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GIS and Remote Sensing to Investigate Urban Growth in Mafraq City/Jordan between 1987 and 2010

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ABSTRACT

The spatial, temporal and spectral characteristics of the remote sensing data are effectively used in land use and land cover change mapping, hence helping in decision making for sustainable land resource management. The aim of the study is to map urbanization growth using satellite imagery, Google imagery and GIS in Mafraq city/North Jordan. Landsat imageries of 1987, 2005 and Google Earth (GeoEye-1) imagery of 2010 were used in GIS environment to map the change in the urbanization at Mafraq city. Maximum likelihood algorithm of supervised classification was used to delineate two land use and land cover classes for the study area, namely: populated areas and non-populated areas from 1987 and 2005 imageries. On-Screen digitizing was adopted on Google Earth (GeoEye-1) imagery of 2010 to map the populated areas. The main change observed for the time period of 1987-2010 was that the urbanized areas have increased approximately by 7.14 km^2 (approximately 23% of the study area). The population density within the study area has increased from approximately 965 inhabitants per sq.km in 1987 to 1808 inhabitants per sq · km in 2005 and reached 2146 inhabitants per sq · km in 2010. The increase in the populated area within Mafraq city has impacted the surface hydrology runoff which leads to diverting some Wadis to avoid passing through the city centre. Also, the increase in urbanization in Mafraq city has put more pressures on the waste water treatment plant and solid waste dumpsite that serve Mafraq city.

KEYWORDS

Jordan; Mafraq; Urban Growth; GIS; Remote Sensing; Google Earth

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