Proposal for August 2009 Research Visit

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The overall objective of this short-term visit is to further develop a prototype agent-based model to explore the resilience of smallholders in the Southern Province of Zambia. Agent-based models are spatially explicit computational models that incorporate the interactions between actors in a system that are responsible for macro-scale outcomes. For example, households within a village may share information that enables the community better to adapt to climate or economic disturbances. At present a conceptual framework has been constructed outlining the spatial components of resilience for smallholders. For the work proposed here this abstract framework will be integrated with existing household level survey data collected for villages in Sinazongwe. In particular, the household survey data will be used to create a household typology to populate the agent-based model with a set of heterogeneous households with diverse attributes (e.g. demographic structure, land holdings).

A second objective of the proposed summer work is to integrate spatial data compiled by project members into the model. These data will be used to characterize aspects of land suitability in the study area. In particular, topography, transportation features and land cover/biomass data derived from remotely sensed satellite imagery will be processed for integration into the agent-based modeling structure.

A last objective will be to interact with Resilience project team members to help improve the overall design of the model. This will involve the development of scenarios of plausible social, economic and biophysical shocks relevant to the study area. In addition, I hope to get feedback regarding any salient system characteristics that are missing from the model.