Zonation and Spatial Planning Based on Physical-Spatial Characteristics
Case Study: City of Urmia

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Received 27 December 2015
Accepted 16 November 2016

1. Introduction

Urmia is one of the important historical cities of Iran which in recent years has been associated with physical-spatial rapid expansion. One of the necessities of spatial planning of Urmia is controlling the rapid expansion of the city in marginal areas that are unbalanced fertile land and industrial and mineral soils are under construction and this problem has presented numerous hazards in the fields of economy and environment. Excessive physical development in the surrounding areas is now one of the major challenges in managing urban spatial development. Recognizing these challenges in identifying the pattern formation and urban structure is important in the context of place and passing of time. The application of this identification helps proper diagnosis and urban land use and appropriate physical development of the city.

Urmia, in West Azarbaijan Province, is one of the ancient cities of Iran. In terms of the geographical coordinate system, it is located in between44 degree and 3 minute to 47 degree and 23 minute east longitude and between 35 degree and 58 minute to 39 degree and 46 minute north latitude, at an altitude of 1332 meters above sea level. The area is 10 thousand and 548 hectares. The city has been located in the vast and verdure plain in length of 70 km and a width of 30 km. Average of monthly minimum and maximum temperature is 6.4 and 17.5, respectively. The average of relative humidity is 60% and the average of monthly precipitation is 341 mm. Most of the existing deposits in the region are sedimentary deposits, yet highly dynamic structural changes such as orogenic and faulting may be created by dynamic metamorphosis in some parts of the region. More outcrop of sedimentary units of Urmia region is related to Mesozoic Era (Jurassic) and Quaternary (Quaternary).

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2. Material and Methods

In this study, documents in the library were used for literature review. Next, using climate data and digital elevation model and field surveys, base maps were prepared for zonation spatial planning. Then, the indicators: elevation, slope, soil, land use, climate, and geomorphology, distance from the rural, distance from the city, distance from the roads and distance from the river were used. The selection of criteria was based on field surveys which were performed on the study area. After that, criteria were turned fuzzy using fuzzy membership function and fuzzy gamma 0.9 operator was provided for spatial planning zonation.

Fuzzy model for the first time was provided by Lotfi Zadeh (1965). Fuzzy theory concluded that by creating the membership function in a range of real numbers, new methods develop. Using fuzzy logic in analysis, geographical processes are described more realistically than by Boolean logic.Fuzzy analysis is performed using GIS software.

3. Results and Discussion

Urmia has had rapid and inharmonious growth in recent years and due to natural population growth, immigration, expansion of services, the granting of political – official identity to the city as the provincial capital, assignment by various government agencies in the city, country development programs, socio-economic and political changes and finally favorable physical conditions, It has never seen such a large body of demographic and physical changes. Urmia has had high population and area growth in 20 years (1986-2006) t. The present study makes clear that following the land reform in 1964, in the process of physical development from 1966 to 2011 in Urmia, the influx of migrant population in the city of Urmia intensified. Development of marginalization in north and northeast parts of the city, in the communication path to the Salmas town in the north-western edge of Urmia Lake has had its consequences. Since 1987up to now the highest growth has been in urban areas mostly in the west, North West, east and southern parts of Urmia, which caused the annexation of the surrounding lands to city, settlement cooperation and development and the establishment of inappropriate settlements and marginalization. The issue of ownership had of rapid population and area growth. The growth was fragmented. Given that Urmia is at a distance of approximately 15 kilometers from the east of Lake Urmia, this issue has been an important obstacle for physical development. In addition, in the east, northeast and southeast of the city there are agricultural lands and horticultural products. City development in these areas has been in contrast with these lands and is causing hazards and limitations for these lands. Thus, the development of the city stopped in this direction and development trends in the west, north, south west and south of the city are spreading. These directions which have followed the development process are the acceptable level of suitability. Overall, based on the assessments done in this study, the west, north, south west and south areas of the city are appropriate for development and consist of high and very high zones. Actually, the city has a single central structure – radial. With regard to the recognition and implementation of aerial photographs and

maps available of physical development, the results are largely acceptable. Obviously, the increased standards and assessment in lesser extent will bring more precision. So, with proper selection of base maps and merge and their detailed analysis, fuzzy logic allows more accurate assessments and provides more accurate locations and can be used for planning urban development.

4. Conclusion

The results showed that zones with high suitability for the growth and development of the city are located in the west and southwest of Urmia and also in the south and northeast, in a scattered manner. In coastal areas of Urmia Lake and its immediate zones we see alluvial terraces deposits and very low, low and moderate areas. These areas have low ability in terms of physical development. Moreover, areas with low suitability can be seen in the northeast to southeast in a scattered manner.

Keywords: Zonation of urban land, Spatial planning, Spatial indices, Spatial- physical development, City of Urmia.

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