Geospatial Techniques and VHR Imagery Use for Identification and Classification of Slums in Gujrat City, Pakistan

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Abstract : The 21st century has been revealed that many individuals around the world are living in urban settlements than in rural zones. The evolution of numerous cities in emerging and newly developed countries is accompanied by the rise of slums. The precise definition of a slum varies countries to countries, but the universal harmony is that slums are dilapidated settlements facing severe poverty and have lacked access to sanitation, water, electricity, good living styles, and land tenure. The slum settlements always vary in unique patterns within and among the countries and cities. The core objective of this study is the spatial identification and classification of slums in Gujrat city Pakistan from very high-resolution GeoEye-1 (0.41m) satellite imagery. Slums were first identified using GPS for sample site identification and ground-truthing; through this process, 425 slums were identified. Then Object-Oriented Analysis (OOA) was applied to classify slums on digital image. Spatial analysis softwares, e.g., ArcGIS 10.3, Erdas Imagine 9.3, and Envi 5.1, were used for processing data and performing the analysis. Results show that OOA provides up to 90% accuracy for the identification of slums. Jalal Cheema and Allah Ho colonies are severely affected by slum settlements. The ratio of criminal activities is also higher here than in other areas. Slums are increasing with the passage of time in urban areas, and they will be like a hazardous problem in coming future. So now, the executive bodies need to make effective policies and move towards the amelioration process of the city.

Keywords : slums, GPS, satellite imagery, object oriented analysis, zonal change detection

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