

## Policy Design and Multiagent Social Simulation

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Policy questions should be addressed by methods that are commensurate with the complexity of the policy context. High fidelity *multiagent social simulations* constitute such a method. Multiagent simulations serve as virtual labs in which a system can be recreated as a counterfactual to the world in which policies, plans, programs or projects are implemented. This property of multiagent simulations suits policy design, impact assessment and evaluation, because it makes attribution of effects to specific interventions possible. That is why multiagent simulations are popular tools in designing, analyzing and evaluating complex socio-natural systems such as transportation, agriculture, environmental management, urban planning, economic development, finance and civil wars, to name a few.

Using a multiagent simulation to study policy impacts on a population *realistically*, requires knowing or estimating the social, economic and demographic properties of the population at the household level. Data on every household is rarely, if at all, available. Furthermore, multiagent simulations are based on the properties and behaviors of individuals to whom one cannot assign aggregate values. So methods to estimate every household in the population are needed. Methods that estimate every unit of a population are called *population synthesis* algorithms and the resulting estimates are called *synthetic populations*.

I will discuss how to construct and exploit multiagent social simulations as a tool for program diagnostics; use models to generate data and evaluate programs, and conduct robust impact assessment. To do so, I will describe participatory elicitation, social simulation and data fusion as the fundamental building blocks of Scensei's approach, and illustrate it with recent examples of our work in Nepal, Iran and Afghanistan.

Scensei is an analytics and decision support firm that regularly collects, compiles, fuses, analyzes and maps data, and builds social simulations to help clients gain deeper insights into their operating environment and make more effective decisions. Dr. Armando Geller is a co-founder of and partner at Scensei.