

Impact Assessment of Sprawling on Lands Use Change of Middle-Sized Cities (Case Study: Qorveh City)

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Abstract

Today, the unplanned and horizontal extension of cities is an important issue for urban planners. This is the result of irregular growth of population on cities' border and suburbs, as well as human's developmental actions such as destruction of lands of economic value for construction. As a result of such factors, a city's breadth undergoes changes, and leads to the unproductive development of city. This study is applied in orientation aiming to assess the phenomenon of sprawling in the development of Qorveh. The method is descriptive-analytical and the tool of gathering data includes documentary and library studies. Data were also collected from organizations and research centers related to the study. In this study, for answering the questions we used different models. At first, for gaining the map of rate of vegetation lands destruction we used Fuzzy Artmap, LCM and Gross Tab table in Idrisi Selva application and Google Earth, also we used CA- Markov for forecasting city's future development. The results of analysis show change of land status of vegetation areas during 1986- 2016 such that 1165/5 Hectare from vegetation lands have changed to constructed lands. This process gradually causes horizontal spread. Therefore, we can see such an action in connecting the village of Qalee to Qorveh from south part and the expansion of Divzand village toward surrounding lands. While suitable agricultural land is more in this part, according to the obtained forecasts for the year 1410, 126/27 hectares from the vegetation lands will have their use changed to construction land; all of these items are among major reasons of horizontal spread and change of body structure and also environmental problems.

Introduction

Urban scattering is one of the main challenges in spatial planning in the 21st century. Urban scattering, as a special form of urban development with low density, dispersion, is car-dependet and influences social and environmental characteristics. Therefore, horizontal extension or urban sprawl always leads to land-use change. It's possible that this change happens in agricultural and garden lands or includes pastures, forests, and inclined hillsides of mountains and hills because population and actions that shift from the central city to the ground in the sprawling process, need the land to settle in around. Therefore, we can say land user change around the city has a direct proportion with the city size. Whenever the city is bigger, and without exact planning, its effect on user change of the periphery lands is more.

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Materials & Methods

The method of the research is practical and for analyzing, we prepared Landsat satellite of urban area of Qorveh related to the periods of 1986, 2000, and 2016. It is necessary to mention that prepared pictures are related to Landsat satellite (4, 5, and 8) and TM and OLI/TIRS sensors that are in the form of false-color images related to selective band 2, 4, 7. Then we determined the condition of intended applications for doing the work, consisting of four classified classes including built lands, vegetation lands, not-planting lands and water areas. In the following, for the assessment and evaluation of the condition of applications and classification of satellite pictures we used the Fuzzy Art map model that is a supervised algorithm. Then, the created changes between applications using the LCM model were shown, and at the end CA-Markov model has been used for forecasting Qorveh's application changes until the year 2030.

Results and discussion

Classification of satellite pictures in the urban area of Qorveh using the Fuzzy Art map model shows that area of use of built lands in Qorveh during the years 1986-2016 has a level increase from 6.23% to 18.27% and the rest of applications has a level decrease toward built lands. In the following Cross-Tab table shows that the most decrease in vegetation lands from the years 1986 until 2016 has been 586.26 Hectares. Reviews from the years 2016 until 2030 show that the most level of change has been inbuilt lands that represent physical development in Qorveh. This leads to complete change in not-planting lands and a decrease in their breadth, also causes vegetation lands and environment destruction. For the rest, including non-planting lands, vegetation lands and water areas has the most decrease in the area of use. Assessment of applications changes using the LCM model shows that about 822.24 Hectares have added to constructed lands extension and there has no decrease in constructed lands extension. In the end, the results of the area of uses forecast using Markov chain and automatic cells show that constructed lands will have 373.95 Hectares than 2016. Also, non-planted lands 184.23 Hectares, vegetation lands 179.55 Hectares and water areas 10.17 Hectares will have level decrease. As a result, the process of probable changes in vegetation lands in the year 1410 will cause official and unofficial construction around the city that destroys other lands .

Conclusion

The results gathered from analyzing user change in vegetation lands during the years 1986-2016 show that 1165.5 hectares from vegetation lands have changed to constructed lands, a fact which gradually causes horizontal extension and lack of city coherence. During the years, Qorveh has experienced the most intense process of urban development in most directions including northwest. Therefore, such a thing can be seen by the Markov model in the development of the villages around and their attachment to Qorveh. We can name villages such as Qal'eh in the south and the development of Divzand toward lands around which high-quality agricultural lands can be seen in this area. All of these cases are the main reasons for horizontal development and change of physical structure and environmental problems in this city.

Keywords: Horizontal Development, Physical Development, Middle sized cities, Land use, Qorveh City

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