

Persuasion, influence, and participatory modelling in socio-ecological systems: A framework for action

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Abstract: Practitioners studying socio-ecological systems (SES) often struggle to ‘persuade’ stakeholders to transform knowledge arising from the scientific modeling process into meaningful changes in behaviour. Participatory modelling (PM) aims to address this problem by engaging stakeholders of a given problem in the process of co-creating knowledge, making decisions, and ultimately converging towards collaborative solutions informed by science. While the effectiveness of PM is well documented, the process of building participatory models could learn from and improve with the aid of behavioural science. Behavioural science studies how humans actually make decisions and act, providing practical knowledge to steer people toward decisions that improve long-term welfare. By applying behavioural science to PM, scientists can position themselves as influencers for ideas and practices that actually improve the systems they study. In turn, it can also help stakeholders by ‘priming’ them to both understand and to implement practices that improve long-term individual and collective outcomes.

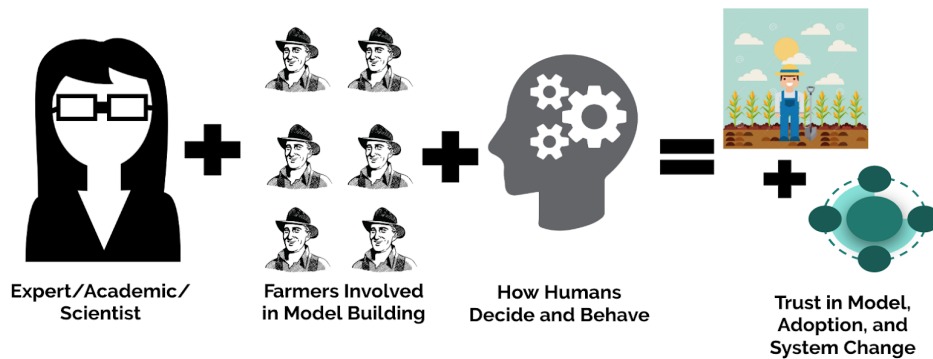


Figure 1. The Benefits of Applying Behavioural Science to PM

This paper describes a diagnostic questionnaire, drawing from the Theory of Planned Behaviour (TPB), that can underlie and improve a PM exercise by ‘mapping’ where stakeholders sit in regards to an idea or practice. TPB states that behaviour can best be predicted by three central concepts: subjective norms (social networks), perceived behavioural control (power), and attitudes (personal). The diagnostic questionnaire examines these three elements to determine which drive stakeholder actions. When combined with other theories from behavioral science, this diagnosis can then lead to a toolkit that experts draw upon during a PM exercise. Such a toolkit helps experts better account for the decision-making processes of their stakeholders. It also assists in choosing more effective ways to deliver their messaging to increase stakeholder understanding, and to improve the likelihood of stakeholders adopting any collectively agreed upon actions.

To test this diagnostic tool, I focus on farmers, as their relationships with the land, the markets, and the services they supply are the archetypal example of a complex, inter-woven SES, in pressing need of change. First, I interview experts in charge of managing the Mulloon Institute near Bungendore, NSW to assess what factors are crucial to changing farmer behaviour, the boundaries of their decision-making, and whether or not my questionnaire captures the main factors influencing behaviour change. These experts include farmers, community leaders, and government officials. With this data to support and update the questionnaire, I will then proceed to a PM exercise, using the diagnostic questionnaire to assess what drives stakeholders of Mulloon towards or against regenerative agricultural practices. While this case study focuses on Australian agriculture, findings of this research should be relevant to other socio-ecological systems where natural capital is deteriorating and human behavior is a key driver of system performance, such as agriculture, fisheries, mining, forestry, and the management of water resources.

Keywords: Participatory modelling, influence, behavioural science, agriculture