School of Sustainability
Arizona State University

In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

Cathy Rubiños

Will defend her dissertation

Commons Governance for Robust Systems: Irrigation Systems Study Under a Multi-Method Approach

Abstract

Sustainability depends in part on our capacity to resolve dilemmas of the commons in Coupled Infrastructure Systems (CIS). Thus, we need to know more about how to incentivize individuals to take collective action to manage shared resources. Moreover, given that we will experience new and more extreme weather events due to climate change, we need to learn how to increase the robustness of CIS to those shocks. This dissertation studies irrigation systems to contribute to the development of an empirically based theory of commons governance for robust systems. I first studied the eight institutional design principles (DPs) for long enduring systems of shared resources that the Nobel Prize Elinor Ostrom proposed in 1990. I performed critical literature review of 64 studies that looked at the institutional configuration of CIS, and based on my findings I propose some modifications of their definitions and application in research and policy making. I studied then, how the revisited design principles when analyzed conjointly with biophysical and ethnographic characteristics of CISs perform to avoid over-appropriation, poverty and critical conflicts among users of an irrigation system. After carrying out a meta-analysis of 28 cases around the world, I found that particular combinations of those variables related to population size, countries corruption, the condition of water storage, monitoring of users behavior, and involving users in the decision making process for the commons governance, were sufficient to obtain the desired outcomes. The two last studies were based on the Peruvian Piura Basin, a CIS that has been exposed to environmental shocks for decades. I used secondary and primary data to carry out a longitudinal study using as guidance the robustness framework, and different hypothesis from prominent collapse theories to draw potential explanations. I developed then, a dynamic model, which shows how at the current situation it is more effective to invest in rules enforcement, than in the improvement of

the physical infrastructure (e.g., reservoir). Finally, I explored different strategies to increase the robustness of the system, through enabling collective action in the Basin.

Tuesday, November 7, 2017
10:00am
Stauffer Hall A132

Faculty, students, and the public are invited.

Supervisory Committee:
John Anderies, chair
Joshua Abbott, member
Marcus Janssen, member