Oversimplification. One size fits all. These are notions that have no place in the Ostrom Workshop. The workshop, whose full name is the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis, is completing its fortieth year of exploring institutional, social, political, and environmental issues all over the world. That research, notably on how people can collectively manage resources for sustainable use, earned the late Elinor Ostrom a Nobel Prize in 2009.

The new co-director of the workshop, IU geography professor Tom Evans, leads one of the last projects Ostrom worked on. His team, together with scholars at Princeton, Dartmouth, Oberlin, and the University of Colorado, is investigating the impact of climate change on areas that experience periods of water shortages. The teams, under a three-year grant from the National Science Foundation, are studying 100 communities in two areas of the world that face major adjustments in their farming practices because of climate change—semiarid regions of Colorado and New Mexico on the one hand and the central plains of eastern Kenya on the other.

Evans described the challenges of climate change for Kenyan farmers. “eastern Kenya has distinct dry seasons. The growing season is short. Temperature is not a constraint, but water is. As climates change, so the time
of year when water is available also changes. The timing can be a very difficult for farmers to figure out. They never know consistently when they are going to have water in the streams. When it hasn’t rained for a couple of weeks and thousands of people are drawing water out of the stream, it is hard to predict if a farmer will have water on a particular day.”

Shortages do not affect all users equally. Farmers upstream can count on more reliable supply, but farmers downstream depend on upstream conservation if there is to be water left for their farms. “Having different rules in place to make sure that there is some equity at all levels is really important. Our project is looking at what kinds of organizations and what level of governance lead to an equitable and sustainable allocation of water.”

The problem is not strictly environmental, and it is not strictly social. The goal of the project is to build a model that incorporates what happens to the supply of water and what farmers and governing units do in response. “We have been learning about the social dynamics, the government dynamics, and the physical dynamics of what has been happening for the past two years.” This data collection touches several disciplines. “In Kenya, the IU group is talking to farmers whose families depend on their crops: “How much did you plant this year? How big are your fields? What did you plant? How many children do you
have? For what months of the year do you lack irrigated water?” The IU team is building a GIS database, mapping road networks, and analyzing satellite imagery and topography. “Then we talk to community organizations and ask what would happen if somebody didn’t pay their fees in a month, in two or three months. We try to understand the actual rules they are using to deal with management problems in their communities.”

“At the same time, the group from Princeton is thinking about the social dynamics. They are primarily responsible for the physical science involved, measuring water flows and monitoring water levels at different places and times and noting different amounts for different farmers along the line. The University of Colorado and Dartmouth team members are coordinating analysis of our sites in New Mexico and Colorado.”

The effort to collect a wide variety of data is a hallmark of the IU Ostrom Workshop. As Evans explains, “Anybody can make a model, but if you don’t have the right kind of data, you don’t know whether your model is good or not. You can propose theoretical models that may not have much data behind them, but we try to build models that are directly tied to data from specific sites. Further, we work hard to collect data for enough places to produce generalizable results. Research on one or two communities can be so specific that you can’t draw conclusions relevant for other places. What Ostrom did was to promote a methodology for environmental governance research to get consistent data from a variety of places.”

Solutions to changes in water availability involve everything from choosing drip systems for irrigation; to building dams and retention areas, or holding tanks; to the cost and benefits for a farmer to install a pump; to developing better communications among farmers up and down the river; to evaluating the effect of setting up pay-per-use schedules; to developing rules for local governance through community cooperatives or national regulations based on centralized control. Data is being collected in areas where there is high-level governance with not much going on locally and areas with high-level governance with much going on locally. Solutions rarely involve a single governance approach or a uniform policy. Rather, they are polycentric, involving the interaction of local and central governance.
Using a GPS device and traveling on the motorcycles of local guides, IU Professor Tom Evans maps the water pipe network of the Miarage community in consultation with project caretakers.

Modeling should accommodate all these options. It “needs to do a reasonably good job of producing the dynamics of what has happened in the past,” says Evans. “Once we are able to have confidence that the model is doing a good job of reproducing historical patterns, we can then generate future scenarios to ask a number of ‘what if’s.’ We can input different rainfall patterns, and determine how the system might need to respond to be able to have sustained agricultural production.”

In Kenya, where population growth will affect farmers as much as climate change, a successful model will be sensitive to both. According to Evans, “Even if the amount of water resources remains constant over the next 10 years, population growth will create pressure on that finite resource. Kenyan farmers depend on their crops to support their families. For them, it’s about survival and development. If we can establish a good understanding of how the structures are working now, we might be able to plan in a better way for the social and environmental changes that might happen in the future.”

**Climate Change and Governance Project**

**Indiana University Research Team:**
- Tom Evans (Professor Geography and Ostrom Workshop)
- Dan Cole (Professor Maurer School of Law and SPEA)
- Paul McCord (Graduate Student–Geography)
- Jampel Dell’ Angelo (Postdoctoral Scholar–Ostrom Workshop)
- Liz Baldwin (Graduate Student–SPEA)

**Investigators at Other Institutions:**
- Kelly Caylor (Associate Professor Princeton U. Dept. of Civil and Env. Engineering)
- Michael Cox (Assistant Professor Dartmouth College–Environmental Studies)
- Krister Andersson (Associate Professor U. Colorado–Political Science)
- Camille Washington-Ottombre (Assistant Professor Oberlin College)