

Assignment 12 - Conceptualization

Purpose

The goal of this exercise is to gain experience and skill in problem definition and system conceptualization leading toward a formal system dynamics model intended for policy analysis. The assignment will not involve using the computer. The product will be a short paper and a presentation, not a model. The focus is on the stages of the modeling process that precede writing equations.

Task

Carry out the initial, conceptual steps of a model-based study of a policy problem. Address explicitly the following considerations:

- *Problem focus
- *Problem dynamics
- *Context
- *Audience
- *Model purposes
- Model boundaries
 - Temporal - what's the time horizon?
 - Conceptual - what's included and what's excluded?
 - Causal - what's endogenous and what's exogenous?
- Aggregation
- Reference modes
- Initial policy options
- Model sectors
 - Important processes in each sector
 - Important levels and associated rates in each process and/or sector
 - Apparently important feedback loops
- Next steps

Write up your thoughts in a well-organized problem statement that might be directed toward obtaining funds to support the proposed research, providing focus for a team of researchers on the project, or clarifying your own directions on a study.

* Think carefully about the starred items in this list. Problem focus, context, audience, and model purpose should determine much of what is discussed in the remaining considerations in the conceptualization process. Is your purpose forecasting, policy analysis, parameter estimation,

understanding, consciousness raising, debate, or ...? Is your context SUNYA, Albany, New York State, the United States, equatorial rain forests, or ...? Is your audience the director of public health services, an insurance company, readers of newspapers, the Senate, the United Nations, or ...? Why are you building this model?

Model a problem not a system.

Resources

The most useful readings on the topic of conceptualization are the Randers article and ISDM, chapter 2. The Wolstenholme & Coyle article and perhaps an overview of Alfeld & Graham's *Introduction to Urban Dynamics* may also be useful.

For topical references on your particular policy problem you will have to rely on what you already know or what you can readily generate from easy-to-find sources. Do *not* spend time gathering data. Concentrate on formulating the problem dynamically and creating a structural view that you could develop into a full formal study if given the time.

You should think of this exercise as an opportunity to gather what you have learned from this course and begin the process of applying it to a policy problem of your choice. This conceptualization exercise could frame the problem you would pursue for a master's essay or a project in PAD 622, PAD 724, or an independent study.