

## Effects of urban physical development on security of urban neighborhoods (Case study: Maragheh)

Houshang Sarvar<sup>1\*</sup>, Hassan Ahar<sup>2</sup>, Amir Ali Zolfaghari<sup>2</sup>, Hadiseh Gheysari<sup>4</sup>

1. Assistant professor of geography and urban planning, Maragheh University
2. PhD candidate of geography and urban planning, Kharazmi University
3. PhD candidate of geography and rural planning, University of Isfahan
4. PhD candidate of urban planning, Islamic Azad University, Tehran Cneter Branch

Received: 26 August 2016

Accepted: 25 September 2017

### Expanded Abstract

#### Introduction

In addition to negative environmental and economic impacts of sprawl in cities, the phenomenon leads to high rate of social costs due to neighborhood movement and formation of suburbs. Urban sprawl or vertical expansion with new constructions around city can cause socio-economic damages and environmental destruction in cities. Jane Jacobs in the death and life of great American cities addresses security issues, spatial and physical deterrent factors of cities and neighborhoods. In this present study, we have explored Maragheh city. Despite population changes of Maragheh in different periods, the city is faced with turbulence and changes in urban growth. However, population of Maragheh in 45 years (1966-2011) increased 2.7 times (Iran Statistic center, 2011), in turn the area of the city at the same period increased 16.5 times and faster than its population growth (extracted and calculated by author based on detailed plan and Iran statistic center data, 2009). This has resulted in an imbalance between area and population growth in each period of urban growth. This pattern of physical growth of this city tends to be sprawl expansion. It seems that this form of city expansion have caused socio-economic impacts, especially undesirable environmental impacts such as agriculture land use changes, air and soil pollution, and degradation of urban green spaces. Based on these findings, suitable pattern in regard to growth and physical expansion of the city is captured by special importance and have to be considered in planning.

In present research, at the purpose of this research is to assess the links between effective factors of sprawl and security using spatial statistics methods, effectiveness rate of sprawl factors in security of neighborhoods. In regard to the indices used by theorist such as Glaster and Ewing sprawl variables are extracted. One of the complete methods of urban sprawl is the method Ewing in 2002. He believed that because of the complicated nature of sprawl, it is hard to measure it by multi variable. He insisted on the variables like population and constructions density, main streets accessibility, rate of concentration and urban centrality. In this research, we have used some variables including population and constructions density, distance from center, rate of open spaces, accessibility and rate of residency. Security variables such as theft, neighborhood and family quarrel, addiction, transportation, and open spaces have been gathered

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\* Corresponding Author, Email: h.sarvar1351@gmail.com, Tel: +989125047338

using questionnaire by citizens. Sprawl variables have been extracted by the existing data using ArcGIS and security variables through questionnaire and statistical calculation.

### Methodology

This is an applied research with descriptive analytic method. Field study and library method have been used to gather information in the field of links between form and shape of city and its effects on security. At first, the factors of urban sprawl and residency transformation of neighborhoods (population density, open space rate, buildings density average, and distance from neighborhood center, and period of residency in neighborhood) assess detailed and comprehensive plan using ArcGIS 10.2.

### Results and discussion

Present study is conducted in 3 stages including assessment of urban sprawl, neighborhood security and finally measuring effectiveness of sprawl factors on neighborhood security. The results indicate that the effects of population and building density and security in neighborhoods like Sahand, Valiasr, Chehlmety, Ohadi, Daraie, Pasdaran, Sheikh-Taj, Darvazeh contains planed texture . Generally, the effects of these factors except distance from city center and accessibility are like each other. The impacts of these factors in northern neighborhoods are positive and accessibility and distance have positive impacts on southern and peripheral neighborhoods.

### Conclusion

As said before, the aim of this research is to analyze the effects of urban sprawl on the neighborhood security by multi variant regression and the effects of urban sprawl factors on the neighborhood security. In the next stage, the rate of the factors is calculated by geographically weighted regression. The amount of overall effects on security is measured through different nature of factors. For solving this, the effects of each factor are separately analyzed.

The second aim is to compare results of multi variant regression with geographically weighted regression. The results of multi variant regression have positive or negative impacts. The geographically weighted regression shows the impact factors in spatial and in the neighborhood level and determines that how is the impact factor. It can be suggested that for analysis of geographical and spatial issues, we have used geographical weighted regression.

**Keywords:** sprawl, security, GWR, GIS, Maragheh

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