

## SEASONAL DYNAMICS AND TREND ANALYSIS OF AGRITOURISM AND MAINSTREAM TOURISM IN TRANSYLVANIA: A COMPARATIVE STUDY

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### RESEARCH ARTICLE

#### Abstract

*Through this study, we aim to explore the seasonal dynamics and trend patterns of agritourism and mainstream tourism across the region of Transylvania and some of its neighbours. By leveraging the Seasonal-Trend decomposition using LOESS (STL) method in R, we analyzed data sourced from the Romanian Institute of Statistics' TEMPO Online portal. Our findings reveal pronounced seasonality, with high fluctuations in tourist arrivals, notably in Alba and Caraș-Severin. Simultaneously, sustained growth is observed through the trend values, especially in Cluj, indicative of successful promotional strategies and infrastructural developments. When comparing seasonality and trend within accommodation types, intriguing patterns emerge, such as counties like Satu Mare and Hunedoara, displaying optimal growth with minimal seasonal fluctuations.*

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#### INTRODUCTION

One of the recurring themes in the tourism research literature is the impact of seasonal variations on the economic performance and sustainability of businesses within this sector. As such, from a tourism demand perspective, seasonality is defined as the recurrent variation in the distribution of touristic arrivals to accommodation units throughout the year. Those demand-side fluctuations lead to seasonal variations in the touristic offer (Alshuqaiqi and Omar 2019). Several economic challenges arise from this phenomenon, among the most important being disruptions to income flow for businesses in the hospitality industry (Alshuqaiqi and Omar 2019; Zvaigzne, Litavniece, and Dembovska 2022). Consequently, seasonality can lead to labor market fluctuations between peak season and trough season, as well as in the output of economic activities dependent on tourism, such as travel agencies, taxi services, retail shops, and catering and food service industry.

Generally, the seasonal patterns in tourism are predictable and are characterised by a single peak season, as follows: April marks the start of the peak season, with continuously increasing levels of arrivals until the summer months, followed by a marked decrease in the autumn and winter months, which exhibit the lowest levels of touristic arrivals. In the case of winter tourism destinations, the pattern is

reversed (Zvaigzne, Litavniece, and Dembovska 2022).

The mitigation of the influence of seasonal variations on the tourism industry is seen as one of the prerequisites, or at least as one of the desirable traits that foster sustainable tourism development, and can be achieved by price differentiation between the peak and trough seasons, as well as through the development of different types of tourism, attractions and events spread throughout the year and tax incentives (Martín Martín et al. 2020).

In the context of sustainable rural development, tourism has long been considered as one of the ways to achieve a more equitable distribution of income, mitigating economic disparities between rural and urban regions, and offering incentives for local communities to safeguard natural landscapes and traditions that can be strategically marketed in a touristic context. These practices emphasize minimizing the negative effects of tourism activities and supporting biodiversity. Considering this, sustainable tourism, rural tourism and agritourism are closely linked on a theoretical level because they aim to promote practices that benefit the environment, economy and society (Ciolac et al. 2022; Iancu et al. 2020).

From an economic perspective, rural tourism and agritourism play an important role in local development. By providing opportunities for farmers and local businesses to diversify their income sources, these forms of tourism

contribute to the robustness of economic activities in the rural areas. This diversification is important as it reduces dependence on specific industries and helps create a balanced distribution of income between rural and urban regions. Seasonality runs counter to those established goals of sustainable development (Iancu et al. 2020).

Social sustainability is also promoted through these forms of tourism by preserving cultures and traditions. They often showcase aspects of life which fosters a sense of pride and belonging within communities. Moreover sustainable practices in tourism encourage community involvement and inclusion in the decision making processes, ensuring that the benefits of tourism are shared among the stakeholders. From a social perspective, seasonality can place a strain on the social services (healthcare, public transport, order) provided in rural areas (Alshuqaiqi and Omar 2019).

Rural and agritourism also contribute to the environmental aspect of sustainability. Tourists engaged in those forms of tourism have the opportunity to learn about sustainable farming practices, biodiversity conservation, and the importance of preserving rural landscapes. Moreover, these forms of tourism promote responsible behavior among visitors, encouraging support for local businesses, respect for local customs, and a conscientious approach to minimizing environmental impact. As mentioned before, local communities are also encouraged to actively maintain the ecological balance of the areas in which they live. Seasonality can be actually desired from this perspective, allowing nature to regenerate or for restoration works to be undertaken in the offseason (Martín Martín et al. 2020).

The research literature shows that one of the most salient features differentiating sustainable and mass tourism is the minimization of the effect of seasonality, together with lower tourism flow volumes, emphasis on authenticity, orientation towards the needs of both tourists and locals, low density, linkages with local sectors, low leakages, high multiplier effect and an emphasis on the well-being of the local community (Weaver 2007). Those factors are useful in identifying the sustainable character of a touristic destination. As such, the main hypothesis in our study is the following: Boarding houses and agritourism boarding houses in rural destinations exhibit

lower seasonality than other types of accommodation units.

A divergent view shared by some researchers show that seasonality is actually one of the factors limiting sustainable development in rural areas. Some of the previous research shows that tourism seasonality exhibits spatial heterogeneity, emphasizing that rural and remote areas experience more pronounced and impactful seasonality compared to urban tourism. This seasonality is viewed as a vulnerability for rural households involved in tourism, posing a threat to their livelihoods and the security of villagers. Farmers participating in tourism operations, often small-scale and family-run, face low returns on investment and limited contributions to rural residents' income due to the highly seasonal nature of the market. During low tourism seasons, oversupply of rural lodges and agritainment resorts leads to an inefficient usage of assets and equipment, resulting in decreased returns for farmers. Employment for farmers in tourism is unstable, with the risk of layoffs during off-seasons, and many serve as temporary workers during peak seasons (Zhang et al. 2022).

The existing literature on the impact of seasonality on rural tourism presents a knowledge gap, particularly in the context of Romanian tourism and of agritourism in general. While some studies utilizing robust statistical or qualitative methodologies have explored seasonality in rural tourism in an international context, they have predominantly centered on regions such as China or Spain.

One previous work focused on the state of seasonality in Romanian agritourism by employing a comparison between the levels of between-months variations of touristic arrivals in Romanian agritourist lodgings, at a NUTS-2 (regional) level (Matei 2015). We seek to improve scholarly understanding of this subject by assessing seasonality at LAU-1 (counties) levels.

## MATERIAL AND METHOD

The study focused on analyzing the seasonal dynamics and trend patterns of agritourism and mainstream tourism in Transylvania. It is important to note that the geographical bounds of Transylvania are subject to interpretation and debate. In this study, a broader area encompassing regions that are considered by some sources to be adjacent to Transylvania was considered, acknowledging

the varying perspectives on its exact boundaries, as evidenced in figure 1.

Data for the analysis were sourced from the TEMPO Online portal, a comprehensive database maintained by the Romanian Institute of Statistics. This portal provides a wealth of information related to tourism, including data on total arrivals in accommodation units, with specific breakdowns for agritourism boarding houses, conventional boarding houses, and hotels.

The seasonal dynamics and trend analysis were conducted using the Seasonal and Trend decomposition using Loess (STL) method implemented in the R programming language, using the `feasts` and `stl` packages (Cleveland et al. 1990; Hyndman and Athanasopoulos 2018). The STL method is particularly suitable for time series data, enabling the separation of time series into components of seasonality, trend, and remainder. This approach is essential for understanding the underlying patterns and fluctuations in tourism data (Adil et al. 2021).

STL decomposition as a method applied to time series data can become as a powerful lens through which to discern the strength of seasonal and trend variations, as shown in previous works. Based on the results of the STL decomposition, an index of seasonality can be calculated, as follows:

$$F_s = \max\left(0, 1 - \frac{\text{Var}(R_t)}{\text{Var}(S_t + R_t)}\right)$$

where:  $F_s$  is the strength of seasonality,  $\text{Var}(R_t)$  is the variance of the remainder component,  $\text{Var}(S_t)$  is the variance of the seasonal component.  $F_s$  ranges from 0 to 1, 0 corresponding to series with no seasonality, while values closer to 1 correspond to time series with prominent seasonal components (Hyndman and Athanasopoulos 2018).

The same calculations can be done to assess the trend strength, by replacing the variance of the seasonal component with that of the trend component.

## RESULTS AND DISCUSSIONS

The table 1 presents the results of a seasonal dynamics and trend analysis for various counties in the specified region, focusing on agritourism, boarding houses, and hotels. The values represent the seasonality and trend components obtained through the Seasonal-Trend decomposition using LOESS (STL) method in R, using the `feasts` and `stl` package.

In terms of seasonality, the values range from 0.36 to 0.90 for agritourism, 0.26 to 0.92 for boarding houses, and 0.48 to 0.86 for hotels. Higher seasonality values indicate greater fluctuations in tourist arrivals throughout the year. Counties such as Alba and Caraş-Severin exhibit high seasonality across all three accommodation types, suggesting pronounced variations in tourist numbers during different seasons. As evidenced by the range of this indicator, both agritourism establishments and conventional guesthouses are able to sustain a type of tourism that is more attractive year-round. However, the median values of the seasonality indicators are similar: 0.71 for agritourism, 0.71 for boarding houses and 0.74 for hotels.

The trend components, ranging from 0.68 to 0.92 for agritourism, 0.53 to 0.92 for boarding houses, and 0.65 to 0.87 for hotels, indicate the long-term patterns or changes in tourist arrivals. Counties like Cluj stand out with consistently high trend values across all accommodation types, reflecting sustained growth in tourism over time, which may in turn be caused by sustained promotional efforts, infrastructure development, or other factors contributing to a steady increase in tourist arrivals over time. Median values for this indicator are 0.83 for agritourism, 0.81 for boarding houses and 0.82 for hotels.

Comparing seasonality and trend values within each accommodation type reveals interesting patterns. For example, in counties like Satu Mare and Hunedoara there is a notable discrepancy between the seasonality values for the three studied accommodation types and the trend values. This suggests that while these counties do not experience seasonal fluctuations, they do sustain optimal growth in the sector.

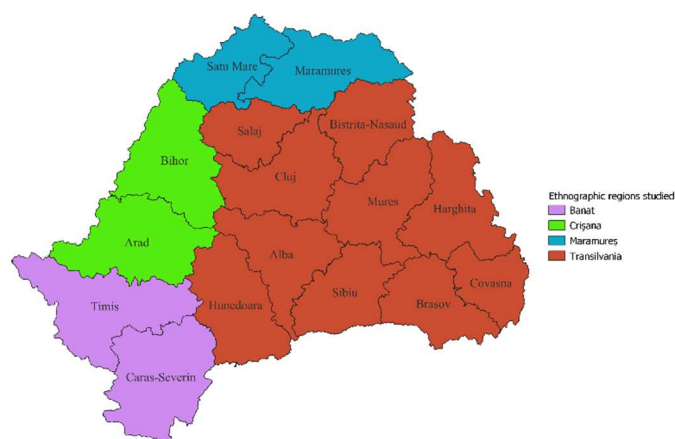


Figure 1 Studied counties and their corresponding ethnographic areas

Table 1

## Strength of seasonality

County	Seasonality index			Trend index		
	Agritourism	Boarding houses	Hotels	Agritourism	Boarding houses	Hotels
Alba	0.90	0.84	0.85	0.85	0.87	0.84
Arad	0.65	0.80	0.79	0.86	0.75	0.73
Bihor	0.89	0.61	0.86	0.87	0.85	0.86
Bistrița-Năsăud	0.63	0.53	0.84	0.82	0.76	0.67
Brașov	0.78	0.76	0.74	0.87	0.83	0.87
Caraș-Severin	0.90	0.92	0.83	0.77	0.74	0.83
Cluj	0.81	0.63	0.74	0.92	0.92	0.86
Covasna	0.72	0.68	0.69	0.88	0.58	0.65
Harghita	0.64	0.74	0.68	0.70	0.63	0.73
Hunedoara	0.42	0.26	0.74	0.87	0.82	0.69
Maramureș	0.77	0.76	0.81	0.85	0.81	0.86
Mureș	0.70	0.80	0.69	0.73	0.79	0.81
Sălaj	0.71	0.58	0.68	0.72	0.53	0.74
Satu Mare	0.36	0.55	0.48	0.80	0.83	0.83
Sibiu	0.76	0.75	0.79	0.79	0.86	0.71
Timiș	0.66	0.58	0.71	0.68	0.87	0.85

## CONCLUSIONS

In summary, our analysis of seasonal dynamics and trend patterns in tourism across various counties presents a nuanced picture of the challenges and opportunities in the specified region. High seasonality values in certain counties, notably Alba and Caraș-Severin, highlight the significant fluctuations in tourist arrivals throughout the year, posing economic challenges for businesses in the hospitality sector. Concurrently, the sustained growth reflected in trend values, particularly in counties like Cluj, suggests the success of strategic promotional efforts and infrastructural

developments in fostering long-term tourism growth.

When comparing seasonality and trend values within each accommodation type, distinct patterns emerge. Counties such as Satu Mare and Hunedoara exhibit notable discrepancies, indicating optimal growth despite minimal seasonal fluctuations. This underscores the need for tailored strategies to address both short-term variations and long-term trends across different regions. However, the study also highlights the persistent challenge of seasonality, particularly in rural areas, where the seasonal nature of tourism activities can lead to

inefficiencies, unstable employment, and decreased returns for local businesses.

The research contributes to the understanding of Romanian tourism and agritourism by offering a county-level analysis and leveraging the Seasonal-Trend decomposition using LOESS (STL) method. The findings provide valuable insights for policymakers, businesses, and stakeholders aiming to promote sustainable tourism development. Future research could delve deeper into the qualitative experiences of local communities and businesses to further elucidate the implications of seasonality on rural tourism. In essence, the study underscores the intricate interplay between seasonality, sustainable rural development, and the economic, social, and environmental dimensions of tourism in the specified region.

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