I See How You Think: Using Influence Diagrams to Support Dialogue

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Climate disruption, resource depletion, biodiversity loss, economic instability, widespread poverty and terrorism—all reflect the pressures that a growing population is placing on a finite planet. Communities worldwide are beginning to take steps to mitigate harmful anthropogenic impacts on the Earth System, and to adapt to those changes that cannot be reduced to tolerable levels (Richardson, Steffen, et al., 2009). Action needs to be taken now to avoid pushing the Earth System beyond thresholds for irreversible change (Tainter 1988; Steffen, Sanderson, et al., 2004; Dyer 2008).

Efforts to take mitigative action are hindered by the growing complexity of human-environment systems and the need to act cooperatively and globally. The behaviour of a complex system emerges from the interactions between its parts—the influence links between key variables cut across disciplinary, institutional, and cultural boundaries, and so the design of integrated policies requires the blending of insights from a wide range of disciplines and worldviews. Differences between individual understandings of cause-and-effect are unavoidable, and are the main drivers of conflict in negotiations. But these differences can be the key to success, provided that we can find ways to blend divergent worldviews to produce better, more comprehensive understandings and policies (Newell, Crumley, et al., 2005). It is urgent that we find ways to meet what Dovers and Price (2007) call the 'integration imperative'.

Newell and Proust have been working for some years on ways to use systems thinking and modelling to facilitate the blending of disparate worldviews (Proust and Newell 2006; Proust, Dovers, et al., 2007; Newell, Proust, Wiltshire and Newell 2008). They have taken ideas from system dynamics (Sterman 2000, Vennix 1996), second-generation cognitive science (Lakoff and Johnson 1980/2003, Lakoff and Johnson 1999, Lakoff and Núñez 2000) and selected studies of frame reflection and conflict resolution (Kuhn 1960, Reddy 1979/1993, Schön 1979/1993, Schön and Rein 1994), and focused them on the issue of how to build a shared understanding of basic dynamical concepts. The operative idea is that, in order to blend different worldviews about 'how the world works', these worldviews need to be expressed in

a shared 'visual language'—so that they can be rapidly compared and combined. The language must be visual, since influence networks are complex and cannot be conveyed adequately by words alone (Reddy 1979/1993).

The 'pair-blending' process under development by Newell and Proust focuses on integrating the existing knowledge and opinions of a specific group of people. Each group member constructs an individual 'influence diagram' that captures a tentative hypothesis about how the target system 'works' (Figures 1 and 2). Group members then enter a dialogue where they work in pairs to simplify and combine their diagrams (hypotheses) to form a single diagram that incorporates the essential features of both worldviews (Figure 3). The process of constructing the influence diagrams supports the dialogue, because they are constructed using a common set of 'grammatical rules'. That is, diagrams constructed this way constitute statements in a form of the required shared visual language, and so allow group members to 'see how each other thinks' in order to compare and contrast their understandings of the structure and behaviour of the system of interest. Not only can the use of influence diagrams facilitate the development of blended worldviews, it can also help to identify and resolve conflicts existing between people with different aims and interests, when those conflicts arise because of narrow, disjoint understandings of cause-and-effect.
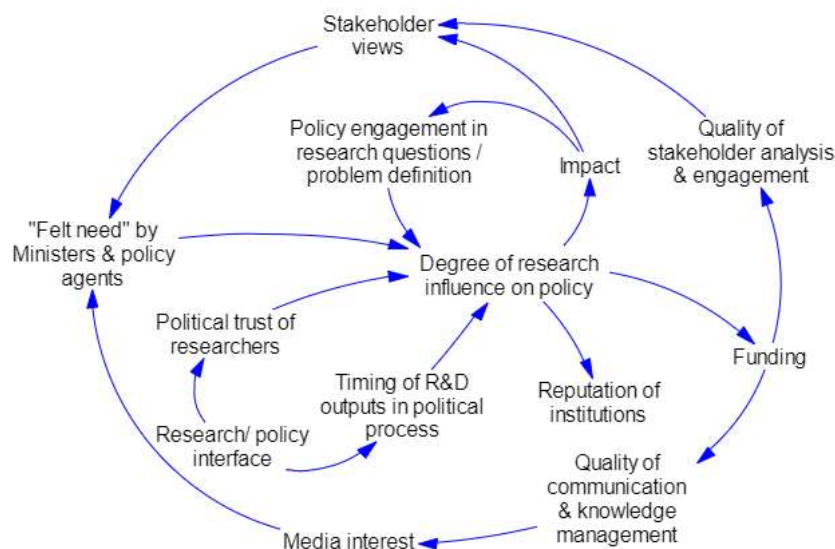

Figure 1. An influence diagram constructed by Climate-Energy-Water (CEW) Links workshop participant AC. The selected focus variable was the extent to which research has an influence on CEW policy development. This diagram captures a tentative hypothesis about possible influences on, and of, the focus variable. Workshop participants were allowed 15 minutes to construct their individual hypotheses and diagrams.
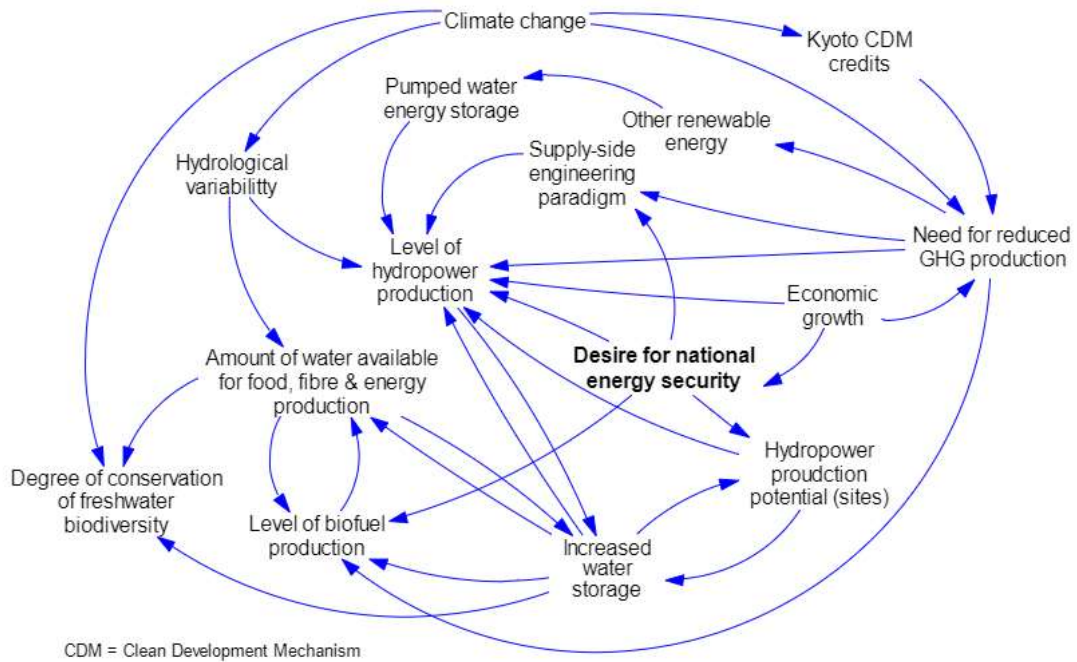
Figure 2. An influence diagram constructed by CEW Links workshop participant JP. The selected focus variable was the Australian community's desire for national energy security. As for Figure 1, the diagram captures a tentative hypothesis about possible influences on, and of, the focus variable. Once again, the participant developed his hypothesis in 15 minutes in the process of constructing this diagram.
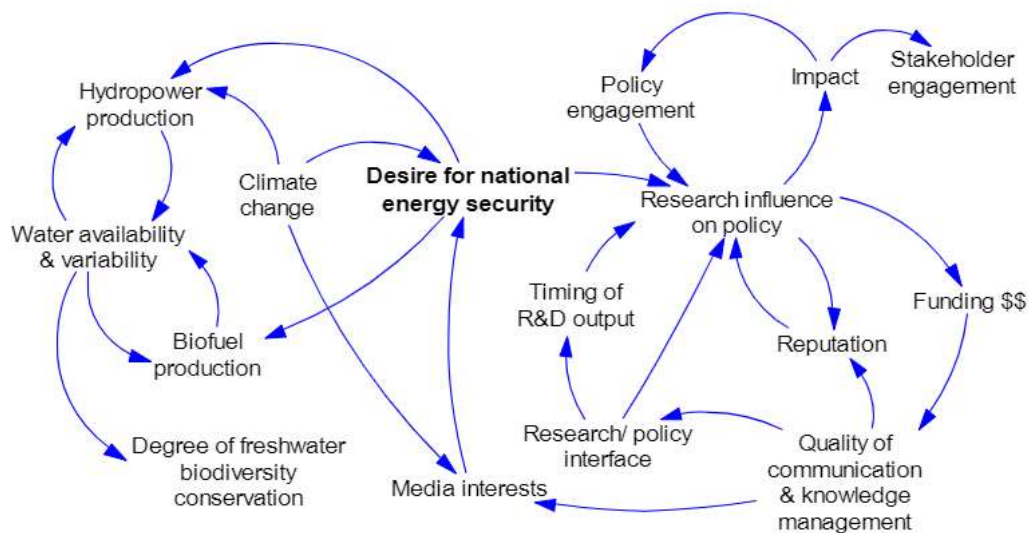

Figure 3. The influence diagram constructed by simplifying and blending the hypotheses expressed in the diagrams of participants AC and JP. Workshop participants were allowed 30 minutes to construct their blended diagrams. The process involved selecting key variables from their individual diagrams and then looking for the influence links between these variables.

It must be stressed, however, that the approach requires careful facilitation. The influence diagrams must be constructed in a disciplined manner if they are to be effective applications of the visual language. Group members also need to share an understanding of the basic 'stock-and-flow' metaphor of system dynamics, and concepts of framing and frame reflection. While still under development, this approach to dialogue has proved effective in a project to build an integrated approach to the management of Pambula Lake and Estuary, in efforts to develop community leadership skills in a six-month series of Local Leader workshops on the NSW Far South Coast, and in a one-day workshop, entitled *Towards an Australian Climate-Energy-Water Links Program*, held at the ANU in 2008. Figures 1, 2, and 3 were generated during the latter workshop.

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