

(Paper)

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Reducing uncertainties in the assessment at national scale of C stock impacts of land use change

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Abstract

Efforts to increase terrestrial carbon stocks to slow down the rate of increase of atmospheric CO₂, can be based on generic national policies aimed at modifying land use decisions of large number of farmers, or on specific interventions at 'project' scale, with a limited spatial extent. For both type of interventions data are needed on the actual impacts of land use on C stocks, but the precision required is higher at the project scale if financial rewards are linked to actual performance. If the credibility of national assessments can be improved, countries can play a more active role in international negotiations on the credits and blame for mitigating and causing climate change.

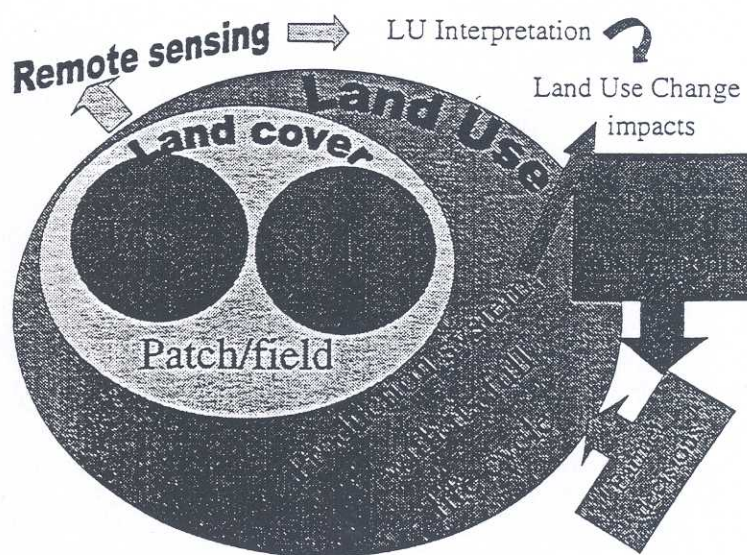
Uncertainties in current assessment procedures are considerable, but no complete analysis has been made of how uncertainties at every step in the procedure propagate in the calculations of overall results. We review the following steps on the basis of research in Indonesia for the Alternatives to Slash and Burn project: land cover/use categories, biomass and soil C measurement in representatives of these categories, and extrapolations from land cover to time-averaged properties of a land use system.

Introduction

Considerable uncertainty remains in the humid tropics on both the rate at which land use practices change and the impacts this has on the global C balance. Here we will review a number of factors contributing to overall uncertainty of the estimates and discuss how this uncertainty can be reduced. Examples used are largely based on the 'Alternatives to Slash and Burn' project, that undertook measurements in the Amazon, the Congo basin (s.l.) and the humid lowlands of SE Asia, using and developing a common methodology (Palm et al., 1999).

Figure 1. Assessments of the impacts of land use change on C stocks involves a number of hierarchical scales:

- tree or other vegetation and soil that interact at patch or field level,
- land cover that can be observed with remote sensing tools,
- land use in the sense of a production system considered over its full life cycle,
- farmer decision making about land use (what, when, where)
- policy instruments that aim to influence farmer decisions.



The current IPCC method for national scale assessments are generally available, and there has been no complete analysis of the uncertainties involved in every step of the procedure and the way these uncertainties propagate in the calculations to provide