

## **Adaptive self-organization in swidden agriculture**

Indigenous societies across the tropics manage forested landscapes through swidden (aka “slash-and-burn”) agriculture—a customary practice that has been studied for centuries. However, insights from complexity science have yet to be integrated into a coherent framework for understanding this enduring coupled human-natural system. This talk outlines how household-level decisions, social norms, and customary land-use practices may help some small-scale societies

practice swidden sustainability without top-down environmental management or institutions. My research draws on nearly 20 years of fieldwork in two Q’eqchi’ Maya villages in southern Belize. I will present results from a global-scale remote sensing analysis of swidden societies that identifies power-law distributions and spatial correlations to be common quantitative signatures of adaptive self-organization. I will then use an ethnographically informed mathematical model developed by my research team to investigate how interactions among key social and environmental elements of swidden agricultural systems can lead to a wide range of swidden disturbance patterns, including the emergence of sustainability.

Theorizing swidden agriculture within an adaptive self-organized systems framework provides new insights into its potential for sustainability and its positive and negative contributions to the global ecosystem. In doing so, we discover that social norms in small-scale societies may simultaneously increase harvests and enhance ecosystems. We provide novel explanation for the how social norms can affect large-scale properties of forest ecosystem. These insights have practical significance for contemporary Indigenous and small-scale societies in tropical and subtropical parts of the world with respect to land rights and climate change, as well as for theories about human history and evolution during the Holocene.