Spatio-temporal analysis of urban growth from remote sensing data in Bandar Abbas city, Iran

ABSTRACT

Today, urban growth is a multidimensional spatial and population process in which cities and urban settlements are considered as centers of population focus owing to their specific economic and social features, which form a vital component in the development of human societies. The analysis of urban growth using spatial and attribute data of the past and present, is regarded as one of the basic requirements of urban geographical studies, future planning as well as the establishment of political policies for urban development. Mapping, modeling, and measurements of urban growth can be analyzed using GIS and remote sensing-based statistical models. In the present study, the aerial photos and satellite images of 5 periods, namely (1956–1965, 1965–1975, 1975–1987, 1987–2001, 2001–2012) were used to determine the process of expansion of the urban boundary of Bandar Abbas. Here, in order to identify the process of expanding urban boundaries with time, the circular administrative border of the city of Bandar Abbas, was divided into 32 different geographical directions. Here, Pearson's Chi-square distribution as well as Shannon's entropy is used in calculating the degree of freedom and the degree of sprawl for the analysis of growth and development of the cities. In addition to these models, the degree-of-goodness was also used for combining these models in the measurement and determination of urban growth. In this way, it was found that the city of Bandar Abbas has a high degree of freedom and degree of sprawl, and a negative degree of goodness in urban growth. Regardless of the results achieved, the current study indicates the capability of aerial photos and satellite imagery in the effectiveness of spatio-statistical models of urban geographical studies.

Keyword: Urban growth; Urban sprawl; Spatio-statistical models; Remote sensing; Bandar Abbas; Iran