

Impacts of Urbanization on Forest and Agriculture Areas in Savannakhet Province, Lao People's Democratic Republic

Authors : Chittana Phompila

Abstract : The current increased population pushes increasing demands for natural resources and living space. In Laos, urban areas have been expanding rapidly in recent years. The rapid urbanization can have negative impacts on landscapes, including forest and agriculture lands. The primary objective of this research were to map current urban areas in a large city in Savannakhet province, in Laos, 2) to compare changes in urbanization between 1990 and 2018, and 3) to estimate forest and agriculture areas lost due to expansions of urban areas during the last over twenty years within study area. Landsat 8 data was used and existing GIS data was collected including spatial data on rivers, lakes, roads, vegetated areas and other land use/land covers). GIS data was obtained from the government sectors. Object based classification (OBC) approach was applied in ECognition for image processing and analysis of urban area using. Historical data from other Landsat instruments (Landsat 5 and 7) were used to allow us comparing changes in urbanization in 1990, 2000, 2010 and 2018 in this study area. Only three main land cover classes were focused and classified, namely forest, agriculture and urban areas. Change detection approach was applied to illustrate changes in built-up areas in these periods. Our study shows that the overall accuracy of map was 95% assessed, kappa~ 0.8. It is found that that there is an ineffective control over forest and land-use conversions from forests and agriculture to urban areas in many main cities across the province. A large area of agriculture and forest has been decreased due to this conversion. Uncontrolled urban expansion and inappropriate land use planning can lead to creating a pressure in our resource utilisation. As consequence, it can lead to food insecurity and national economic downturn in a long term.

Keywords : urbanisation, forest cover, agriculture areas, Landsat 8 imagery

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