

## Large-Scale Land Transactions as Drivers of Land-Cover Change in Sub-Saharan Africa

### Proposal Summary

We will synthesize available remotely sensed and other information, complemented with targeted new data collection, to investigate the impacts of recent large-scale land transactions. Ours will be the first project to undertake a systematic, quantitative analysis of the impacts from large-scale changes in land tenure on land-cover change *and* livelihoods, to investigate both the multiple drivers of and the patterns of interactions among these outcomes, and to do so through a rigorous, statistical matching-based causal inference approach. We will make use of existing satellite-based land-cover products and survey-based socioeconomic data in and around the locations of recent large-scale land acquisitions in three countries in Sub-Saharan Africa. We pose two sets of research questions. First, what are the patterns of large (>5,000 ha) transactions, in terms of number, size, anticipated use, and impacts in the target countries; what is their distribution across environmental, institutional, economic, and social contexts; and what are the sources of investment for large scale land transactions between 2000 and 2012? Second, how have land cover and livelihood outcomes changed in and around a selection of transacted properties, and how do these changes compare to changes observed at similar locations within the same countries? Our three selected countries (Ethiopia, Tanzania, Liberia) vary significantly on numbers and sizes of transactions, and the primary purposes of the transaction (agriculture versus forestry). Building on our existing network of country partners and researchers through the International Forest Resources and Institutions (IFRI) program, we will collect data on the boundaries of large (>5,000 ha), multi-national transactions completed during the period 2000-2012 in each country. This step will involve both visits to the field and advantageous use of high-resolution imagery. Next, we will compile transaction, land-cover, socioeconomic, and environmental information at the level of sub-national units using existing satellite-derived and survey-based data products to assess the contexts within which the transactions have occurred in each country. We will then select a sample of 20-30 large transactions within each country. For each selected transaction, we will use a combination of moderate (i.e., Landsat) and high (i.e., Worldview and others) resolution image products to analyze changes in forest and land cover in three zones: within the transacted parcel, within a 5-km distance buffer around the transacted parcel, and within a control area that is environmentally and socioeconomically similar and about the same size as the transacted parcel but is at least 10 km away and not within a known transacted parcel or protected area. We will compare the rates of forest and land-cover change following the transaction through a statistical matching-based approach to identify the causal role of the transacted parcels in driving land-cover change, while accounting for possible confounding factors. Additionally, we will conduct household surveys within the buffer and control areas of a subset of transacted and matched parcels to evaluate the effects of transactions on household level incomes and livelihoods. In year 3, we will hold a *workshop* to assemble scholars of land change, governance, and markets to evaluate the available evidence and develop a series of testable questions and hypotheses that form the basis for an initial conceptual framework for modeling the role of large-scale land transactions in affecting local and regional land systems in target countries. The primary outcome of this project will be new information about the role of large-scale land transactions in local and regional land systems in Sub-Saharan Africa, a topic about which much has been written but for which systematic empirical evidence is sorely needed and for which satellite remotes sensing serves as a valuable data input.