Soft Systems Methodology: An Intervention Strategy

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Abstract
Agricultural and extension educators are frequently called upon to intervene in situations where solutions to problems are complex, subjective, and often impossible to achieve. Soft Systems Methodology (SSM) is commonly considered to be an intervention methodology to use in situations where the problem is poorly-defined, controversial, or ‘messy.’ SSM is used to help ensure that the people component remains a central element of the program development and problem solving process, and is key to develop agreement on issues such as the nature of the problem, and the definition of an improved situation. The authors discuss SSM educational importance and applications for agricultural and extension educators, and present the seven stages of SSM as described by Checkland (1981): 1. Inquire into the situation (real world); 2. Describe the situation (real world); 3. Define Human Activity Systems (HAS) (systems thinking); 4. Conceptual modeling (systems thinking); 5. Compare conceptual model with real world; 6. Debate desirable and feasible change (real world); and 7. Implementation (real world).

Keywords: Soft Systems Methodology, Program Development, Problem Solving, Human Activity Systems, Complexity, Systems Thinking
Introduction

Agricultural and extension educators are frequently called upon to intervene in situations where solutions to problems are complex, subjective, and often impossible to achieve. Soft Systems Methodology (SSM) is commonly considered to be an intervention methodology, and has been employed in situations where the problem is poorly-defined, controversial, or ‘messy.’ Wilson and Morren (1990) suggest that SSM helps develop agreement on key issues such as the nature of the problem, the definition of an improved situation, and the notion that such agreement cannot be achieved without significant contribution from all parties involved in the situation. This approach may lead to the identification of specific technical problems where the basic sciences or hard systems approach may be more appropriate.

Soft Systems Methodology (SSM)

SSM is a process that includes both ‘real world’ and ‘systems thinking’ activities. The process starts with ‘real world’ activities (inquiry and description of the problem situation) and purposefully involves the people, the environment, and the problem being addressed. ‘Systems thinking’ activities follow to define human activity systems and conceptual models. Once constructed, these conceptual models are compared to the expressed ‘real world’ problem situations. Finally, the process again involves activities in the ‘real world,’ including participatory analysis, communication, evaluation, and implementation of the proposed changes (Checkland, 1981). Although apparently linear, SSM is more of a recurring process, as described by Von Bulow (as cited by Luckett & Grossenbacher, 2003):

SSM is a methodology that aims to bring about improvement in areas of social concern by activating in the people involved in the situation a learning cycle, which is ideally never-ending. The learning takes place through the iterative process of using system concepts to reflect upon and debate perceptions of the real world, taking action in the real world, and again reflecting on the happenings using system concepts. (p. 149-150)

More specifically, the seven stages of SSM were described by Checkland (1981) as follows:

Stage 1 – Inquire into the Situation (Real World). The approach most frequently used to analyze of problematic situations is to start by identifying the problem. In the Soft Systems inquiry approach, this is exactly what the researcher should not do, because the majority of situations s/he will encounter do not have only one problem, but are a complex series of situations with interconnected and multifaceted problems. Moreover, these problems may not be easily understood at the beginning of the process. The main objective of this stage, therefore, is to identify and study in-depth the perspectives of people in a particular situation and environment.

Stage 2 – Describe the Situation (Real World). Help the stakeholders rationalize their environment, realize the main topics of concern or issues to be dealt with, and identify a range of possible and relevant strategies for improvement.

Stage 3 – Define Human Activity Systems (HAS) (Systems Thinking). Define relevant systems by using Smyth and Checkland’s (1976) CATWOE (see also Checkland, 1981), a mnemonic that suggests six elements in which to concentrate when defining a system, as described in Table 1. CATWOE is particularly in helping to articulate assumptions, particularly the worldview of the stakeholders involved in the process.
Stage 4 – Conceptual Modeling (Systems Thinking). Develop a conceptual model based on CATWOE. The purpose is to have the stakeholders involved in the process thinking deeply, creatively, and with a multidisciplinary perspective, about how things might operate in the future, but without a commitment to actually implement any of the changes.

Stage 5 – Compare Conceptual Model with Real World. Test proposals for change by comparing the conceptual model(s) to the real world depiction of the situation developed in stages 1 and 2. The ultimate objective of this stage is to prepare the conceptual model(s) for presentation to all stakeholders, including preparing and developing appropriate communications and debate.

Stage 6 – Debate Desirable and Feasible Change (Real World). The comparison and debate stages have much in common in that both aim to test the conceptual models developed in stage 4 and contrast them with the situation expressed in stage 2. Also they both show full participation, learning, and communication between all stakeholders, as compared to the expert to client approach (advice-giving and recommendation-receiving) (Wilson & Morren, 1990) so often criticized in the analysis of diffusion of innovations (Rogers, 2003). This stage looks forward, discussing the recommended changes of the model and considering whether they are needed and workable.

Stage 7 – Implementation (Real World). Design a plan to carry out specific actions, communicate the specifics of the plan to all stakeholders affected (actors), monitor performance and the environment, and evaluate results. As a result, some modifications in the plan may be necessary.

Table 1. Summary of CATWOE Questions: Six Items Covered in a Well Formulated Systems Definition (Smyth & Checkland, 1976; Checkland, 1981)

<table>
<thead>
<tr>
<th>C (Customers)</th>
<th>= Who could benefit or suffer by the change put forward through the SSM process?</th>
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<td>A (Actors)</td>
<td>= Who would manage and be responsible for the improved situation/operation?</td>
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<tr>
<td>T (Transformations)</td>
<td>= What could be a central transformation or change process that characterizes an improved situation?</td>
</tr>
<tr>
<td>W (Weltanschauung) (Worldview)</td>
<td>= What is the outlook, mental framework, or image that makes this transformation meaningful? What are the values and assumptions in our view of the improvement?</td>
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<tr>
<td>O (Owners)</td>
<td>= Who has most concern for the system and has or could be granted the power to alter or stop the proposed transformation process?</td>
</tr>
<tr>
<td>E (Environment)</td>
<td>= What environmental factors might constrain and assist our improved situation in the future? What is the feasibility of the change?</td>
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Educational Importance and Applications

SSM may be difficult for some individuals to understand. In teaching such a methodology, one is teaching a way of thinking, not what to think (Checkland, 2000). Despite many drawbacks, SSM has been used in a number of contexts throughout the world (van de Water, Schinkel & Rozier, 2007). SSM is a simple process that can be used to address complex agricultural issues and plan programs. Most faculty involved in teaching, research, or
extension excel in a subject matter discipline that does not include training on program development theory, concepts, or related principles, thus the importance of involving people throughout the process may be overlooked. SSM can be used independently or combined with other methods in a pluralist perspective to research (Mingers, 2001). SSM is not a substitute for the scientific method, but a precursor to it. It ensures that the people component remains a key element of the program development and problem solving process.

References