PUBLIC TRANSPORT - ANALYSIS OF NATURAL AND SOCIO-POLITICAL FACTORS IN THE PETROŞANI BASIN

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Abstract: Currently, public transport has become an indispensable element of life, as it offers members of society opportunities to travel, communicate, perceive and assimilate as much as possible of what civilization offers. Public passenger transport is one of the most important functions of a city (geographic areas), because it ensures the unity and coherence of all its activities. Public passenger transport is characterized by: the large number of transported passengers; vehicle changes; short distances; good accessibility; high availability. In this context, the analysis of the natural and socio-political factors in the Petroşani Basin helps to understand the current situation of the public transport system and the relationships between it and social activities.

Keywords: public transport, sustainable mobility, population

1. INTRODUCTION

The Petroşani Basin has a high degree of urbanization and includes the municipalities of Petroşani, Vulcan, Lupeni and the towns of Petrila, Aninoasa and Uricani. The public transport of people must be seen in the context of the general development of the city (geographical area), of its political and socio-cultural importance, the extent of the territory served, the number of inhabitants, the volume of transport demand and the specifics of the activity being decisive [1]. The organization of the operation of the general public transport system in a city or in an area starts from the need to ensure its unitary character and from the subordination of different modes of transport to the general interest of the community in accordance with the limits and possibilities that each one offers in taking over travelers and the use of the street network or specific facilities [2], [3], [4]. For a good knowledge of traffic phenomena in order to optimize the deployment of public transport of people in urban areas, the analysis of natural and socio-political factors and their interdependence is of particular importance [5].

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2. NATURAL FACTORS

The geographical position of the area, the situation of the natural environment, natural wealth, demographic factors, etc., represent the natural factors that influence public passenger transport systems. The Petroșani Basin (Fig. 1) is located in the southwest of Romania, in the Southern Carpathians, between the coordinates 45°17' - 45°22' north latitude and 20°-13' and 20°33' east longitude [12]. Access to the Basin is from the south through the Jiu Gorge from Târgu Jiu or from the north on the national road DN66 from Simeria and in perspective from the west through the Cheile Buții from Herculane. The Petroșani Basin is approximately 60 km long, between the towns of Răscoala to the east and Câmpu lui Neag to the west, and has a triangular shape, oriented W-S-W - E-N-E. The width decreases to 9 km, near the towns of Petrila and Livezeni, to 1.5 km at Câmpul lui Neag. The municipality of Petroșani is located on two important roads: DN 66, Târgu Jiu – Simeria, at the intersection with DN 66A Petroșani - Uricani - Câmpu lui Neag, with an extension to Herculane and DN 7A, which connects the municipality with Olt Valley (Petroșani - Voineasa - Brezoi). Petroșani is located on the north-south railway axis, which connects Transylvania with Oltenia, through the Jiu Valley (Simeria - Petroșani - Târgu-Jiu - Filiași). The Petroșani Basin has a tectonic origin and is located in the western part of the Southern Carpathians, between the slopes of the Retezat (W-NW), Șureanu (N-NE), Parâng (E-SE) and Vâlcan (S-SW) mountains. The average altitude of the basin is about 620 m. In the immediate vicinity of the basin, the contact with the mountain is given by high hills and mountains with altitudes of 1300-1500 m to the north, respectively of 1000-1600 m to the south, the contact being marked by steeps with altitude differences of 800-1000 m. At the contact between the piedmont areas with the terraces and meadows of the valleys are located the most numerous and extensive hearths of the localities (Petroșani, Lupeni, Vulcan, Petrila, etc.) [6].

The climate of the Petroșani Basin is submontane, cool (average annual temperature: 6°C), with abundant precipitation (1000-2000 mm annually), with a number of 45 days/year in the form of snow and frequent temperature inversions. The tributary rivers of the West Jiu and the East Jiu have their sources in the surrounding mountains, have short and rapid courses, respectively narrow valleys with steep slopes (15-20%). On one of the right tributaries of the West Jiu is the Valea de Pești Dam, which supplies water to most of the towns in the area. Deciduous and resinous forests are the elements of the dominant vegetation, extended over very large areas within the basin: 58 thousand ha (47.7% of its surface), of which 8.3 thousand ha are natural protected areas (13.6% of the total area of the basin), and 9.2 thousand ha are Natura 2000 sites (14.3%). The use of land in the entire Petroșani Basin highlights the dominance of forest areas (over 60%) and agricultural areas (32.06% - of which the majority are pastures and hayfields). The area of forests is significant in Uricani (69.37%) and Petrila (66.5%), the least in Vulcan (43.4%), those occupied by constructions is greater in Lupeni (5.08%) and Aninoasa (4.08%), and unproductive land occupies important shares in Aninoasa (6.19%) and Petrila (5.66%).
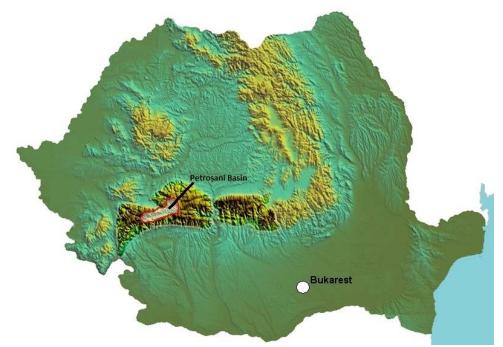
Fig. 1. Petroșani Basin

In addition to the natural riches represented by forests, pastures and hayfields, another major natural wealth in the Petroșani Basin is high-quality coal. The known coal resources in Romania are 232 million tons [85 million toe] of which 83 million tons [30 million toe] can be exploited in concession areas. At an average consumption of reserves of 0.3 million tp/year, the degree of insurance with coal resources is 104 years, but the exploitation of this primary energy resource is conditioned by the economic feasibility of exploitation. The average calorific value of coal exploited in Petroșani Basin is 3,650 kcal/kg [7].

Tourism represents an area with growth potential that the Petroșani Basin (Fig. 2) can rely on to ensure a fair transition towards a diversified economy, especially due to the potential of the natural environment and cultural heritage. The diversity of these factors favors increasing the importance of tourism in economic activity, through initiatives both at the individual, entrepreneurial level and at the level of the entire area, through close collaboration between local actors. Consolidation of tourist activity can be achieved based on the concept of sustainable tourism, which is differentiated by quality, accessibility for tourists and in harmony with the natural environment. Tourism can develop satisfactorily only on the assumption that there are sufficient possibilities for accommodation, food, recreation and transportation of visitors. That is why the accommodation capacities condition, perhaps to the greatest extent, the volume of tourist activity. From Figure 3 it can be seen that, in total, the number of accommodation units increased, with tourist cabins predominating [10].
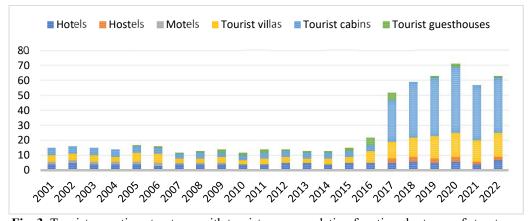
Fig. 2. Tourist map of the Petroșani Basin [8]

Fig. 3. Tourist reception structures with tourist accommodation functions by types of structures in the Petroșani Basin

From the analysis of the number of tourists arriving and staying in tourist accommodation units in the area (Fig. 4), it can be seen that it increased from 2016 to 2019, followed by a steep decrease in 2020 (pandemic year). In 2021 there is a revival even if it is still a pandemic year. It can be seen that among the 6 localities that make up the Petroșani Basin, Petroșani and Lupeni are the most requested, thanks to the Parâng and Straja ski areas.
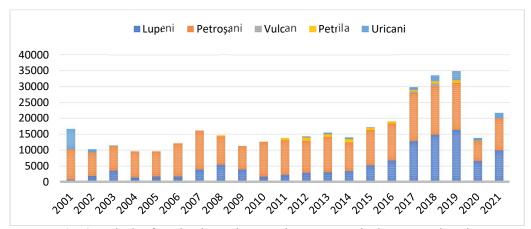
Fig. 4. Arrivals of tourists in tourist reception structures in the Petroșani Basin

It can be seen from figure 5 that the number of overnight stays in the area varies a lot during the year, during the winter period it increases visibly due to the fact that winter sports can be practiced in the area in very good conditions.
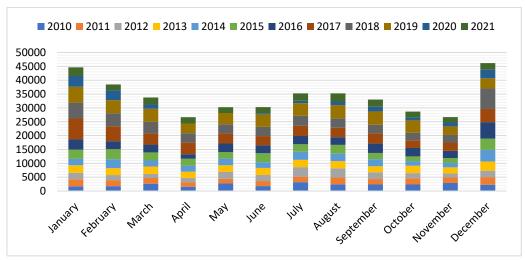

Fig. 5. Tourist overnight stays in the Petroșani Basin, per month, in the period 2010-2021

From figure 6, it can be seen that the number of overnight stays corresponds to the number of arrivals in figure 5. It should be noted that during the pandemic, the number of overnight stays decreased a lot, for the months of April 2020 and May 2020, no data being available.

The tourist potential of the area is not properly exploited, and for its development a better infrastructure and efficient public means of transport are needed.
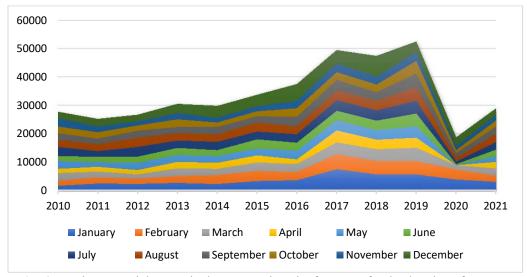
Fig. 6. Tourists' overnight stays in the Petroşani Basin, for years, for the duration of one year

　　　　Regarding the population of the Petroşani Basin, after 1992 the general trend of population decline was slower than the national average, a fact explained by mitigating the impact of the general economic crises through the special support given to miners in the region. However, the natural increase (Fig. 7) gradually decreased, passing from positive values in 1992 to negative values accentuated in 2014. After 1992, the birth rate recorded the most drastic decrease, a consequence of the restructuring of the extractive industry and the massive layoff of miners, as well as the accentuation of the phenomenon of regressive migration. In addition, the natural movement is marked by the intensification of international migrations of a significant number of the active population [9], [10].
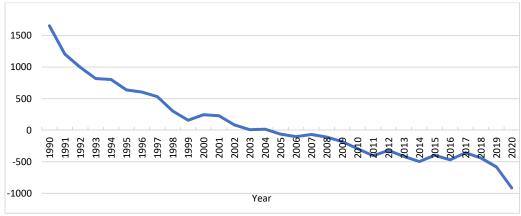

Fig. 7. Petroşani Basin population natural growth

3. SOCIO-POLITICAL FACTORS

The number and structure of the population, the standard of living, social protection measures, etc., represent the socio-political factors that influence public transport systems.

The state of the economy strongly influenced the socio-political factors, the population decrease being approximately 34,000 inhabitants in the last 30 years (164,456 inhabitants in 1992, 130,249 in 2021). (Fig. 8) [10].
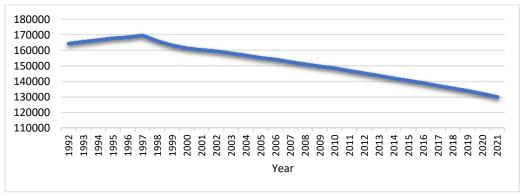

Fig. 8. Population evolution in the Petroșani Basin

The structure of the population by age groups (Fig. 9) highlights the dynamics of the age pyramid and announces future demographic and economic crises [10].
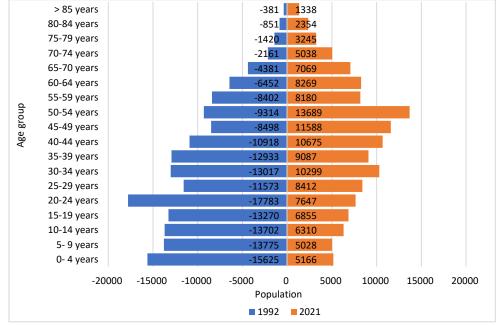

Fig. 9. Age pyramid dynamics

The analysis of age pyramids highlights the dynamics of certain population groups throughout the period of economic transition until now. Although the birth rate has steadily decreased in the period 1992-2021, the share of the young population has recorded higher values than the national average. Thus, apart from the generational cohorts with large numbers generated by the pronatalist measures from 1966-1970, respectively the 50-54 and 55-59 age groups and the 30-34 age group born after the events of 1989, when in Petroșani Basin, the economic well-being has favoured a sustained birth rate, the other age groups are decreasing numerically.

The analysis of the school population (Fig. 10), based on existing statistical data [10], reveals a reduction in the number of students in all categories, except for those enrolled in post-secondary, professional (which was resumed since 2012) and university education.

The main reason for the reduction of the school population is given by the low birth rate, which is reflected in the young population, aged between 0 and 24, whose share in the total number of inhabitants has decreased considerably (Fig. 9).

Figure 11 shows the structure of the population by education level in 2011 [10].

The Petroșani Basin is one of the most affected urban systems in Romania from a socio-economic point of view. The economic evolution of recent years, the current standard of living and the prospects of life in the Petroșani Basin urban system are the direct consequences of the rapid deindustrialization process and of the policies implemented after the fall of the communist regime, their impact also extending to Hunedoara County. In general, the standard of living of the Petroșani Basin population has increased, this statement being based on the statistical data of the National Institute of Statistics (NIS) regarding the average number of durable goods per 100 households (Fig. 12) [10].
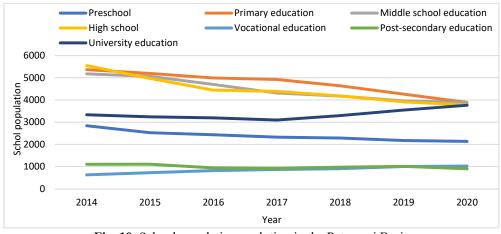

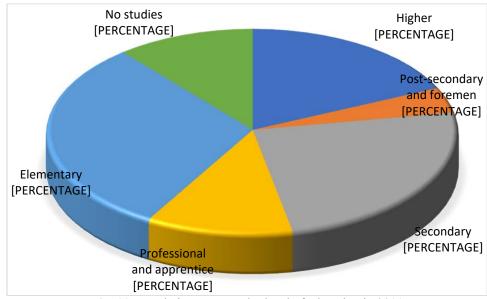**Fig. 10.** School population evolution in the Petroșani Basin

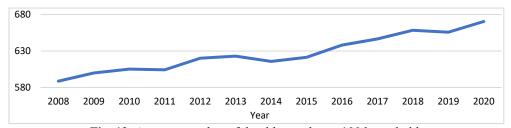**Fig. 11.** Population structure by level of education in 2011

Fig. 12. Average number of durable goods per 100 households

Limited social services make the population even more vulnerable. There is a relatively large number of disabled people who do not have the opportunity to live in a specialized institution. The insufficient number of nurseries for children has a great impact on their development and well-being, especially those whose parents are away from the Petroșani Basin. These children are raised either by relatives or by the community. The interviews highlighted the existence of a considerable number of vulnerable people who do not benefit from decent housing, sufficient financial resources for a decent living or who are subject to domestic violence due to alcohol, drug use or gambling addiction [11].

4. CONCLUSIONS

Passenger transport is one of the important components of the transport service. Public transport must be beneficial for the majority of the population, which also includes some disadvantaged categories, who cannot afford, from a financial point

of view, individual transport or do not have the ability to use it.

The paper presents the research carried out in the Petroşani Basin regarding the natural and socio-political factors and their influence on the activity of public transport of people. The study carried out led to the conclusion that the public transport system is very strongly influenced by the geographical shape, the general tendency of the population decrease reflected by the dynamics of the age pyramid, by the negative natural increase and the reduction of the school population. The sharp increase in durable goods (personal automobiles) also has a strong influence.

Thus, it can be concluded that the public transport of people will register a decrease in the volume of transported passengers in the coming years, probably up to a level at which the number of inhabitants will stabilize and the natural wealth, in this case tourism, will be exploited at the level that the area offers them.

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