Spatial analysis of the physical development planning pattern in cities of Markazi province

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Extended Abstract

Objective: According to the distribution of population and socio-economic activities at different geographical levels, it is evident that the facilities and capacities at each level have not been used consistently and consistently. The consequences of such unbalanced development can be traced to the inappropriate distribution of the urban system, the concentration of economic, social activity in specific areas, the stagnant and unemployment-driven migration and the destruction of the regional ecosystem. The first step in dealing with such a situation is to identify spatial relationships and analyze the distribution of activities commensurate with the ecological and natural potential of the region. In the regional approach, regions are defined based on the distribution of spatial variables and the degree of homogeneity and similarity between them. Different techniques and methods have been used to identify this spatial distribution. The most important of them is spatial analysis. Ability to integrate levels analysis and benefit from the integration of different layers of information are important features of the new technologies in the field of spatial data analysis such as GIS, which can lead to a better understanding of spatial patterns at different geographic levels. The purpose of this research is to spatial analysis of the physical development planning pattern in cities of Markazi province using spatial analysis techniques. By analyzing the spatial distribution of the enactments of Markazi Province infrastructure and urban planning committee at the level of the cities, we can address the regional development situation in the province. The results of this study can explain the tendency of regional policy makers in spatial distribution of land uses in Markazi province.

Methods: The present research is applied in terms of purpose and is descriptive - analytical in terms of nature and method. In this study, all enactments of Markazi Province infrastructure and urban planning committee between 2011 and 2017 were gathered, which included 655 enactments, were collected and their spatial information was uploaded to the GIS. Accordingly, industrial land use (245), agriculture (85), tourism (66), and transport services (58) were the most enactments among other land uses. Arak County with 144, Saveh 112, Zarandieh 87 and Mahallat with 80 enactments had the most enactments in the Markazi province during 2011-2017. In order to analyze spatial distribution of these enactments, the spatial statistics analysis of the GIS was used. In this regard, three methods of Average Nearest Neighbor (ANN), High/Low Clustering (HLC) and Spatial Autocorrelation (SA) in statistical spatial analysis and Kernel Density (KD) estimation method were used to spatial show of the phenomena in continuous levels.

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Results: The results of Average Nearest Neighbor analysis show that the distribution of enactments in cities has a cluster distribution pattern. The result of the High/Low Clustering analysis also confirms the existence of a cluster distribution pattern and says that this clustering belongs to the cities with the most number of enactments. The results obtained from the analysis of Spatial Autocorrelation also show that enactments based on land use have a spatial correlation, but the spatial distribution of land uses across provinces is not balanced. The Kernel Density estimation test was also extracted in four land uses including industrial, agricultural, transportation and tourism services, which confirms the results of spatial autocorrelation analysis.

Conclusion: Ignoring regional capacity and the role of environmental factors in the planning is one of the most prominent results of spatial analysis of the enactments of Markazi Province infrastructure and urban planning committee in the current decade. What results from the analysis is the over-concentration of enactments in the center of the province, indicating a lack of a regular and specific pattern, commensurate with regional capacity. Large-scale development decisions and policies without a glance have led to the polarization of the province's populous cities, which leads to spatial focus and increased regional inequality. Therefore, by creating a geospatial database at the provincial level and updating and monitoring it continuously and analyzing the development policies in the cities level appropriate to regional and ecological capability, one can step towards sustainable regional development.

Keywords: Statistical Spatial Analysis, Spatial Autocorrelation, Regional Development, Infrastructure and Urban Planning Committee, Cities of Markazi Province.

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