

## Using Geographic Information Systems Techniques and Multi-Source Earth Observation Data to Study the Trends of Urban Expansion in Welayat Barka Sultanate of Oman during the Period from 2002 to 2019

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**Abstract :** Urban Sprawl is a phenomenon that many regions in the Sultanate of Oman suffer from in general and in Welayat Barka in particular. It is considered a human phenomenon that causes many negative effects as it has increased in the last time clearly, and this study aims to diagnose the current status of urban growth taking place in Welayat Barka. The objective of this study is to monitor and follow up on the most prominent changes and developments taking place in Barka in the period from 2002 to 2019 and provide suggestions to the decision-makers to reduce the negative effects of the phenomenon. The study methodology depends on the descriptive and analytical approach to describe the phenomenon and its analysis and knowledge of the factors that helped in urban expansion in the Barka, using a number of studies and interviews with the specialists, both in governmental and private institutions, as well as with individuals who own land, real estate, and others. Geographic Information Systems (GIS) and Remote Sensing (ERDAS software) have been used to analyze the satellite images that helped in obtaining results that reflect the changes Barka, in addition to knowing the natural and human determinants that stand on Urban Sprawl Expansion. The study concluded that the geographical location of Barka has a significant role in its urban expansion, as it is the closest state to the capital Muscat, as this expansion continues toward the southern and south-western directions, as this expansion has significant negative effects represented in the low number of agricultural lands due to the continuous change in land use. In addition, it was found that there are two types of natural determinants of urban expansion in Barka, which are consumed land from the Sea of Oman and from the western sands.

**Keywords :** GIS applications, remote sensing, urbanization, urban sprawl expansion trends

**Conference Title :** ICUSP 2022 : International Conference on Urban Studies and Planning

**Conference Location :** Vancouver, Canada

**Conference Dates :** August 08-09, 2022