Spatial Analysis of Factors Affecting the Unbalanced Physical Growth of Rasht City Using Geographic Information System (GIS)

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Extended Abstract

1. Introduction

After industrial revolution, complex economic and technical developments led to wide changes in the size of cities, the proportion of the population in urban areas, and the growth rate of urbanization (Johnson, 1998). More than half of the world population currently lives in urban areas and the uncontrolled expansion of cities is becoming a global concern. It is predicted that over 65% of world’s population by 2025 will be living in cities (Kaya, 2006). Meanwhile the rapid increase in the urban sprawl leaves a harmful impact on the environment (Jaeger, et al, 2010). Nowadays, most developing countries are dissatisfied with the process of the spatial expansion of their settlements (Zebardast, 2004). Such disproportionate growth of cities plus the ordinate density of urban areas have led to the phenomenon such as informal settlements (Shiite, 2002). The consequences of such phenomenon are increased and unused lands, the high proportion of open spaces, the reduced population density, the fragmentation of urban sectors and social segregation. This study aimed to examine the factors affecting the rapid and spiral expansion of the city of Rasht. The findings obtained from the current study can help to manage the city of Rasht in deliberate planning for preserving the environmental resources such as agricultural lands and gardens through vertical development policies, attention to the plans for land preparation, the performance of housing cooperatives, and providing appropriate lands through establishing the urban land banking within the framework of the proposed strategic plan.

2. Theoretical framework

The theoretical framework of the study is based on Holder n’s quantitative method in order to determine the indiscriminate urban growth. The advantages of this method is to determine the factors associated with urban sprawl (e.g. population and indiscriminate growth) while this model can be interpreted easier compared to other models (Anseline,
1995). Therefore, Holdern’s model is considered as one of the fundamental methods in determining indiscriminate urban growth. Using this method, the amount of urban growth caused by the population growth and the indiscriminate urban growth can be determined (Ebrahimzadeh, 2009).

3. Methodology

The current study is an applied research and the method is of descriptive-analytical approach. The maps were drawn using GIS software while the analysis data were done using the obtained maps in the next step.

4. Results

The results obtained from Holdern’s model concerning the city of Rasht revealed that between the years 1966 and 2006, about 57% of the city’s physical growth was associated with population growth, and 43% was associated with vertical and spiral growth leading to a decrease in gross population density and an increase in urban lands per capita gross.

5. Discussion

This study aimed to examine the physical development of the city of Rasht to determine the factors affecting the spatial development of the city, to review the history of development for the city and the pattern for physical development, to identify the abilities and limitations of physical development and to provide solutions for fundamental and practical planning for the spatial development of the city. The method of the study was of descriptive-analytical approach. After reviewing the historical development of the city, the factor and limitations affecting the spatial and physical development of the city were examined. The role of urban development plans and projects (detailed and comprehensive scheme, preparation, housing cooperatives, Mehr Housing Project, etc.) were then examined in the context of urban development of the city of Rasht. The administrative, service and tourism capacity of Rasht and the attraction of population from local and regional areas have led to an increase in the population of the city. This has provided the need for lands in order to supply housing for different social strata along with the development of unplanned buildings, constructions and their expansion towards agricultural lands and gardens. Such consequences have increased the need for deliberate, appropriate, and organized urban designing and planning for an optimized utilization of the available lands in the city. Moreover, various factors, including the increase of deserted barren lands, the expansion of informal settlements, and the integration of villages to urban areas as well as the housing cooperatives and urban development projects have played a major role in the unbalanced spatial development of the city.

6. Conclusion

The speculation of more than 25% of barren lands in the city’s legal boundary, 7.7% of the expansion of informal settlements, 5.6% of the development of housing cooperatives, and the 25.4% of the increase in the integration of villages to urban areas, which is inconsistent with the approved detailed and comprehensive developmental plans of the city have played a major role in the unbalanced development of the city. The contribution of only three factors of the integration of villages into the main urban districts, the development of housing cooperatives and the development of informal settlements have added a surface area of almost 4051 hectares to the main legal district of the city, equivalent to 39.6% of the total area of the city. Another factor affecting the city’s unbalanced spatial development is the urban land-use changes while implementing the comprehensive and detailed projects and plans that have added a surface area of almost 9290 hectares to the city from the implementation of the first comprehensive project (i.e. from 1966 to 2006).
Keywords: Physical expansion, Holdern’s model, Analysis of urban development process using GIS software, City of Rasht.

References (in Persian)

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