

LANDCOVER MAPPING OF TANJUNG JABUNG BARAT, JAMBI USING LANDSAT - ALOS PALSAR DATA FUSION AND OBJECT-BASED HIERARCHICAL CLASSIFICATION

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Abstract: Land cover mapping is fundamental for most land-resource-based studies such as land suitability analysis, carbon stock analysis, habitat analysis and many others. Currently, land cover classification based on Landsat imageries is widely produced owing to Landsat's geographic coverage, data continuity, spatial resolution, spectral extent and not to mention data accessibility and cost effectiveness. However, as commonly with optical remote sensing sensor, loss of information due to cloud cover has become a major problem especially if it affects a large area and/or it affects exactly the specific areas of interest. Active remote sensing sensor such as Synthetic Aperture Radar (SAR) has become one of solution because of its ability to penetrate clouds. The objective of this work is improve land cover classification for Tanjung Jabung Barat district, Jambi, Indonesia, due to high cloud cover in the area, by using combination of Landsat and ALOS PALSAR. Major vegetation cover that needs to be differentiated includes undisturbed forest, logged-over forest, logged-over swamp forest, undisturbed mangrove, logged-over mangrove, acacia (*Acacia crassicarpa*) plantation, oil palm (*Elais guinensis*) plantation, coffee (*Coffea robusta*) agroforest, betel-nut (*Areca catechu L.*) agroforest, rubber (*Hevea brasiliensis*) agroforest, rubber monoculture formed from 4 level hierarchical classification scheme which require combination of spectral and spatial information. We applied integration of Landsat and ALOS Palsar into one image (6 bands of Landsat + 3 bands of ALOS Palsar mosaic) and texture information in a classification rule sets using hierarchical object-based classification approach in Definiens Developer 7 and accuracy assessment used kappa analysis. Our result shows that land cover map generated from the fusion of Landsat and ALOS Palsar has higher accuracy (> 85%) compared to the one generated from Landsat or ALOS Palsar alone. In addition, oil palm plantation has the highest level of separability and accuracy when using a combination between landsat and ALOS palsar mosaic. We conclude that the combination of Landsat and ALOS Palsar mosaic can provide solution to reduce the lost area due to cloud and it improved the accuracy of land cover map produced.

Keyword: land cover mapping, Landsat, ALOS Palsar, image fusion, hierarchical object based classification