

---

# Addressing the Challenge in the Post-2012 Climate Regime through REDD+: a Case Study in Southeast Asia

Heli Lu<sup>\*1</sup> and Guifang Liu<sup>1</sup>

<sup>1</sup>Key Laboratory of Geospatial Technology for Middle and Lower Yellow River Regions of Ministry of Education, Henan University – China

## Abstract

The REDD+ (Reducing Emissions from Deforestation and Forest Degradation) partnership works to promote the reduction of greenhouse gas (GHG) emissions by protecting forests in developing countries through positive incentives. It is regarded as an essential component of the post-2012 climate regime to stabilize GHG emissions and engage developing countries in worldwide mitigation endeavors. We develop an approach comprising two components: distributed land use modeling for assessing the profitability gap between maintaining palm oil plantations and complying with REDD+ and a sensitivity analysis of the model's predictions. First, a spatially explicit model is used to predict the future distribution of land use changes in central Kalimantan, Indonesia. Second, a sensitivity analysis is conducted to assess the robustness of the modeling results to alternative assumptions about palm oil price and carbon price. The palm oil price is shown to have the highest relative sensitivity. Further analysis indicates remarkable changes in the profitability gap depending on the price of palm oil; a change in palm oil price from \$545.33 to \$773.03 shows a large 155% increase in the profitability gap. Unfortunately, the most likely forecasts of palm oil prices continue to predict large differences in the profitability gap, favoring palm oil plantation over REDD+ projects. Thus, the effect of carbon pricing policies, as they currently stand, will remain limited. Moreover, since country participation is voluntary, it is difficult for governments to ensure that a REDD+ program paying land users to reduce emissions by protecting forests "reaches the ground." The continuing high demand for biofuels and food puts carbon stocks in tropical forests at risk, and in doing so, potentially undermines efforts to stabilize the atmospheric CO<sub>2</sub> concentration through REDD+. Although our study focused on the central Kalimantan region, where forests are directly threatened by future palm oil plantations, this research also provides a possible means to evaluate whether the financial benefits from carbon compensation from REDD+ projects could be financially attractive in other forest areas of the world.

---

<sup>\*</sup>Speaker