

## DEMOGRAPHIC FLOWS SPATIAL BEHAVIOUR IN TERRITORIAL MOUNTAIN SYSTEMS IN THE CONTEXT OF SARS-CoV-2 PANDEMIC

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### Abstract

*Unreservedly, the SARS-CoV-2 pandemic generates structural and functional mutations in the diffusion of spatial interaction flows, even in the case of mountains that are often considered adaptive and emerging territorial systems to crisis situations. This paper analyzes the spatial behaviour of demographic flows from two perspectives: of measures derived from the self-protection instinct of population and of restrictive circulation and social distancing measures adopted by the central authorities. The research methodology consisted in the analytical introspection of the Emergency Ordinances issued by the Romanian Government during 18.03.2020 - present, of the media information, respectively of the Risk Assessment Reports on SARS-CoV-2 contamination communicated by the National Institute for Public Health in Romania. The research results highlight the fact that the Carpathian Mountains have become areas of attractiveness for the population working in the tertiary sector of economic activities. Carrying out the activities on a teleworking basis was the triggering factor that led to the growing interest for purchasing/renting a secondary residence located in the mountain area. At the same time, the mountain quickly became a frequently chosen touristic destination, as an option to spend the annual leave/holidays detrimental to other touristic areas from the country or abroad. The conclusions of the study highlight the natural subsistence offer and the emerging regeneration capacity that the territorial mountain systems generally present. Furthermore, the study brings out the perception of the mountain as a safer place, capable to provide through its natural resources, a more sanitary environment than elsewhere.*

**Keywords:** pandemic, demographic flows, SARS-CoV-2, secondary residences, rural gentrification

### INTRODUCTION

Historical demography studies show the fact that humanity has often faced various crisis caused by epidemics/pandemics that have had more or less devastating consequences on the world's population (VOICU, 2020). Thus, only recurrent plague epidemics from the mid-fourteenth century to the nineteenth century (POOS, 1981), caused in Europe the decimation of a third of the continent's population (KARLSSON ET AL. 2014). Influenza virus was first reported in Europe and Japan in 1556, having a mortality rate of around 20% (DOBSON AND CARPER, 1996).

Spatial mobility and migratory flows have always played a major role in the spread of epidemics, the movements from one community to another favouring the transmission of contagious diseases beyond the boundaries of existing outbreaks (DOBSON AND CARPER, 1996).

In the contemporary era, alongside with the increase of territorial mobility, new epidemiological challenges have arisen, because the modern transport means allow long distance

travels in very short periods of time, which favours rapid transmission to different regions of the globe of infectious diseases that have an incubation period longer than the duration of the trip, so that the disease occurs after arrival at the destination (MACPHERSON AND GUSHLAK, 2001).

The aim and objectives of the research are substantiated on the analysis of the spatial behavior of demographic flows, both from the perspective of the impact measures derived from the self-protection instinct of the population and of restrictive circulation and social distancing measures adopted by the central authorities. At the same time, the preliminary approach of an extreme phenomenon, topical worldwide was pursued, contextualized in national and regional-mountain territorial profile. The analyzed content elements and the information synthesis allowed the initiation of an approach to shape a database regarding the impact of spatial interaction flows on the mountain area of Romania, as an effect of the pandemic caused by the new coronavirus.

The conducted research was based on a working hypotheses group regarding the mountain area development new paradigm, as an effect produced by the current pandemic on the reorientation of demographic flows to rural areas, in terms of socio-identity perception transformations (VÉLIZ TORRES, 2012) and the decrease of living environment attractiveness degree offered by the urbanized areas.

The present study tries to highlight the impact of the coronavirus pandemic (COVID-19) on the contemporary process dynamics of rural gentrification and the effect of structural and functional mutations on territorial-mountain systems from the perspective of a territorial planning alternative and local development. Taking into consideration that the geographic systems are complex and dynamic (MAC, 2008), the gentrification process analysis in rural space (VARTOLOMEI ET AL. 2009), must be followed in the light of local factors and of specific conditions that induce the increase of mountain area territorial attractiveness degree (the possibility of optimally carrying out remunerated activities in “home office” system, decent living conditions in harmony with nature, access to educational services and medical assistance, the diversity of territory landscape offer, the unpolluted environment, relaxed and extended space, the possibility of regional-identity potential capitalizing, the desire to make changes in socio-professional plan and of returning to nature, etc.)

Getting over through different evolutionary phases of territorial systems depends largely on the relationships between their components, the degree of complexity and forms of spatial organization, the structural capacity to take over dynamic flows and the adaptation/functional reorganization of systems, i.e. the level of resilience.

In this context, it is important to know how the demographic flows manifest in the context of the SARS-CoV-2 pandemic and the impact of spatial interaction forms on territorial-mountain systems, because currently, the Romanian mountain space is facing a series of anomic phenomena and exodynamic processes (depopulation, demographic aging, shortage of qualified personnel and other induced social risks) (BĂNICĂ and ISTRATE, 2018), doubled by numerous natural restrictions of geomorphological, climatic, pedological, hydric order, etc.

## **MATERIAL AND METHODS**

In terms of data and materials used, the paper is based on an comprehensive bibliographic documentation, some publications being consulted especially to deepen the concepts of territorial-mountain systems resilience analysis, vulnerability of geodemographic

structures and gentrification in rural areas (RADU, 2015; BAJURA AND TURETCHI, 2017) in this sense being compiled a derived database.

For the current approach it was also appealed to the information analysis presented by the most believable news sites, retaining a series of parameters and indicators necessary for both descriptive, exploratory and typological synthesis analysis.

In this respect were taken into consideration the information presented in the study carried out by *Reuters Institute Digital News Report (RIDNR)*, for 2020, that indicates the percentage of romanians that trust the press (38%), as well as the top of the most credible brands in local media (fig. 1), along with the sites with the largest audience (ProTV news, ziare.com, Digi24 online, stiripesurse and Yahoo news).

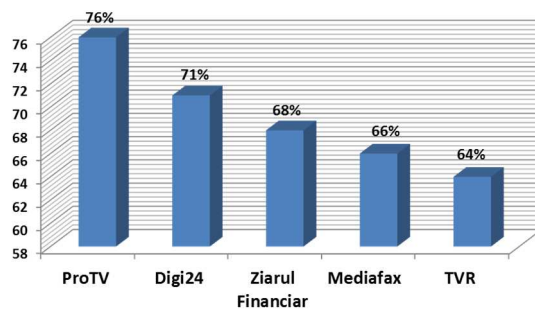


Fig. 1. Brands from the local media with the highest credibility (source: authors, with RIDNR data)

In addition to the published documents, the indicators were based mainly on the quantitative data drafted by experts from national/ international sources, the reports of the National Institute for Public Health from Romania (INSP), which contain data series using existing information at the base territorial level (LAU-2) and data recorded in geographic information systems (GIS).

For the processing of raw information, the methodology used in this paper targeted three distinct levels of analysis. The first, followed a primary, descriptive information analysis, that allowed the deciphering of spatial distributions that reflect the ability of mountain communities to adapt to general trends of socio-economic evolution.

The second level allowed the comparative and typological analysis of the derived indicators that take into account several parameters (territory accessibility, connectivity, natural potential, polarization capacity, spatial diffusion of some tendencies) and the resilience of some structures anchored in traditional models of mountain space capitalization.

The last methodological level focused on analyzing the similarity of evolutionary trends or the correlation of evolution-specific indicators that converge towards illustrating the spatial behavior of demographic flows in territorial-mountain systems in the context of the current pandemic caused by SARS-CoV-2 virus.

## RESULTS AND DISCUSSIONS

The issue of rural space returns in the spotlight of many specialists from various research fields (geography, economy, sociology, etc.) nowadays being present many preoccupations that are focused on the rural-urban relations analysis, because today's rural is very different compared to the one from decades ago, both in terms of spatial configuration and as an economic and cultural manifestation, both as infrastructure and as a superstructure (VARTOLOMEI ET AL. 2009).

Much of the studies is focused on recent evolutions recorded by rural settlements, the modernisation and rural development need, as well as on the identification of areas with potentialities or restrictions of occupational multiplication (VARTOLOMEI ET AL. 2009).

Given the fact that in mountain rural areas the territorial structures dynamics occurs in different conditions compared to other morphological units (hill, plateau, plain) it requires a more careful research of demographic flows in relation to territorial mobility processes, based on correlative geographical analysis that will allow exploring the impact at the most appropriate scales of investigation, in accordance with the level of complexity of the induced transformations.

According to the opinions expressed by several researchers (PAQUETTE AND DOMON, 2003; MITCHELL ET AL. 2004) man tends to locate himself in spaces where the sum of perceived benefits is higher than in other areas, this summing up both the tangible ones (attractive landscape ) as well as the intangible ones (safe and friendly spaces).

Along with the the current pandemic expansion, lifestyle and quality of life (ZAMFIR AND ZAMFIR, 2020) have been affected by forecasted imbalances that affect both the structure and functionality of territorial systems. On this new background, dominated by uncertainty and vulnerability, the declining attractiveness of many cities for housing, work, tourism and investment, the restriction of economic activities and the amplification of social problems create increasingly positive prerequisites for revitalizing rural communities, located both in the proximity of urban centers and at greater distances (fig. 2).

In Romania, the exponential increase in the number of people infected with the SARS-CoV-2 virus (fig. 3), of incidence rate and prevalence of infection cases has now led to almost 5,000 new cases / day (Ministry of Health, 2020).

The crisis situation extension, started on 18.03.2020 (according to the Emergency Ordinances issued by the Romanian Government), determined a higher increase of the pressure felt in most sectors of activity, with negative effects on the entire socio-demographic system.



Fig. 2. Rural regeneration. New constructions recent inserted through traditional houses and households Mărișel village, Gilău Mountains (Image source: Gligor, 2020).

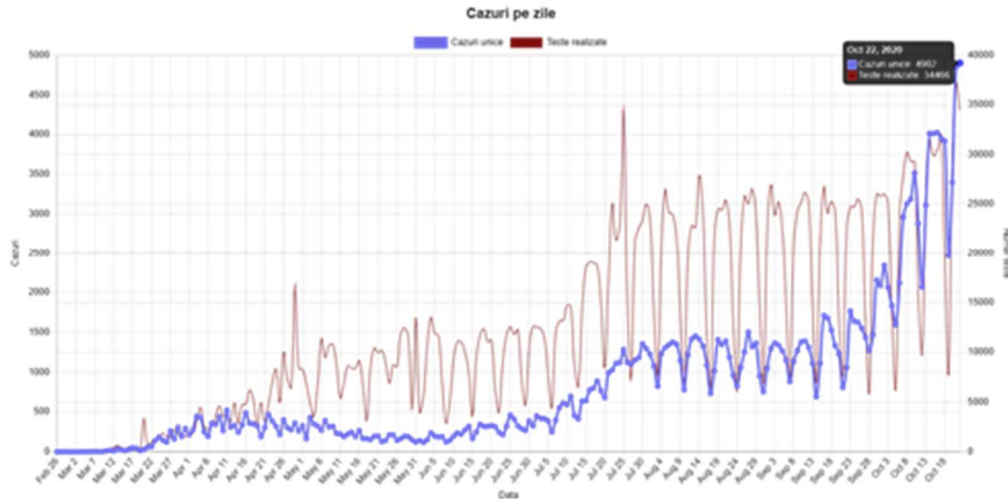


Fig. 3 SARS-CoV-2 virus infections evolution number at national level (March-October 2020).  
 Source: <https://covid19.geo-spatial.org/statistici/statistici-generale?chart=cazuri-pe-zile>.

At national level, the demographic flows diffusion process to areas of attractiveness belonging to rural spaces began several years ago, but their intensity did not register significant values, capable to outline patterns with major regional impact, until the epidemiological crisis outburst.

The current pandemic is responsible for the return phenomenon of romanians gone to work in different European Union states, so that a large number of migrants being under the impact of the socio-economic crisis, had to enter the counterflow of remigration, whose effect was also felt at rural localities level. The situation generated by the current pandemic highlighted the significant importance of mountain area (REY ET AL. 2020), and on this manifestation background there have been various structural and functional mutations in the distribution of spatial interaction flows, with an impact on revalorizing the territorial-mountain systems potential. At the level of administrative-territorial units that are comprised in the mountain area (Joint Order no. 97/1332/2019), according to the data published by the National Institute of Public Health, regarding the incidence rate of SARS-CoV-2 virus infections (Fig. 4) is standing out a predominance of localities (85.55%) with the lowest number of cases (0-1 ‰), and 12.45% have an incidence rate of 1-3 ‰. Although there are also more affected localities, between 3-50 ‰ (Moneasa, Aghireșu, Bulz, Tăuț, Vălișoara, Poiana Teiului, Coroieni, Pleșcuța, Dezna, Conop, Buteni, etc.), they own only 2.0% of the mountain space.

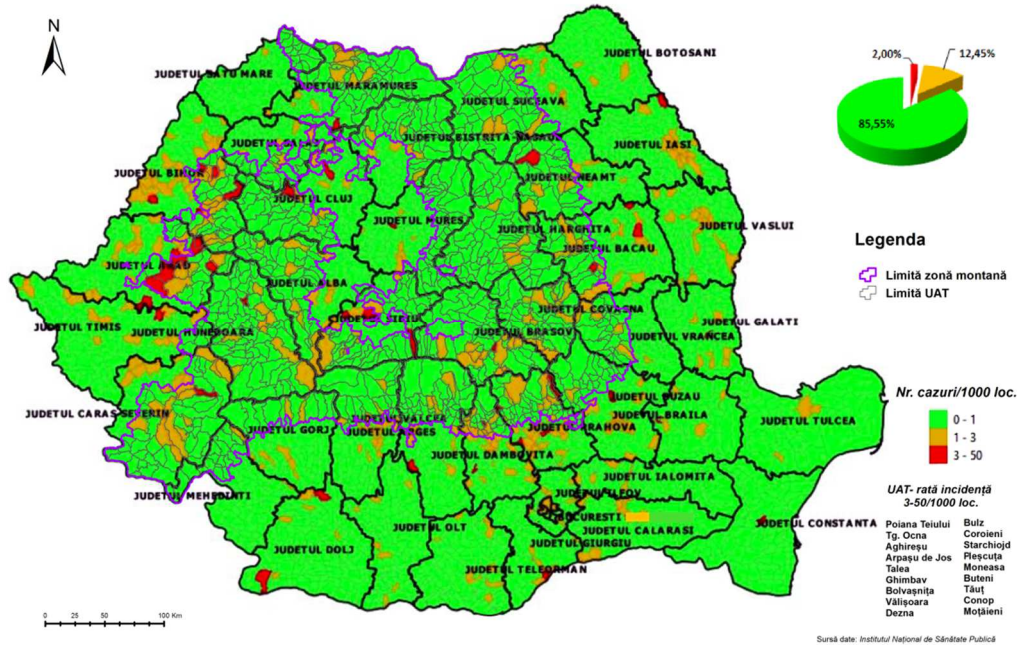


Fig. 4. Incidence rate of SARS-CoV-2 virus infections in Romania (7th September 2020). Source: INSP, with addendums.



Fig. 5. Mountain touristic agglomeration, Moldoveanu Peak - 22 August 2020. Source: <https://www.mediafax.ro/life-inedit/sute-de-iubitori-ai-muntelui-s-au-inghesuit-sa-urce-pe-varful-moldoveanu-19517545/galerie?foto=1> (Image source: Izvoreanu, D.)

With the outbreak of COVID-19 an increased interest in the purchase / rental of second homes in the mountains was observed, which provides both the necessary security offered by the relative isolation from populated centers and the possibility to continue telework activities. Thus, recently, the local media presented a series of information regarding the size and shape of the impact produced in relation with the discovery of alternatives offered by rural mountain areas to go through the current pandemic.

Various news sites (știrileProTV.ro, Digi24.ro, Agerpres, stiripesurse.ro, ziare.com, G4Media.ro, Mediafax.ro, Adevărul.ro, Libertatea.ro, RomaniaTV.net, etc.), through specific media means of information (press, radio, television, internet) referred to the growing attractiveness of the rural lifestyle by

rediscovering the functional values of the mountain space. Among the most relevant headlines presented in the national and international news are the following: "Corporates from Cluj start buying homes in the Apuseni Mountains" (source: Cluju.ro, Cluj Day, July 27, 2020), "The rich of the world can use and the Alps as vaults" (Agerpres, July 10, 2020), "The "Moved to the countryside" phenomenon group gathered 100,000 members and started the "We want internet at the countryside" initiative (G4Media.ro, July 5, 2020), "There were over 30.000 tourists in the Prahova Valley" (observatornews.ro, July 12, 2020), "Exodus from London to suburbs and rural areas" (știrileProTV.ro, August 4, 2020), "The pandemic makes people choose more isolated places to spend their holidays" (observatornews.ro, July 21, 2020), "Almost 1.000 people made the route to Moldoveanu" (Mediafax.ro, August 24, 2020) - fig. 5, "Neoruralism in Romania - the village parallel to the state" (Dilema Veche, September 10-16, 2020), "Work from home shows us how cities could change, and the village could become a new space of opportunities" (Libertatea.ro, July 31, 2020).

The content of the above mentioned materials, through the data and information transmitted, highlights quite expressively the demographic flows spatial manifestation forms, activities and mountain areas that present a specific attractiveness, along with the perception of mountain as a safe place, which through its available resources can to provide a fairly attractive environment and an optimal alternative to the busy life of cities. In this context and considering the fact that the territorial-mountain systems are comprised of complex structures, capable of absorbing large energy-material and demographic flows, it is mandatory to continue this analysis in order to highlight the correlation between the housing potential of mountain area, the territory suitability degree and the forms of best capitalization by extending the functional space.

## CONCLUSIONS

The current pandemic, through the induced socio-economic crisis, has brought to light numerous vulnerabilities, critical conditions and dysfunctions of the territorial systems, with direct and indirect impact on the mountain area. This study opens a new direction for interdisciplinary research, managing, through a specific methodology analysis, to highlight the structural and functional mutations in the spatial interaction flows diffusion as an effect of the crisis caused by the new coronavirus (SARS-CoV-2).

Territorial-mountain systems are composed of physical-geographical and anthropic structures with high resilience to the processes and phenomena generated by the dynamics of spatial interaction flows. For rural mountain communities, the pandemic situation caused by COVID-19 represents a reconnecting opportunity of natural and social systems at different scales, to find appropriate solutions for optimal management of the mountain environment and to develop new sustainable economic activities, based on both traditional practical experiences, as well as on the implementation of certain innovative solutions.

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