Analysis of the Impacts of Urban Sprawl on Land Use Changes in Sari City

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Extended Abstract

Introduction

The process of land use change in urban areas has gone through an increasing trend since 1960s in Iran. This process has caused a type of unbalanced and unpredictable condition amongst the sustainable use of urban and environmental lands in urban areas of Iran. According to this procedure and its consequences, the land use patterns in the central parts of of Mazandaran (the northern province of Iran located on the coast of Caspian Sea and plays a key role in tourism and agricultural productions of Iran) including Sari City have experienced huge impacts and have gone through a massive fluctuations based on these changes (i.e., the process of urbanization as well as the increasing rate of population expansion and the increasing rate of migration both within and from the city). These changes have expanded and have identified new issues for urban management of Sari. All these impacts have left inspiring effects on Sari. These can be attributed to agricultural land use changes (it should be noted that agriculture is very important in Mazandaran and plays a very important role in the economy of Mazandaran and to some extent in the economy of Iran) in urban areas and also in peripheral areas of the city as a big change in the spatial condition. Based upon the observation and researches in this field, it seems that the continuance of this trend has instigated a discrete and decentralized pattern of growth. Finally, this procedure has caused urban sprawl, a condition in which city expansion develop to go toward peripheral parts of the city in the areas out of city borders while abandoning central parts of the city. According to what it was mentioned above, this paper is aimed at analyzing the interactive effects and impacts of suburban area's land use changes on urban sprawl and we want to see if there is any correlation between the two factors. In the next step, the prognostication of the process of land development and land changes until 2031 (1410) would be afforded. In other words, we would try to predict the probable changes in land use and the way the land would be manipulated by the highlighted time (the year 1410).

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Methodology

The methodology of this paper is descriptive-analytical and we have done our best to use different methods and tools to justify expected assumptions in this research. In the first step, using GEOMOD methodology, we tried to prognosticate the condition of constructed lands in Sari and then on the basis of Markov chain model, we tried to predict the probable trends of land use changes in peripheral areas of Sari in 2031 (1410). In the final step, we used the Geographical Information System (GIS) to join and relate different layers of data produced by previous models (Markov chain model and GEOMOD). We would analyze the interaction between different factors such as constructed areas and land use until 1410 in order to justify the expansion and spatial distribution of land uses.

Results and Discussion

The results of the research show that what we have gained through the research declare that agricultural land use and garden land use changes in 1410 would be decreased with a negative rate of 1.43%. In line with this trend, the constructed areas and regions will be increased with a positive rate of 4.85%. The spatial distribution of the constructed areas in northern parts of the region is concentrated. Same as this trend, in western areas and eastern regions, an increasing trend might be observed.

Conclusion

As we said before this paper is aimed at analyzing the interactive effects and impacts of suburban area's land use changes on urban sprawl and we would try to predict the probable changes in land use and the way the land would be manipulated by the highlighted time (the year 1410). It can be concluded that land use changes have formed the kind of sprawl in pre-urban areas of the Sari region. One of the main reasons of the pre-urban sprawl, amongst other probable reasons to this issue, is formation of the spatial inclination by the people toward residence in suburban areas of city in single house pattern (single household and second- based home pattern are a type of inhabitation in northern parts of Iran; in the pattern the house has a yard and is featured with just one floor). These types of houses are mostly located in peripheral areas of the city because these areas have a bigger potential for expansion and construction due to available vacant lands, these houses can be constructed there and we should note that these houses have other features to attract citizens to inhabit in there. For example, they are cheap and affordable for virtually all the citizens with different social and financial backgrounds. Yet, this is not the end of the story and other criteria can be found that affect the process. For example, this trend is also based upon the intensifying emerging of urban sprawl in urban regions of Sari and it needs to be directed in an appropriate way to lessen its damages toward the spatial condition of the city and save the environment by future planning and development schemes either in regional scale or urban scale.

Keywords: GEOMOD, land use change, Markov Chain, Sari urban region, sprawl.

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