SCHOOL of SUSTAINABILITY

ARIZONA STATE UNIVERSITY

In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

Benjamin Warner

Will defend his prospectus

Fostering Equitable Climate Change Adaptation in the Increasingly Globalized Costa Rican Agricultural System

The political structure of agriculture is changing across the developing world as the global demand for water and arable land increases. The process of agricultural globalization, or agroindustrialization offers investors a chance for economic growth, increased affluence, and socio-economic development. Local farmers, however, worry that the expansion of internationally owned large-scale commercial farms will threaten their local livelihoods, natural environments, and quality of democracy. These worries have historically spawned spirited reactions from farmers throughout Latin America. In Central America, and in Costa Rica specifically, 'land grabbing' is accelerating and locals' reactions have forced government officials to begin asking how this process will affect future political stability in rural-agricultural areas. Climate change will further complicate management strategies as the different actors maneuver to gain access to scarce water. Decision makers must understand this relationship between globalizing agriculture and changing resource availability and intervene to limit future conflict and promote equitable agricultural systems. Therefore, my research goals are to

1. ***add to our understanding of the relationship between the process of agricultural globalization and climate change using the case of the Arenal-Tempisque Irrigation District in Guanacaste Province, Costa Rica,***
2. ***co-produce management strategies with local government officials that can be used to help equitably manage Costa Rican agriculture within a changing climate.***

I will meet my research goals by combining a unique set of qualitative and quantitative methods to study how farmers' decisions aggregate to affect regional land tenure patterns in the Arenal-Tempisque Irrigation District (DRAT) in Guanacaste, Costa Rica by completing the following objectives:

Objective 1: I will determine how smallholder farmers and large-scale commercial farms (LSCFs) make decisions to buy or sell their land in the DRAT.

Objective 2: I will build and run an agent-based model using land tenure decision functions developed for each of the two groups of farmers to explain how the current land tenure pattern in the DRAT emerged from farmers' decisions. The model will be validated by comparing modeled results to the current land tenure structure in the DRAT.

Objective 3: I will use my model to determine how the institutional structure (i.e. the combination of written laws and rights that influence farmers' decisions) can be changed or enforced to constrain farmers' decision functions, thereby changing the land tenure pattern of the DRAT.

Objective 4: I will hold three workshops with Costa Rican government officials from the DRAT, the Ministry of Agriculture and Livestock, and the National Groundwater, Irrigation, and Drainage Service to co-produce and test management strategies in real-time using my agent-based model that promote smallholder farmers livelihoods under increasing water scarcity in the DRAT.

Wednesday, September, 19th, 2012
10:00 AM
Wrigley Hall, Room 481

Faculty, students, and the general public are invited.

Supervisory Committee:
Dr. Daniel L. Childers
Dr. Hallie Eakin
Dr. Joshua Abbott
Dr. Arnim Wiek