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**Calistus N. Ngonghala\*** (calistusnn@ufl.edu), **Giulio De Leo**, **Matthew Bonds**,  
**Mercedes Pascual** and **Andrew Dobson**. *Integrated models for the economics of land–use  
change and pathogen dynamics*. Preliminary report.

The extremely poor generally rely on their immediate natural environment for subsistence and suffer high rates of morbidity and mortality due to infectious diseases. We present a framework for modeling the ecology of poverty, focusing on the exemplar drivers: land use change and infectious diseases. Interactions between these drivers and poverty create reinforcing feedbacks associated with persistent poverty, which can be characterized as a stable, low level, equilibrium in ecological-economic space. We use simple coupled land use change-infectious disease-economic models to demonstrate nonlinear relationships that give rise to multiple stable equilibria, such that initial conditions (or threshold levels) determine whether populations can experience vicious versus virtuous cycles and the associated transitions or “tipping points”. The inherent complexity of these relationships, combined with the spatial and temporal scales at which they occur in the real world, create empirical challenges for estimating parameters and validating the models. Accordingly, we present a series of sensitivity analyses to explore the range of uncertainty and variability around the multidimensional parameter space. (Received September 04, 2019)