Application of cluster analysis in determining the development level of local self-government units in the region of Vojvodina

The concept of regional development is of increasing importance in modern geographical research since development differences are observed at different levels of administration. In Serbia, a highly centralized country, development opportunities have led to the drastic disparities at the national, intraregional and interregional levels. One of the basic objectives of regional development is the reduction of intraregional disparities, i.e. differences in the level of development of local self-government units (LSGUs) of a region. Hence, the paper focuses on determining the development level of Cities and municipalities in the region of Vojvodina. For this research, seven demographic and socio-economic indicators, generated from the publications of the Statistical Office of the Republic of Serbia (SORS), were included in the consideration. Non-hierarchical k-means cluster analysis, one of the most widely used statistical methods, was used as the basic method. In order to obtain more precise results, the used indicators were standardized using the Euclidean distance measure. All 45 LSGUs in Vojvodina region were divided into three clusters. The differentiation based on standardized indicator values was carried out and made into the most developed, medium developed and least developed LSGUs. The analysis covered the years 2011 and 2022, so a comparative method was applied to examine the change in the level of development of the selected territory. The results of the cluster analysis show that the territory of Vojvodina is characterized by the heterogeneous development of LSGUs during both selected years. However, the largest number of LSGUs belongs to the least developed cluster, which implies that balanced intraregional development of Vojvodina has not yet been achieved. It is important to emphasize that in the period 2011–2022, according to the selected indicators, there was a significant progress in four Cities: Vršac, Zrenjanin, Sremska Mitrovica and Subotica. The aforementioned four Cities, including also Novi Sad and Pančevo, which were belonged to the most developed cluster in 2011, represent Vojvodina’s poles of development. Such data are not in accordance with the main principles of equal regional development. The paper represents another drawing of the public's attention to unequal intraregional development and a contribution to the understanding of the given problem.

Keywords: Regional development, intraregional development, cluster analysis, local self-government units (LSGUs), Vojvodina region