



Figure 32. Modeling the linkages between climate change and late third millennium B.C. empire: a preliminary Influence Diagram (DPL 4.0) for Akkadian imperialization of Sumer and Subir. Squares enclose decisions, circles enclose natural variables (e.g., “dry farm precip”) that can be modeled as an uncertainty. Quantification is through linked spreadsheet models. Influence arcs are not simply “causal,” but inputs for calculation, and reflect the variety of possible causal linkages: standing, auxiliary, and precipitating conditions, agents, interventions, contraventions, modifications, contributory factors, enhancements, inhibitions, factors that raise the number of effects and factors that only raise the level (Cartwright 1999:119). Note that herding and manufacturing activities are not included in this model. (Source: J. Kadvanly and H. Weiss)

e. Urban growth and scales: Bettencourt 2007