used extensively in tourism marketing are related to high costs involved as the technology is still

expensive and to the fact that users need to be technology savvy (Han, tom Dieck, and Jung, 2018; Mascho & Singh, 2013). Some destination managers and marketers also worry that the use of VR technologies may have unintended consequences; for example, in the case of heritage sites, managers fear that the use of VR could dilute the authenticity of the site (Dueholm & Smed, 2014).

Even though the literature on the use of VR in tourism marketing has been steadily growing (Han, tom Dieck, and Jung, 2018), it is still scarce and fragmented (Moorhouse, tom Dieck, and Jung, 2018; Verma et al., 2022). A number of more recent studies have investigated how virtual tours can change tourists' attitudes towards a destination and influence their visitation intention (Kim et al., 2020). However, most of these studies are very general and, while they agree that employing virtual tours (VT) may be useful for destination marketing, they rarely make any useful recommendations to tourism practitioners. The main objective of this study is to better understand how could VR be used to improve the marketing of a tourism destination. It will try to answer the following questions:

1. How satisfied were users of the VR technology with their experience?
2. Can VT improve the image of a destination?
3. Can VR technology influence users' satisfaction with visiting a destination?
4. Can this technology influence users' intention to visit or re-visit a destination and/or recommend it to others?
5. Which socio-demographic segments are the most likely to enjoy the VR, to improve their image of the destination and to decide to visit (or re-visit) the destination after the VR experiment?
6. Is it better to use VR for marketing purposes before or after the actual physical visit to the destination?

The paper will proceed as follows: after a thorough review of the extant studies, we will discuss our methodology to collect and process the data and, then, we will present our findings. In the last section, we will summarize the main findings emphasizing its practical implications and acknowledging its limitations.

Literature Review

Virtual tourism (VT) and virtual reality (VR)

Our intention here is limited to identifying and to shortly defining the main concepts related to our research topic without getting too specific. Scholars interested in learning more about VT and VR should consult the

handful of papers that review the extant literature on the subject (Moro et al., 2019; Yung & Khoo-Lattimore, 2017; Fan, Jiang, and Deng, 2022; Beck, Rainoldi, & Egger, 2019; Flavian, Ibanez-Sanchez, and Orus, 2019; Guttentag, 2010; Loureiro, Guerreiro, and Ali, 2020).

VT is a concept that refers to the situation in which someone is able to experience a specific place without actually (physically) traveling to the location (Verma et al., 2022; Loureiro, Guerreiro, and Ali, 2020; Cho, Wang, and Fesenmaier et al., 2002; Daasi & Debbabi, 2021). This can happen via "the use of computer-generated 3D environment – called a 'virtual environment' (VE) – that one can navigate and possibly interact with, resulting in real-time simulation of one or more of the user's five senses" (Guttentag, 2010, p. 638). VE used in tourism applications generally replicate central areas of tourist cities with a great number of tourism attractions that can be examined using a VR tool in greater detail (Guttentag, 2010).

The technology that allows the users to partially or fully immerse themselves into the VE (Gonzalez, Richards, and Bilgin, 2021) and to sense that they are physically and psychologically present in that very place (Guttiérez, Vexo, & Thalmann, 2008; Tussyadiah et al., 2018; Loureiro, Guerreiro, and Ali, 2020; Lu & Hsiao, 2022; Marasco et al., 2018) is known as VR. The level of immersion could vary (Baños et al., 2004)) with a fully immersive state referring to a complete disconnect from the real place "in which the participant's body is actually located" (Sanchez-Vives & Slater, 2005: 333). While immersed into the VE, the user also has the ability to "navigate" and "interact with" the VE (Wiltshier and Clarke 2017). The mental imagery could be so strong that the participant may no longer distinguish between real and illusion (Wedel, Bigné, and Zhang, 2020; He, Wu, and Li, 2018; Fan, Jiang, and Deng, 2022). Thus, the three key elements that characterize any effective VR are visualization, immersion and interactivity (Yung & Khoo-Lattimore, 2019).

Another important concept linked to VT and VR is presence or telepresence. The concept of presence refers to the "psychological similarities between virtual and actual objects when people experience – perceive, manipulate, or interact with – virtual objects" (Lee, 2004: p. 38). To put it more simply, presence measures how realistic the destination is portrayed by the VE (Slater & Usoh, 1993). VR induces mental imagery for real-world like tourism experiences (He, Wu, Li, 2018) so when the VE is a true representation of the destination, it could have a positive influence on the user's intention to physically visit the destination (Tussyadiah et al., 2018; Marasco et al., 2018; Kim & Hall, 2019; Lee et al., 2010). Indeed, Tussyadiah et al. (2018) conducted two studies in Hong Kong and UK on the use of VR technology in destination marketing. They found that users are likely to enjoy the VR experience when this technology

allows them to be "transported" in the VE. When participants feel that they are physically and psychologically present in the VE they will end up liking the destination more which will determine a higher level of visitation intention.

User satisfaction and intention to visit

This concept can be broken up into three components: satisfaction with the VR experience, satisfaction with the destination and intention to visit. However, as any literature review will show, the three components are connected. Users are more likely to physically visit the destination when they are satisfied with their VT experience (Kim, Lehto, and Kandampully, 2019; Nguyen, Le, and Chau, 2023) and when the VR improves their image of the destination (Huang & Hsu, 2009). Also, a positive experience with the VR tour could lead to increased positive feelings toward the destination (Huang et al., 2016), which, in turn, could influence users' intention to physically visit the destination. Before taking the VR tour, most users have an image of the destination that was made up by previous experiences, other people's experiences, media advertising and common beliefs (Baloglu and Brinberg 1997, as cited in Buhalis 2000). However, this initial image can be changed following the VR tour.

Indeed, as several studies have highlighted, VR can play an important role in destination image building (Govers, Go, and Kumar, 2007; Hyun O'Keefe, 2012). By creating imagery and information that is realistic (Gibson & O'Rawe, 2018; Guttentag, 2010), the VR tour allows the user to make an informed decision about travel to the destination (Sussman & Vanhegan, 2000) and even daydream about the destination (Bogicevic et al 2019) which, then, could translate into the actual visitation of the destination (Hyun and O'Keeffe, 2012) and a greater likelihood of sharing information about the destination with friends and family (Griffin et al., 2017). Indeed, a study by Griffin & Muldoon (2022) on a number of participants who were given a VR HMD tour of a slum in Manila has found that most participants have become more confident and more comfortable to physically visit the slum because they felt that the VR tour was a realistic representation of the slum. Similarly, a study by Marasco et al. (2018) has demonstrated that visual appeal of VR and emotional involvement can have a positive and significant effect on tourists' attitudes and behavior, which, then, can increase the likelihood of visitation.

The literature also shows that experiments with VR tours have already been included in destination marketing studies. For example, Gibson & O'Rawe (2018) used 360-degrees VR videos of the Wild Atlantic Way developed by Ireland's marketing and product development agency to learn about users' attitudes and experiences. The results indicated that a positive experience with the VR tour could increase the likelihood of physically visiting the destination

in the future. Other case studies with similar results were conducted in Scotland (Roughhead, 2017), British Columbia, Canada and Australia (Yung & Khoo-Lattimore (2017), as well as Valladolid in Spain (Zarzuela et al., 2013). After having toured the destination in VR, most participants are looking forward to physically travel to the site so that they can compare it to the one reconstructed in VR (Pantano & Servidio, 2011).

Differences between population groups' assessment of VR

We found that the literature is ambivalent about how certain demographic characteristics can influence users' satisfaction with the VR tour and their intention to visit de destination. Thus, while Tussyadiah et al. (2018) found that younger tourists are more likely to be interested in VR, Marasco & Balbi's (2019) and Akhtar et al.'s (2021) studies concluded that older tourists may be better targets for promoting a destination using VR. Others found no differences across demographic groups (Gibson & O'Rawe, 2018). Marasco & Balbi (2019) also found that women and lower educated tourists tended to be more appreciative of VR as a marketing instrument.

Differences between those who have already visited and those who have not visited the destination

VR tours can be given pre-, post-, or during physical trips to a destination (Nguyen et al., 2023). People perceive destination images differently, depending on whether they have been there in the past or they intend to visit in the near future (Hughes, 2008). A legitimate question here is when would it be more effective to give such VR tours from a marketing perspective? Does the timing of the VR tour moderate the perceived usefulness for influencing intention to visit, perceived ease of use or enjoyment of the VR experience? Kim & Hall (2019) argued that the answer is yes to all of these questions. VR users who have already visited the destination are able to associate the VE with the destination environment, thus, creating clear mental imagery; at the same time, those who have not yet visited the destination form a vaguer mental imagery following the use of the immersive technology (Fan, Jiang, and Deng, 2022). This is the reason why extant literature makes a clear distinction between real tourists (those who have visited the destination) and imaginary tourists (those have only visited the destination through VR). Visitors generally find it easier to immerse themselves into the VE while the imaginary visitors have more difficulty generating mental imagery (Bogicevic et al., 2019). Another study, by Fan, Jiang, and Deng (2022) found that prior visitation has a negative moderating effect of presence on the VR experience.

Methodology

Data collection

To gather data for this study we first employed an experiment (according to Akhtar et al. (2021), most VR-related studies are based on experimental research). Before filling out a questionnaire, the participants were asked to take a VR tour of the city of Paris lasting between 10 and 15 minutes. The invitation to participate was sent using a number of social media platforms (Facebook, Reddit, Messenger, WhatsApp, Instagram and Snapchat). Those who agreed to participate in our study were sent a link to a website (www.youvisit.com/tour/paris) and instructions on how to take one of the virtual tours featured on this website. Among the popular tourism objectives participants could choose to virtually visit, were: the Eiffel Tower, the Notre Dame Cathedral, Sainte-Chapelle, the Luxembourg Gardens and others.

After completing the VR tour, the participants were invited to fill out a questionnaire in which to share their first impression of the VR experiment. We have, in fact, prepared two sets of questionnaires: one for those who have visited the chosen tourism objective in the past and one for those who have not.

The questionnaire was divided into two parts. In the first part, we collected socio-demographic data about the participants: gender, age, level of education, income, and knowledge of technology. The second part included a number of 14 statements that were identical for both versions of the questionnaire plus seven and respectively five statements that were specific for each version. The statements referred to the respondents' satisfaction with the VR tour experience, their image of the destination after taking the tour and their intention to visit or re-visit. Respondents could express their agreement or disagreement with each statement using a Likert scale from 1 to 5, with 1 meaning total disagreement and 5 total agreement.

In the end, 89 usable questionnaires were collected, of which 30 were sent by participants who visited the objective in Paris before viewing the VR and 59 by users who have not yet been at the destination. In writing the questionnaire items we were inspired by similar studies (for example, Gibson & O'Rawe, 2018).

Data processing

We employed SPSS 26 to process the data resulting from the questionnaires collected. We used descriptive statistical methods (frequencies, percentage of total, median and IQR) to understand the socio-demographic make-up of our sample and to evaluate participants' answers to our statements

and inferential statistics (Mann-Whitney U Test and Kruskal-Wallis H Test) to learn whether or not there were any statistically significant differences between groups based on socio-demographic characteristics and visitation status (whether or not they have visited the site in the past).

Findings

Socio-demographic characteristics of our respondents

Most of our respondents were women, young (18-25 years), with less than a university degree and with average or above average incomes (table 1). Also, more than half did not see themselves as "technology-savvy". Lastly, one-third of our respondents has physically visited the site in the past and two-thirds have taken other virtual tours in the past (table 1).

Table 1. Socio-demographic characteristics of respondents

Socio-demographic characteristic	Frequency	% from total	Socio-demographic characteristic	Frequency	% from total
Gender			***Income***		
Male	27	30.34	Below average	37	41.57
Female	62	69.66	Average and above	52	58.43
Age group					
18-25 years	55	61.80	***Technical skills***	41	46,06
26+ years	34	38.20	***Have physically visited the site***	30	33,70
Education			***Have taken virtual tours in the past***	58	66,17
Less than university degree	57	64.05			
Undergraduate degree+	32	35.95			

Source: the authors

Satisfaction of participants who have physically visited the site in the past

Table 2 below shows that our respondents were generally satisfied with their VR experience (all medians were 4 or higher). They particularly found the VR tour to be very pleasant and very interesting (medians 4.5) and were willing to recommend it to others (median 5).

Table 2 also shows that our respondents were satisfied with the destination (medians 4 and up). They especially enjoyed revisiting the location they have physically visited in the past (median 5). Finally, the participants agree that the VR influenced their decision to revisit the destination in the near future and to recommend it to others (medians 4). They also assessed the use of VR technology to be very useful for destination marketing (median 5).

Table 2. Satisfaction of tourists who have physically visited the site in the past

Satisfaction with experience (n= 30)	**Totally disagree (%)**	**Disagree (%)**	**Not sure (%)**	**Agree (%)**	**Totally agree (%)**	**Median**	**IQR**
Information about the destination is accurate	0	6.7	13.3	36.7	43.3	4.00	1.00
Information about the destination is reliable	3.3	0	16.7	43.3	36.7	4.00	1.00
Information about the destination is well-organized	0	10.0	16.7	43.3	30.0	4.00	2.00
During the virtual tour I felt completely immersed	6.7	10	16.7	36.7	30.0	4.00	2.00
During the virtual tour I felt totally involved	0	6.7	26.7	26.7	40.0	4.00	2.00
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	6.8	3.3	23.3	23.3	43.3	4.00	2.00
The virtual tour was very pleasant	0	6.7	16.7	26.7	50.0	4.50	1.00
The virtual tour was very interesting	3.3	10.0	10.0	26.7	50.0	4.50	1.00
I learned a lot after this virtual tour	3.3	20.0	23.3	26.7	26.7	4.00	2.00
I am very satisfied with this virtual tour experience	3.3	10.0	20.0	36.7	30.0	4.00	2.00
I will go on other virtual tours in the future	3.3	6.7	26.7	23.3	40.0	4.00	2.00

Satisfaction with experience (n= 30)	**Totally disagree (%)**	**Disagree (%)**	**Not sure (%)**	**Agree (%)**	**Totally agree (%)**	**Median**	**IQR**
I will recommend the virtual tour to others	0	13.3	13.3	13.3	60.0	5.00	2.00
I enjoyed virtually revisiting the location I visited physically in the past.	0	3.3	23.3	13.3	60.0	5.00	2.00
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	0	3.3	16.7	36.7	43.3	4.00	1.00
The image of this tourism destination has improved after this virtual tour	6.7	13.3	26.7	23.3	30.0	4.00	2.00
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	6.7	16.7	20.0	33.3	23.3	4.00	2.00
During this virtual tour I was able to study the location in greater detail	16.7	3.3	20.0	26.7	33.3	4.00	2.00
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	10	6.7	26.7	13.3	43.3	4.00	2.00
This virtual tour influenced my decision to revisit this tourism destination	10	6.7	26.7	23.3	33.3	4.00	2.00
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	6.7	6.7	20.0	26.7	40.0	4.00	2.00
I think using VR technology is very useful to visit a tourist destination/ attraction	3.3	3.3	20.0	20.0	53.3	5.00	2.00

Source: the authors

We found no statistically significant differences in experience satisfaction based on gender (annex 1), level of education (annex 3), income (annex 4) and technical skills (annex 5). However, we found some statistically significant differences in experience satisfaction based on age (table 3; annex 2). It seems that participants 26 years of age or older are more likely to benefit from the VR tour than youger participants. For example, they tend to find the information acquired through VR to be more reliable and to learn during the VR tour. They are also more likely than younger users to discover new details about the destination and to have their image of the destination enhanced following the VR tour (table 3).

Table 3. Differences in experience satisfaction among those who already visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is reliable	18-25 yr.	22	13.14	U= 140.0 Z= 2.621	**.013***
	26+ yr.	8	22.00		
I learned a lot after this virtual tour	18-25 yr.	22	13.59	U= 130.0 Z= 2.029	**.049***
	26+ yr.	8	20.75		
The image of this tourism destination has improved after this virtual tour	18-25 yr.	22	13.11	U= 140.5 Z= 2.540	**0.12***
	26+ yr.	8	22.06		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	18-25 yr.	22	13.61	U= 129.5 Z= 2.009	**.049***
	26+ yr.	8	20.69		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	22	13.41	U= 134.0 Z= 2.234	**.031***
	26+ yr.	8	21.25		

* Significant at 95% confidence level

Source: the authors

Satisfaction of participants who have not yet physically visited the site

Table 4 shows that those participants who have not visited the site physically were also satisfied with their VR experience (medians 4 or higher). The highest median (5) was calculated for six statements. Thus, the majority of the participants totally agreed that the information about the destination is reliable, and that the VR tour was very pleasant and interesting. Most users also

totally agreed that they will take other VR tours in the future and will recommend them to others. Finally, most participants found the VR technology very useful for destination marketing (table 4).

Table 4. Satisfaction of participants who have not yet visited the site physically

Satisfaction with experience (n= 59)	Totally disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Totally agree (%)	Median	IQR
Information about the destination is accurate	3.4	5.1	6.8	39.0	45.8	4.00	1.00
Information about the destination is reliable	3.4	5.1	10.2	25.4	55.9	5.00	1.00
Information about the destination is well-organized	3.4	1.7	10.2	35.6	49.2	4.00	1.00
During the virtual tour I felt completely immersed	1.7	3.4	15.3	42.4	37.3	4.00	1.00
During the virtual tour I felt totally involved	3.4	1.7	15.3	40.7	39.0	4.00	1.00
During the virtual tour I felt that I was physically present at the tourism site	11.9	6.8	25.4	25.4	30.5	4.00	2.00
The virtual tour was very pleasant	1.7	1.7	11.9	33.9	50.8	5.00	1.00
The virtual tour was very interesting	1.7	1.7	11.9	28.8	55.9	5.00	1.00
I learned a lot after this virtual tour	3.4	8.5	13.6	35.6	39.0	4.00	2.00
I am very satisfied with this virtual tour experience	3.4	3.4	13.6	40.7	39.0	4.00	1.00
I will go on other virtual tours in the future	1.7	3.4	8.5	28.8	57.6	5.00	1.00
I will recommend the virtual tour to others	3.4	1.7	11.9	23.7	59.3	5.00	1.00
I enjoyed seeing virtually the location I planned to visit physically	6.8	1.7	18.6	25.4	47.5	4.00	2.00
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	3.4	5.1	13.6	39.0	39.0	4.00	1.00

Satisfaction with experience (n= 59)	Totally disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Totally agree (%)	Median	IQR
The image of the tourist destination has improved as a result of this virtual tour	3.4	0	25.4	22.0	49.2	4.00	2.00
During this virtual tour I was able to study the location in greater detail	5.1	3.4	25.4	32.2	33.9	4.00	2.00
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	1.7	1.7	25.4	33.9	37.3	4.00	2.00
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	5.1	5.1	18.6	23.7	47.5	4.00	2.00
I think using VR technology is very useful to visit a tourist destination/attraction	5.1	1.7	8.5	25.4	59.3	5.00	1.00

Source: the authors

We found that, in the case of those participants who have not yet visited the destination, presence is, in general, stronger for women than for men (table 5; annex 6). Thus, women are more likely than men to feel totally immersed and involved during the virtual tour as if they were physically present at the tourism site (table 5).

Table 5. Differences in experience satisfaction among those who have not yet visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
During the virtual tour I felt completely immersed	Male	18	23.00	U= 495.0 Z= 2.225	**.026***
	Female	41	33.07		
During the virtual tour I felt totally involved	Male	18	23.47	U= 486.5 Z= 2.074	**.038***
	Female	41	32.87		
During the virtual tour I felt that I was physically present at the tourism site	Male	18	21.31	U= 525.5 Z= 2.661	**.008***
	Female	41	33.82		

* Significant at 95% confidence level

Source: the authors

In terms of age, we found a statistically significant difference in experience satisfaction for only two statements. Thus, participants 26 years of age or older are more likely than younger participants to enjoy touring the site virtually before the actual visit and to recommend the destination to others (table 6; annex 7).

Table 6. Differences in experience satisfaction among those who have not yet visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	18-25 yr.	33	25.41	U= 580.5 Z= 2.480	**.013***
	26+ yr.	26	35.83		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	18-25 yr.	33	26.09	U= 558.0 Z= 2.108	**.035***
	26+ yr.	26	34.96		

* Significant at 95% confidence level

Source: the authors

With the exception of one statement we found no differences in the way participants of different education levels evaluate their satisfaction with the VR experience. The only exception is that participants with less than a college degree are more likely to go on other virtual tours in the future than participants that have at least a college degree (table 7; annex 8). However, we found no differences in satisfaction assessment based on income (annex 9) or technical skills (annex 10).

Table 7. Differences in experience satisfaction among those who have not yet visited the destination based on level of education

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
I will go on other virtual tours in the future	< univ. degree	37	33.20	U= 288.5 Z= -2.097	**.036***
	≥ univ. degree	22	24.20		

* Significant at 95% confidence level

Source: the authors

Differences in experience satisfaction between those who have visited the site in the past and those who have not

Finally, table 8 below (and annex 11) shows that there are no statistically significant differences in experience satisfaction between those who have physically visited the site and those who have not, except for two statements. Those who have not visited the tourism objective yet are more likely than those who have to take other virtual tours in the future. Our study has also shown that virtual tours are more effective in improving the image of the tourist destination when applied to tourists who have not visited the destination in the past (table 8).

Table 8. Differences in experience satisfaction between those who have visited and those who have not visited the site

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
I will go on other virtual tours in the future	Yes	30	37.77	U= 1102.0 Z= 2.056	**.040***
	No	59	48.68		
The image of the tourist destination has improved as a result of this virtual tour	Yes	30	37.20	U= 1119.0 Z= 2.149	**.032***
	No	59	48.97		

* Significant at 95% confidence level

Source: the authors

Conclusion

This study has shown that almost all of our respondents were satisfied with their VR experience. They have also agreed that their image of the destination has improved after the VT. Moreover, based on the results of our research, we could also safely conclude that VR technology does improve users' satisfaction with visiting a destination and can positively influence their intention to visit or re-visit a destination and to recommend it to others.

In terms of satisfaction differences based on socio-demographic characteristics, we found that older participants may benefit more from the VR tours than younger participants as they may be more appreciative of these technologies. Generation Z users are practically digital natives; they are more knowledgeable of new technologies which they use frequently, thus, they may be more difficult to impress. This is congruent with findings by Marasco & Balbi

(2019) and Akhtar et al. (2021) who concluded that older tourists are more likely to be highly satisfied with their VR experience and should be the main targets of destination marketers.

Our findings also pointed to the conclusion that women who have not yet visited the destination are more likely than men to feel totally immersed or involved during the VTs. It goes without saying that they may represent more suitable targets for promoting a destination. We also found that participants with less than a college degree are more likely to take other VTs in the future than more educated participants. Both conclusions are consistent with findings of previous studies (see Marasco & Balbi, 2019). Finally, according to our research, income and technical skills cannot be used as discriminants when studying users' satisfaction with their VR experience and their subsequent perception of the destination.

Finally, our study found that it is almost equally effective to use VR for destination marketing before and after tourists visit the site; however, the technology may be more useful in improving the image of the destination when applied before the physical visit to the tourism destination.

The main limitation of this study is represented by the relatively small number of respondents. However, given the fact that the main methodology is a quasi-experiment we were guided by Cohen, Manion, and Morrison's (2007, p. 10) recommendation that all groups include at least 15 participants. Still, other studies based on larger groups would be needed to test our findings.

Another limitation comes from the sampling method we used as the population sample is not representative. In fact, neither group is demographically balanced. For example, they are clearly skewed towards the younger generation as very few participants over 30 were included in either group. This anomaly happened because older people (especially over 40) were reluctant to take part in our experiment. Yet, for future studies it would desirable to investigate how people over 40 or 50 feel about taking virtual tours of a destination.

VR technology will gradually become one of the important technologies to promote the digitalization of tourism information in the future (Talafubieke, Mai, and Xialifuan, 2021). The results of our study show that VT can be used for destination marketing. For example, tourism agencies could use VR to give potential tourists a taste of the place before buying a travel package.

REFERENCES

1. Abrash, M. (2018), *Welcome to the virtual age: AR, VR and the future of connection*, https://www.oculus.com/enus/blog/welcome-to-the-virtual-age
2. Akhtar, N., Khan, N., Khan, M.M., Ashraf, S., Hashmi, M.S., Khan, M.M., & Hishan, S.S. (2021), *Post-COVID 19 tourism: Will digital tourism replace mass tourism?,* Sustainability, 13, 10, 5352.
3. Baños, R.M., Botella, C., Alcañiz, M., Llaño, V., Guerrero, B., & Rey, B. (2004), *Immersion and emotion: Their impact on the sense of presence*, CyberPsychology & Behavior, 7, 8, 734-741.
4. Beck, J., Rainoldi, M., & Egger, R. (2019), *Virtual reality in tourism: A state-of-the-art review*, Tourism Review, 74, 3, 586–612.
5. Berg, L. P., and Vance, J. M. (2017), *Industry use of virtual reality in product design and manufacturing: a survey*, Virtual Reality, 21, 1, 1-17.
6. Berger, H., Dittenbach, M., Merkl, D., Bogdanovych, A., Simoff, S., & Sierra, C. (2007), *Opening new dimensions for e-tourism*, Virtual Reality, 11, 2, 75–87.
7. Bogicevic, V., Seo, S., Kandampully, J. A., Liu, S. Q., & Rudd, N. A. (2019), *Virtual reality presence as a preamble of tourism experience: The role of mental imagery*, Tourism Management, 74, 55–64.
8. Buhalis, D. (2000), *Marketing the competitive destination of the future*, Tourism Management, 21, 1, 97–116.
9. Cabello, J., Collado, A., Cruz-Lara, S., Armisen, A., Franco, J., Janer, J., Oyarzun, D. & Geraerts, R. (2011), *Standards in virtual worlds. Virtual travel use case metaverse1 project*, Journal of Virtual Worlds Research, 4, 3, 1–5.
10. Cheong, R. (1995), *The virtual threat to travel and tourism*, Tourism Management, 16, 6, 417–422.
11. Cho, Y.H.; Wang, Y.; Fesenmaier, D.R. (2002), *Searching for experiences: The web-based virtual tour in tourism marketing*, Journal of Travel & Tourism Marketing, 12, 1–17.
12. Cohen, L., Manion, L., & Morrison, K. (2007), Research methods in education, London: Routledge
13. Daasi, M. & Debbabi, S. (2021), *Intention to reuse AR-based apps: The combined role of the sense of immersion, product presence and perceived realism*, Information & Management, 58, 4, 103453.
14. Dewailly, J. M. (1999), *Sustainable tourist space: From reality to virtual reality?,* Tourism Geographies, 1, 1, 41–55.
15. Dueholm, J., & Smed, K. M. (2014), *Heritage authenticities – a case study of authenticity perceptions at a Danish heritage site*, Journal of Heritage Tourism, 9, 4, 285–298.
16. Escobar-Rodriguez, T. & Carvajal-Trujillo, E. (2014), *Online purchasing tickets for low-cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model*, Tourism Management, 43, 70-88.

17. Fan, X., Jiang, X., Deng, N. (2022), *Immersive technology: A meta-analysis of augmented/virtual reality applications and their impact on tourism experience*, Tourism Management, 91, 104534.
18. Flavian, C., Ibanez-Sanchez, S., & Orus, C. (2021), *Impacts of technological embodiment through virtual reality on potential guests' emotions and engagement*, Journal of Hospitality Marketing & Management, 30, 1, 1–20.
19. Flavian, C., Ibanez-Sanchez, S., & Orus, C. (2019), *The impact of virtual, augmented and mixed reality technologies on the customer experience*, Journal of Business Research, 100, 547–560.
20. Gibson, A. & O'Rawe, M. (2017), Virtual reality as a promotional tool: Insights from a consumer travel fair. In, Jung, T & tom Dieck, M.C. (eds.), Augmented Reality and Virtual Reality – Empowering Human, Place and Business (pp. 93-107). London: Springer.
21. Gonzalez, D.A.Z., Richards, D., & Bilgin, A.A. (2021), *Making it real: A study of augmented virtuality on presence and enhanced benefits of study stress reduction sessions*, International Journal of Human-Computer Studies, 147, 102579.
22. Govers, R., Go, F.M., & Kumar, K. (2007), *Promoting Tourism Destination Image*, Journal of Travel Research, 46, 1, 15-23.
23. Griffin, T. & Muldoon, M. (2022), *Exploring virtual reality experiences of slum tourism*, Tourism Geographies, 22, 6-7, 934-953.
24. Griffin, T., Giberson, J., Lee, S. H., Guttentag, D., & Kandaurova, M. (2017), *Virtual reality and implications for destination marketing*, Tourism Travel and Research Association: Advancing Tourism Research Globally, 29.
25. Guerra, J., Pinto, M., & Beato, C. (2015), *Virtual reality shows. A new vision for tourism and heritage*, European Scientific Journal, Special Edition, 49-54, Retrieved July 12, 2023, from https://core.ac.uk/download/pdf/236412918.pdf.
26. Guttentag, D. (2010), *Virtual reality: Applications and implications for tourism*, Tourism Management, 31, 5, 637–651.
27. Gutiérrez, M., Vexo, F., & Thalmann, D. (2008), *Stepping into virtual reality*, London: Springer.
28. Han, D.I., tom Dieck, M.C., & Jung, T. (2018), *User experience model for augmented reality applications in urban heritage tourism*, Journal of Heritage Tourism, 13, 1, 46-61.
29. He, Z., Wu, L., & Li, X.R. (2018), *When art meets tech: The role of augmented reality in enhancing museum experiences and purchase intentions*, Tourism Management, 68, 127-139.
30. Huang, S., & Hsu, C. H. (2009), *Effects of travel motivation, past experience, perceived constraint, and attitude on revisit intention*, Journal of Travel Research, 48, 1, 29-44.
31. Huang, Y.C., Backman, K.F., Backman, S.J., & Chang, L.L. (2016), *Exploring the implications of virtual reality technology in tourism marketing: An integrated research framework*, International Journal of Tourism Research, 18, 2, 116-128.
32. Hughes, H. L. (2008), *Visitor and non-visitor destination images: The influence of political instability in South-Eastern Europe*, Tourism: An International Interdisciplinary Journal, 56, 1, 59–74.

33. Hyun, M.Y. & O'Keefe, R.M. (2012), *Virtual destination image: testing a telepresence model*, Journal of Business Research, 65, 1, 29-35.
34. Israel, K., Zerres, C., & Tscheulin, D. K. (2019), *Presenting hotels in virtual reality: Does it influence the booking intention?,* Journal of Hospitality and Tourism Technology, 10, 3, 473–493.
35. Jayawardena, C. (2019), *What are the key innovative strategies needed for future tourism in the world?,* Worldwide Hospitality and Tourism Themes, 11, 2, 235-247.
36. Jung, R. & Khoo-Lattimore, C. (2019), *New realities: A systematic literature review on virtual reality and augmented reality in tourism research*, Current Issues in Tourism, 22, 17, 2056-2081.
37. Kim, M. J., & Hall, C. M. (2019), *A hedonic motivation model in virtual reality tourism: Comparing visitors and non-visitors*, International Journal of Information Management, 46, 236–249.
38. Kim, M.J.; Lee, C.-K.; Jung, T. (2020), *Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model*, Journal of Travel Research, *59*, 69–89.
39. Kim, S., Lehto, X. and Kandampully, J. (2019), *The role of familiarity in consumer destination image formation*, Tourism Review, 74, 4, 885-901.
40. Lee, K.M. (2004), *Presence, explicated*, Communication Theory, 14, 1, 27-50.
41. Lee, W., Gretzel, U., & Law, R. (2010), *Quasi-trial experiences through sensory information in destination websites*, Journal of Travel Research, 49, 3, 310-322.
42. Lin, L.-P.; Huang, S.-C.; Ho, Y.-C. (2020), *Could virtual reality effectively market slow travel in a heritage destination?,* Tourism Management, 78, 104027.
43. Loureiro, S. M. C., Guerreiro, J., & Ali, F. (2020), *20 years of research on virtual reality and augmented reality in tourism context: A text-mining approach*, Tourism Management, 77, 104028.
44. Lu, J., Xiao, X., Xu, Z., Wang, C., Zhang, M., & Zhou, Y. (2022), *The potential of virtual tourism in the recovery of tourism industry during the COVID-19 pandemic,* Current Issues in Turism, 25, 3, 441-457.
45. Lu, X. & Hsiao, K.-L. (2022), *Effects of diffusion of innovations, spatial presence, and flow on virtual reality shopping*, Frontiers in Psychology, *13*, 941248.
46. Marasco, A.; Balbi, B. (2019), *Designing accessible experiences for heritage visitors through virtual reality*, E-Review of Tourism Research, 17, 426–443.
47. Marasco, A., Buonincontri, P., van Niekerk, M., Orlowski, M., & Okumus, F. (2018), *Exploring the role of next-generation virtual technologies in destination marketing*, Journal of Destination Marketing & Management, 9, 138–148.
48. Martins, J., Goncalves, R., Branco, F., Barbosa, L., Melo, M., & Bessa, M. (2017), *A multi-sensory virtual experience model for thematic tourism: A Port wine application proposal*, Journal of Destination Marketing & Management, 6, 2, 103-109.
49. Mascho, E., & Singh, N. (2013), *Virtual tourism: Use of 'second life' for destination marketing*, Anatolia, 25, 1, 140–143.
50. Mohanty, P., Hassan, A., & Ekis, E. (2020), *Augmented reality for relaunching tourism post-Covid-19: Socially distant, virtually connected*, Worldwide Hospitality and Tourism Themes, 12, 6, 753-760.

51. Moorhouse, N., tom Dieck, M.C., & Jung, T. (2018), Technological innovations transforming the consumer retail experience: A review of the literature. In, Jung, T. & tom Dieck, M. (eds.). Augmented Reality and Virtual Reality. Progress in IS (pp. 133-143). Cham, Switzerland: Springer International.
52. Moro, S., Rita, P., Ramos, P., & Esmerado, J. (2019), *Analyzing recent augmented and virtual reality developments in tourism*, Journal of Hospitality and Tourism Technology, 10, 571-586.
53. Mura, P., Tavakoli, R., & Sharif, S.P. (2017), *"Authentic but not too much": Exploring perceptions of authenticity of virtual tourism*, Information Technology & Tourism, 17, 2, 145-159.
54. Navarrette, T. (2019), *Digital heritage tourism: Innovations in museums*, World Leisure Journal, 61, 3, 200-214.
55. Nguyen, T.B.T., Le, T.B.N., & Chau, N.T. (2023), *How VR technological features prompt tourists' visiting intention: An integrated approach*, Sustainability, 15, 6, 4765.
56. Pantano, E., and Servidio, R. (2011), *An exploratory study of the role of pervasive environments for promotion of tourism destinations*, Journal of Hospitality and Tourism Technology, 2, 1, 50-65.
57. Roughead M. (2017), *Scotland transposed to VR in effort to lure tech-savvy visitor*, The Drum, July 3. Retrieved July 17, 2023, from http://www.thedrum.com/news/2017/03/07/scotland-transposed-vr-effortlure-tech-savvy-visitors
58. Sanchez-Vives, M., & Slater, M. (2005), *From presence to consciousness through virtual reality*, Nature Reviews Neuroscience, 6, 4, 332–339.
59. Slater, M., & Usoh, M. (1994), *Body centred interaction in immersive virtual environments*, Artificial Life and Virtual Reality, 1, 125–148.
60. Subawa, N.S., Widhiasthini, N.W., Astawa, I.P., Dwiatmadja, C., & Permatasari, N.P.I. (2021), *The practices of virtual reality marketing in the tourism sector, a case study of Bali, Indonesia*, Current Issues in Tourism, 24, 23, 3284-3295.
61. Sussmann, S., & Vanhegan, H. (2000), *Virtual reality and the tourism product. Substitution or complement?,* European Conference on Information Systems (ECIS) 2000 Proceedings 117, 1077-1083. http://aisel.aisnet.org/ecis2000/117.
62. Talafubieke, M., Mai, S., & Xialifuan, N. (2021), *Evaluation of the virtual economic effect of tourism product emotional marketing based on virtual reality*, Frontiers in Psychology, 12, 759268.
63. Thomas, W.A. & Carey, S. (2005), *Actual/virtual visits: What are the links?,* International Conferences on Museums and the Web, Vancouver, British Columbia, Canada.
64. Tussyadiah, I.P., Wang, D., Jung, T.H., & tom Dieck, M.C. (2018), *Virtual reality, presence, and attitude change: Empirical evidence from tourism*, Tourism Management, 66, 140-154.
65. Verma, S., Warrier, L., Bolia, B., & Mehta, S. (2022), *Past, present, and future of virtual tourism – a literature review*, International Journal of Information Management Data Insights, 2, 2, 100085.

66. Vishwakarma, P., Mukherjee, S., & Datta, B. (2020), *Travelers' intention to adopt virtual reality: A consumer value perspective*, Journal of Destination Marketing & Management, 17, 100456.
67. Wan, C., Tsaur, S., Chiu, Y., & Chiou, W. (2007), *Is the advertising effect of virtual experience better or contingent on different travel destinations?,* Information Technology and Tourism, 9, 1, 45–54.
68. Wedel, M., Bigné, E., & Zhang, J. (2020), *Virtual and augmented reality: Advancing research in consumer marketing*, International Journal of Research in Marketing, 37, 3, 443-465.
69. Wei, W. (2019), *Research progress on Virtual reality (VR) and Augmented Reality (AR) in tourism and hospitality*, Journal of Hospitality and Tourism Technology, 10, 4, 539-570.
70. Williams, P., & Hobson, J. S. (1995), *Virtual reality and tourism: Fact or fantasy?,* Tourism Management, 16, 6, 423–427.
71. Wiltshier, P., & Clarke, A. (2017), *Virtual cultural tourism: Six pillars of VCT using co-creation, value exchange and exchange value*, Tourism & Hospitality Research, 17, 4, 372-383.
72. Yung, R. & Khoo-Lattimore, C. (2019), *New realities: A systematic literature review on virtual reality and augmented reality in tourism research*, Current Issues in Tourism, 22, 17, 2056-2081.
73. Zarzuela, M. M., Pernas, F. J. D., Calzón, S. M., Ortega, D. G., & Rodríguez, M. A. (2013), *Educational tourism through a virtual reality platform*, Procedia Computer Science, 25, 382– 388.

Annexes

Annex 1. Differences in experience satisfaction among those who already visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Male	9	18.67	U= 66.0 Z= -1.385	.209
	Female	21	14.14		
Information about the destination is reliable	Male	9	17.33	U= 78.0 Z= -.803	.476
	Female	21	14.71		
Information about the destination is well-organized	Male	9	17.67	U= 75.0 Z= -.937	.397
	Female	21	14.57		
During the virtual tour I felt completely immersed	Male	9	17.06	U= 80.5 Z= -.661	.533
	Female	21	14.83		
During the virtual tour I felt totally involved	Male	9	17.39	U= 77.5 Z= -.812	.449
	Female	21	14.69		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Male	9	16.44	U= 86.0 Z= -.407	.722
	Female	21	15.10		
The virtual tour was very pleasant	Male	9	15.89	U= 91.0 Z= -.172	.894
	Female	21	15.33		
The virtual tour was very interesting	Male	9	16.00	U= 90.0 Z= -.220	.859
	Female	21	15.29		
I learned a lot after this virtual tour	Male	9	18.83	U= 64.5 Z= -1.399	.178
	Female	21	14.07		
I am very satisfied with this virtual tour experience	Male	9	17.89	U= 73.0 Z= -1.017	.349
	Female	21	14.48		
I will go on other virtual tours in the future	Male	9	19.44	U= 59.0 Z= -1.689	.114
	Female	21	13.91		
I will recommend the virtual tour to others	Male	9	19.06	U= 62.5 Z= -1.642	.150
	Female	21	13.98		

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Male	9	18.44	U= 68.0 Z= -1.367	.244
	Female	21	14.24		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Male	9	17.33	U= 78.0 Z= -803	.476
	Female	21	14.71		
The image of this tourism destination has improved after this virtual tour	Male	9	18.06	U= 71.5 Z= -1.074	.304
	Female	21	14.40		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Male	9	19.50	U= 58.5 Z= -1.682	.104
	Female	21	13.79		
During this virtual tour I was able to study the location in greater detail	Male	9	19.00	U= 63.0 Z= -1.476	.164
	Female	21	14.00		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Male	9	17.39	U= 77.5 Z= -.812	.449
	Female	21	14.69		
This virtual tour influenced my decision to revisit this tourism destination	Male	9	15.67	U= 93.0 Z= -.070	.965
	Female	21	15.43		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Male	9	15.50	U= 94.5 Z= 0	1.000.
	Female	21	15.50		
I think using VR technology is very useful to visit a tourist destination/attraction	Male	9	16.28	U= 87.5 Z= -.347	.756
	Female	21	15.17		

* Significant at 95% confidence level

Annex 2. Differences in experience satisfaction among those who already visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	18-25 yr.	22	13.98	U= 121.5 Z= 1.687	.118
	26+ yr.	8	19.69		
Information about the destination is reliable	18-25 yr.	22	13.14	U= 140.0 Z= 2.621	**.013***
	26+ yr.	8	22.00		
Information about the destination is well-organized	18-25 yr.	22	14.09	U= 119.0 Z= 1.544	.156
	26+ yr.	8	19.38		
During the virtual tour I felt completely immersed	18-25 yr.	22	14.68	U= 106.0 Z= .881	.420
	26+ yr.	8	17.75		
During the virtual tour I felt totally involved	18-25 yr.	22	13.95	U= 122.0 Z= 1.682	.118
	26+ yr.	8	19.75		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	18-25 yr.	22	15.00	U= 99.0 Z= .585	.629
	26+ yr.	8	16.88		
The virtual tour was very pleasant	18-25 yr.	22	14.34	U= 113.5 Z= 1.296	.237
	26+ yr.	8	18.69		
The virtual tour was very interesting	18-25 yr.	22	14.34	U= 113.5 Z= 1.293	.237
	26+ yr.	8	18.69		
I learned a lot after this virtual tour	18-25 yr.	22	13.59	U= 130.0 Z= 2.029	**.049***
	26+ yr.	8	20.75		
I am very satisfied with this virtual tour experience	18-25 yr.	22	14.18	U= 117.0 Z= 1.421	.185
	26+ yr.	8	19.13		
I will go on other virtual tours in the future	18-25 yr.	22	14.59	U= 108.0 Z= .986	.368
	26+ yr.	8	18.00		
I will recommend the virtual tour to others	18-25 yr.	22	14.68	U= 106.0 Z= .957	.420
	26+ yr.	8	17.75		

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	18-25 yr.	22	13.82	U= 125.0 Z= 1.978	.087
	26+ yr.	8	20.13		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	18-25 yr.	22	14.59	U= 108.0 Z= 1.008	.368
	26+ yr.	8	18.00		
The image of this tourism destination has improved after this virtual tour	18-25 yr.	22	13.11	U= 140.5 Z= 2.540	**0.12***
	26+ yr.	8	22.06		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	18-25 yr.	22	13.61	U= 129.5 Z= 2.009	**.049***
	26+ yr.	8	20.69		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	22	13.41	U= 134.0 Z= 2.234	**.031***
	26+ yr.	8	21.25		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	18-25 yr.	22	13.84	U= 124.5 Z= 1.807	0.87
	26+ yr.	8	20.06		
This virtual tour influenced my decision to revisit this tourism destination	18-25 yr.	22	14.09	U= 119.0 Z= 1.507	.156
	26+ yr.	8	19.38		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	18-25 yr.	22	14.09	U= 119.0 Z= 1.524	.156
	26+ yr.	8	19.38		
I think using VR technology is very useful to visit a tourist destination/attraction	18-25 yr.	22	14.23	U= 116.0 Z= 1.439	.202
	26+ yr.	8	19.00		

* Significant at 95% confidence level

Annex 3. Differences in experience satisfaction among those who already visited the destination based on level of education

Satisfaction with experience	Ed. level	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Less than uni. grad.	20	15.00	U= 110.0 Z= .472	.681
	Uni. grad. & postgr.	10	16.50		
Information about the destination is reliable	Less than uni. grad.	20	15.70	U= 96.0 Z= -.189	.880
	Uni. grad. & postgr.	10	15.10		
Information about the destination is well-organized	Less than uni. grad.	20	15.10	U= 108.0 Z= .374	.746
	Uni. grad. & postgr.	10	16.30		
During the virtual tour I felt completely immersed	Less than uni. grad.	20	16.45	U= 81.0 Z= -.872	.411
	Uni. grad. & postgr.	10	13.60		
During the virtual tour I felt totally involved	Less than uni. grad.	20	14.70	U= 116.0 Z= .742	.502
	Uni. grad. & postgr.	10	17.10		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Less than uni. grad.	20	15.45	U= 101.0 Z= .047	1.000
	Uni. grad. & postgr.	10	15.60		
The virtual tour was very pleasant	Less than uni. grad.	20	15.85	U= 93.0 Z= -.334	.779
	Uni. grad. & postgr.	10	14.80		
The virtual tour was very interesting	Less than uni. grad.	20	15.75	U= 95.0 Z= -.238	.846
	Uni. grad. & postgr.	10	15.00		
I learned a lot after this virtual tour	Less than uni. grad.	20	14.25	U= 125.0 Z= 1.133	.286
	Uni. grad. & postgr.	10	18.00		
I am very satisfied with this virtual tour experience	Less than uni. grad.	20	15.85	U= 93.0 Z= -.322	.779
	Uni. grad. & postgr.	10	14.80		
I will go on other virtual tours in the future	Less than uni. grad.	20	16.53	U= 79.5 Z= -.948	.373
	Uni. grad. & postgr.	10	13.45		
I will recommend the virtual tour to others	Less than uni. grad.	20	16.45	U= 81.0 Z= -948	.422
	Uni. grad. & postgr.	10	13.60		

Satisfaction with experience	Ed. level	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Less than uni. grad.	20	15.25	U= 105.0 Z= .251	.846
	Uni. grad. & postgr.	10	16.00		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Less than uni. grad.	20	15.80	U= 94.0 Z= -.284	.812
	Uni. grad. & postgr.	10	14.90		
The image of this tourism destination has improved after this virtual tour	Less than uni. grad.	20	15.15	U= 107.0 Z= .318	.779
	Uni. grad. & postgr.	10	16.20		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Less than uni. grad.	20	15.05	U= 109.0 Z= .409	.713
	Uni. grad. & postgr.	10	16.40		
During this virtual tour I was able to study the location in greater detail	Less than uni. grad.	20	15.70	U= 96.0 Z= -.182	.880
	Uni. grad. & postgr.	10	15.10		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Less than uni. grad.	20	15.38	U= 102.5 Z= .116	.914
	Uni. grad. & postgr.	10	15.75		
This virtual tour influenced my decision to revisit this tourism destination	Less than uni. grad.	20	15.98	U= 90.5 Z= -.433	.681
	Uni. grad. & postgr.	10	14.55		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Less than uni. grad.	20	16.40	U= 82.0 Z= -.830	.448
	Uni. grad. & postgr.	10	13.70		
I think using VR technology is very useful to visit a tourist destination/attraction	Less than uni. grad.	20	15.95	U= 91.0 Z= -.434	.713
	Uni. grad. & postgr.	10	14.60		

* Significant at 95% confidence level

Annex 4. Differences in experience satisfaction among those who already visited the destination based on income

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< average	13	13.15	U= 141.0	.171
	≥ average	17	17.29	Z= 1.370	
Information about the destination is reliable	< average	13	14.62	U= 122.0	.650
	≥ average	17	16.18	Z= .517	
Information about the destination is well-organized	< average	13	13.46	U= 137.0	.281
	≥ average	17	17.06	Z= 1.178	
During the virtual tour I felt completely immersed	< average	13	15.77	U= 107.0	.902
	≥ average	17	15.29	Z= -.153	
During the virtual tour I felt totally involved	< average	13	13.58	U= 135.5	.300
	≥ average	17	16.67	Z= .270	
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	< average	13	13.88	U= 131.5	.385
	≥ average	17	16.74	Z= .930	
The virtual tour was very pleasant	< average	13	13.65	U= 134.5	.320
	≥ average	17	16.91	Z= .277	
The virtual tour was very interesting	< average	13	13.38	U= 138.0	.263
	≥ average	17	17.12	Z= .213	
I learned a lot after this virtual tour	< average	13	12.85	U= 145.0	.157
	≥ average	17	17.53	Z= 1.487	
I am very satisfied with this virtual tour experience	< average	13	14.77	U= 120.0	.711
	≥ average	17	16.06	Z= .415	
I will go on other virtual tours in the future	< average	13	14.08	U= 129.0	.457
	≥ average	17	16.59	Z= .814	
I will recommend the virtual tour to others	< average	13	15.12	U= 115.5	.837
	≥ average	17	15.79	Z= .237	

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	< average	13	12.31	U= 152.0	.086
	≥ average	17	17.94	Z= 1.980	
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	< average	13	13.00	U= 143.0	.183
	≥ average	17	17.41	Z= 1.482	
The image of this tourism destination has improved after this virtual tour	< average	13	13.12	U= 141.5	.198
	≥ average	17	17.32	Z= 1.338	
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	< average	13	13.08	U= 142.0	.198
	≥ average	17	17.35	Z= 1.361	
During this virtual tour I was able to study the location in greater detail	< average	13	13.04	U= 142.5	.183
	≥ average	17	17.38	Z= 1.387	
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	< average	13	14.19	U= 127.5	.483
	≥ average	17	16.50	Z= .751	
This virtual tour influenced my decision to revisit this tourism destination	< average	13	13.58	U= 135.5	.300
	≥ average	17	16.97	Z= 1.084	
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	< average	13	12.65	U= 147.5	.123
	≥ average	17	17.68	Z= 1.624	
I think using VR technology is very useful to visit a tourist destination/attraction	< average	13	14.46	U= 124.0	.592
	≥ average	17	16.29	Z= .612	

* Significant at 95% confidence level

Annex 5. Differences in experience satisfaction among those who already visited the destination based on technical skills

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Yes	18	15.92	U= 100.5 Z= -.341	.755
	No	12	14.88		
Information about the destination is reliable	Yes	18	15.00	U= 117.0 Z= .682	.723
	No	12	16.25		
Information about the destination is well-organized	Yes	18	16.33	U= 93.0 Z= -.674	.545
	No	12	14.25		
During the virtual tour I felt completely immersed	Yes	18	16.44	U= 91.0 Z= -.751	.491
	No	12	14.08		
During the virtual tour I felt totally involved	Yes	18	16.28	U= 94.0 Z= -.625	.573
	No	12	14.33		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Yes	18	17.61	U= 70.0 Z= -1.701	.113
	No	12	12.33		
The virtual tour was very pleasant	Yes	18	16.53	U= 89.5 Z= -.848	.439
	No	12	13.96		
The virtual tour was very interesting	Yes	18	16.00	U= 99.0 Z= -.412	.723
	No	12	14.75		
I learned a lot after this virtual tour	Yes	18	17.47	U= 72.5 Z= -1.548	.134
	No	12	12.54		
I am very satisfied with this virtual tour experience	Yes	18	15.97	U= 99.5 Z= -.376	.723
	No	12	14.79		
I will go on other virtual tours in the future	Yes	18	16.89	U= 83.0 Z= -1.112	.305
	No	12	13.42		
I will recommend the virtual tour to others	Yes	18	16.50	U= 90.0 Z= -.864	.465
	No	12	14.00		

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Yes	18	16.92	U= 82.5 Z= -1.230	.285
	No	12	13.38		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Yes	18	17.61	U= 70.0 Z= -1.729	.113
	No	12	12.33		
The image of this tourism destination has improved after this virtual tour	Yes	18	15.72	U= 104.0 Z= -.175	.884
	No	12	15.17		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Yes	18	17.25	U= 76.5 Z= -1.377	.185
	No	12	12.88		
During this virtual tour I was able to study the location in greater detail	Yes	18	17.14	U= 78.5 Z= -1.293	.215
	No	12	13.04		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Yes	18	16.19	U= 95.5 Z= -.559	.602
	No	12	14.46		
This virtual tour influenced my decision to revisit this tourism destination	Yes	18	17.11	U= 79.0 Z= -1.272	.232
	No	12	13.08		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Yes	18	15.89	U= 101.0 Z= -.311	.787
	No	12	14.92		
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	18	16.28	U= 94.0 Z= -.649	.573
	No	12	14.33		

* Significant at 95% confidence level

Annex 6. Differences in experience satisfaction among those who have not yet visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Male	18	28.58	U= 394.5 Z= .457	.648
	Female	41	30.62		
Information about the destination is reliable	Male	18	28.03	U= 404.5 Z= .650	.515
	Female	41	30.87		
Information about the destination is well-organized	Male	18	26.89	U= 425.0 Z= 1.009	.313
	Female	41	31.37		
During the virtual tour I felt completely immersed	Male	18	23.00	U= 495.0 Z= 2.225	**.026***
	Female	41	33.07		
During the virtual tour I felt totally involved	Male	18	23.47	U= 486.5 Z= 2.074	**.038***
	Female	41	32.87		
During the virtual tour I felt that I was physically present at the tourism site	Male	18	21.31	U= 525.5 Z= 2.661	**.008***
	Female	41	33.82		
The virtual tour was very pleasant	Male	18	26.75	U= 427.5 Z= .290	.290
	Female	41	31.43		
The virtual tour was very interesting	Male	18	24.17	U= 474.0 Z= 1.933	.053
	Female	41	32.56		
I learned a lot after this virtual tour	Male	18	25.19	U= 455.5 Z= 1.507	.132
	Female	41	32.11		
I am very satisfied with this virtual tour experience	Male	18	24.89	U= 461.0 Z= 1.623	.105
	Female	41	32.24		
I will go on other virtual tours in the future	Male	18	28.94	U= 388.0 Z= .353	.724
	Female	41	30.46		
I will recommend the virtual tour to others	Male	18	28.28	U= 400.0 Z= .579	.562
	Female	41	30.76		

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	Male	18	29.39	U= 380.0 Z= .194	.846
	Female	41	30.27		
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	Male	18	29.75	U= 373.5 Z= .079	.937
	Female	41	30.11		
The image of the tourist destination has improved as a result of this virtual tour	Male	18	28.97	U= 387.5 Z= .329	.742
	Female	41	30.45		
During this virtual tour I was able to study the location in greater detail	Male	18	26.97	U= 423.5 Z= .940	.347
	Female	41	31.33		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Male	18	30.11	U= 367.0 Z= -.035	.972
	Female	41	29.95		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Male	18	25.14	U= 456.5 Z= 1.541	.123
	Female	41	32.13		
I think using VR technology is very useful to visit a tourist destination/attraction	Male	18	25.44	U= 451.0 Z= 1.534	.125
	Female	41	32.00		

* Significant at 95% confidence level

Annex 7. Differences in experience satisfaction among those who have not yet visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	18-25 yr.	33	30.44	U= 414.5 Z= -.241	.810
	26+ yr.	26	29.44		
Information about the destination is reliable	18-25 yr.	33	27.20	U= 521.5 Z= 1.572	.116
	26+ yr.	26	33.56		
Information about the destination is well-organized	18-25 yr.	33	30.58	U= 410.0 Z= -.317	.751
	26+ yr.	26	29.27		
During the virtual tour I felt completely immersed	18-25 yr.	33	26.71	U= 537.5 Z= 1.777	.076
	26+ yr.	26	34.17		
During the virtual tour I felt totally involved	18-25 yr.	33	28.48	U= 479.0 Z= .818	.413
	26+ yr.	26	31.92		
During the virtual tour I felt that I was physically present at the tourism site	18-25 yr.	33	26.97	U= 529.0 Z= 1.577	.115
	26+ yr.	26	33.85		
The virtual tour was very pleasant	18-25 yr.	33	29.48	U= 446.0 Z= .285	.775
	26+ yr.	26	30.65		
The virtual tour was very interesting	18-25 yr.	33	29.27	U= 453.0 Z= .410	.682
	26+ yr.	26	30.92		
I learned a lot after this virtual tour	18-25 yr.	33	29.56	U= 443.5 Z= .234	.815
	26+ yr.	26	30.56		
I am very satisfied with this virtual tour experience	18-25 yr.	33	27.79	U= 502.0 Z= 1.194	.232
	26+ yr.	26	32.81		
I will go on other virtual tours in the future	18-25 yr.	33	30.09	U= 426.0 Z= -.052	.959
	26+ yr.	26	29.88		
I will recommend the virtual tour to others	18-25 yr.	33	28.67	U= 473.0 Z= .762	.446
	26+ yr.	26	31.69		

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	18-25 yr.	33	25.41	U= 580.5 Z= 2.480	**.013***
	26+ yr.	26	35.83		
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	18-25 yr.	33	28.79	U= 469.0 Z= .651	.515
	26+ yr.	26	31.54		
The image of the tourist destination has improved as a result of this virtual tour	18-25 yr.	33	28.83	U= 467.5 Z= .636	.525
	26+ yr.	26	31.48		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	33	27.11	U= 524.5 Z= 1.527	.127
	26+ yr.	26	33.67		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	18-25 yr.	33	26.52	U= 544.0 Z= 1.858	.063
	26+ yr.	26	34.42		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	18-25 yr.	33	26.09	U= 558.0 Z= 2.108	**.035***
	26+ yr.	26	34.96		
I think using VR technology is very useful to visit a tourist destination/attraction	18-25 yr.	33	30.94	U= 398.0 Z= -.538	.591
	26+ yr.	26	28.81		

* Significant at 95% confidence level

Annex 8. Differences in experience satisfaction among those who have not yet visited the destination based on level of education

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< univ. degree	37	30.99	U= 370.5 Z= -.623	.534
	≥ univ. degree	22	28.34		
Information about the destination is reliable	< univ. degree	37	30.45	U= 390.5 Z= -.288	.774
	≥ univ. degree	22	29.25		
Information about the destination is well-organized	< univ. degree	37	30.11	U= 403.0 Z= -.069	.945
	≥ univ. degree	22	29.82		
During the virtual tour I felt completely immersed	< univ. degree	37	29.24	U= 435.0 Z= .471	.638
	≥ univ. degree	22	31.27		
During the virtual tour I felt totally involved	< univ. degree	37	31.23	U= 361.5 Z= -.765	.445
	≥ univ. degree	22	27.93		
During the virtual tour I felt that I was physically present at the tourism site	< univ. degree	37	28.88	U= 448.5 Z= .672	.502
	≥ univ. degree	22	31.89		
The virtual tour was very pleasant	< univ. degree	37	30.74	U= 379.0 Z= -.474	.636
	≥ univ. degree	22	28.75		
The virtual tour was very interesting	< univ. degree	37	31.11	U=366.0 Z= -.719	.472
	≥ univ. degree	22	28.14		
I learned a lot after this virtual tour	< univ. degree	37	31.55	U= 349.5 Z= -.934	.340
	≥ univ. degree	22	27.39		
I am very satisfied with this virtual tour experience	< univ. degree	37	30.61	U= 384.5 Z= -.378	.706
	≥ univ. degree	22	28.98		
I will go on other virtual tours in the future	< univ. degree	37	33.20	U= 288.5 Z= -2.097	**.036***
	≥ univ. degree	22	24.20		
I will recommend the virtual tour to others	< univ. degree	37	31.82	U= 339.5 Z= -1.201	.230
	≥ univ. degree	22	26.93		
I enjoyed seeing virtually the location I planned to visit physically	< univ. degree	37	28.51	U= 462.0 Z= .924	.355
	≥ univ. degree	22	32.50		

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	< univ. degree	37	29.82	U= 413.5 Z= .109	.913
	≥ univ. degree	22	30.30		
The image of the tourist destination has improved as a result of this virtual tour	< univ. degree	37	32.09	U= 329.5 Z= -1.314	.189
	≥ univ. degree	22	26.48		
During this virtual tour I was able to study the location in greater detail	< univ. degree	37	29.00	U= 444.0 Z= .608	.543
	≥ univ. degree	22	31.68		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	< univ. degree	37	29.36	U= 430.5 Z= .390	.697
	≥ univ. degree	22	31.07		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	< univ. degree	37	30.42	U= 391.5 Z= -.260	.795
	≥ univ. degree	22	29.30		
I think using VR technology is very useful to visit a tourist destination/attraction	< univ. degree	37	32.54	U= 313.0 Z= -1.674	.094
	≥ univ. degree	22	25.73		

* Significant at 95% confidence level

Annex 9. Differences in experience satisfaction among those who have not yet visited the destination based on income

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< average	24	31.08	U= 394.0 Z= -.437	.662
	≥ average	35	29.26		
Information about the destination is reliable	< average	24	30.48	U= 408.5 Z= -.197	.843
	≥ average	35	29.67		
Information about the destination is well-organized	< average	24	30.73	U= 402.5 Z= -.295	.768
	≥ average	35	29.50		
During the virtual tour I felt completely immersed	< average	24	31.21	U= 391.0 Z= -.480	.631
	≥ average	35	29.17		
During the virtual tour I felt totally involved	< average	24	32.96	U= 349.0 Z= -1.174	.240
	≥ average	35	27.97		
During the virtual tour I felt that I was physically present at the tourism site	< average	24	29.27	U= 437.5 Z= .279	.780
	≥ average	35	30.50		
The virtual tour was very pleasant	< average	24	33.06	U= 346.5 Z= -1.246	.243
	≥ average	35	27.90		
The virtual tour was very interesting	< average	24	30.71	U= 403.0 Z= -.293	.769
	≥ average	35	29.51		
I learned a lot after this virtual tour	< average	24	28.96	U= 445.0 Z= .408	.683
	≥ average	35	30.71		
I am very satisfied with this virtual tour experience	< average	24	28.73	U= 450.5 Z= .504	.614
	≥ average	35	30.87		
I will go on other virtual tours in the future	< average	24	31.81	U= 376.5 Z= -.758	.448
	≥ average	35	28.76		
I will recommend the virtual tour to others	< average	24	31.63	U= 381.0 Z= -.683	.495
	≥ average	35	28.89		
I enjoyed seeing virtually the location I planned to visit physically	< average	24	28.92	U= 446.0 Z= .430	.667
	≥ average	35	30.74		

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	< average	24	31.52	U= 383.5 Z= -.601	.548
	≥ average	35	28.96		
The image of the tourist destination has improved as a result of this virtual tour	< average	24	27.67	U= 476.0 Z= .935	.350
	≥ average	35	31.60		
During this virtual tour I was able to study the location in greater detail	< average	24	26.73	U= 498.5 Z= 1.269	.240
	≥ average	35	32.24		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	< average	24	25.48	U= 528.5 Z= 1.772	.076
	≥ average	35	33.10		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	< average	24	26.73	U= 498.5 Z= 1.296	.195
	≥ average	35	32.24		
I think using VR technology is very useful to visit a tourist destination/attraction	< average	24	30.83	U= 400.0 Z= -.351	.726
	≥ average	35	29.43		

* Significant at 95% confidence level

Annex 10. Differences in experience satisfaction among those who have not yet visited the destination based on technical skills

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Yes	23	31.48	U= 380.0 Z= -.575	.565
	No	36	29.06		
Information about the destination is reliable	Yes	23	31.00	U= 391.0 Z= -.398	.691
	No	36	29.36		
Information about the destination is well-organized	Yes	23	32.80	U= 349.5 Z= -1.097	.273
	No	36	28.21		
During the virtual tour I felt completely immersed	Yes	23	32.02	U= 367.5 Z= -.775	.438
	No	36	28.71		
During the virtual tour I felt totally involved	Yes	23	33.59	U= 331.5 Z= -1.375	.169
	No	36	27.71		
During the virtual tour I felt that I was physically present at the tourism site	Yes	23	32.93	U= 346.5 Z= -1.084	.278
	No	36	28.13		
The virtual tour was very pleasant	Yes	23	30.78	U= 396.0 Z= -.307	.759
	No	36	29.50		
The virtual tour was very interesting	Yes	23	31.09	U= 389.0 Z= -.435	.664
	No	36	29.31		
I learned a lot after this virtual tour	Yes	23	33.09	U= 343.0 Z= -1.168	.243
	No	36	28.03		
I am very satisfied with this virtual tour experience	Yes	23	34.67	U= 306.5 Z= -1.790	.073
	No	36	27.01		
I will go on other virtual tours in the future	Yes	23	31.57	U= 378.0 Z= -.632	.528
	No	36	29.00		
I will recommend the virtual tour to others	Yes	23	32.11	U= 365.5 Z= -.855	.392
	No	36	28.65		
I enjoyed seeing virtually the location I planned to visit physically	Yes	23	34.09	U= 320.0 Z= -1.566	.117
	No	36	27.39		

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistic (t)	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	Yes	23	33.96	U= 323.0 Z= -1.508	.131
	No	36	27.47		
The image of the tourist destination has improved as a result of this virtual tour	Yes	23	32.83	U= 349.0 Z= -1.093	.274
	No	36	28.19		
During this virtual tour I was able to study the location in greater detail	Yes	23	33.20	U= 340.5 Z= -1.197	.231
	No	36	27.96		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Yes	23	32.07	U= 366.5 Z= -.781	.435
	No	36	28.68		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Yes	23	27.93	U= 461.5 Z= .790	.430
	No	36	31.32		
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	23	28.61	U= 446.0 Z= .565	.572
	No	36	30.89		

* Significant at 95% confidence level

Annex 11. Differences in experience satisfaction between those who have visited and those who have not visited the site

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Yes	30	43.90	U= 918.0 Z= .310	.756
	No	59	45.56		
Information about the destination is reliable	Yes	30	40.47	U= 1021.0 Z= 1.283	.199
	No	59	47.31		
Information about the destination is well-organized	Yes	30	38.55	U= 1078.5 Z= 1.806	.071
	No	59	48.28		
During the virtual tour I felt completely immersed	Yes	30	40.37	U= 1024.0 Z= 1.281	.200
	No	59	47.36		
During the virtual tour I felt totally involved	Yes	30	43.07	U= 943.0 Z= .535	.593
	No	59	45.98		
The virtual tour was very pleasant	Yes	30	43.58	U= 927.5 Z= .403	.687
	No	59	45.72		
The virtual tour was very interesting	Yes	30	42.13	U= 971.0 Z= .825	.410
	No	59	46.46		
I learned a lot after this virtual tour	Yes	30	38.47	U= 1081.0 Z= 1.777	.076
	No	59	48.32		
I am very satisfied with this virtual tour experience	Yes	30	40.48	U= 1020.5 Z= 1.248	.212
	No	59	47.30		
I will go on other virtual tours in the future	Yes	30	37.77	U= 1102.0 Z= 2.056	**.040***
	No	59	48.68		
I will recommend the virtual tour to others	Yes	30	43.87	U= 919.0 Z= .334	.738
	No	59	45.58		
The image of the tourist destination has improved as a result of this virtual tour	Yes	30	37.20	U= 1119.0 Z= 2.149	**.032***
	No	59	48.97		
During this virtual tour I was able to study the location in greater detail	Yes	30	42.58	U= 957.0 Z= .656	.512
	No	59	46.23		

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	30	45.33	U= 875.0 Z= -.099	.921
	No	59	44.83		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Yes	30	40.48	U= 1020.5 Z= 1.234	.217
	No	59	47.30		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Yes	30	42.60	U= 957.0 Z= .664	.507
	No	59	46.22		

* Significant at 95% confidence level

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 139-147)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.07

ANALYSIS OF THE CULTURAL LANDSCAPE ELEMENTS IN THE MUNICIPALITY OF BISTRIȚA AND THEIR POTENTIAL FOR TOURISM VALORIZATION

Ileana-Cristina VASILIȚĂ-CRĂCIUN[1]

ABSTRACT. Analysis of the Cultural Landscape Elements in the Municipality of Bistrița and Their Potential for Tourism Valorization. The study of the cultural landscape elements in the urban area of Bistrița determines clear tourist values that refer to the attractiveness of both natural elements and that of cultural ones. This study highlights the specific natural environment, the churches and other buildings that have a characteristic function, belonging to different historical periods, starting from the Middle Ages. All of these benefit from an appropriate infrastructure that favors tourist access and capitalization, currently to a modest extent, but which as a whole can constitute the basis of a new integrated development strategy of the city. Thus, the study reveals both the analysis of the elements with real tourist values, as well as the main objectives to be achieved for the subsequent development of the area.

Keywords: *Bistrița Municipality, cultural landscape elements, tourism potential, tourism valorization*

1. Introduction

It is well known that evolution, as a general approach, involves permanent adaptation to changes in the environment, be it natural, social, economic, political or of any other nature. Thus, in the given context, geographical research through a careful and permanent connection to them, offered answers to the times and trends' demands, thus marking its evolutionary process.

[1] *Romanian Academy, Cluj-Napoca Branch, Geographic Research Center, Republicii Street, 9, Cluj-Napoca, Romania, e-mail: ileana.vasilita@academia-cj.ro*

If around 1928, through Schlüter (quoted by T. Gunzelmann, 1987, p. 32), the concept of cultural landscape was at the beginning of scientific research, considering that "it arises from all the actions it exercises each era, each culture (according to its capacity of evaluation) on the landscape", further research highlighted the fact that it is "rarely stable because people's needs and opportunities are continuously changing; change which can be slow but inevitable. The new structures gradually replace the old ones being next to each other in the territory" (J. F. Hart, 1998, p. 14). Consequently, in order to be able to analyze or "interpret a landscape, one must know its history and culture attached" (Alexandra Kruse, Gloria Pungetti, 2009, p. 220).

The subsequent interest in it increased and focused mainly on practical aspects, the landscape being seen as "environment for the human species, in a living environment, built, shaped and adapted by the individual and the community according to its ideals of progress and civilization" (P Cocean, Nicoleta David, 2014, p. 176). Its intrinsic qualities can contribute to the increase of social well-being by valuing them especially in the tourism field.

When one approaches cultural landscape in its relationship with tourism, the association of the two essential elements is inevitable: the natural setting and the cultural elements, as human-made tourist resources.

Embracing this last approach, the present study highlights the potential of the researched area, Bistrița, which represented "from the earliest times an environment of human habitation, whose continuity cannot be denied" (P. Cocean, C. N. Boțan, Oana- Ramona Ilovan, 2011, p. 92), an aspect demonstrated by the variety of cultural landscape elements, "which benefit of accessibility and visiting possibilities [...], in their absolute majority, constituting the raw material of cultural tourism, in a varied form of practicing it (religious tourism, information tourism, etc.)" (P. Cocean, A. Niță, Ș. Dombay, 2013, p. 251).

2. Features of Bistrița Municipality

2.1. Physical-geographical characteristics

From a territorial-administrative point of view, Bistrița municipality includes 6 component localities (Ghinda, Sărata, Sigmir, Slătinița, Unirea and Viișoara), being the largest city of Bistița-Năsăud County, in addition to having an administrative function, as the main and leading town of the county.

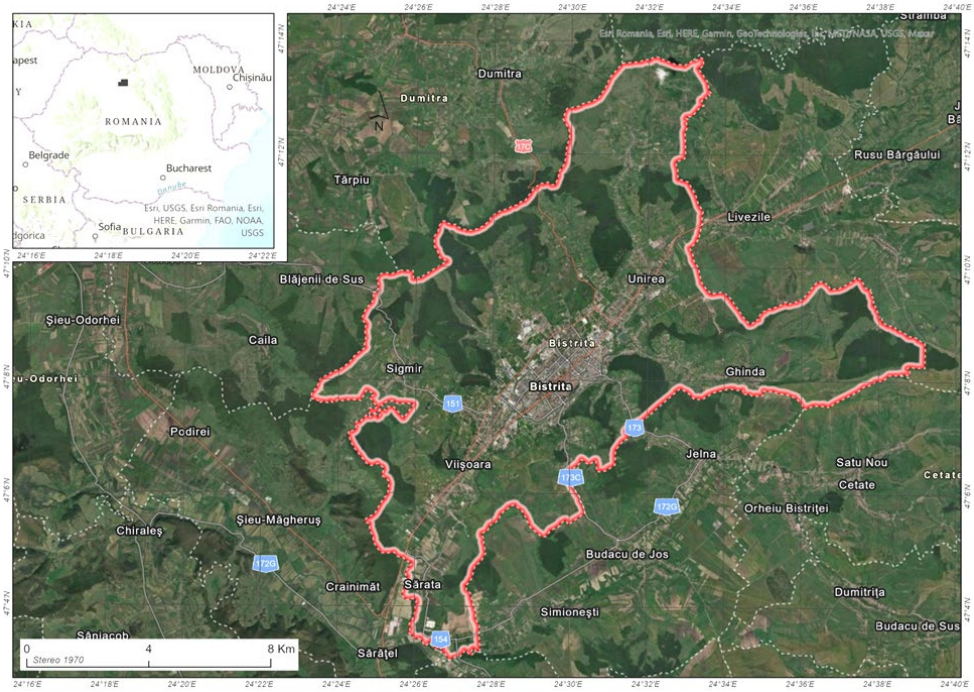

Fig. 1. Bistrița Municipality Map. *Source: the author*

Geographically, the city is located, according to the map, in the western part of Livezile-Bârgău Basin, along the Bistrița River. The visible aspect is predominantly that of a basin, surrounded by hills (450-680 m). Thus, the study of the topographic map reveals prominences, such as Ciuha Hill (620 m) in the northwest, Cetății Hill (682 m) in the north, Budacului Hill (578 m), Jelnii Hill (536 m), and Ghinzii Hill (538 m) in the southeast.

These have found their usefulness over time through cultivation with fruit trees and vines, under the shelter of a favorable temperate continental climate, inscribed in the local latitudinal and altitudinal limits, "with an average annual air temperature of 8.2°C. The annual course of air temperatures is typical continental, with the maximum in July (average temperature 19.1°C) and the minimum in January (average temperature -4.4°C). The multiannual average precipitation is around 680 mm. The month with the lowest average precipitation amounts is January (35.2 mm) and the wettest is June (94.4 mm). Precipitation in the form of snow falls on average starting from the first decade of December to the second decade of March, the average number of days with snow cover oscillating between 75 and 85" (I. Buta, 1976, pp. 44-45).

2.2. Short history

In terms of historical development, the cultural elements describe the trajectory of local society over time. "Bistrița, capital of the county, located at the crossroads of old commercial roads, presenting numerous traces of a long Slavic coexistence with the native population of Dacian-Roman origin. The development of crafts and trade also accelerated the development of Bistrița, with great fame in the following centuries" (T. Morariu, I. Buta, A. Maier, 1972, p. 144).

Documentarily attested from 1264 (Villa Bistiche), Bistrița owes its appearance to German settlers. Already at the end of the 12th century, the long sides of the Central Square, as well as the main street routes of Bistrița, had already been outlined. The city had numerous planimetric similarities with central or northern European towns from the same period (P. Goja, 2006, p. 6).

Thus, it can be seen that the colonized German population is the primary factor in shaping the local cultural landscape, adopting the street structure and architectural style typical of the areas of origin, distinct from the local one. Subsequently, each historical era, marking its existence through successions of newly introduced elements in the local cultural landscape. Of these, "the Gothic and the Renaissance gave essential features to the building aspect of medieval Bistrița. The 16th century is, moreover, the peak moment of the urban development of the old city" (P. Cocean, C. Boțan, Oana-Ramona Ilovan, 2011, p. 130), culminating, naturally, with cultural elements belonging to the contemporary period.

3. Analysis of Elements that Have Tourist Value Within the Cultural Landscape

The context of the emergence and the long history of Bistrița favored the permanent introduction of new elements into the local cultural landscape, its complexity gradually increasing. Currently, it reveals a relatively homogeneous structure, naturally reflecting the various historical stages encountered, highlighted by specific authentic cultural elements.

The general contemporary trends of the proliferation of the tourism phenomenon, applied in the studied area, are able to lead to an efficient economic valorization of the cultural elements with tourist significance.

Among the elements with important tourist potential, the *Orthodox Church* stands out in particular, significant for its age, and for its massive structure, decorated according to the trends of the second half of the 13th century, being "the oldest architectural monument in the city , [...] in which some valuable frescoes are preserved" (T. Morariu, I. Buta, A. Maier, 1972, p. 144);

The *Evangelical Church*, in fact "an architectural monument, built in the 14th - 15th centuries in the Gothic style and modified in the 16th century, in the Renaissance style, by the Italian architect Petrus Italus de Lugano" (P. Cocean, C. N. Boțan, Oana-Ramona Ilovan, 2011, p. 133), to which the *Roman Catholic church* is added. They all add up to a treasure trove remarkable for their age, specific styles, paintings and well-preserved material objects.

Fig. 2. The Evangelical Church.
Source: the author

Fig. 3. The Coopers' Tower.
Source: the author

The city is also distinguished by secular constructions, which often have historical significance, through various aspects related to them during the various eras. Thus, *the House of the Silver crafts Man* is an architectural monument that reveals the specifics of the medieval era and at the same time the social manner of division into guilds. On the same note, *the Coopers' Tower* bears witness once again to social segregation, having as a criterion the various crafts practiced. "With a height of 25 m, it dates from the second half of the 15th century" (P. Goja, 2006, p. 9), it had a significant role in the defense of the fortress thanks to its solid and imposing structure, in the same category as the Cetății Hill.

Also, the series of medieval constructions continues with representative architectural elements such as: Ion Zidaru House, the architectural ensemble "Șugălete" visible in the form of a row of storied buildings distinguished by 20 vaults supported on 21 columns.

Recent eras are highlighted by buildings that overwhelmingly serve activities in the tertiary sector such as the Palace of Culture, the Old Post Office Building, the Andrei Mureşanu National College Building, the Bistriţa-Năsăud County Center for Popular Creation, the Bistriţa-Năsăud County Library.

Public monuments, intended to remind the society of various historical events or related to certain personalities, are distinguished in the perimeter of the squares and parks, usually in the form of statues, busts and various monuments. One may list the statue of the poet Andrei Mureşanu, the author of the anthem of the 1848 revolution, of the poet George Coşbuc; the statue of the writer Liviu Rebreanu, the statue of the photographer Alexandru Roşu (the first Romanian photographer who captured various snapshots related to the city of Bistriţa). From the category of busts, we can distinguish those that are completely related to representative historical leaders such as Avram Iancu, Petru Rareş, ruler of Moldova, or the ruler Alexandru Ioan Cuza, and the monuments, in particular, the Jewish Monument, the Monument to the Heroes of the Nation, the Monument to the Soviet Soldier, the Monument to the Former Political Detainees and so on, all this reconstructing fragments of local and national history.

A foray into the perimeter close to the settlement brings to completion varied and significant cultural elements, such as the Roman fort in Livezile, the Evangelical Church in Herina, a monument of medieval architecture, the old salt mines in Sărăţel, the dendrological park and the castle in Arcalia, and "the Doll Hill" from Domneşti. They are all added in the category of cultural elements suitable for tourism.

4. The Potential for Tourism Valorization of the Elements of the Cultural Landscape

The municipality of Bistriţa, in accordance with the above, sums up a homogeneous local cultural landscape, harmoniously structured by the successive introduction into the natural environment of elements specific to various historical eras and derived from the particular manner of social evolution. Overall, it is a valuable tourist resource that lends itself to being exploited, the specific infrastructure fully supporting this activity.

Thus, the access of the flow of tourists to the mentioned area is ensured by various road access routes such as the European road E58 (DN 17) which connects Transylvania and Moldova (Dej – Vatra Dornei), national road DN 17C (Bistriţa – Năsăud), county road DJ 173 to Budacu de Sus and the origin of Budacu Valley in Călimani Mountains. The DN 15A branch provides access to Herina-Teaca-Reghin-Târgu Mureş-Topliţa and Gheorgheni. In addition, rail access is possible by means of Sărăţel railway junction and main railway no. 4.

The tourist infrastructure is complemented by adequate accommodation and food establishments. According to the data provided by *the Bistrița-Năsăud Regional Directorate of Statistics*, for the period 2017 – 2021, generally the capacity of tourist accommodation has registered a slight decline in accommodation units (hotels, motels, tourist villas, tourist guesthouses, agro-tourism guesthouses), from 1299 beds in 2017 to 1246 in 2021. Positive fluctuations can be noticed among hotels and tourist guesthouses at the expense of motels, which denotes a general decrease in the preference of tourists for accommodation in motels.

Table 1. The existing tourist accommodation capacity by types of tourist reception structures in the municipality of Bistrița

Year	**2017**	**2018**	**2019**	**2020**	**2021**
Total	1299	1291	1280	1195	1246
Hotels	921	917	951	884	966
Motels	96	96	46	-	-
Tourist villas	29	25	25	25	25
Tourist guesthouses	221	221	226	224	223
Agro-tourism guesthouses	32	32	32	62	32

Source: *Bistrița-Năsăud Regional Directorate of Statistics*

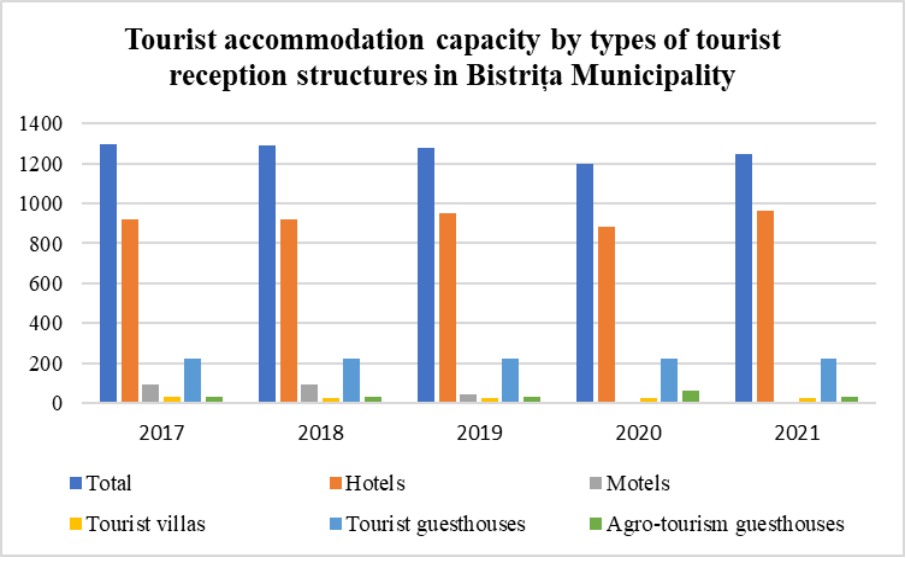

Fig. 4. Tourist accommodation capacity by types of tourist reception structures.
Source: Bistrița-Năsăud Regional Directorate of Statistics

Also, at the level of Bistrița municipality, there is an adequate network of public catering units (covering various types of catering structures and categories), which has registered a significant increase during the studied period. They complete the infrastructure elements supporting the tourist activity and not only that.

Table 2. The number of public food establishments in the municipality of Bistrița

YEAR	2017	2018	2019	2020
Total	86	99	110	127

Source: Bistrita-Năsăud Reaional Directorate of Statistics

5. Conclusions

All these previously identified, analyzed and exposed elements, benefit from an adequate infrastructure, which facilitates access and tourist exploitation, currently in a relatively modest way, but which can mean, as a whole, the basis of a new integrated development strategy of the city.

Thus, in accordance with the local development strategy 2015-2030, established by the Bistrița Local Council, which also provides for tourism exploitation, we propose the following suitable interventions for the development of the tourism sector: the development of projects in collaboration with institutions interested in tourism development; expanding tourism collaboration with neighboring localities on whose territory there are elements of the cultural landscape that lend themselves to being exploited; the diversity of services offered and the attraction of investors; tourism promotion through various means (e.g. social networks, websites, etc.); the implementation of policies for planning, protection and conservation of the cultural landscape at the local level; projects that support the concerns for the quality of landscapes and the sustainable development of local characteristic elements.

REFERENCES

1. Buta, I. (1976), *Bistrița-Năsăud, Ghid turistic*, Editura Sport-Turism, București.
2. Cocean, P., Boțan, C., Ilovan, Oana-Ramona (2011), *Județul Bistrița-Năsăud*, seria Județele României, Editura Academiei Române, București.
3. Cocean, P., Niță, A., Dombay, Ș. (2013), *Județul Harghita*, Editura Academiei Române, București.

4. Cocean, P., David, Nicoleta (2014), *Peisaje culturale*, Editura Risoprint, Cluj-Napoca.
5. Goja, P. (2006), *Bistrița-Năsăud, ghid turistic*, Editura Ad Libri, Bucureşti.
6. Gunzelmann, T. (1987), *Die Erhaltung der historischen Kulturlandschaft*, im Selbstverlag des Faches Wirtschaftsgeographie der Universität Bamberg.
7. Hart, J. F. (1998), *The Rural Landscape*, The Johns Hopkins University Press, Baltimore, Maryland.
8. Kruse, Alexandra and Pungetti, Gloria (2009), *Euca Land, European culture expressed in Agricultural Landscape,* in Sixth meeting of the Workshops of the Council of Europe for the implementation of the European Landscape Convention, Sibiu, România 20-21 sept. 2007. European spatial planning and landscape, No. 88 Council of Europe Publishing, (2009), Printed in Belgium.
9. Morariu, T., Buta, I., Maier, A. (1972), *Județul Bistrița-Năsăud*, Editura Academiei Republicii Socialiste România, Bucureşti.
10. *** (2023), *Statistical data*, Direcţia Regională de Statistică Bistriţa-Năsăud.

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 149-163)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.08

THE REINTRODUCTION OF BOBÂLNA HILL INTO THE TOURIST CIRCUIT

Violeta-Elena MOIS[1], Iulia HĂRĂNGUŞ[2]

ABSTRACT. The reintroduction of Bobâlna Hill into the tourist circuit. Bobâlna Hill is the highest part of the Cluj and Dej Hills, an integrated part of the Someşan Plateau, with an altitude of 693 m. From a geomorphological point of view, it falls within the erosive-structural level formed on the horizon of the Dej tuff, of Lower Pannonian age. At the foot of the hill, a series of subsequent valleys developed, such as Olpret Valley to the north, northeast and east, Măr Valley and Lujerdiu Valley to the south, and Luna Valley to the west and southwest respectively. From a geological point of view, Bobâlna Hill is composed by the Dacitic tuff of Dej, interspersed with marls, clays, sandstones with coals and marly shales. Due to its altitude and the rocks it is made of, Bobâlna Hill determined the meaning of the evolution of the other natural components of the environment, flora, fauna, soils, as well as the hydrography. The development of human communities in the adjacent communes was deeply influenced by the presence of Bobâlna Hill. The hill is located about 30 km west of Dej City. Its area of polarization is more visible on the territories of Bobâlna, Aluniș, Cornești, Recea-Cristur and Panticeu communes. Bobâlna Hill has been the source of building materials for houses and other buildings for a long time. There are still buildings made of "Băbdiu stone" today. In addition to resistance over time, tuff has a beautiful appearance and was accessible to people. In June 1437, an army of peasants gathered on Bobâlna Hill, armed with pitchforks and scythes, ready to fight to regain their rights and freedom. The uprising in Bobâlna took place as a result of burdensome feudal obligations towards the state, the feudal lord and the Catholic church, but also because of numerous abuses. On June 8, 1937, the leaders of the villages in the Olpret area formed an initiative committee to build a monument in honour of the peasants who revolted in 1437, on Bobâlna Hill, at an altitude of 693 meters. The initiative was successful and a limestone monument was built, unveiled on

[1] *Liceul Teoretic Petru Maior, 405300 Gherla, Romania, e-mail: violetaretegan@yahoo.it*
[2] *E-mail: iulia_harangus@yahoo.com*

December 21, 1957. Starting from 1968 and up to 1989, popular celebrations were organized, most of them just above, on the Bobâlna plateau. The heroes of the 1437 uprising were commemorated and it was an occasion of joy, reunion and party for the inhabitants of the area. Between the years 1989-1999, the celebrations stopped, but they were resumed in 1999, 2001 and 2002. The last celebration was in 2015, in the school yard in Bobâlna commune, but it had a smaller scale. In the years 2021 and 2022, the first two editions of the Revolution Race event took place, on Bobâlna Hill. Revolution Race is a sporting event that highlights nature, history and rural traditions. The "Înfloreşti" Sports Club Association participated to the organization of the two events in partnership with the Go4Fun Association and the administration of the municipalities of Bobâlna and Cornești. Over 300 runners from Romania and abroad participated in each edition. Starting from the advantages offered by the natural setting, the presence of Bobâlna Hill, and the significance of the historical event of 1437, Bobâlna municipality is currently designing a long-term development strategy based on ecological rural tourism.

Keywords: *Bobâlna Hill, Revolution Race, Bobâlna Monument*

1. Introduction

Bobâlna Hill is the highest of the Cluj and Dej Hills in the Someşan Plateau (Pop, Gr. P., 2012). It is located about 30 km west of Dej, being accessible on the DJ 108B road, while access from Cluj-Napoca or Gherla is possible by following the DJ 109B road.

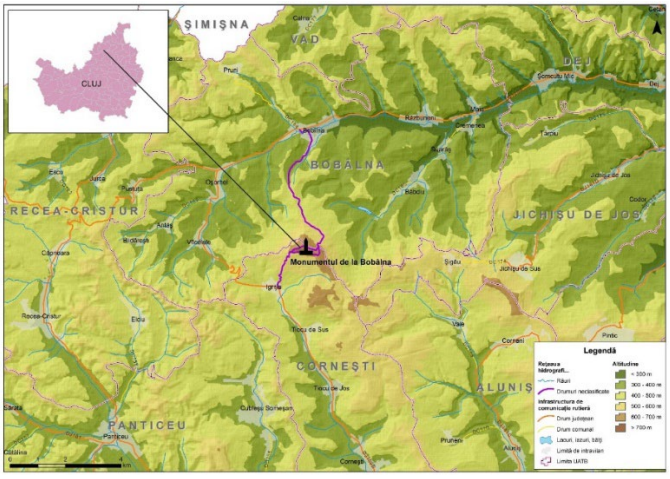

Fig. 1. Location of the Bobâlna Monument

2. Bobâlna Hill

The hill is located in the southwestern part of Bobâlna commune. As a landform, it is part of the erosive-structural surface of lower Pannonian age. The geological strata are monoclinal and form cuesta slopes to the southeast and east, which are fragmented by Olpret (Bobâlna) and Lujerdiu valleys and their tributaries. Structural escarpments developed in the north and northeast of the hill. The most representative steep slope is the northern one, towards Valea Mare, located to the south of the villages of Vâlcelele and Oşorhel. Although it is only 693 m high, the inhabitants of the villages at the foot call it "Băbdiu Mountain". Numerous arguments can be made in support of this statement.

Fig. 2. Pointer to the Monument in the locality of Igriția

Fig. 3. Bobâlna Hill, western slope, seen from Igriția

• From the Bobâlna plateau there is a panoramic view of great beauty. On clear days, the gentle hills of the Someşan Plateau are clearly visible, and on the horizon, towards the northeast and east, the eroded craters of the Gutâi and Ţibleş mountains, the summit of Rodna, as well as the Călimani Mountains appear. To the west one can see the mountains of Gilău-Muntele Mare, Vlădeasa and Meseș.

Fig. 4. Wide view of the Cluj Hills from Bobâlna Hill

• Climatically, Bobâlna Hill contributes to cooling the climate of the surrounding areas. In the villages of Bobâlna and Corneşti communes, for example, the phenological difference compared to the city of Dej is 10-12 days. Summers are hot, but summer evenings are cold. Winters are very

cold, with temperatures 5-6°C lower than in the city of Dej. Bobâlna Hill has the role of an orohydrographic barrier. In the villages located on the exposed southern and eastern slopes, precipitation is more frequent, compared to the isolated northern and western slopes, with more frequent droughts (Croitoru, Adina-Eliza, 2006). The difference in temperature and precipitation is visible in the sowing and planting period, 10-12 days later than Dej, as well as in the amounts of agricultural products.

Fig. 5. Structurally steep slope to the north of Bobâlna Hill

• From a hydrographic point of view, short streams spring from the Bobâlna Hill, tributaries of the Someş River (Olpret) or Someşul Mic (Lujerdiu), having a daily flow regime. They are predominantly supplied by rainwater and less by underground waters (Ujvari, I., 1959).

• The flora is composed of xerophilic and mesoxerophilic formations on the sunny slopes, including species of sedge, St. John's wort, plantain, clover, etc. (Pop, I., Cristea, V., Hodişan, I., 2002). On the shaded slopes and hill ridges there are forests of oak, sessile oak, beech, hornbeam (Doniţă, N., Cocioabă, Suzana, 2007). During the communist period, the spontaneous flora was replaced, in many areas, by agricultural crops. After 1989, agriculture experienced a significant decline, so that many areas that were once ploughed remained in a state of abandonment, and now there is only secondary vegetation of unproductive shrubs. The positive side of this situation is that the hill, and especially its foothills, have returned to a more natural, pleasing appearance. One of the assets of the Bobâlna Hill is precisely its natural appearance and green colour, which is rarely alternated with other colours, only in the case of village centres.

Fig. 6. Structural scarp on Dej tuff

Fig. 7. Wide view towards the Hills of Dej

Fig. 8. Hilly aspect of the Someşan Plateau

Fig. 9. Xerophilous vegetation on the southern slope of Bobâlna hill

3. Bobâlna commune

Bobâlna commune is located about 20 km to the west of the city of Dej, and runs in a west-east direction, along the drainage basin of Olpret Valley. The villages that make up the commune are: Antăş, Băbdiu, Blidăreşti, Bobâlna, Cremenea, Maia, Oşorhel, Pruni, Răzbuneni, Suarăş and Vâlcelele. It borders the communes of Recea-Cristur to the west, Şimişna and Vad to the north, Cornești to the south, Jichişul de Jos to the southeast. Traces of habitation on the territory of the commune are old, from the Paleolithic and Neolithic, evidence of this being Dacian ceramic objects of various uses, which are exhibited at the City Museum in Dej. The documentary attestation of the villages in the Bobâlna commune is between the years

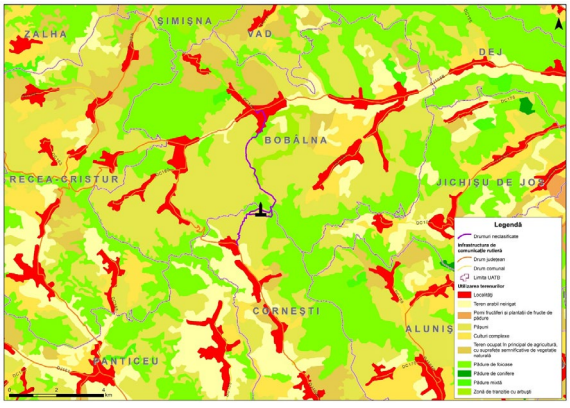

Fig. 10. Land use mode (data source: https://land.copernicus.eu/pan-european/corine-land-cover)

1300-1400. The villages are mentioned in the documents related to the Peasants' Uprising of 1374 or, more often, when the churches in these villages were built (Maier, A., 2001).

The commune covers an area of 9,550 ha. As for the population of the commune, as can be seen from fig. 11, it exceeded 4,000 inhabitants between 1890 and 1966, and reached even more than 5,000 inhabitants. Since 1941 the population has gradually decreased, down to 1,382 people in 2021 (Varga E. Á., 2008, Romanian Population Census, 2011 and 2021).

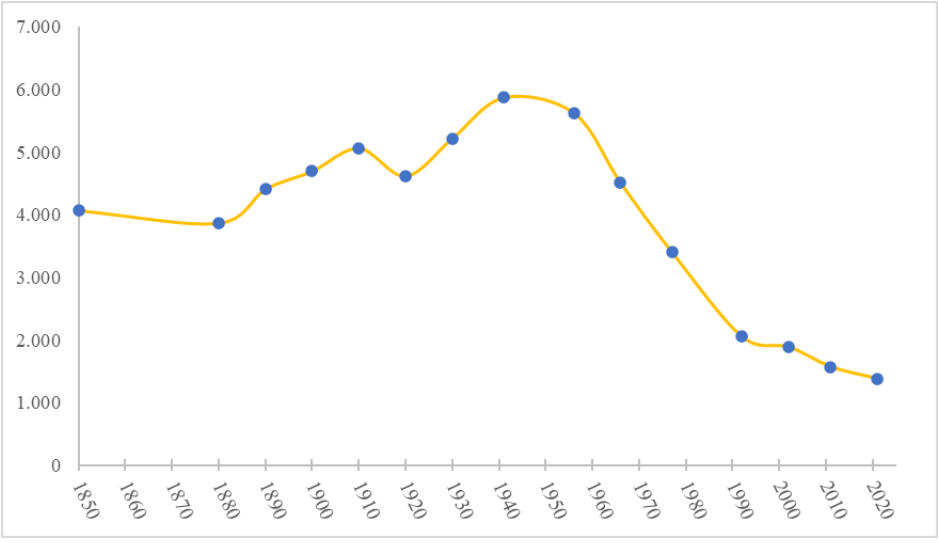

Fig. 11. Evolution of the population of Bobâlna commune
(data source: Varga E. Á., 2008, RPC, 2011, RPC, 2021)

The history of the commune has been troubled by events that have had their say in many ways.

- When the Hungarians came, the population was led by Romanian rulers, who had fortified fortresses, such as Gelu Valahu's Dăbâca Fortress. After the occupation of Transylvania by the Hungarians, the process of transforming free peasants into serfs began. The number of serfs increased greatly, but at the same time their obligations to their oppressors also increased. This led to the outbreak of the Bobâlna uprising in 1437.
- The union of Transylvania with Romania on December 1, 1918 and the agrarian reform after the First World War had a beneficial influence on the peasants of the commune.

- The period of the Second World War, 1940-1944, was of great suffering for the population of the area.
- After the agrarian reform of 1945, the peasants became masters of the land they worked from their grandparents.
- The joy of the peasants to be the owners of the lands was short-lived. In the period 1949-1960, collective agriculture was introduced. Many peasants were forced to give up their land, animals and agricultural machinery in favour of the collective farms. Some lost their minds under the duress. Others lost their lives, those who vehemently opposed the changes. Collectivization meant a new difficulty in the life of the peasants, forced to pay quotas to the state from all agricultural products. The quotas were very high and left the peasants with few products to survive on. This aspect resulted in theft.
- The collectivization was followed by the migration of the population from the villages to the industrialized cities: Dej, Gherla, Cluj-Napoca, Zalău, Bistrița, Cugir, Mediaș, Hunedoara, Reșita, and Brașov. In this way, there was a massive depopulation of the villages. Currently, the population of the commune is ageing, most of the inhabitants are over 60 years old. Return migration also contributed to the aging of the population after 1990. Many retirees from the previously mentioned cities, who have parental homes in the commune, chose to move to the village and live a quiet life.
- After the 1989 Revolution, everything that was built in almost 45 years was demolished and sold. The peasants shared the inherited lands and forests, but the essential, the labour force to work the lands, was missing. Very little land is worked, especially outside the villages, the rest of the land remains unworked because agricultural work is very expensive, and the products obtained do not cover the expenses.

4. The influence of Bobâlna Hill in the development of Bobâlna commune

Bobâlna Hill remained in history as the place where the peasant uprising took place in 1437, the largest event in Transylvania up to that time. In June of that year, an army of Romanian and Hungarian peasants, armed with pitchforks and scythes, rebelled against the feudal lord, the state and the Catholic church, no longer enduring the increasing burdens imposed on them. From Olpret, the following people directly participated in this uprising: Ban Ladislav, Vicenţiu, the representative of Olpret, and Ladislau Gall, the representative of the serfs in Antăș, as reported by Pop Viorel in the monograph “Bobâlna”.

The situation of the rebellious serfs did not improve much after the revolt. Four or five centuries after the uprising, some peasants continued to live in holes ("hruba") dug in the ground, a fact attested by the surname Hruban specific to the village of Băbdiu. Generally, the houses were small, composed of two rooms, built of "voioaje", unfired clay bricks mixed with straw, with wooden beams and covered with straw, reeds or shingles. The rooms were paved with dirt mixed with dung. Some residents were so poor that they had no glass in the windows, but "bindeu", skin made from sheep's bellows. The occupations of the villagers in the commune were and remain growing crops and raising animals.

The Hungarian baron had great power even in the interwar period, ruling not only the lands and forests of the commune, but also the peasants, the inhabitants of the villages. The Romanian children had their names Hungarianized in catalogues and school records. They studied for a maximum of seven years. In Buduș (Vâlcelele), school was held every now and then, when Arghil, the only teacher, was not drunk. He loved his pupils and taught them to read and write Romanian, arithmetics, history and geography. The children loved going to school also because the teacher was a joker and taught them less good things, like for example: to weave cigarettes out of corn cobs or roast potatoes in the fire. Most days they did not go to school, but attend the cattle and sheep in the field, barefoot, dressed in a long shirt, which did not protect them from the cold and rain on autumn days. When they met the baron, they had to bow their heads and greet him "Kiss your hand, your Highness".

The hard living conditions of all times, since the attestation of the villages of the Bobâlna commune, have impressed upon the inhabitants a brave character, of worthy fighters, who have resisted the vicissitudes of the times, just like Mount Băbdiu. Noticing how hard it is to "fight for the land", especially when it is no longer yours, the villagers, especially those from Vâlcelele, put a lot of emphasis on education. Schools were built in all villages, except Cremenea. As a result of the rural-urban migration, the number of schoolchildren has considerably decreased. Therefore, today only the school in Bobâlna is functional, and the children from all the villages of the commune study there. During the 20th century and up to nowadays, there were and are doctors, engineers, lawyers, pharmacists, university and pre-university teachers, and economists who originate in the villages belonging to Bobâlna commune.

Fig. 12. Alexandru Vaida-Voevod (data source: https://ro.wikipedia.org/wiki/Alexandru_Vaida-Voevod)

4.1. The most representative personality of Bobâlna is Alexandru Vaida-Voevod, the one who drafted the Declaration of Self-Determination of the Romanian Nation in Transylvania, which he read in the plenary session of the Parliament in Budapest, on October 18, 1918. "From this hour, anyway decides the powers of the world, the Romanian nation in Hungary and Transylvania is determined to better perish than to suffer further slavery and hanging", emphasized the fearless politician. As an elected member of the Central Romanian National Council, he worked intensively on the organization of the Great Assembly in Alba-Iulia on December 1, 1918. He is also present in the Transylvanian delegation that handed over the Union Resolution to the King. As a member of the Governing Council, starting from December 2, 1918, he was entrusted with the Department of Justice and Foreign Affairs. He was the first president of the Chamber of Deputies (28 November 1918) and the prime minister of the first parliamentary government in Great Romania (1919-1920). In Bobâlna commune, the mansion where Alexandru Vaida-Voevod was born is still preserved today, where the communal health centre operated during the communist period (https://ro.wikiped.ia.org/wiki/Alexandru_Vaida-Voevod).

4.2. Another outstanding personality of the commune was Valer Pop, born in Buduş (Vâlcelele) in 1892. He graduated from the Faculty of Law in Cluj-Napoca, where he obtained a PhD in legal sciences. He was the first president of A.G.R.U. (General Association of United Romanians) and held this position in the period 1929-1937. He was minister of justice in the Nicolae Iorga government and minister secretary of state in the Tătărăscu governments in 1936-1937 (https://ro.wikipedia.org/wiki/Valer_Pop).

Valer Pop is the one who contributed the monetary funds to the construction of the Orthodox church in the village of Vâlcelele.

Fig. 13. Valer Pop (data source: https://ro.wikipedia.org/wiki/Valer_Pop)

4.3. Also, another personality who comes from Buduș village, Bobâlna commune, is Iulian Pop, born in 1880. He was the first Romanian mayor of Cluj-Napoca after the Great Union in 1918. He held the position of mayor in the period 1919-1923. He graduated from Gherla High School, then studied law at "Franz Joseph" University in Cluj and the Royal Hungarian University in Budapest. He obtained his PhD in legal sciences on September 27, 1902. As mayor, he contributed to the establishment of the Romanian administration in Cluj City Hall and in other Cluj institutions (https://ro.wikipedia.org/wiki/Iulian_Pop).

Fig. 14. Iulian Pop (data source: https://ebibliothecaseptentrionalis.files.wordpress.com/2021/01/dr.-iulian-pop.jpg)

Fig. 15. Dej tuff constructions, Morau locality

Fig. 16. Dej tuff constructions, Stoiana locality

Fig. 17. Dej tuff constructions, Cornești locality

Fig. 18. Dej tuff constructions in Tiocu de Jos village

In addition to the obvious influence in the historical evolution of the commune, Bobâlna Hill is present in all the villages by means of the volcanic tuff, used as a construction rock (Savu, A., 1963, Ciupagea, D. T., Păucă, M., Ichim, Tr., 1970, Pop, V., 2003), locally called "Băbdiu stone". Most of the houses and other buildings in the villages on the Olpret and Lujerdiu valleys were built from volcanic tuff at the end of the 19th century and up to the middle of the 20th century. The Băbdiu stone was transported by oxen-driven carts on a road that goes up from the village of Igriţia to the plateau. The road was preserved and was used for the transport of the materials from which the television relay was built in the 20th century. The same road was used to transport the materials for the construction of the monument to the 1437 uprising, as well as the two telephone relays in the 21st century. Volcanic tuff is a resistant rock, and buildings made of this material have withstood time, in the form in which they were built. Until the 1989 Revolution, tuff was not given any particular importance, being seen as a kind of rock at the disposal of the villagers. After 1990, the urban-rural return migration began, and the former townspeople, mostly retired, began to live in the houses inherited from their parents, many of them built of tuff. It has been noted that in addition to durability, tuff also has a pleasing appearance. Therefore, people began to strip the plaster from the walls and expose the tuff. The stone buildings of Băbdiu give a specific note to the villages located on the valleys springing from Bobâlna Hill.

Fig. 19. Dej tuff constructions, Igriţia locality

Fig. 20. Dej tuff constructions in Tiocu de Sus village

The Bobâlna celebration was organized between 1968-1989, around July 20. It was the most anticipated event of the year in all the surrounding villages. More than 2000 participants gathered each time. The heroes of the 1437 Uprising were commemorated through artistic programs supported by popular music singers and groups of students coordinated by teachers, from the schools of the

adjacent communes. A social outpouring was developing, in which children, youth, adults and the elderly became more aware that they were living on a land steeped in history. The sounds of music mingled with the voices of children reciting poems, in the inviting smells of small barbecues, sprinkled with beer, juices or other drinks. Gastronomic diversity was less in those days, but the good mood was genuine. People lived in a world where stress had not even been heard of, they were simply happy to be on Băbdiu, together.

5. Revolution Race

"Revolution Race" is a sports event that took place outdoors, in the years 2021 and 2022. It was organized on the Bobâlna Hill by the "Înfloresti" Sports Club Association, in partnership with the Go4Fun Association. The sporting event promotes the local community and puts a special emphasis on outdoor movement on the grounds where the Transylvanian peasants gathered to revolt against the taxes unjustly demanded by the Catholic bishop of the area. Marathon, half-marathon, cross-country, bicycle race and obstacle race took place during the event. On October 10, 2021, when the first edition of the event took place, at the starting point there were 300 participants and about the same number of spectators.

Fig. 21. Participant to the Revolution Race (data source: https://revolutionrace.run)

On June 18-19, 2022, 311 people participated out of 384 registered. There were 60 participants in the obstacle race, 87 people signed up for the 5K route (Popular Uprising Route), of which 58 participated, 84 people participated in the 10k route (Freedom Cross) out of 104 registered, 99 people signed up for the 21k (Independence Half Marathon), but only 82 participated, while for the 42k (Revolution Marathon) out of the 34 registered competitors, only 27 showed up at the starting line. During the two days, in addition to the runners, about 600 spectators also participated. They also enjoyed the other events held on the set. In addition to the sports activity, there were also other events, such as:

- stage for music and artistic activities
- natural products fair (booths of local producers)
- relaxation and dining area
- food court with traditional peasant products
- activity areas for children
- presentation booths for partners
- booths with plastic artists
- areas for massage, yoga, reading, etc.

Fig. 22. The Popular Uprising Route
(data source: https://revolutionrace.run)

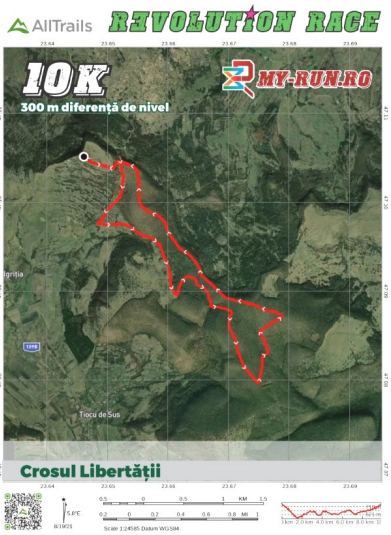

Fig. 23. The Freedom Cross Route
(data source: https://revolutionrace.run)

Fig. 24. The route of the Independence Half Marathon
(data source: https://revolutionrace.run)

Fig. 25. The Revolution Marathon Route
(data source: https://revolutionrace.run)

In 2023, the Revolution Race was not organized, the next edition being planned for 2024 (https://revolutionrace.run).

6. Conclusion. Development projects for Bobâlna commune

According to the Local Development Strategy of the Bobâlna commune for the period 2020 - 2027, several projects are being considered, including the "Restoration and introduction into the tourist circuit of the Commemorative Monument of the Bobâlna Uprising", which provides for the restoration of the historical monument, the modernization of the access road, the setting up a parking lot, a tourist information centre, toilets, etc. Another priority project for the studied commune would be, according to the same source, the construction of a cultural centre, which would include an event hall, a kitchen, toilets, storage spaces, as well as other facilities (***2020, *Strategia de dezvoltare locală a comunei Bobâlna pentru perioada 2020 – 2027*).

REFERENCES

1. Ciupagea, D. T., Păucă, M., Ichim, Tr. (1970), *Geologia Depresiunii Transilvaniei*, Editura Academiei Republicii Socialiste România, București
2. Croitoru, Adina-Eliza (2006), *Excesul de precipitații din Depresiunea Transilvaniei*, Editura Casa Cărții de Știință, Cluj-Napoca.
3. Doniță, N., Cocioabă, Suzana (2007), *Fitocenologie integrată și vegetația României*, Editura Printech, București.
4. Maier, A. (2001), *Podișul Someșan – populația și așezările*, Edit. Gh. Barițiu, Cluj-Napoca.
5. Pop, I., Cristea, V., Hodișan, I. (2002), *Vegetația județului Cluj (Studiu fitocenologic, ecologic, bioeconomic și ecoprotectiv)*, extras din Contribuții botanice XXXV (2), 1999-2000, Universitatea „Babeș-Bolyai" Cluj-Napoca, Grădina botanică „Alexandru Borza", printed at ROPRINT S.R.L. Cluj-Napoca.
6. Pop, P. Gr. (2012), *Depresiunea Transilvaniei*, Editura Presa Universitară Clujeană, Cluj-Napoca.
7. Pop, V. (2003), *Bobâlna-studiu monografic*, Edit. Casa Cărții de Știință, Cluj-Napoca.
8. Savu, A. (1963), *Podișul Someșan: studiu geomorfologic*, PhD thesis, Babeș-Bolyai University of Cluj-Napoca, 323 p.
9. Ujvari, I. (1959), *Hidrografia R.P.R.,* Editura Științifică, București, 288 p.

10. Varga E. Á (2008)*, Kolozs megye településeinek etnikai (anyanyelvi/nemzetiségi) adatai 1850-2002,* A csíkszeredai Pro-Print Kiadónál 2001-ben „Erdély etnikai és felekezeti statisztikája. IV. Fehér, Beszterce-Naszód és Kolozs megye. Népszámlálási adatok 1850–1992 között" címmel megjelent kötet vonatkozó részének javított és frissebb adatokkal bővített elektronikus változata. Utolsó módosítás: 2008. november 2.
11. Krészek C., Filipescu, S. (2005*), Middle to Late Miocen sequence stratigraphy of the Transylvanian Basin (Romania),* Tectonophysics, 410, p. 437-463, Elsevier, Amsterdam.
12. Filipescu, S., Gârbacea, R.A. (1997), *Lower Badenian sea-level drop on the western border of the Transylvanian Basin: foraminiferal paleobathymetry and stratigraphy*, Geologia Carpathica, 48 (5), p. 325-334, Bratislava.
13. *** (2011), *Romanian Population Census*.
14. *** (2020), *Strategia de dezvoltare locală a comunei Bobâlna pentru perioada 2020 – 2027,* Cluj-Napoca.
15. *** (2021), *Romanian Population Census*.
16. https://ro.wikiped.ia.org/wiki/Alexandru_Vaida-Voevod
17. https://ro.wikipedia.org/wiki/Valer_Pop
18. https://ro.wikipedia.org/wiki/Iulian_Pop
19. https://revolutionrace.run

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 165-180)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.09

SENEGAL: A TYPICALLY AFRICAN COUNTRY?

Csaba M. KOVÁCS[1]

ABSTRACT. Senegal: A Typically African Country? The young nation of West Africa, part of the former French colonial system, has a long history showing a clear integration within the context of the Sahel region. After independence, it followed a particular evolution: though its economic and social development was not free of the contradictions and the failures so characteristic for former colonies, compared to other African states, Senegal showed a considerable political stability, successfully avoiding civil wars, military coups and dictatorships and maintaining a multiparty system. However, recent evolutions show a certain tendency towards constitutional instability, a weakening of the rule of law and certain signs of drift towards authoritarian governing. The present international situation of the Sahel and of West Africa represent a further challenge for Senegal, because it can play a crucial role there showing a positive example, on the condition of preserving its stability and democracy.

Keywords: *colonialism, slavery, négritude, independence, French Community, Françafrique, elite, president, crisis, coup d'État, corruption.*

In March 2023 we had the opportunity to participate at an Erasmus+ mobility in Senegal, at the University Cheikh Anta Diop of Dakar. The first conversation with our colleagues was an introductory one and among others they asked us whether we visited Africa before. After we told them we both visited Morocco and Madagascar a couple of years ago, they replied that those countries, though geographically belong to Africa, were however not quite the "real Africa". "You have to come to sub-Saharan Africa to experience that" they told us.

[1] *"Babeş-Bolyai" University, Faculty of Geography, 400006, Cluj-Napoca, Romania, e-mail: csaba.kovacs@ubbcluj.ro*

After all, what can be considered as the "real Africa" or typically African, when we compare countries and peoples? Senegal is certainly situated in the so-called "Afrique Noire" (Black Africa). However, if we compare it to other African countries, it does not always fit in a pattern.

From the geographic point of view, Senegal can be mostly considered as a country of the Sahel region, though the second smallest (after Eritrea): situated between the 12th and 17th parallels, its climate makes a transition between the dry tropical, desert climate of its northern neighbour Mauritania and the subecuatorial, grassland climate of its southern neighbours, with a rather short rainy season during summer. The northern half of the country receives between 200-600 mm of rainfall per year and is dominated by shrubland (semidesert), while its southern half is more humid and the typical vegetation is wooded grassland (savanna). The climate of the Sahel region used to be more humid in prehistoric times, which favoured the early apparition of agriculture and a higher population density, compared not only to the neighbouring Sahara, but especially to the more southern regions of West Africa, which used to be mostly covered by evergreen or deciduous tropical forests.

1. The Republic of Senegal: a historical review

The territory of the Senegambia region has been inhabited since prehistoric times, the oldest archaeological findings (bifacial chopped stone axes and other tools from the Cape Verde peninsula and from the area of Rufisque) being dated as palaeolithic tools. Hunter-gatherers and fishermen in the coastal area were probably speaking proto-saharan or proto-berber (Afroasiatic) languages.

In the neolithic era, the stone tools became much more diversified and accompanied by ceramics and other kitchen remains, proving the presence of an important population of fishermen and traders in the Atlantic Coast area. Following the dessication of the Sahara (cca 3500 BCE), the southward migration of Saharan peoples and the expansion of the Niger-Congo language peoples can be associated with the expansion of the Sahel agriculture. The first commonly cultivated crops were millet (with fonio as its local variety) and broomcorn (sorgho), later barley and African rice too, while livestock was mainly represented by goats, sheep and cattle.

An interesting theory about the origins of the Senegalese was launched by the famous historian Cheikh Anta Diop, who was firmly convinced about the strong connection between (if not the direct origins of) the first inhabitants of Senegal and the ancient Egyptians. Oral tradition also claims that some people,

such as the Dia-Ogo, came from the Nile valley. However, the desertification of the Sahara represented a major obstacle for long distance contacts in ancient times (the horse and the camel were much later domesticated), so the influence of Egypt in Africa during the rule of the pharaohs cannot be proved to have been effective outside of the Nile river basin and North Africa (Iliffe, J., 2022), not to mention the completely different linguistic history of West Africa (dominated by the Niger-Congo language family) and the Nile valley (the ancient Egyptian was a branch of the Afroasiatic languages, besides the Semitic and Cushitic branches, and their southern neighbours were speaking Nilotic languages).

The origins of the Niger-Congo family and of the Sudanese Africans is still under debate, but most probably they migrated initially in the fifth millennium BCE from an area situated in today's Eastern Nigeria and Cameroon, in the Benue, Nyong and Sanaga rivers basins. The spread of territory occupied by the Niger-Congo peoples at the beginning of the fourth millennium BCE ran from the Senegal river in the west to Cameroon in the east (Meredith, M., 2014). The western zone was inhabited by the sub-groups known as Volta, Mande and North-West Atlantic or Senegambian languages, of which the Serer–Fulani–Wolof branch became predominant in present day Senegal.

The protohistorical period (first millennium BCE) was represented in Senegal by the presence of metallurgy (at first copper and later iron processing) and some megalithic circles built of mostly volcanic rocks in the frontier region with the Gambia. Iron processing and agriculture were introduced, according to the oral tradition, by the Dia-Ogo people, who came here in the 6th century BCE from present day Mauritania.

Migration always shaped the peopling of Africa, but by the end of the first millenium CE the most important ethnic groups that inhabited Senegambia were already living in the region: the Wolof (or Ouolof/Jolof) presumably came from the north and settled between the Senegal River delta and the town of Diourbel, and from the Atlantic Ocean to the Ferlo Desert; the Serer, living initially in the Tekhrur Kingdom, were later displaced by the Muslim Fulbe populations; the Peul (also named Fulani/Fulbe/Pular), a pastoral people who later spread into more than a dozen of African countries of the Sahel region, most of them in today's Niger and northern Nigeria; the Tukulor (or Toucouleur), a Fulbe-speaking people who later became sedentary and were among the first to convert to Islam; the Soninke (or Sarakolé), a Mande-speaking ethnic group spread in Mali, southern Mauritania, Guinea, Gambia and eastern Senegal, founders of the Ghana Empire; the Mandingue (or Malinka/Mandinka/Mende), who founded the Mali empire in the 13th century and are spread today in several countries of West Africa; the Diola (or Jola/Joola) from southern Senegal, predominantly in the Casamance River basin.

Climate change had also a great influence on African migration patterns, as it still has today. In West Africa, after a rather wet period before 1000 CE, came a prolonged dry period from c. 1000 to 1500, followed again by a wet period from c. 1500 to 1640 in which geographical boundaries shifted, and with those boundaries went movements of people; after 1640 a new dry period followed, with further migrations (Green, T., 2020).

Arab chronicles such as *Tarikh al-Sudan, Tarikh el Fetach* or the works of El Bekri are attesting that during more than 1300 years in this part of Africa, from the 4th until the 16th century CE, permanent dynastic struggles took place, when smaller states were conquered by their stronger neighbours. The first states in the western extremity of Africa appeared in the 4th century CE: the Empire of Ghana which, at its maximal extent, included the eastern part of present day Senegal. Ghana was one of the main providers of gold for the Mediterranean area, having rich gold mines at Galam, on the lower Falémé River (a tributary of the Senegal). The gold from Galam was exported to Morocco starting from the first centuries of CE, and it finally caused the decline and fall of the Ghana Empire, invaded in the 12th century by the Almoravids (Radian, L., 1966).

The first local political entity was the Kingdom of Tekrour, a rival state of Ghana, created by the Tukulor on the southern banks of the Senegal River. South of Tekrour the Dia-Ogo founded the Kingdom of Namandirou, later named Fuuta-Tooro, where Soninke, Serer and Peul (Fulbe) people lived together. The first predominantly Wolof state was founded in the 14th century by Ndiadiane Ndiaye, which reunited by 1360 the smaller kingdoms situated between the Senegal and the Gambia river mouths into a much bigger state, the Jolof Empire. By this time the influence of Islam became preponderant, more and more people of the Sahel region becoming Muslims.

Between the 13th and 17th centuries most of the western extremity of Africa was included into the Mali or Mandingo Empire, the largest empire of West Africa, founded by Sundiata Keita (1214-1255), which replaced the former Ghana empire in the region. At its maximal extension, at the end of Mansa Musa's reign in 1337, it included not only the upper basin of the Niger River, but the whole of Senegambia until the Atlantic Ocean to the west and to the cities of Gao and Tadmekka in the east. Between 1235 and 1265, one of Sundiata's generals, Tiramakang Traoré founded the Mandingo state of Kaabu with its capital located at Kansala in the Gambia. By the 16th century its influence extended over what are now The Gambia, the southern Senegalese region of Casamance and Guinea-Bissau. This was a federation with a fierce warrior aristocracy, who shaped Kaabu's strength and secured its power for centuries to come. To the north of the Gambia River was the most powerful state

in the 15th century, Great Jolof, with five provinces: Jolof, Cayor, Waalo, Bwol and Siin. The size of Jolof cavalry by the 16th century reveals extensive connections to trans-Saharan and also Atlantic trade (Green, T., 2020).

The first Europeans who reached in the 15th century the shores of Senegal were the Portuguese: Dinis Días, the father of Bartolomeo and Diogo Días, was the first navigator to go in 1444 "beyond the land of the Moors" and reach the furthest point west of Africa that he named Cape Green (Cabo Verde), situated today in the city of Dakar, and Île de Gorée, which he named Ilha de Palma. In 1445 Nunho Tristao reached the mouth of the Senegal river and in 1446 probably that of the Gambia too. Alvise Cadamosto, hired by prince Henry the Navigator, explored in 1455 the Canary Islands and Madeira, then the mouths of the Gambia River. One year later he discovered the Cape Verde Islands and reached the Geba River delta (in today's Guinea-Bissau).

The Portuguese founded in 1536 a settlement on the island of Gorée (known before as Bezeguiche) and they soon used it as a base for slave trade between West Africa, North Africa, the islands of Madeira, Azores, Cape Verde and Sao Tomé, then across the Atlantic Ocean into Brazil and the Caribbean. The 16th and 17th centuries brought to the region competition from other European sea powers too: the Dutch conquered and founded their first comptoir at Île de Gorée in 1588.

The French arrived at the mouths of the Senegal in 1626 and built a fortress on Ndar Island, renamed Saint Louis. In 1633, cardinal Richelieu granted the monopoly of commerce in Senegal and Gambia to the *Compagnie normande*, founded in 1626 by Jean Rozée from Rouen, which became in 1634 the *Compagnie du Cap Vert*. The French occupied James Island in 1651 (in The Gambia) and Saint Louis in 1659. In 1664, these settlements were ceded to the French Company of the West Indies, founded by Colbert. In 1677, during the Franco-Dutch War, a fleet led by admiral d'Estrées destroyed the fortifications of Île de Gorée and took the island. In 1678 captain Jean Du Casse founded the comptoirs of Rufisque, Portudal and Joal, then took and destroyed the Dutch fortress of Arguin Island (in today's Mauritania). In 1679, the *Compagnie du Sénégal* obtained the right of trade between Cap Blanc (Mauritania) and the mouth of the Gambia river, where it founded the comptoir of Albreda (today Albadarr in The Gambia). In 1685, King Louis XIV signed the so-called "Black Code", establishing the rules for the treatment of Negroes in the colonies (Radian, L., 1966), while Île de Gorée remained one of the main centers of slave trade in Africa.

Between 1692 and 1783, several wars between France and England caused the colonies of Saint Louis and Île de Gorée to change ownership: the English took both in 1692, then again in 1758. The Paris Treaty of 1763 (ending the Seven Years War) gave back Île de Gorée to the French, but the rest of Senegal

remained under British rule. In 1765 the French bought from the King of Cayor the land between Saint Louis and Dakar. The Cap-Vert peninsula was settled in the 15th century by the Lebu people, who founded the village of Ndakaru, at the bay across Île de Gorée (where is today the port of Dakar), that became the capital of the Lebu Kingdom (Meredith, M. 2014). The other villages of the peninsula like Ouakam, Ngor, Yoff and Hann represent today distinctively Lebu neighbourhoods of the city of Dakar. In 1783, according to the Treaty of Versailles (ending the American War for Independence), the settlements of Senegal came back to France, who recognized in exchange the British possession of the Gambia River valley. Then, between 1800 and 1814, during the Napoleonic Wars, the forts of Saint Louis and Île de Gorée were again occupied by the British, but the Paris Treaty of 1814 brought back Senegal into French possession, just like the majority of French colonies occupied by the British after 1793.

The slave trade was first banned by France during the Great Revolution in 1794, then by the British in 1807. Though emperor Napoleon I reintroduced slavery into the French colonies in 1803, he banned the slave trade in 1815, and in 1848 the second French Republic abolished slavery on all French territories. However, the slave trade within the African continent continued in the 19th century, until it was finally banned.

In the 1830's France started building its second colonial empire. After the conquest of Algiers in 1830, the French created in 1845 three provinces in Algeria, conquered the Moroccan port of Mogador in 1844 and started the conquest of the Ivory Coast in 1842-1843. Admiral Bouët-Willaumez, governor of Senegal from 1843 to 1845, extended French sovereignty by founding in 1843 the new comptoirs of Assinie and Grand-Bassam in Senegal and the town of Libreville in Gabon, the later for the settlement of freed African slaves. The second French Republic also gave a parliamentary representation for Saint Louis in 1848. In parallel they encouraged the missionary activity of the Franciscans and Jesuites, especially within the heathen population of the south.

The extension of the colonies remained also a top priority of the second French Empire. The nomination of general Louis Faidherbe as governor of Senegal in 1854 was a clear sign of an even more agressive colonial policy. On November 1st 1854 he founded the Colony of Gorée and Dependencies, separate from Senegal. In 1855-1856, under the pretext of the "pacification" of Senegal and securing the free navigation on the Senegal River, the French fought the guerilla of the Trarza Moors led by Mohammed Habib. Between 1855 and 1863, they crushed the resistance of the Toucouleur and Serer peoples, in 1857 occupied Dakar, founded the port of Dakar and organized the corps of *tirailleurs sénégalais* of well-trained African soldiers who were to become soon one of the main forces of the French colonial army. Between 1854 and 1865 Faidherbe

organized the *Quatre communes* of Senegal (Saint-Louis, Gorée, Dakar and Rufisque), whose statute was recognised by the Third Republic. In 1862-1864 France annexed the territories of Salum, Siné, Baol and Casamance and finally in 1865 the Kingdom of Cayor (Radian, L. 1966). By extending the French influence much beyond the boundaries of Senegal, Faidherbe became the founder of French West Africa.

The conquest of West Africa was realized according to Faidherbe's plan to connect Senegal to the Niger River by constructing a series of fortifications between 1880 and 1883. After this the French were able to take into possession the middle Niger valley by the successful assault on Tombouctou under commander (future Marshall) Joffre in 1894 and the expedition of captain Monteil to Lake Tchad. French Guinea and the Ivory Coast were occupied by 1883 and finally Dahomey in 1886 (Duclert, V., 2022).

At the Conference of Berlin (or "Congo Conference", 1884-1885), the European powers divided the still unconquered parts of Africa between themselves, establishing the future spheres of interest of the European powers. Among others they agreed on 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). Consequently, Congo was recognized as a possession of Leopold II, King of Belgium, Sudan as a British possession, the frontiers of Nigeria, British East Africa (present Kenya and Uganda), German East Africa (Tanganyika, Rwanda, Burundi), Cameroon, Togo, German South-West Africa (present day Namibia), Rhodesia and Nyassaland (Malawi) were delimited.

The third French Republic organized between 1885 and 1895 a series of expeditions of exploration and conquest in the Sahara, the upper Niger basin and Central Africa, followed by the founding of new colonies: Mauritania, French Sudan (Mali), Niger, Upper Volta (Burkina Faso), Tchad, Oubangui-Chari (present Central African Republic), French Congo and Gabon. In 1886 an agreement was signed with Portugal according to which the town of Ziguinchor with the region of Casamance became a French possession. On the 16th of June 1895 Senegal, Mauritania, French Sudan, French Guinea, Upper Volta, Niger, Cote d'Ivoire and Dahomey (present Benin) were reunited in a super-colony of 4689000 km^2 (about seven times the size of France), named *Afrique Occidentale Française* (French West Africa), recognized internationally in 1898. Its first capital was at Saint-Louis, then from 1902 at Dakar. With the new colonies of North Africa, Equatorial Africa, Madagascar and Indochina, the worldwide extent of the French colonial empire was increased ten times between 1870 and 1914.

Though relatively short-lived in their great majority (compared to the Spanish, Portuguese, Dutch and British empires), the African colonies played an important role in the history of the French Republic. Though there is today a rather general consensus about the unjust, exploitative character of the colonial regimes, there is a strong debate about how profitable they really were for the metropoles. In the case of France, the African colonies, though very extended, were rather poor in natural resources and sparsely populated, where effective control (especially in the Sahara desert and in the rainforest areas) was rather a fiction than reality, so their exploitation was not very profitable. According to V. Duclert, the colonisation was technically a disaster, politically a failure and morally a shame for the Republic. The maintenance of the colonies was however a question of geopolitical influence and of international prestige. The majority of the French public opinion and its leaders were firmly convinced about the *"mission civilisatrice"* of France in the world and were willing to accept the huge expenses of the development, management and defence of the colonies. The source of power for the pro-colonial parliamentary group was an extended clientele in the colonies, within the army and among the businessmen. It was also leaning on a nebula of associations, rather militant than scientific, like the *Société de Géographie* from Paris. Founded in 1821, it was spreading an ideal of discovery and conquest, especially in Africa. After 1890, the *Comité de l'Afrique Française,* initiated by Hypollite Percher, financed several expeditions in Africa (Duclert, V., 2022).

For Senegal, two different statuses were introduced after 1901: the inhabitants of the *Quatre communes* were French citizens with full rights, while the newly-colonised territories were submitted to the legal system of *indigénat*, which allowed the discrimination of African natives and their submission by punishment and forced labour. Under the influence of deputy Blaise Diagne, mayor of Dakar between 1920 and 1934, a special status could be chosen by the inhabitatnts of the Quatre communes from 1916.

The turn of the 19th-20th centuries was the period of Mouride revival in Senegambia. The Mouride Brotherhood was a Sufi order with the headquaters in the city of Touba, founded in 1884 by Shaykh Ahmadou Bamba Mbakke, a Muslim mystic and ascetic marabout who, though did not support the French conquest of West Africa, did not wage outright war on them, but preached the *jihad al-akbar*, the fight through hard work, learning and fear of God. The Mourides had an important contribution in the spread of intensive agriculture in Senegal, especially for commercial crops such as peanuts.

The project of general Gallieni (commander of French Sudan between 1886 and 1888), to construct a railway relying Dakar to Tombouctou (the Dakar-Niger railway) was realized between 1900 and 1924. The railway was to play a major role in the transport of peanuts, the main cash crop of Senegal and Mauritania. A much larger project of a railway between Paris and Dakar (through Algeria and Morocco) was never finalized, the last station being built at Colomb-Béchar (today Tafilalet in Morocco). In exchange, the air connection between France and Senegal was realized in the 1920s: Jean Mermoz flew in 1925 from Casablanca to Dakar and the writer Antoine de Saint-Exupéry started mail flights in 1926 between Toulouse and Dakar. Between 1929 and 1932, in order to balance the effects of the Great Depression, the French colonial administration quadrupled the amount of investments in the colonies, mainly in the form of government loans. An official report declared in 1932 that "urban Dakar and its rural satellites became vast construction sites". The extension of the cities, the increase of cash crop production and a mounting public debt introduced the colonies into a new phase of under-development (Iliffe, J., 2022).

The French colonies played also an important role in the world wars, sending thousands of conscripts in both wars who fought on the fronts of Europe, Africa and the Middle East. In 1940, 63000 tirailleurs were enlisted of which 24000 were dead or missing in action by 1945. Between 1940-1943, the colonial authorities of French West Africa remained loyal to the fascist regime of Vichy. In September 1940, the British navy, accompanied by the French Free Forces of general De Gaulle, attempted unsuccessfully to occupy the port of Dakar (operation Menace/Battle of Dakar). Pushed back by the defense of the French government forces lead by governor-general Boisson, the operation was a total fiasco.

After the war, the French government made clear the intention of maintaining the colonies under its control. The massacre of Thiaroye sent a brutal message on this matter: on December 1st 1944, in a military camp near Dakar, dozens of Senegalese tirailleurs were shot and 34 were imprisoned because they demanded their wages for their four years captivity in France (Blanc, G., 2022). On December 26th 1945 France joined the Bretton Woods system and created the official currency of the French colonies, the CFA.

In conducting their "civilizing mission" in Africa, the French had been highly successful in cultivating a small black elite to whom they granted full rights as citizens on condition that they accepted assimilation into French society and rejected their African heritage, family law and customs. In outlook, members of the elite saw themselves, and were seen, as Frenchmen, brought up in a tradition of loyalty to France, willingly accepting its government, its language and culture,

and taking a certain pride in being citizens of a world power. Their political aspirations centered on securing for the African populations the same rights and privileges enjoyed by metropolitan Frenchmen. No one campaigned for independence and political debate tended to reflect metropolitan tastes. One of the main means of creating a loyal elite was the school system. To accomplish this role, in Senegal the William Ponty Normal School (named after colonial administrator William Merlaud-Ponty) was founded in 1903, where many later African celebrities, such as Félix Houphouët-Boigny, Modibo Keïta, Hubert Maga, Mathias Sorgho, Hamani Diori, Mamadou Dia ou Abdoulaye Wade were educated (Iliffe, J., 2022).

The close relationship that France strove to establish with its African elite was best personified by two men: Léopold Sédar Senghor of Senegal and Felix Houphouët-Boigny of Côte d'Ivoire. Both rose to become ministers in the French government and both acted as staunch advocates of the "*Union Française*". However, Senghor soon began to react against assimilation, formulating a philosophy termed "négritude", a black consciousness that served as an intellectual precursor to nationalism (Meredith, M., 2011). Another important representative of Senegalese thought was Blaise Diagne, member of the French parliament between 1914-1934, who was at first a pan-African thinker but later formulated a proper philosophy called "diagnisme". According to Diagne, the future success of African societies should not be based on brutal revolutions, but on "reasonable evolution" and cultural assimilation into more developed civilizations. Because of his loyalist pro-French opinions, Diagne was labelled as anti-African by radicals and pan-African activists.

The *Union Française* was proclaimed in 1946 including metropolitan France and the territories of the French colonial empire. Senegal became a *territoire outre-mer* (overseas territory) of France. As a result of the strengthening anticolonial movement, Senegal and other colonies of French West Africa became in 1956 autonomous territories and introduced the universal suffrage for men and women. In 1958 Charles de Gaulle (as first president of the Fifth French Republic) proposed a new constitutional project for all the French territories in Africa. Submitted to a referendum on September 28th 1958, 97.2% of the Senegalese chose the status of member of the French Community, with a constitution following the French model.

In order to preserve the regional unity, Senegal and the Sudanese republic (former French Sudan) created in 1959 the Mali Federation, but soon tensions appeared between the two members of the federation, so it was dissolved on August 20th 1960. On September 28th 1960 both Senegal and Mali proclaimed their independence and became separately members of the U.N.

2. Characteristics and peculiarities of present-day Senegal

Most of the French colonies in sub-Saharan Africa gained their independence in 1960 and France remained for decades after that date strongly involved in the development and defense of these countries, although the French Community has ceased to function de facto since 1961. It was replaced by the *Union Africaine et Malgache* and from 1965 by the *Organisation Commune Africaine et Malgache* (African and Malagasy Union), an intergovernmental organization created to promote cooperation among newly independent states in Francophone Africa. Until its dissolution in 1974, it tried to present itself as an alternative to the Organization of African Unity (Búr, G., 2011).

General De Gaulle counted on Africa during World War II and he was counting on it even more after the war. Facing the hegemony of the two great world powers, he expected that African colonies would restore the power of Europe and especially of France. Even if De Gaulle was out of power between 1946 and 1957, the Fourth Republic followed the trail of Gaullist colonial politics and engaged in three directions: the economic exploitation of the colonies, their military control and the selection of African elites supposed to preserve the interests of France. After the independence, the French Community was meant to reinforce France on the international stage, to help it procure the raw materials that were lacking in the country and find opportunities on the African markets, conditioning the help for development on the subordination to the French economy. As for the new African heads of state, if they acceded to independence in a subordinate manner, they were rewarded with the monopoly of power they were looking for since the end of the war. This is how *Françafrique* worked, put into practice by men like Houphouët-Boigny (who used the term Françafrique for the first time) and Léopold Sédar Senghor (Blanc, G., 2022).

Senghor was very successful as a poet and a philosopher, but his presidency received less favourable reviews. The close ties he maintained with France prompted accusations from radicals that he was lending himself to neocolonial interests rather than promoting the kind of African socialism he claimed to support. He relied on French trade and industry, and kept a French praetorian guard to ensure national security. French paratroopers promptly intervened in December 1962, when Prime Minister Mamadou Dia accused him of subordinating the economy to the interests of his acolytes and tempted a coup. Senghor refused to countenance a more rapid rate of Africanisation by allowing unqualified Africans to take over jobs from qualified Frenchmen. In Dakar the French population actually grew after independence. Despite French assistance, Senegal's economy remained largely stagnant, as demographic growth effectively canceled out the increase of the economy. At the same time

Senegal became increasingly encumbered by external debt. Senghor steered through these difficulties with a mixture of compromise, coercion and pork-barrel politics. He kept the support of the Muslim Brotherhoods by providing marabouts with special favours, such as large loans and strategically placed development projects. He bought off political opponents by offering them government posts and material benefits. He reacted to student protests with strong arm tactics - tear gas and arrests. At the age of 74, Senghor announced his decision to resign in favour of his protégé, Abdou Diouf. Senghor thus became the first African leader since independence to give up power voluntarily. The tradition of multi-party politics he established in Senegal survived. In 1981 Diouf passed legislation allowing for the legalization of all political parties. He went on to win several elections until accepting defeat in 2000 (Meredith, M., 2011).

On July 30th 1981, an attempted coup d'état in The Gambia resulted in the intervention of the Senegalese army in order to reinvest President Dawda Jawara into power. Following these events, Gambia agreed to sign a union agreement with Senegal and create the *Senegambia Confederation*, which would exist until 1989, when it was dissolved because of mutual disagreements between the two member countries.

Between 1989 and 1991 a serious conflict broke out between Senegal and its northern neighbour Mauritania on the basis of older etnic conflicts, this time on the matter of the water of the Senegal river and the project of two dams, the Diama and the Manantali Dam. The conflict resulted in a temporary break of diplomatic relations between the two countries, tens of thousands of victims, thousands of refugees on both sides and serious repercussions on internal political life in Senegal.

Another conflict errupted in the southern province of Casamance, whose population of mainly Diola origins previously already resisted to islamisation, enslavement and French colonial administration. Exploited as the country's main granary and at the same time neglected because of geographic isolation, the province used to be one of the main tourist attractions of Senegal. Sporadic fighting took place between a separatist group, the Movement of Democratic Forces of Casamance (MFDC) and government forces following which tourism ceased to work, not lastly because of the presence of landmines in the region.

In 1998 a military coup throw the southern neighbour Guinea-Bissau into a civil war, followed by the intervention of the Senegalese army to help president Joao Vieira, finally ousted by the rebels in May 1999.

The presidential elections of March 19th 2000, won in the second round by the longtime leader of the opposition, Abdoulaye Wade, brought the fall of president Abdou Diouf. Wade abolished the Senate and the Economic Council in 2000, then in 2001 succeeded in amending the constitution, reducing the presidential mandate from 7 to 5 years, dissolving the National Assembly and naming Mme Madior Bouaye as first female prime minister of Senegal in March 2001. The tragedy of the Joola, the ferry boat connecting Dakar to Ziguinchor, capsized in September 2002, caused the death of more than 1800 people and resulted in the resignation of Mme Bouaye.

Abdoulaye Wade, after being reelected as president in 2007, reestablished the Senate and a seven-year presidential mandate in 2008. His liberal economic policy brought significant foreign investments into Senegal and spectacular investments in infrastructure, but also resulted in the decay of agriculture, the crash of several industrial sectors (like the chemicals' industry), a high unemployment rate, an increasing number of emigrants seeking refuge especially in the Canary Islands and a dependence on the Senegalese diaspora in covering the needs for foreign currency.

The opposition denounced on several occasions a drift into authoritarianism during the mandates of A. Wade, who presented himself for a third mandate in 2012, but was finally defeated by his former Prime Minister Macky Sall. The new president launched a series of institutional reforms in order to reduce government spending and the corruption, creating a national antifraud and anti-corruption agency in 2012. The massive government investments resulted in a 6.8% economic increase in 2018, while the country became increasingly dependent on Chinese, Indian and Middle Eastern capital. At the same time, the drift into authoritarianism did not cease: during his first mandate, the Constitution was amended ten times and the electoral law eighteen times. As a result, Macky Sall was reelected for a second term in 2019, then the Parliament abolished (for the third time) the office of Prime Minister between 2019 and 2022, installing a presidential form of government.

In March 2023, based on the opinion of the Constitutional Council of 2019, Macky Sall declared himself eligible for a third presidential mandate. His main opponent, Ousmane Sonko, mayor of Ziguinchor, was charged in 2021 with rape and murder threatening and condemned in March 2023 to two years of prison. His conviction started a series of violent riots in the capital with several deaths and injuries and resulted in his elimination from the list of eligible presidential candidates. In Juin 2023, president Macky Sall declared that he would not candidate in 2024 for a third term, supporting Prime Minister Amadou Ba as presidential candidate for the Benno Bokk Yakaar coalition.

3. Conclusions

Most of the authors who write about contemporary Africa (Fage, 2002, Meredith, 2011, Iliffe, 2022) draw a grim picture of the post-colonial sub-Saharan countries: a deep under-development with chronic poverty and famines, endemic corruption, turbulent or faked elections and frequent coups d'État resulting in military dictatorships, unscrupulous elites whose only concern is the conservation of their privileges or nouveau riches looking for making even greater fortunes, ethnic conflicts installing into power military casts of blood suckers who are starting civil wars in order to control the natural resources of the occupied territories.

Compared to other African states, Senegal showed a considerable political stability, successfully avoiding civil wars, military coups and dictatorships and maintaining a multiparty system. However, recent evolutions show a certain tendency towards constitutional instability, a weakening of the rule of law and certain signs of drift towards authoritarian governing.

According to M. Meredith (2011, p. 691-693), fifty years after beginning of the independence era, Africa's perspectives are as bleak as ever. Already the world's poorest region, it is falling further and further behind all other regions of the world. With a population rising to more than one billion, real per capita income is lower than in the 1970s. Between 1981 and 2002, the number of people living on poverty nearly doubled. Although Africa possesses enormous mineral wealth, its entire economic output is less than 2 per cent of the world GDP. Its share of world trade and investment is similarly minimal – less than 2 percent. Though there was a period of optimism due to an increase of commodity prices in the mid-2000s, with real GDP rising about 5 percent a year, the improved economic performance did little to reduce unemployment and poverty levels. The prospects of Africa escaping from precipitous decline depend heavily on international assistance. The magnitude of the crisis is too great for African states to resolve by themselves. Most states are effectively bankrupt, weighed down by debt, barely able to raise sufficient funds on their own account to provide a minimum of public services.

On the other hand, the enormous demographic potential of Africa which presently looks rather like a burden, could represent on the long term one of the main strengths and chances for economic development, on the condition of significant improvements in education. Though access to higher education multiplied in the last decades, due mostly to the apparition of dozens of new universities, the lower levels do not show the same progress. In the Francophone countries for instance, while elementary education is in the national languages (like Wolof or Malagasy) or ethnic maternal languages, there is a dual system

within the high schools, with French Lycées (financed by the French government or by private funds) continuing to educate the children of the privileged elites and high schools in local languages for the rest of the students. As teaching in the universities is almost exclusively in French (like in Madagascar), the children of underprivileged families with no access to the Lycées Français do not really have a chance to follow a higher education institution.

The fabulous mineral riches of Africa always attracted all sorts of traders and investors eager to make a profit and this is still true today, but instead of western countries and companies, usually labelled as "neo-colonialist exploiters", in the last couple of decades more and more investors from China, India and the Arab monarchies of the Gulf gain contracts of development not only in the mining sector, but in the infrastructural and institutional development too, offering generous loans with more than suspect conditions and always ready to pay off officials who do not care too much about enslaving their countries with indebtment and further economic dependence.

The East-West rivalry was present in Africa during the Cold War and it is unfortunately present again, not only on the field of economic control, but also in the geopolitical fight for new spheres of influence: the recent coups in the former French colonies of Africa (Mali, Guinea, Burkina Faso, Niger and Gabon) show a general shift from French domination, whose military are gradually ousted from the region and replaced by radical Islamic militias or foreign (especially Russian) mercenaries. In the present international context Africa is sadly becoming again a scene for localized conflicts between the superpowers. In this situation, the current government of Senegal is reacting consequently: reinforcing its military and playing a leading role within the ECOWAS, including sending military in different conflict areas of West Africa in order to counter foreign influence and Islamic extremism, both representing serious threats for the stability of the whole continent.

REFERENCES

1. Ade Ajayi, J.F., Crowder, M. (eds., 1985), *Historical Atlas of Africa*, Longman Group Limited, Burnt Hill, Harlow, Essex.
2. Bigo, D. (1987), *Les coups d'État en Afrique 1945-1985. Conflit pour l'État - de groupes - de personnes,* Études polémologiques No. 41. Les coups d'État, Institut Français de Polémologie, Fondation pour les Études de Défense Nationale, Paris.
3. Blanc, G. (2022), *Décolonisations. Histoires situées d'Afrique et d'Asie,* Éd. Du Seuil, Paris.
4. Búr, G. (2011), *Afrika-történeti tanulmányok (Studies on African History),* Mundus Novus, ELTE BTK Történeti Intézet, Budapest.

5. Delacroix, C., Zancarini-Fournel, M. (2022), *1945-2020. La France du temps présent*, Folio Histoire de France, Ed. Gallimard, Paris.
6. Duclert, V. (2021), *La France coloniale,* in: 1870-1914. La République imaginée, Folio Histoire de France, Ed. Gallimard, Paris.
7. Fage, J.D., Tordoff, W. (2002), *A History of Africa,* Routledge, London & New York.
8. Green, T. (2020), *A Fistful of Shells. West Africa from the Rise of the Slave Trade to the Age of Revolution,* Penguin Random House Inc., London, New York.
9. Iliffe, J. (2022), *Les Africains. Histoire d'un continent,* 3e édition, Champs histoire, Flammarion, Paris.
10. Keresztes, I. (2023), *Puccsok a Szahelben. Régi reflexek* (Putsches in Sahel. Old reflexes), HVG no. 34/24.8.2023.
11. Kovács, Cs. M. (2022), *The Great Island of Mini-Oceania: Madagascar at the Crossroads of Empires,* Studia Universitatis Babeş-Bolyai, seria Geographia nr. 1-2.
12. Leichtman, M. (2010), *Shi'a Lebanese Migrants and Senegalese Converts in Dakar,* in: The Shi'a Worlds and Iran, edited by Sabrina Mervin, SAQI, London, Institut Français du Proche-Orient, Paris.
13. Meredith, M. (2011), *The State of Africa. A History of the Continent Since Independence,* Simon & Schuster, London, New York, Sydney.
14. Meredith, M. (2014), *The Fortunes of Africa. A 5000 Year History of Wealth, Greed and Endeavour,* Simon & Schuster, London, New York, Sydney.
15. Montefiore, S. S. (2023), *La Grandeur: de Gaulle and Houphouët,* in : World. A Family History, Weidendfeld & Nicolson, London.
16. Radian, L. (1966), *Senegal,* Pe harta lumii, Edit. Ştiinţifică, Bucureşti.
17. Regan, G. (2001), *Operation Menace,* in: Naval Blunders, Guiness Publishing Ltd., London.
18. Senghor, L. S. (1986), *De la negritudine la civilizaţia universalului,* Edit. Univers, Bucureşti.
19. Singaravélou, P. (2013), *Les empires coloniaux (XIXe-XXe siècle),* Éd. Points, Paris.
20. Verschave, F.-X. (1998), *La Françafrique. Le plus long scandale de la République,* Éd. Stock, Paris.

STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 181-187)
(RECOMMENDED CITATION)

BOOK REVIEW

PE MARGINI DE CĂRȚI: VOLKER WOLLMANN, 2010-2021, *PATRIMONIUL PREINDUSTRIAL ŞI INDUSTRIAL ÎN ROMÂNIA*, VOL. I-IX, EDITURA HONTERUS, SIBIU

Pe parcursul perioadei 2010-2021, la Editura Honterus din Sibiu a văzut lumina tiparului în condiții tipografice de excepție, un veritabil monument de cultură: „*Patrimoniul preindustrial şi industrial în România*", lucrare monumentală în nouă volume, a cărui autor este neobositul şi pasionatul cercetător Volker Wollmann. Prin materializarea pasiunii sale într-o operă de o așa anvergură, cercetătorul se înscrie în galeria autorilor, rarissimi astăzi, cu adevărat dedicați cercetării, materializată între coperți de cărți, şi ale cărei roade sunt diseminate apoi publicului.

Rar mi-a fost dat să țin în mâini şi să parcurg o astfel de lucrare ... minunată pentru un spectru larg de cititori şi de specialişti, inclusiv geografi.

Seria volumelor I-IX „*Patrimoniul preindustrial şi industrial în România*", Editura Honterus, Sibiu, a cercetătorului Volker Wollmann.

Pentru aceştia din urmă, volumele se constituie într-un important instrument de lucru care devine indispensabil specialiştilor care au în vedere problematica Geografiei Umane la modul general, şi a memoriei locurilor cu ale sale identități teritoriale, ca abordări mai fine, punctuale, de nişe, ce se înscrie în tendința absolut modernă de reliefare a ceea ce latinii numeau *„genius loci"*, adică identitatea locurilor.

Din această perspectivă, România, mai corect spațiul geografic locuit de români, cuprins între Tisa – Carpații Păduroşi – Nistru – Marea Neagră – Dunăre şi chiar dincolo de aceste repere naturale, ne oferă o multitudine de dovezi materiale şi imateriale: de la limba română vorbită în tot acest spațiu, la obiceiurile locuitorilor; de la tipologia aşezărilor rurale româneşti, a raportului lor cu mediul înconjurător, la activitățile locuitorilor, inclusiv uneltele lor de lucru; de la manifestările culturale care s-au

transmis oral ori s-au materializat sub diverse forme. Exegeza cercetătorului Volker Wollmann se axează pe prezentarea patrimoniului preindustrial şi industrial din România, una din formele de manifestare a identităţii acestui întins spaţiu geografic unitar, dar atât de divers, cu un patrimoniu valoros, cristalizat şi dezvoltat ca urmare a convieţuirii plurietnice care l-a caracterizat.

Volumele I-VI au apărut în două ediţii, prima începând cu anul 2010, iar a doua cu anul 2017, apoi, din anul 2018, opera s-a întregit cu volumele VII-IX, atrăgând atenţia unor specialişti de prima mână, care au prefaţat volumele şi din opiniile cărora, eu am ales să prezint acest monument de cultură, care este *„Patrimoniul preindustrial şi industrial în România*".

Dr. Ronald Hochhauser subliniază că cercetătorul Volker Wollmann abordează *„o problematică incitantă"* a patrimoniului preindustrial şi industrial de pe teritoriul României din perspectivă locală, regională şi al întregului spaţiu geografic românesc. Primele două volume vizează realizările tehnice din industria extractivă, industria energiei electrice şi de gaze naturale, aprovizionarea cu apă, şi a industriei prelucrătoare, respectiv a materialelor de construcţii, textilă şi agro-alimentară. El remarcă *„bogatul material ilustrativ, planuri de arhivă, fotografii de epocă, dar şi fotografii contemporane"* care ilustrează volumul, precum şi *„izvoarele arhivistice inedite, colecţii particulare, mărturii orale"* pe care autorul le-a consultat pentru realizarea *„analizei originale în circumstanţa prezervării pentru posteritate a acestor valori"*, catalogând demersul său ca *„o contribuţie ştiinţifică valoroasă"* legată de reconstituirea parcursului progresului tehnic în acest spaţiu european, parte a revoluţiei industriale a umanităţii.

Pentru dr. med. Traian Popescu, Volker Wollmann este *„un pionier al arheologiei industriale din România"*, preocupat fiind *„de patrimoniul industrial din Transilvania şi Banat, încă din anii când această tematică era în faşă în ţara noastră"*. Lucrarea, *„ce pare că ar fi mai degrabă efortul unui colectiv interdisciplinar decât al unui singur autor"*, se conturează ca *„un manual standard de referinţă şi a unei enciclopedii monumentale a patrimoniului preindustrial şi industrial din România"*.

Recenzorul vol. II conchide: *„Prin atitudinea sa critică provocantă, documentaţia vastă şi complexă, drept remediu împotriva amneziei istoriei, autorul propagă necesitatea primordială de a recunoaşte, ocroti şi pune în valoare cultura industrială din România, ce are o profundă semnificaţie istorico-ştiinţifică, tehnologică, arhitecturală şi socială"*!

Această recenzie surprinde de o manieră reuşită evoluţia ciclică a economiei mondiale, cu reverberaţiile sale în spaţiul românesc, autorul ei afirmând: *„cu fiecare descoperire a unei noi surse de energie, se declanşează o nouă revoluţie industrială, care de fiecare dată a înlocuit tot mai mult forţa de muncă umană cu cea mecanică automatizată"*. În *„procesul selecţiei naturale din domeniul economic"*, formele învechite de producţie sunt înlocuite de noile tehnologii şi, astfel, *„vechiul patrimoniu tehnic* […] *este distrus şi dat uitării"*, fenomen care s-a repetat de-a lungul timpului, arată dr. Traian Popescu.

Acest proces ciclic cunoaşte noi valenţe, atât ca intensitate, cât şi ca răspândire spaţială în această perioadă a globalizării când, *„o parte a peisajului industrial dispare sau se transformă într-un cimitir industrial"*. În acest context contemporan de mare amploare, *„eruditul istoric Volker Wollmann face un vehement apel la conservarea, păstrarea şi punerea în valoare a moştenirii culturale industriale naţionale în România"*, încheie recenzia dr. Traian Popescu.

Recenzorul volumului III, dr. Ligia Fulga, subliniază faptul că *„cercetătorul Volker Wollmann continuă magistral demersul său solitar în universul patrimoniului preindustrial și industrial din România”*, demersul său impresionând prin *„munca de cercetare în teren, neobosită, utilizarea documentului de arhivă, a fotografiilor de epocă, originale, cărți poștale și reclame, multitudinea de surse și artefacte”* care probează fără echivoc *„apogeul dezvoltării preindustriale în România”* de la sfârșitul secolului al XIX-lea și începutul secolului XX.

Autoarea recenziei constată lipsa *„preocupării din partea societății românești de a păstra in situ aceste «documente» semnificative pentru istoria economică a acestei mari regiuni europene”* care a fost spațiul cultural românesc cuprins între Tisa – Nistru – Carpații Păduroși – Dunăre – Marea Neagră și chiar dincolo de aceste limite naturale, unde geniul creator al celor ce l-au locuit a trimis razele binefăcătoare ale progresului. Autoarea recenziei remarcă corelațiile pertinente care evidențiază evoluția tehnologică lentă a lumii rurale, cu precădere în capitolul dedicat morilor, arătând că Volker Wollmann, *„documentează cu acribie și rigoare documentară”* progresul tehnic, la care adaugă *„descrieri de arhitectură, dotările tehnologice, liniile de fabricație, capacitățile de producție”*, diferitele societăți comerciale din acest domeniu predilect al vieții economice românești, al industriei alimentare, domeniu în care exegetul realizează reușite *„mici monografii tematice”*, bogat ilustrate. Dr. Ligia Fulga conchide: *„cartea cercetătorului Volker Wollmann se poate numi un omagiu adus culturii industriale din România în faza ei de trecere de la preindustrie la o altă epocă de dezvoltare din perioada ante- și interbelică”*.

Referitor la mori, deopotrivă țărănești și industriale, excelent documentate și prezentate de autor, inclusiv sub aspect imagistic, prin fotografii, releveuri, schițe, planuri și hărți, cercetătorul ne introduce în această lume fascinantă, unde micile sale „monografii” sunt adevărate bijuterii. Într-una din ele – astfel am putut verifica soliditatea cercetărilor sale – descrie istoricul morii mecanice cu valțuri „Seewald” din Brașov (pp. 180-181), unde a lucrat bunica mea paternă Păcurar Rozalia (n. Pozna) în tinerețea ei. Moara, căreia patronii i-au adăugat ulterior o fabrică de macaroane, a funcționat în cartierul Blumăna, la poalele Dealului Morilor, unde, în copilăria mea și eu am apucat s-o văd, desigur naționalizată, inclusiv locuințele pentru lucrătorii ei, care au „supraviețuit” până la sfârșitul anilor ’70, pe care patronii le-au pus la dispoziția muncitorilor în anii 1920-1930. Trebuie spus că cea mai mare parte a familiei patronilor (tatăl, mama și doi sau trei fii), având origini evreiești, a fost exterminată în lagărele germane, doar un fiu a supraviețuit. Bunica îmi povestea că până la naționalizarea ei din 11 iunie 1948, după ocuparea țării noastre de către Armata Roșie (septembrie 1944), bunului mers al fabricii i s-au pus fel de fel de piedici de „binevoitorii” ocupanți sovietici și uneltele lor românești, inclusiv acuzația că ar “sabota” producția fiindcă, pentru răcirea unei componente metalice, se folosea apa ca agent de răcire și, chipurile, prin acest procedeu ar fi înșelat la cântar prin umidificarea produsului final... Astăzi, doar corpul central al vechii fabrici mai există la poalele dealului căruia noi, copii, îi spuneam „Dealul Țiganilor” – „Cigányok dombja”, care era locul nostru predilect iarna, pentru a ne da cu sania...

Inginerul Marcel Stancu din Sibiu, găsește că lucrarea, ajunsă la al IV-lea volum, *„a căpătat de acum dimensiuni monumentale”*, catalogând-o *„un monument dedicat vestigiilor arheologice industriale din România: într-atât copleșește prin bogăția informațiilor și prin multitudinea ilustrațiilor încât e uimitor faptul că este rodul eforturilor unui singur om și nu al unei întregi echipe de experți”*! Pentru inginerul recenzor, el însuși un pasionat cercetător și autor (vezi lucrarea *„Omnibuz, tramvai, troleibuz: transportul public electric în Sibiu și în România*”, 388 p., format A4, 2019, Editura Honterus, Sibiu), *„vastitatea investigațiilor de teren, amploarea cercetărilor în arhive și precizia informațiilor sunt, într-adevăr, demne de admirat”* la Volker Wollmann.

Referindu-se la subiectul volumului IV: transportul urban în comun, iluminatul public și construcțiile utilitare (băi comunale, remize de pompieri, cântare publice, poduri rutiere), Marcel Stancu apreciază că *„pe aripile cărții sale, domnul Volker Wollmann ne **transportă** în lumea industrială românească a secolelor XIX-XX, **iluminându-ne** cunoștințele, **purificându-ne** sufletele, **stingând** prejudecăți, **cântărind** fapte dar, mai presus de toate, construind **poduri** sufletești între români și popoarele trăitoare alături de aceștia”*!

Iată că *„alături”*, dar mai ales împreună, locuitorii spațiului geografic carpato-danubiano-pontic au realizări preindustriale și industriale de excepție!

Marcel Stancu oferă cititorilor și schița biografică a lui Volker Wollmann, istoric, arheolog și epigrafist. El se naște la Sibiu în 1942 și, după finalizarea studiilor, are o carieră frumoasă: *„director al Muzeului Raional din Reșița (1965), cercetător la Institutul de Istorie și Arheologie din Cluj (1967), corespondent al României pe lângă International Commitee for the Conservation of the Industrial Heritage (1980), distins de Academia Română cu premiul «Vasile Pârvan» (1984), membru de onoare al Institutului de Arheologie Industrială și Cultură Materială din Roma (1986), director al Muzeului Transilvănean din Gundelsheim (1989-2002), profesor asociat al Universității din Alba Iulia (2000-2006), consilier științific al Fundației Sașilor Transilvăneni din München (2004), cetățean de onoare al orașelor Sebeș și Brad (2011)”*. Pentru aportul său la cercetarea, cunoașterea și promovarea valorilor culturale preindustriale și industriale din spațiul European, a fost *„onorat cu Ordinul de Merit al Republicii Federale a Germaniei (2012)”*. Ca *„un împătimit de România”*, cercetătorul enciclopedist *„trage un semnal de alarmă, făcând apel la conservarea patrimoniului arheologic industrial românesc”*. Finalmente, Marcel Stancu concluzionează: *“cartea este o mărturie a premoniției călătorului german Rudolf Berger din Leipzig care, în 1884, spunea despre români că sunt «un popor de oameni înzestrați care poartă în el germenii unei mari dezvoltări industriale și spirituale»“*!

Profesorul dr. Ioan Opriș, numește pe Volker Wollmann *„cel mai avizat istoric din România în ceea ce privește patrimoniul industrial, componentele, dispunerea teritorială și starea de conservare și protecție a acestuia”* și astfel, în opinia sa, *„patrimoniul industrial are așadar, prin demersul civic și lucrările sale magistrale, pe cel mai competent cunoscător și fervent său susținător în țară și în afara ei”* în persoana exegetului care se dovedește a fi cercetătorul al cărui volum îl recenzează.

Istoricul cu preocupări pentru readucerea în conștiința publicului a unor personalități de excepție, precum Vasile Stoica și frații Lapedatu, arată: *„destinul profesional al lui Volker Wollmann a fost marcat definitiv de muzeografia tehnică încă din anii ’60 ai secolului trecut și a anunțat de atunci – în locul cel mai potrivit, la Reșița – un pionier la*

noi al arheologiei industriale", subliniind în continuare că *„cercetările şi studiile sale luminează o avuţie tehnică impresionantă, scot în evidenţă inventica, tradiţiile, abilităţile şi realizările prin mărturii preindustriale şi industriale, puţine muzeificate, multe in situ"*, pe care pasionatul cercetător, în opinia profesorului Opriş, *„le consideră fundament solid al dezvoltării societăţii moderne din România"*, apelând *„în sprijinul tezei sale"* la *"metodele arheologiei şi istoriei, studiind atent* [...] *instalaţiile, artefactele, scrutează documente istorice şi le evaluează, îşi asociază lecturi epigrafice, dar şi constatările etnografilor, geografilor, geologilor"* nefiind exclusivist în demersul său, caracteristică definitorie a omului de ştiinţă de mare anvergură. Mai mult decât un simplu inventar, chiar şi cronologic, Volker Wollmann *„a luminat cauzele şi factorii generatori ai diversităţii industriale, ca şi contextul favorizant al influenţelor benefice externe stimulatoare"*. El priveşte patrimoniul nostru, în opinia lui Ioan Opriş, *„ca parte a celui tehnic european, rezultat al inventicii native şi al unui consistent dialog"*!

Ce observaţie pertinentă!, care se poate exemplifica în sute şi mii de cazuri, însă noi ne rezumăm doar la "moara cu făcaie", cu ale sale palete cioplite asamblate pe un fus vertical, prototipul turbinei moderne de tip Pelton, creaţie a geniului ţărănesc de la noi, prezentă peste tot în cuprinsul ţării, cu deosebire în Muntenia, Oltenia subcarpatică şi Banat. Profesorul Opriş ţine să sublinieze la acest *„evaluator onest şi corect"* care este Volker Wollmann, recomandarea lui către *„cei care sunt responsabili de dezvoltarea României, că tezaurul tehnic rezultat în lungi acumulări, ca factor cultural şi economic ce aşteaptă să fie valorificat"*!

Profesorul dr. Rudolf Gräf remarcă că dr. Volker Wollmann *„reuşeşte, în mai puţin de şase ani, să publice cel de-al şaselea volum al unei serii care se dovedeşte a fi monumentală*: Patrimoniul preindustrial şi industrial în România, *o lucrare de proporţii nemaiîntâlnite în istoriografia românească, dar nici în lucrările de istoria tehnicii ori de muzeologie şi cu atât mai puţin în cele de arheologie industrială, domeniu în care autorul este pionier în România"*, considerând pe bună dreptate că *„este o lucrare care ar fi putut reprezenta rezultatul activităţii unei instituţii de cercetare"*. Astfel, Volker Wollmann *„reprezintă el însuşi o instituţie"*, afirmă recenzorul.

Istoricul Rudolf Gräf trece succint în revistă cariera autorului, *„desfăşurată în cea mai mare parte în România*: *profesor de istorie la Reşiţa, director al Muzeului din Reşiţa în anii '60 ai secolului trecut, cercetător ştiinţific la Institutul de Istorie şi Arheologie din Cluj-Napoca (1967-1988), continuată din 1988 în Germania"*, menţionând că *„a fost format sub îndrumarea unor mari personalităţi ale ştiinţei istorice româneşti"* şi, ulterior, *„a descifrat cu succes istoria epocii moderne şi în special istoria industriei"* pentru care s-a folosit *„de cunoştinţele şi metodele deprinse în studiul arheologiei clasice"*. El continuă astfel o tradiţie care începe cu Johann Michael Ackner, *„cunoaşte experienţa cultivată de «Verein für Siebenbürgische Landeskunde»"*, extinzându-şi – arată Rudolf Gräf – *„sfera interesului cercetării asupra întregii ţări, fiind conştient de importanţa unui patrimoniu"*, care este *„grav neglijată"* în prezent, care poate constitui *„profilul cultural al unei regiuni sau al unei ţări"*.

Punctând conţinutul volumului recenzat, volum conceput *„ca un «supliment» destinat să ofere completări istorice punctuale atât industriei «casnice», cât şi ramurilor industriale tratate în celelalte volume"*, Rudolf Gräf arată că autorul *„dă amploare unei*

opere care, la ora actuală, este singura lucrare complexă dedicată acestui important subiect", completând *„o imagine a unui domeniu de activitate extrem de energic şi de inventiv, care a dat industriei şi culturii din România personalităţi de anvergură, unele pe nedrept uitate astăzi"*.

Profesorul Gräf arată că lucrarea monumentală a lui Volker Wollmann, *„oferă o imagine foarte promiţătoare asupra industriei româneşti, punând în lumină o bogăţie de activităţi, de personalităţi şi de realizări astfel nebănuită, dovedind conectarea industriei transilvănene şi bănăţene, dar şi a celorlalte provincii ale României de astăzi, la marile tendinţe din economia europeană a secolelor XVIII – XIX"*. Preocupat de soarta acestor comori ale creaţiei geniului uman autohton, recenzorul încheie recenzia volumului VI cu întrebarea retorică: – *„Cine mai poartă grija celor făcute de cei de dinainte?"...*

Academicianul Dorel Banabic, preşedintele Secţiei de Ştiinţe Tehnice a Academiei Române, constată că *„istoria tehnicii româneşti este puţin tratată"* şi *„aproape numai de ingineri"* (sic!), iar dintre istorici menţionează pe Nicolae Iorga, Constantin C. Giurescu, Ştefan Pascu şi dr. Volker Wollmann. Academicianul arată că, *„cunoştinţele din domeniu, metodele şi mijloacele moderne de investigare pe care le stăpâneşte, precum şi pasiunea pentru subiectul abordat"* l-au ajutat pe Volker Wollmann să publice *„un tratat"* care abordează *„cvasitotalitatea domeniilor patrimoniului tehnic din România"*, fiind la începutul carierei sale *„unul din primii istorici care a făcut cercetări sistematice şi riguroase în arealul Banatului Montan pentru descoperirea, cercetarea şi recuperarea artefactelor legate de activitatea minieră şi metalurgică din această zonă, care reprezintă leagănul industrializării României"*.

Recenzorul remarcă *„munca de căutare în arhivele din România"*, cercetarea pe teren şi *„documentarea sistematică în bibliotecile din ţară şi din străinătate"*, dar mai ales, din arhive adăugăm noi! În „era internetului", acest mijloc minunat de difuzare a cunoştinţelor, se potenţează la maximum valoarea operei lui Volker Wollmann, mărindu-se posibilitatea diseminării nelimitate a rezultatelor cercetărilor sale asupra patrimoniului preindustrial şi industrial al României. Dorel Banabic încheie recenzia sa, astfel: *„Printr-un efort deosebit, atât intelectual, cât şi fizic şi financiar, depus pentru recuperarea acestui tezaur, dr. Wollmann a adus un extraordinar serviciu României, realizând de unul singur, printr-o muncă de o viaţă, ceea ce nu au realizat instituţii întregi"*!

Amară constatare privitoare la *„instituţii întregi"* care, cel puţin, s-ar fi cuvenit să prezerve în condiţii optime acest tezaur...

Academicianul Marius Porumb, făcând referire la *„monumentala lucrare* [...] *semnată de distinsul meu coleg şi prieten, dr. Volker Wollmann"*, respectiv la volumele I-VIII, scrie cu referire doar la volumul VIII, că *„reprezintă o excepţională cercetare privind clopotele turnate din evul mediu până în prezent în spaţiul carpato – danubian",* meditând asupra faptului că *„sunetul clopotelor a însemnat de-a lungul veacurilor comunicare, rugăciune, veste, bucurie, doliu, pace şi înviere"*, ele făcând parte *„din viaţa comunităţilor, a satelor, oraşelor şi a ţării"*, ca pretutindeni în ţările creştine.

Lărgind aria creaţiei artefactelor cu folosinţe religioase, academicianul scrie: *„subsolul Transilvaniei este bogat în acele metale preţioase, în special aurul şi argintul, care constituie materia primă pentru obiectele sacre ale bisericilor. Potire şi cădelniţe, ferecături de evanghelii şi de icoane, sfeşnice şi candele, vase liturgice şi cristelniţe,*

adevărate capodopere, au fost create de aurarii și argintarii transilvani, la cererea domnitorilor pentru a-și înzestra ctitoriile din Moldova sau Țara Românească, ori spre a le trimite ofrandă la Muntele Athos sau în alte părți ale creștinătății".

Astfel, *„clopotele făurite în atelierele transilvănene sunt lucrări de artă vestite pentru calitatea sonoră, le auzim de secole în clopotnițele bisericilor ardelene, moldovene, oltene sau muntene. O documentare asupra clopotelor din spațiul românesc, ne relevă o nuanțată relație în lumea artistică, dar și în cea religioasă, care apropie comunități și oameni dintr-o parte sau alta a Carpaților"*.

La finalul operei care se încheie cu volumul IX, Benjamin Józsa, editorul lucrării, consemnează următoarele: *„Editarea unei cărți este un drum, un drum cu suișuri și coborâșuri, ca viața însăși. Drumul seriei de cărți «Patrimoniu preindustrial și industrial din România» a început în anul 2009 când autorul Volker Wollmann a propus editurii un proiect, care din spusele dânsului, ar putea ajunge chiar la trei volume și ar putea include o serie de imagini ale unor vestigii industriale uitate sau chiar demolate în urma unei modernizări fals înțelese"*.

Astfel, reliefând în cuvinte simple, dar adânci, latura umană înnobilată de modestie a ilustrului exeget – autorul monumentului de cultură evocat aici, recenzorul își continuă mărturisirea: *„Încântat de această idee am spus «da», fără a sta prea mult pe gânduri, neștiind că acest drum o să continue mai mult de un deceniu și o să includă peste 3 000 pagini* (3 520, s.n.) *și peste 7 000 imagini tipărite"*.

Spre finele recenziei sale, editorul scrie: *„ca «prim cititor» îl răsfoiesc cu aceeași fascinație cu care am parcurs și pe celelalte opt volume anterioare. Bucuria editorului care ține în mână o carte interesantă se împletește cu tristețea cititorului care vede un imens patrimoniu industrial dispărut, salvat doar în paginile unei cărți"*!, concluzionând: *„recomand cartea cu multă căldură oricărui cititor interesat de patrimoniul preindustrial sau industrial și, în sens larg, de istoria acestui tărâm multietnic care este România"*!

Semnalarea apariției acestui veritabil monument de cultură se vrea un îndemn pentru parcurgerea și cunoașterea realizărilor preindustriale și industriale din spațiul cultural românesc, rod al conviețuirii plurietnice cu care Dumnezeu l-a binecuvântat. Prin informațiile prețioase asupra acestui tip de creație a geniului uman autohton, însoțite de numeroase și valoroase imagini, lucrarea este un ghid exhaustiv referitor la creația preindustrială și industrială, devenind prin calitățile ei intrinseci, un instrument de lucru indispensabil oricărui pasionat și cercetător din varii domenii, îndrăznesc să afirm, dar cu precădere geografi, istorici, personal tehnic ingineresc. Orice geograf ar trebui s-o cunoască și s-o aibă în bibliotecă, nemaivorbind de bibliotecile de specialitate.

Alexandru A. PĂCURAR
Departamentul de Geografie Umană și Turism
Universitatea Babeș-Bolyai, Cluj-Napoca