

Using the Simplicity Cycle in Model Building

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Abstract: Computer based Decision Support Tools or Systems (DST or DSS) have been used in agriculture and natural resource management for over 30 years. However their uptake has been patchy, and reviews in both fields arrive at a similar set of explanations; 1) Absence of market research to establish need and target audience; 2) Failure to clearly define the problem in participation with users; 3) Their complexity; 4) Failure to acknowledge the qualitative and subjective processes common to all problem solving; 5) Making decisions for the user instead of providing information to help them make their own (e.g. optimising); 6) Use of opaque logic; 7) Failure to provide intermediaries to facilitate their use by managers. An additional impediment identified for agricultural DSS is that of scale, where those that focus on whole of system (e.g. farm profitability) rather than operational issues (e.g. nutrient application in cropping) have poorer uptake. While this question of scale is more difficult to avoid in natural resource management, it is related to the issue of complexity and has implications for ease of use and likelihood of uptake.

The Landscape Logic research hub (www.landscapelogic.org.au) was set up to develop decision support systems with environmental managers who have responsibility for investing public funds to improve water quality and vegetation condition. Its approach to DDS development is based on four principles, adopted in an attempt to avoid the shortcomings identified above; 1) Participation of end users in problem definition and model testing; 2) Using Bayesian Decision Networks as the modelling framework to establish a transparent logic and incorporate quantitative and qualitative information; 3) Using the Simplicity Cycle to guide model development 4) Training and licensing third party intermediaries to facilitate future use. A companion paper (Pollino, Lefroy and Jakeman, this volume) describes the first two features.

This paper concentrates on the application of the simplicity cycle to model building. This process starts from a position of low utility and low complexity with naively simple conceptual models. It then moves through several iterations of high complexity and low utility (confused complexity) until it arrives at a sufficient level of complexity to adequately represent the system (requisite complexity). The ultimate aim is to arrive at a state of low complexity and high utility (informed simplicity) by progressively discarding drivers, nodes and links to which the systems is least sensitive.

Keywords: *Simplicity, Model Building, Natural Resource Management.*

Abstract only

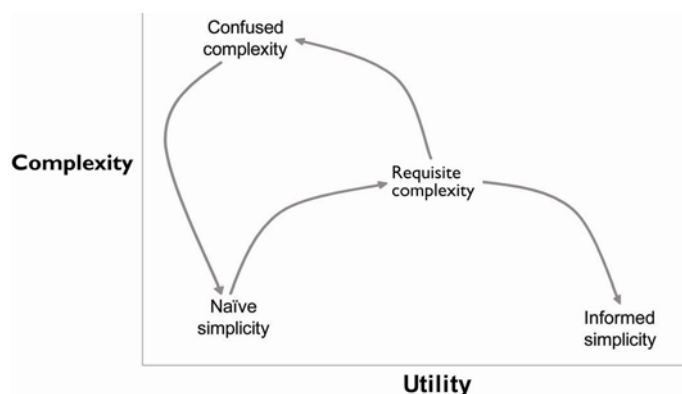


Figure 1. The simplicity cycle (adapted from Ward D 2008 *The Simplicity Cycle; An exploration of the relationship between complexity, goodness and time.* Rogue Press, San Francisco USA.)