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PERFORMANCE OF AGRITOURISM AND ITS FUTURE DEVELOPMENT IN MARAMUREȘ COUNTY, ROMANIA - A SWOT-BASED ASSESSMENT OF INNOVATION POTENTIAL

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Abstract

The paper examines the potential for digital innovation within agritourism development in Maramureș County, Romania. Using tourism data from the National Institute of Statistics and a SWOT-based framework, the study analyses the region's readiness to adopt immersive technologies, with a particular focus on virtual reality. Between 2020 and 2024, agritourism guesthouses in Maramureș increased by 47.5%, from 185 in 2020 to 273 in 2024, while domestic overnight stays nearly tripled, from 54,487 in 2020 to 143,866 in 2024. Although foreign tourist numbers remain relatively low, their overnight stays increased more than tenfold during the same period, from 433 to 4,868, despite the lingering effects of the pandemic. Even if virtual reality is not currently implemented, the region shows structural and cultural features that could support future adoption. The SWOT analysis identifies both enabling factors and critical barriers, such as digital infrastructure deficits and institutional fragmentation. The article provides insights into the region's current position and the conditions needed to enable future digital engagement in rural tourism.

Key words: *agritourism, Maramureș country , innovation in rural tourism, SWOT analysis, virtual tourism*

INTRODUCTION

Tourism continues to be one of the most adaptive and economically impactful sectors worldwide, with major contributions to employment, GDP and regional development [20, 8]. Nevertheless, the industry has proven vulnerable to global crises, the most recent and disruptive being the COVID-19 pandemic, which led to border closures, flight cancellations and lockdowns, causing a drastic decline in both international and domestic travel [13]. The large-scale repatriation of hundreds of thousands of citizens required swift coordination between multiple stakeholders [13], thus exposing the fragility of the tourism system and sparking critical discussions on the need for more adaptive, sustainable and resilient models of tourism development.

In Romania, the most critical phase occurred between March and June 2020, followed by a partial recovery during the summer [30]. Despite this rebound, the sector incurred significant losses, with many businesses closing permanently. Domestic tourism became a crucial buffer, as Romanians turned to national destinations, especially countryside, coastal and mountain areas, in search of nature, cultural authenticity and slower-paced experiences [30].

Agritourism, a subcategory of rural tourism, offers visitors engagement with agricultural life and local heritage [5]. It is commonly practiced on working farms and agri-business properties, where guests participate in recreational and cultural activities such as food experiences, farm tours and artisanal crafts [27]. More than diversifying rural economies, agritourism contributes to mitigating rural depopulation and revitalizing abandoned land through sustainable, place-based experiences [1].

Europe currently dominates the global agritourism market, accounting for over 47% of the global share in 2019 [10]. The region's dense network of small family farms and strong hospitality traditions makes it a natural leader in agritourism. With the market expected to grow from USD 69.24 billion in

2019 to USD 197.37 billion by 2032, this sector is driven by growing interest in sustainable, nature-based travel and increasing public support. A key trend is agri-food tourism, which blends gastronomy, farming and heritage into unique experiences, offering local producers' new ways to promote their skills, products and identity to both national and international visitors [10].

In Romania, Maramureș is widely regarded as one of the most culturally intact and authentic rural regions, with strong potential for agritourism development. The area is known for its traditional wooden houses, family-run guesthouses and deep connection between people, land and heritage [6]. Its identity is shaped by elements such as carved wooden gates, festive rituals and wooden churches, some included on the UNESCO World Heritage list [33], which together reflect a living spirituality rooted in local tradition.

Covering 6,303 km² and home to approximately 512,588 people, Maramureș county includes 2 municipalities, 11 towns, 63 communes and over 200 villages [32]. In 2022, agritourist accommodations represented 34.1% of total lodging capacity, with 3,666 available beds. Efforts to promote the county as a rural and cultural destination have intensified in recent years under the "Visit Maramureș" identity that included participation in national tourism fairs and integration into thematic national routes such as the "Traditional Architecture Villages Route" and the "Romanian Traditional Gastronomy Trail" [32]. Visitors can enjoy a rich culinary heritage that includes dishes such as balmoș, sarmale, smoked sausages and homemade bread, all prepared with natural ingredients from household farms and often served with local preserves and țuică [7]. These attributes make Maramureș an ideal case for exploring agri-food tourism as a pillar of rural development. Yet challenges persist, including seasonality, limited digital visibility and low levels of innovation [23].

Meanwhile, digital technologies are reshaping tourist behaviour. Travelers are now highly connected to online spaces that allow them to explore destinations, plan journeys and share experiences in real time [29]. This possibility has increased demand for immersive and interactive formats that extend beyond conventional visual or textual content.

Within this evolving digital landscape, virtual reality (VR) is gaining recognition as a strategic tool for destination promotion, tourists' engagement and market expansion [4, 28], typically through the use of head-mounted displays [2]. It creates navigable 3D environments that simulate real-time sensory experiences [14].

This growth has enabled new narrative formats in tourism. Digital narrative-based formats have proven effective in capturing attention by drawing audiences into the emotional atmosphere of a destination [21]. Virtual previews of touristic locations delivered through immersive environments have been found to generate a strong sense of spatial presence and positively influence attitudes and visitation intent [39].

A recent report titled *Tourism in the Metaverse: Can Travel Go Virtual?* published by McKinsey & Company (2025) [24], outlines early hybrid applications, including travel inspiration, edutainment and virtual events. These touchpoints, while not replacing physical travel, offer profitable and low-risk avenues for integration. The report encourages tourism actors to begin developing metaverse strategies [24]. As Pestek & Sarvan (2021) [28] argue, a forward-looking approach is essential for technological adaptation in the tourism and hospitality sectors.

Given these developments, in rural areas such as Maramureș, VR could strategically complement traditional tourism, enhancing visibility to broader audiences and addressing seasonality.

Although emerging technologies have been increasingly examined in tourism literature [40, 22], the application of VR in agritourism development and branding lacks in-depth analysis [26, 11], particularly in Romania, despite its potential to support competitiveness in travel and hospitality sector.

To address this gap and examine the relevance of immersive technologies in agritourism development, this study combines recent tourism statistics from Maramureș with conceptual perspectives on virtual reality and

employs a SWOT framework to assess the feasibility and strategic implications of its local adoption.

As a strategic planning tool, S.W.O.T. helps highlight internal strengths and weaknesses alongside external opportunities and threats in order to generate coherent strategies and support decision-making processes [12].

The article is structured into three main sections: first section outlines the methodological approach of the study; the second one presents a contextual synthesis of recent research on VR in tourism, recent statistical data from Maramureș and a S.W.O.T. analysis and the last one presents the conclusions derived from the analysis.

MATERIALS AND METHODS

This study has an exploratory, mixed-method perspective to examine how Virtual Reality (VR) could be integrated into the agritourism sector of Maramureș, Romania. The approach is built around three elements: (1) review of recent academic work regarding the use of VR in rural, cultural and heritage tourism. The review focuses on how immersive technologies contribute to visibility, audience engagement and sustainability; (2) statistical analysis – empirical data on agritourism were sourced from the National Institute of Statistics, Romania (NIS Tempo Online), covering the period 2020–2024. The analysis includes both absolute indicators (number of beds, tourist arrivals, overnight stays) and relative measures (year-on-year change, operational capacity, regional share).

The objective is two-fold: to map the post-pandemic evolution of agritourism in the North-West region of Romania, with emphasis on Maramureș County and to assess the region's developmental trajectory and infer its strategic potential for innovation and internationalization in agritourism; (3) a S.W.O.T. analysis to examine the strategic feasibility of adopting VR in Maramureș agritourism.

RESULTS AND DISCUSSIONS

Virtual reality (VR) and tourism development: a context-based review

Virtual reality is increasingly recognized as a transformative tool in tourism, helping destinations and businesses to promote themselves, engage visitors and rethink the delivery of experiences [4]. For virtual reality to bring real value in tourism, particularly within rural or emerging destinations, its use cannot be detached from the visitors' willingness to interact with such tools. The degree to which potential users are ready to adopt immersive technologies determines how effective these applications can be. In this light, segmenting audiences according to their technological openness becomes essential when shaping agritourism strategies. Studies indicate that travelers who display higher levels of digital openness are more inclined to perceive VR encounters as immersive, authentic and engaging, which in turn positively strengthens their overall perception of the destination [35].

Virtual reality has the capacity to deepen the emotional bond that visitors develop with natural environments. This, in turn, can encourage more responsible behavior and directly support the goals of sustainable tourism [36]. In this perspective, agritourism, as a particular form of rural tourism, remains anchored in agriculture, local traditions and natural landscapes, elements that both characterize the identity of rural communities [31] and position agritourism as an integral part of sustainable tourism.

Education and experiential values are not the only advantages of using virtual reality; it also increases the possibility of tourists' desire to visit destinations in person after exploring them virtually [16]. In practice, this was shown in China, where VR systems tested in the villages of Dazhai, Xidi and Jingzhu led to a 10–15% increase in awareness and promotional effectiveness and the intention to visit increased from 8.16 to 98.57. In the same time, due to a more compelling content, the engagement duration and costs efficiency also brought improved results that ultimately led to higher booking conversion rates [15].

A similar effect was seen in an interactive VR project that presented the Cloisonné art

experience at the Beijing Enamel Factory [17]. Using 360° video tutorials, visitors were introduced to traditional metal inlay and painting methods, while interactive options such as changing camera angles or pausing the session made the learning process more engaging [17].

Another example comes from Heraklion, Greece, where a cultural VR tourism project incorporated gamification, 360° videos and virtual guides. Visitors followed a treasure-hunt narrative while interacting with historical content and receiving personalized storytelling from human-like avatars [19]. This improved cultural learning and emotional involvement while demonstrating that gamified VR formats can make underexposed heritage more attractive and educationally impactful [19].

In Bali, a study identified virtual reality marketing (VRM) as an emerging promotional practice used by businesses to target niche segments, such as returning tourists and mobility-constrained individuals. While not tested directly on users, the study revealed that VRM is perceived by stakeholders as a strategic response to pandemic disruptions, with potential benefits for sustainable tourism and economic revitalization at the local level [37].

In Romania, a VR-based web platform was created to offer virtual tours of wooden churches located in rural areas of Bihor County, with the goal of promoting sustainable tourism while safeguarding fragile cultural heritage. Through the use of photogrammetry and 360° imagery, the project enabled immersive and interactive access to remote ecclesiastical landmarks without exposing them to physical degradation. The initiative served not only to simulate authentic visitation experiences but also to build a digital bridge between the sites and potential visitors, encouraging active cultural learning and raising awareness among both the general public and local authorities about the churches' importance for tourism and the rural economy [3].

These cases present the possibilities that virtual reality offers to connect tourists from different parts of the world with destinations that are more difficult to reach, while at the same time creating a genuine motivation to visit them in real life. This is especially true for culturally distinctive regions such as Maramureș, where agritourism has continually expanded.

The dynamics of agritourism in the North-West of Romania, with Maramureș County as a focal point.

Although the pandemic formally ended in 2023 [34], its effects reshaped travel behaviours. Travelers increasingly avoided crowded urban areas, turning instead to rural regions that offered space, safety and personalized experiences [30].

In Maramureș, agritourism proved to be a resilient alternative [32] as the region has continued to attract visitors through its well-preserved rural lifestyle and distinctive culinary offer [38, 33].

The analysis below relies on data that is provided by the National Institute of Statistics (NIS) to outline the development of agritourism in Romania's North-West region, with particular attention to Maramureș County.

As presented in Table 1, agritourism guesthouses in Romania's North-West region increased from 616 in 2020 to 872 in 2024, totalling 256 new units, an overall growth of around 41.5%.

The highest annual rise was recorded in 2021, with 134 new guesthouses, an increase likely driven by growing interest in countryside escapes due to Covid-19 pandemic. The following years brought further additions: 56 units in 2022, 29 in 2023 and 37 in 2024.

In Maramureș county, the growth path was more uneven but followed a similar direction. In 2021, the number of guesthouses jumped from 185 to 264 (+79), responding to demand for rural, low-density travel options. A decrease in 2022 (down to 227) may reflect updated records or operational closures, followed by new increases in 2023 (+27) and 2024 (+19), reaching a total of 273 units in 2024.

Despite yearly variations, Maramureș consistently moved forward in expanding its agritourism accommodation offer, maintaining strong position in the regional tourism landscape.

Other counties also registered positive changes. Cluj started with 166 agritourism

guesthouses in 2020 and reached 228 by 2024. The growth was slow and incremental, with only a few new units added each year, 220 in 2022, 227 in 2023 and just one more in 2024. Bihor followed a steadier upward trend, culminating in its highest value in 2024. Interestingly, during the pandemic period, Bihor had already reached a peak of 195 guesthouses in 2023, likely reflecting the easing of restrictions and the formal end of the health crisis.

Bistrița-Năsăud showed more fluctuation, including a decline in 2023, but has managed to reach 110 agritourism guesthouses in 2024. Satu Mare, on the other hand, experienced a clear decline, with no change in 2021 and fewer guesthouses recorded in 2024 compared to 2020.

Table 1. Number and annual variation of agrotourism guesthouses in the North-West Region, 2020–2024

Type of Tourist Accommodation Structure	Development Region / County	2020	2021	Δ 2021–2020	2022	Δ 2022–2021	2023	Δ 2023–2022	2024	Δ 2024–2023
Agritourism Guesthouses	North-West Region Total	616	750	134	806	56	835	29	872	37
	Bihor	144	139	-5	190	51	195	5	206	11
	Bistrița-Năsăud	73	86	13	110	24	103	-7	110	7
	Cluj	166	203	37	220	17	227	7	228	1
	Maramureș	**185**	**264**	**79**	**227**	**-37**	**254**	**27**	**273**	**19**
	Satu Mare	18	18	0	16	-2	11	-5	9	-2
	Sălaj	30	40	10	43	3	45	2	46	1

Source: Calculation based on data from NIS Tempo Online, TUR101D [25] .

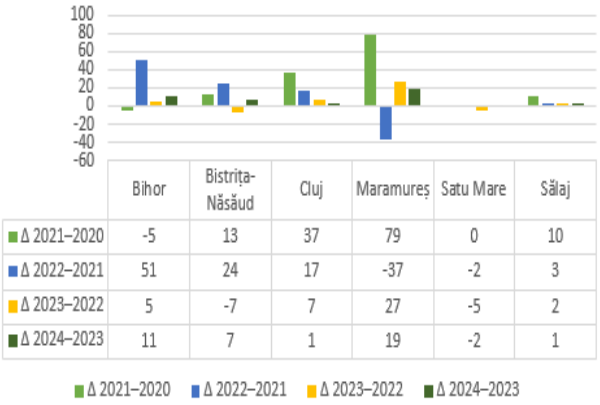

Fig.1. Yearly variation (Δ) in the number of agritourism guesthouses across counties in Romania's North-West region, 2020–2024.
Source: Author's calculation based on data from NIS Tempo Online, TUR101D,[25]

In Figure 1, the evolution of agritourism guesthouses is displayed through annual variations (Δ) across six counties in Romania's North-West region between 2020 and 2024, offering a clearer view of intra-regional dynamics.

Maramureș recorded the sharpest increase in 2021 (+79), followed by a drop in 2022 (−37), and a renewed rise in 2023 and 2024 (+27 and +19). Cluj, showed bigger growth in 2021 (+37) and in 2022 (+17), afterwards, the increase was not significant, respectively, 7 in 2023 and just 1 in 2024. Bihor had a drop in 2021 (−5), followed by recovery in 2022 and modest annual increases in 2023 and 2024. Bihor had a drop in 2021 (−5), followed by recovery and modest annual increases. Satu Mare showed a declining pattern overall, with stagnation in 2021, then gradual losses (−2 in 2022 and 2024) while Sălaj had minor variations, with small positive gains each year (Fig. 1).

Table 2 presents bed capacity compared to the number of agritourism guesthouses in the North-West region of the country.

According to National Institute of Statistics (NIS) methodology, bed capacity reflects the number of officially certified accommodation places, based on the most recent classification documents. Temporary beds are excluded, while complementary units (e.g., huts, campsites) are included under their primary structures. The data indicate growth across most counties. Maramureș leads in both guesthouse numbers (from 185 to 273) and bed capacity (from 3,218 to 4,371), pointing to sustained investment and high regional appeal.

Cluj and Bihor also recorded growth, each exceeding 3,500 beds by 2024.
In Bistrița-Năsăud, the number of guesthouses grew moderately, but bed capacity more than doubled (from 600 to 1,477), possibly due to reclassification or expansion of existing units. Satu Mare and Sălaj remained largely unchanged, each staying below 50 guesthouses and 650 beds, reflecting limited development or demand (Table 2).

Table 2. Agritourism and bed capacity in North-West Romania by county, 2020–2024

North-West Region - County	Agritourism Guesthouses 2020	Beds 2020	Agritourism Guesthouses 2021	Beds 2021	Agritourism Guesthouses 2022	Beds 2022	Agritourism Guesthouses 2023	Beds 2023	Agritourism Guesthouses 2024	Beds 2024
Bihor	144	3,103	139	3,014	190	3,565	195	3,723	206	3,819
Bistrița-Năsăud	73	600	86	703	110	868	103	846	110	1477
Cluj	166	2,862	203	3,323	220	3,477	227	3,571	228	3,546
Maramureș	185	3,218	264	3,961	227	3,666	254	4,078	273	4,371
Satu Mare	18	282	18	284	16	208	11	168	9	175
Sălaj	30	433	40	538	43	585	45	613	46	628

Source: NIS Tempo Online, TUR101D and 102D [25].

While the previous tables illustrated the structural growth of agritourism in the North-West region, Figures 2 and 3 provide a clearer view of how bed capacity evolved across space and time between 2020 and 2024.

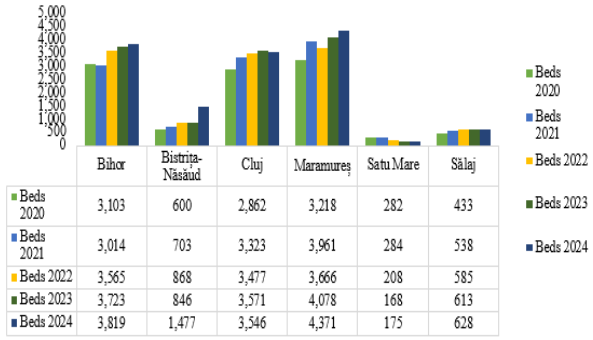

Fig. 2. Comparative evolution of bed capacity in agritourism guesthouses by county, 2020–2024
Source: NIS Tempo Online, 102D [25].

Although Maramureș and Cluj led in total bed capacity, reaching 4,371 and 3,546 beds respectively by 2024, the highest percentage increase was recorded in Bistrița-Năsăud, where bed numbers grew from 600 to 1,477, a growth of 146.2%. Sălaj also showed expansion (+47.3%), despite its smaller size. Maramureș grew by 35.8%, while Cluj and Bihor registered similar increases of 23.9% and 23.0%. By contrast, Satu Mare experienced a decline of 37.9%, remaining the only county with negative growth over the period.

Figure 3 focuses on Maramureș, where the number of bed capacities grew in 2021, only to drop again in 2022, most likely due to reclassification processes or temporary closures. Growth picked up once more in 2023 and continued into 2024, when the county reached 4,371 beds distributed across 273 agritourism guesthouses. This recovery points to the resilience and adaptability of the sector in the aftermath of the global health crisis.

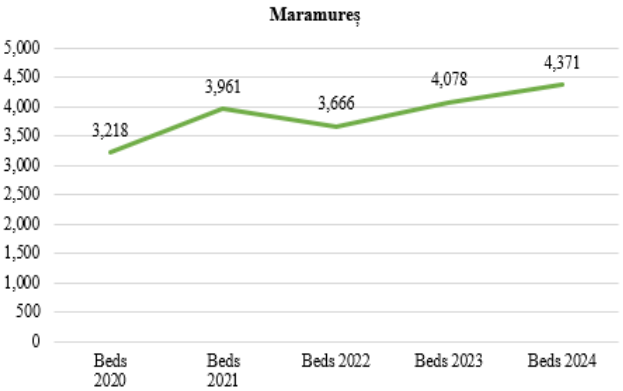

Fig. 3. Evolution of bed capacity in Maramureș agritourism,2020–2024
Source: NIS Tempo Online, TUR102D [25]

Table 3 outlines how agritourism infrastructure was actually used in the North-West region during 2020–2024, showing the gap between total capacity and the number of overnight stays. In Maramureș, bed capacity almost doubled, from 631,129 to 1,257,783 bed-days,

yet occupancy remained modest, fluctuating only between 8.7% and 11.8%. The numbers suggest that demand failed to keep pace with the rapid expansion of infrastructure.

Table 3. Operational rate (%) of agritourism beds in North-Western Romania, 2020–2024

Year	County	Available bed-days	Overnight stays (Romanian and Foreign)	Operational Rate (%)
2020	Bihor	440,097	104,420	23.7
2021		636,302	134,769	21.2
2022		808,252	173,854	21.5
2023		808,368	175,201	21.7
2024		921,390	165,747	18.0
2020	Bistrița-Năsăud	184,103	32,260	17.5
2021		251,558	30,234	12.0
2022		301,998	38,643	12.8
2023		395,098	50,780	12.9
2024		407,162	58,485	14.4
2020	Cluj	461,435	82,648	17.9
2021		789,010	130,619	16.6
2022		904,867	152,929	16.9
2023		909,349	157,965	17.4
2024		916,948	145,767	15.9
2020	Maramureș	631,129	54,920	8.7
2021		965,553	101,274	10.5
2022		1,095,827	116,973	10.7
2023		1,261,548	126,486	10.0
2024		1,257,783	148,734	11.8
2020	Satu Mare	44,727	10,509	23.5
2021		65,836	11,718	17.8
2022		64,123	14,697	22.9
2023		63,875	20,733	32.5
2024		64,050	23,093	36.1
2020	Sălaj	95,727	4,802	5.0
2021		139,119	11,219	8.1
2022		183,633	14,754	8.0
2023		195,047	15,233	7.8
2024		204,895	13,668	6.7

Source: Calculation based on data from NIS Tempo Online, TUR103B and 105D [25].

Cluj maintained a large capacity, but its operational rate hovered around 16–18%, showing persistent underuse. Bihor performed better, with consistent rates above 21%, indicating more efficient use of available beds. In Bistrița-Năsăud and Sălaj, rates stayed below 13%, with minimal yearly changes, pointing to slow recovery and limited tourist flows. Satu Mare saw a sharp rise in 2024, reaching 36.1%, the highest in the region, despite smaller infrastructure, possibly due to more stable local tourism.

Overall, the data confirm a mismatch between supply and demand in most counties, reinforcing the need for better planning, targeted promotion and tools to increase year-round occupancy.

Figure 4 illustrates the annual operational rate (%) of tourist accommodation beds in Maramureș county between 2020 and 2024.

Fig. 4. Annual operational rate (%) of tourist accommodation beds in Maramureș county, 2020–2024
Source: Calculation based on data from NIS Tempo Online, TUR103B and 105D [25].

Despite a visible positive trend, from 8.7% in 2020 to 11.8% in 2024, the whole level of utilization remains low. The most significant growth occurred between 2020 and 2021, followed by a slight plateau in 2022 and a minor decline in 2023. The increase in 2024 suggests modest improvement in demand or management efficiency, yet the figures confirm that a large share of available capacity remained underused throughout the period. These results prove persistent imbalance between infrastructure development and consistent tourist flows, confirming the need for diversification strategies and more effective year-round promotion (Fig. 4).

Table 4 presents a comparative view of tourist arrivals across different types of rural

accommodation in North-Western Romania between 2020 and 2024, distinguishing between Romanian and foreign visitors.

The data confirm that domestic tourists consistently preferred tourist and agritourism guesthouses, with agritourism experiencing the most visible growth.

Arrivals in agritourism guesthouses almost doubled over five years, from 142,582 in 2020 to 281,218 in 2024. Although foreign arrivals remained modest, they followed an increasing trend, from just 1,215 in 2020 to over 11,200 in 2024, suggesting that rural destinations were gradually gaining attention on the international market as well.

Looking at the wider trend, the pandemic seems to have strengthened the appeal of rural destinations, with every category of rural accommodation in the North-West region showing positive tourist numbers over the five-year period (Table 4).

Table 4. Distribution of domestic and foreign tourist arrivals by rural accommodation type in North-West Romania, 2020–2024

Types of Tourist Accommodation Facilities in North-Western Romania	Type of tourists	2020	2021	2022	2023	2024
		Number of people				
Inns	Romanian	:	:	:	:	244
	Foreign	:	:	:	:	25
Tourist villas	Romanian	23,463	38,940	52,127	56,040	55,213
	Foreign	954	2,759	7,180	5,699	5,753
Tourist cabins	Romanian	7,446	11,463	10,365	10,347	9,467
	Foreign	49	36	287	240	406
Bungalows	Romanian	554	906	1,644	2,910	2,544
	Foreign	:	8	20	:	16
Campgrounds	Romanian	1,388	1,035	1,263	2,795	1,697
	Foreign	40	410	235	454	270
Tourist cottages	Romanian	495	1,295	2,380	4,092	4,130
	Foreign	19	4	10	61	233
Tourist guesthouses	Romanian	84,588	105,882	121,901	123,640	127,317
	Foreign	2,779	4,560	6,924	8,616	8,892
Agritouriosm guesthouses	**Romanian**	**142,582**	**212,950**	**257,979**	**276,244**	**281,218**
	Foreign	**1,215**	**4,588**	**7,848**	**11,564**	**11,215**

Source: NIS Tempo Online, 104B [25]

Table 5 presents tourist arrivals in agritourism guesthouses across North-Western Romania, broken down by county and visitor origin.

Maramureș recorded 27,551 domestic tourist arrivals in 2020 and by 2024, surpassed Cluj with 74,835 arrivals, exceeding it by 1,739 visitors, despite starting from a much lower baseline. In contrast, Cluj maintained the lead in terms of foreign visitors, with 5,845 arrivals in 2024, while Maramureș reached only 2,667, approximately half.

In Bihor, domestic arrivals peaked in 2023 at 79,529, overpassing Cluj and Maramureș, while foreign arrivals also reached their highest point that year with 1,719 tourists.

Sălaj registered the lowest domestic arrival numbers across the region, starting at 2,543 in 2020, peaking at 8,141 in 2023 and slightly declining to 7,113 in 2024.

Satu Mare recorded the lowest foreign arrivals, with only 14 visitors in 2020, a short-lived increase to 140 in 2021 and zero reported arrivals in both 2023 and 2024, indicating either a sharp decline or missing data.

Table 5. Number of domestic and international tourists' arrivals in agritourism establishments by county in the North-West region, 2020-2024

Types of Tourist Accommodation Facility in North-Western Romania	Type of tourists	County	2020	2021	2022	2023	2024
			Number of people				
Agritourism guesthouses	Romanian	North-West region	142,582	212,950	257,979	276,244	281,218
		Bihor	46,901	59,571	77,499	79,529	76,224
		Bistrita-Nasaud	13,893	15,188	17,864	25,465	28,876
		Cluj	41,814	69,304	79,283	78,354	73,096
		Maramures	27,551	52,305	61,982	65,694	74,835
		Satu Mare	9,880	10,669	13,599	19,061	21,074
		Salaj	2,543	5,913	7,752	8,141	7,113
	Foreign	North-West region	1,215	4,588	7,848	11,564	11,215
		Bihor	191	499	1,218	1,719	1,518
		Bistrita-Nasaud	99	59	200	112	509
		Cluj	509	2,729	4,799	6,606	5,845
		Maramures	262	806	963	2,364	2,667
		Satu Mare	14	140	34	:	:
		Salaj	140	355	634	763	676

Source: NIS Tempo Online, 104B [25]

Table 6 provides an overview of overnight stays recorded in agritourism guesthouses, between 2020 and 2024, in both domestic and foreign visitors.

At regional level, the numbers of Romanian tourists grew from 287,384 in 2020 to 533,324 in 2024, showing that rural tourism remained attractive even in the challenging pandemic years.

Most overnight stays came from Romanian tourists and by 2024, Maramureș had taken the lead in this segment, reaching 143,866 stays, almost triple compared to 2020. In 2020, Cluj had been ahead, with over 81,800 stays, but by

2024, it reached 134,000, slightly behind Maramureș.

Table 6. Yearly overnight stays in agritourism guesthouses, broken down by county and by tourist origin, North-West region of Romania, 2020–2024

Types of tourist reception structures	Type of tourists	North-West region of Romania	2020	2021	2022	2023	2024
			Overnights stays - number				
Agritourism guesthouses	Romanian	North-West region of Romania	287,384	412,085	498,186	525,668	533,324
		Bihor	103,964	133,675	171,403	171,158	162,252
		Bistrita-Nasaud	32,053	30,160	38,323	50,535	57,209
		Cluj	81,830	126,453	144,856	147,101	134,533
		Maramures	54,487	99,684	115,309	122,506	143,866
		Satu Mare	10,495	11,578	14,657	20,733	23,093
		Salaj	4,555	10,535	13,638	13,635	12,371
	Foreign	North-West region of Romania	2,175	7,748	13,664	20,730	22,170
		Bihor	456	1,094	2,451	4,043	3,495
		Bistrita-Nasaud	207	74	320	245	1,276
		Cluj	818	4,166	8,073	10,864	11,234
		Maramures	433	1,590	1,664	3,980	4,868
		Satu Mare	14	140	40	:	:
		Salaj	247	684	1,116	1,598	1,297

Source: NIS Tempo Online, 105D [25].

For international visitors, Cluj remained in front, with more than 11,200 stays, while Maramureș followed with 4,868, up from just 433 in 2020.

Bihor showed strong numbers as well in domestic overnight stays, especially in 2022 when it reached its peak of 171,403 stays. Bistrița-Năsăud had slower, but steady growth, both in domestic and foreign stays. Meanwhile, Satu Mare and Sălaj remained well below regional levels, suggesting lower visibility or limited development in this tourism segment.

Foreign overnight stays across the region grew more than ten times over, from 2,175 in 2020 to 22,170 in 2024. While the increase is encouraging, the total remains small compared to domestic tourism. Still, it signals that rural areas in Maramureș and Cluj are starting to gain attention beyond Romania's borders and the interest seems to go beyond the short-term effects of the pandemic.

Table 7 reflects the growing prominence of Maramureș in the regional agritourism landscape.

For Romanian overnight stays, the county recorded a considerable rise, growing from 54,487 in 2020 to 143,866 in 2024. In term of regional share, this translated into an increase from 18.96% to nearly 27%, indicating that over one in four domestic overnight stays in the North-West took place in Maramureș by 2024. This might suggest a strengthened tourism infrastructure and sustained visitor interest in the area.

On the foreign tourism side, although the share remained relatively stable, oscillating around 20–22%, the absolute number of international overnight stays in Maramureș surged from just 433 in 2020 to 4,868 in 2024. This more than tenfold growth points to a significant improvement in international visibility, even if the regional share did not drastically change.

Maramureș increased its absolute performance and strengthened its regional leadership, particularly among domestic tourists, while making steady progress in attracting foreign visitors.

Table 7. Share of overnight stays in agritourism guesthouses: Maramureș vs. North-West region, 2020–2024

Year	Maramureș (Romanian) - overnights	NW Region (Romanian) - overnights	Share (%)	Maramureș (Foreign) - overnights	NW Region (Foreign) - overnights	Share (%)
2020	54,487	287,384	18.96%	433	2,175	19.89%
2021	99,684	412,085	24.19%	1,590	7,748	20.52%
2022	115,309	498,186	23.14%	1,664	13,664	12.18%
2023	122,506	525,668	23.30%	3,980	20,730	19.20%
2024	143,866	533,324	26.97%	4,868	22,170	21.96%

Source: Calculation based on data from NIS Tempo Online, 105D [25].

SWOT analysis: implementing virtual reality (VR) in agritourism development in Maramureș county

Given the structural growth of agritourism in

Maramureș and the rising interest in immersive technologies, a SWOT analysis was conducted to explore the region's strategic readiness for innovation.

Table 8. SWOT analysis – virtual reality (VR) in agritourism development (Maramureș)

STRENGTHS	WEAKNESSES
🔹 Strong cultural heritage and beautiful nature landscapes offer great support for immersive formats	🔻 Digital infrastructure and VR equipment are still limited
🔹 Local tourism is already align with global preferences for authentic, nature-based and sustainable experiences.	🔻 Rural operators lack the necessary skills or confidence to adopt new, emerging technologies
🔹 The diversity of crafts, gastronomy, architecture offers rich content for VR storytelling	🔻 Insufficient or weak links between local producers or agritourism operators and potential technology partners.
🔹 The increasing popularity of the region offers a good starting point for testing VR solutions and adjusting them to visitors' needs.	🔻 Public institutions often lack the necessary know-how to secure financing or attract investors for projects based on emerging technologies.
🔹 The presence of many small guesthouse owners and local producers forms a network that could support collaborative projects in rural and agri tourism.	🔻 The destination continues to rely on conventional forms of tourism promotion rather than digital or technological solutions.
	🔻 There is no clear institutional framework or shared local strategy to guide digital tourism development for the next 5-10 years in accordance with rapid technology developments, including artificial intelligence and metaverse.
	🔻 Many communities are still not fully aware of the benefits that immersive technologies could offer for safeguarding traditions and cultural heritage and this lack of trust often slows down their acceptance.
OPPORTUNITIES	**THREATS**
🌿 European programs provide consistent support for rural development and digital transformation, with funding opportunities available through the Common Agricultural Policy (CAP), the European Agricultural Fund for Rural Development (EAFRD) and the Digital Europe Programme.	⚠️ Traditional communities sometimes view new technologies with caution, fearing they may alter established ways of life.
🌿 The use of virtual reality technology (VR) provides opportunities to collect and analyze visitor data, which could help shape better tourism policies and destination management strategies.	⚠️ Risk of loss of authenticity through "virtual commercialization"
🌿 Younger generations, especially Gen Z and Millennials, are drawn to digital formats, interactive ways of exploring and immersive storytelling.	⚠️ Limited digital infrastructure in remote rural areas, reducing the feasibility of VR adoption
🌿 Virtual platforms can raise international visibility at the county level and showcase varied tourism opportunities.	⚠️ Accelerated digital innovation in other regions may outpace Maramureș, reducing its competitive positioning
🌿 Local producers and guesthouse owners can use VR to present their products and services, while also offering options for direct booking and online sales.	⚠️ Possible lack of continuity in funding or institutional support
🌿 Virtual reality can open up alternative sources of income for public authorities, such as: digital ticketing, licensing or data-based tourism planning.	⚠️Overreliance on external technologies and lack of local digital content providers
🌿 Technology pilot initiatives could benefit from transnational collaboration, linking Romania with broader European or global networks.	⚠️Immersive content that lacks local authenticity may fail to meet visitor expectations and damage destination credibility
🌿 The demand for personalized, emotion-driven tourism experiences connects closely with what VR, through its immersive nature, can provide.	
🌿 The expanding of digital tourism content is creating new business opportunities for entrepreneurs in rural areas.	

Source: Authors' own assessment.

Rather than assessing existing VR initiatives, which are currently absent, this section aims to identify the main enablers and constraints that could shape the adoption of virtual reality in agritourism.

The analysis takes into account internal aspects, including cultural authenticity, quality of infrastructure, as well as factors which are external, such as technological advances, policies and tourists' expectations.

Strengths

Maramureș has some specific features that could support a gradual transition towards integrating virtual reality into agritourism. We are not just talking about well-preserved cultural heritage or beautiful landscapes, although these contribute a lot to the region's visual identity and storytelling potential. What sets Maramureș apart is the richness of its everyday life: a diversity of living practices, from crafts and gastronomy to rural architecture, that offer authentic content, ready to be adapted into interactive digital experiences without losing their meaning. Maramureș is not held back by outdated digital systems, which opens the possibility to develop flexible and up-to-date solutions that match today's realities. But attention must be paid because this "blank page" can also become a vulnerability if it is not completed with local resources. If local resources, be they human, technical or institutional, do not appear, this land free from constraints can remain just an empty space, without the capacity to generate its own solutions. In other words, the lack of barriers can itself become a barrier, in the absence of strategic investment in what is to be built. One last but not least element worth noting is the presence of small-scale producers and guesthouse owners who are already active in the local tourism landscape. While they may not yet be formally connected, their experience and visibility within the community suggest they could support the digital development of rural tourism, as long as efforts are aligned with the local values and practices [5].

Weaknesses

Despite its rich cultural and natural assets, Maramureș faces several structural weaknesses that could delay or hinder the integration of virtual reality in agritourism. The most pressing issue is the absence of digital infrastructure and access to basic VR equipment, which makes it difficult to imagine immediate or scalable implementation. This minus is further compounded by limited digital competencies among rural tourism operators and agri-business owners, many of whom are unfamiliar with immersive technologies or digital promotion tools. There is currently no established connection between local producers, guesthouses and technology providers, a missing link that prevents coordinated development [23]. While starting from a clean digital slate may be seen as an opportunity, in practice, it requires significant capacity-building and institutional support to avoid fragmentation and wasted efforts. Without structured training, accessible public funding and partnerships with digital innovators, the potential of Maramureș risks remaining untapped, especially in a context where tourism innovation increasingly relies on technological integration.

Opportunities

Maramureș finds itself in a favourable policy and technological climate that could support the introduction of virtual reality in rural tourism. At the European level, there are many funding instruments, including Common Agricultural Policy (CAP), the European Agricultural Fund for Rural Development (EAFRD) [9] and the Digital Europe Programme that create frameworks for digital transformation in rural areas, including tourism. These programs are not only about infrastructure, they promote innovation, entrepreneurship and smarter destination management through tools like data collection and digital mapping.

Virtual reality also aligns well with the preferences of younger generations, particularly Gen Z and Millennials, who are more inclined toward interactive exploration and emotionally engaging formats [18].

These attributes open the door for new types of experiences that go beyond traditional tourism, allowing rural destinations like Maramureș to gain visibility on international platforms without relying exclusively on physical infrastructure.

Local producers and guesthouse owners can benefit directly from VR applications by showcasing their offerings in engaging digital environments to a multinational audience, enabling direct bookings, virtual tastings or storytelling-based product sales.

Public authorities may tap into alternative revenue streams through digital ticketing systems, licensing of digital experiences, even more effective planning based on user interaction data.

More than this, as digital tourism content becomes a growing niche, rural areas have a real chance to develop creative industries adapted to their context. Transnational pilot projects could offer both visibility and capacity-building, helping regions like Maramureș position themselves as testing grounds for smart rural tourism solutions.

Threats

Despite the opportunities offered by immersive technologies, several structural and cultural risks may hinder the adoption of virtual reality in Maramureș. First, a degree of cultural resistance or suspicion towards digital tools remains prevalent in more traditional communities, where innovation is sometimes perceived as incompatible with established rural lifestyles. This reluctance can delay adoption or undermine local engagement with new platforms.

In parallel, the risk of "virtual commercialization", where immersive content prioritizes spectacle over substance, may lead to a loss of perceived authenticity, one of the region's most valuable assets. If VR representations fail to reflect local voices and practices, they may weaken the credibility of Maramureș as a genuine rural destination.

Infrastructure deficiency remains another critical barrier. Limited internet connectivity and outdated equipment in remote areas, to a large extent, reduce the feasibility of implementing VR solutions at scale. Most probably, faster-paced innovation in other regions may widen the digital divide, causing Maramureș to fall behind in terms of competitiveness and visibility.

Discontinuity in funding, fragmented institutional support or overdependence on external technologies and service providers may also compromise long-term sustainability. Without locally rooted content creators and technical capacities, immersive experiences may fail to evolve in line with community needs. This can lead to VR content that lacks cultural depth, ultimately failing to meet visitor expectations or contribute positively to rural development.

CONCLUSIONS

This study examined the potential role of virtual reality (VR) in advancing agritourism in Maramureș, Romania, through a SWOT-based assessment. Although VR technologies are not yet implemented in the region, the findings suggest that Maramureș possesses several unique attributes, such as: cultural richness, a strong visual identity and diverse rural practices, that make it particularly well-suited for immersive content development.

The consistent growth in domestic arrivals and overnight stays underlines the county's increasing relevance as a tourism destination with expanding infrastructure and stable demand.

The integration of VR could play a dual role: first, by creating digital platforms through which guesthouse owners and small-scale agri-food producers can gain visibility, promote authentic rural experiences and generate supplementary income, whether through virtual farm tours, immersive tastings or storytelling-based product showcases; second, by strengthening the region's visibility on international markets.

At the same time, several structural and institutional weaknesses must be addressed before digital innovation can take root. These include the lack of digital infrastructure, limited technical skills and the absence of coordinated public strategies to integrate technology into rural tourism.

The SWOT analysis highlights both opportunities, such as: EU funding, emerging digital markets and younger generations' affinity for immersive media and threats, including cultural resistance, risk of de-authentication and overreliance on external providers.

This article is not offering one-size-fits-all model but an exploration of possible directions for VR implementation to support the sustainable development of agritourism in Maramureș, pathways that may also be transferable to other rural regions in Romania if adapted with sensitivity to local contexts.

Policymakers, local actors and rural entrepreneurs are encouraged to pursue pilot initiatives, capacity-building programs and creative partnerships aligned with the region's identity and values, turning virtual innovation into tangible benefits for agritourism stakeholders.

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