

MONITORING RESPONSIBLE RESOURCE DEVELOPMENT AND COMMUNITY LAND-USE USING MULTI-DATE RAPIDEYE DATA

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Abstract

Responsible resource development in Lao PDR faces several challenges, including communities living close to mining areas and competition for land resources. Resource developers have a responsibility to manage their land resources and associated risks throughout the life of a project. Monitoring of land use is a dynamic and continuous process that can be supported through the use of remote sensing providing information across a large area to help manage environmental and social risks. Hatfield has developed www.landmonitoring.com to give users consistent and regular information about their land resources through the use of Earth observation satellite images.

This applied research shows that the use of multi-spectral sensors can improve situational awareness and is effective for regular monitoring of land use in Lao PDR. Images from the RapidEye constellation were acquired over a four-year period to provide land cover information and track incremental changes in land use within a resource developer's operational area. Changes in land cover/use are visualized and tracked through www.landmonitoring.com.

Initial baseline land cover classification was established using object-based segmentation. Subsequently, changes in land cover were identified through RapidEye image-to-image differencing. The accuracy was assessed using Quickbird, GeoEye-1, and ground validation data. The change detection method proved successful and reliable, with the major factor causing misclassification being seasonal changes between wet and dry season. The accuracy of land cover change detection can be improved by enhancing the knowledge base and rules related to actual change versus seasonal change.

Baseline land cover and land use changes extracted from satellite images can be integrated into an environmental and social management system that can assist resource developers improve their understanding of their land and natural resources. Ongoing land use monitoring will subsequently help resource developers in their decision-making about the development, health, and safety of their operations and surrounding communities.

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