

Practicalities of Methodologies in Monitoring Forest Degradation in the Tropics

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Abstract

Conversion of natural forest to agricultural land is one of the most important forms of land-use change affecting both carbon stock and biodiversity. When the agricultural land contains trees, e.g. fallow-land forest of slash-and-burn agriculture, the conversion can be categorized into forest degradation when the forest definition covers such vegetation. One practical method to monitor carbon stock change is an approach using a parameter for plant community age. For cyclic land use that includes clear-cutting stage, from which chronosequential changes in carbon stock can be estimated by determining time and spatial-distribution of cleared land. Inoue et al. (2007) detected slash-and-burn fields using a time-series of Landsat images and a model containing the parameter for plant community age, and estimated chronosequential changes in carbon stock in fallow land in northern Laos. Kiyono et al. (2011) examined non-destructive methodologies for practicalities in monitoring anthropogenic greenhouse gas (GHG) emissions from tropical dry-land forest under the influence of various forms of human intervention. No reasonable remote sensing methods exist for monitoring at a large scale the amount of carbon loss by forest conversion and logging in forests with high-biomass. To enable practical and frequent monitoring of all types of forests impacted by humans, it is vital to devise a new methodology to detect changes in high-biomass forests.

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