Reconsidering technology transfer in a context of wicked problems:

Opening systemic co-inquiry in climate change research

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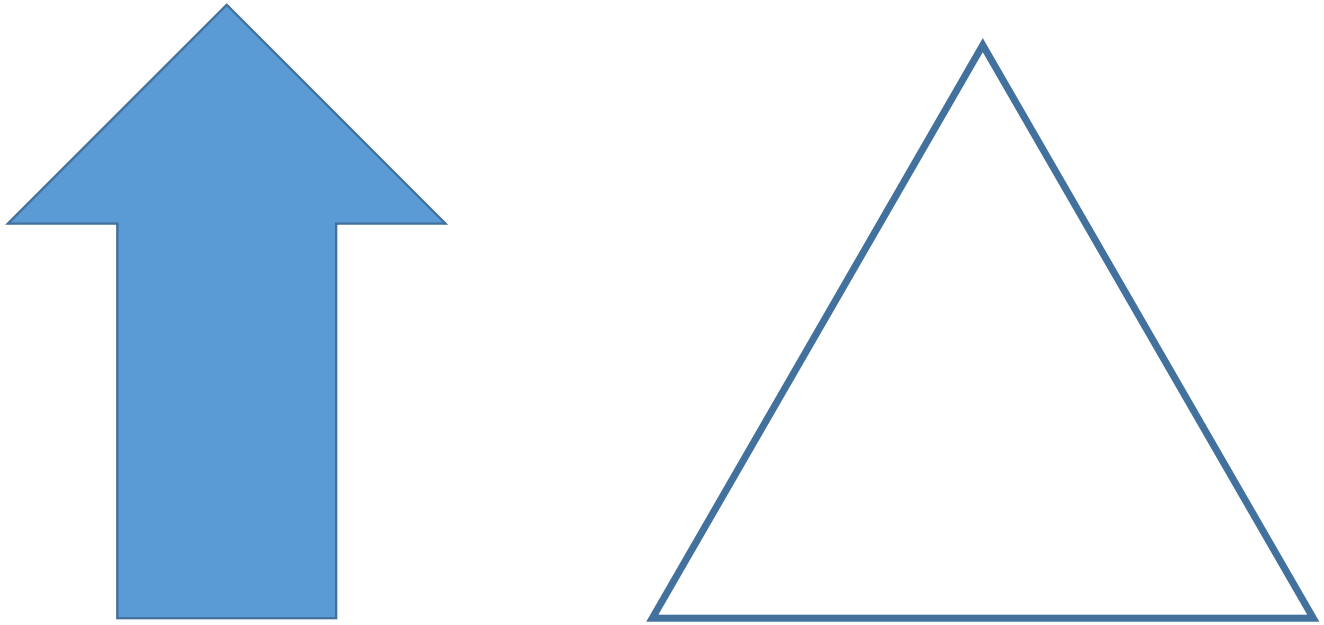

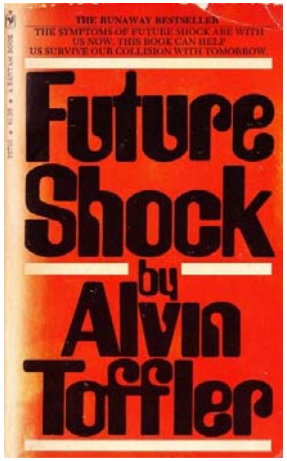

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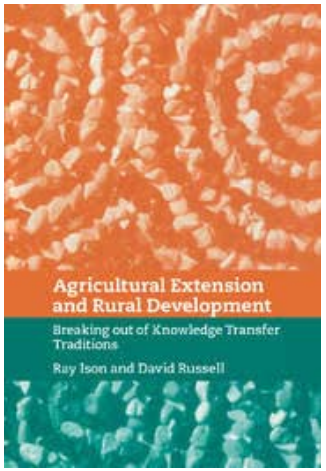

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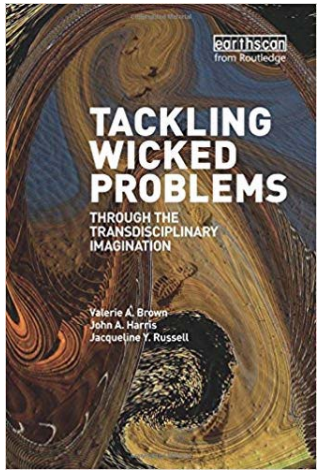

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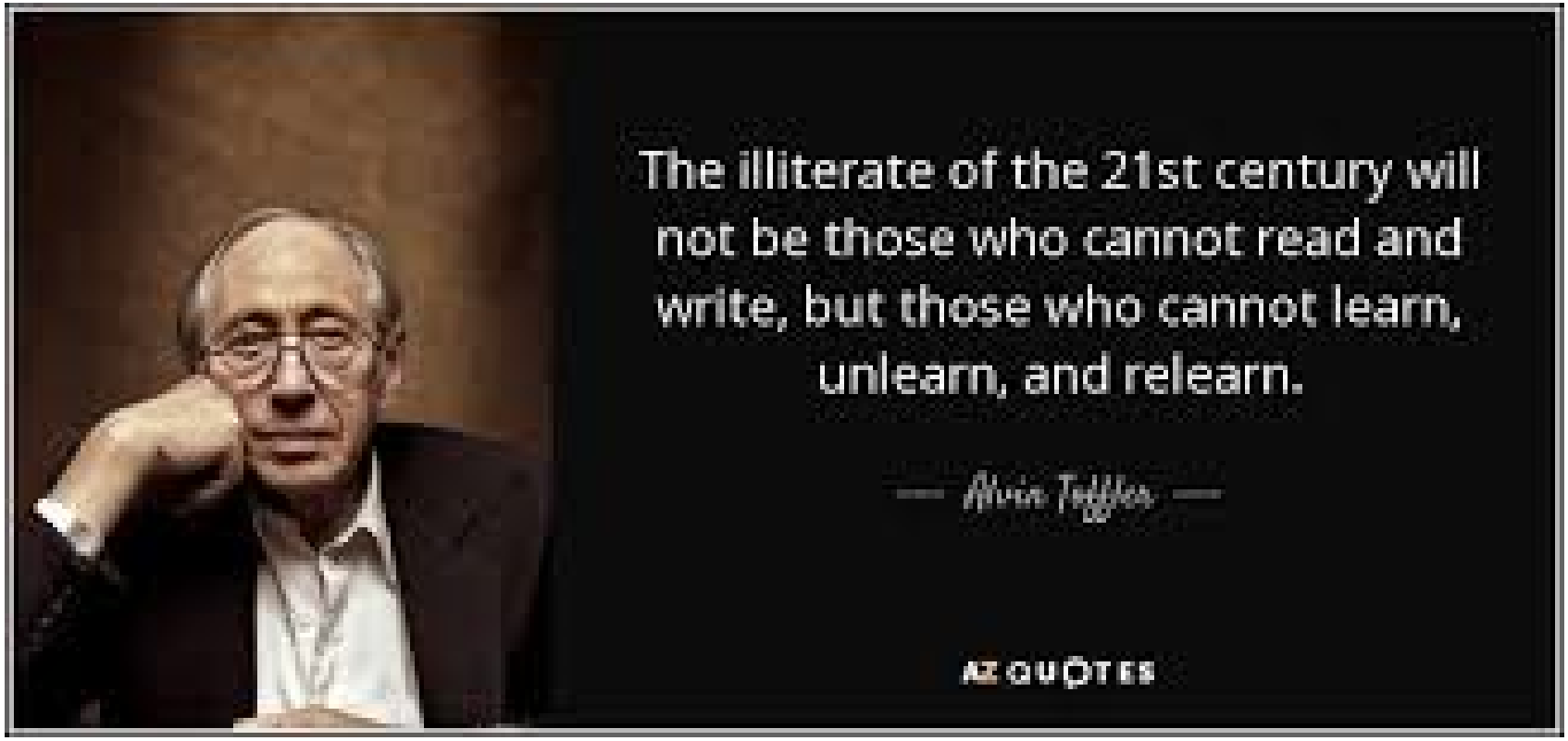

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.
— Alvin Toffler —
AZ QUOTES

Image source: Wahl, Apr 29, 2017

Four key features of “super wicked” problems

- time is running out;
- those who cause the problem also seek to provide a solution;
- the central authority needed to address it is weak or non-existent; and, partly as a result,
- policy responses discount the future irrationally. (Levin et al, 2012)

A systemic inquiry into climate change adaptation research

- Climate change adaptation is appropriately framed as a “wicked problem” involving uncertainty, complexity and risk.
- The research division directorate and managers regard systems thinking as an important capability for the delivery of high impact science to address wicked problems as evidenced by funding thus far for the systems initiative.
- Between 2006 and 2010, DPI invested $25M into climate change research including $5M into an adaptation research programme

How research mediates planning and action

Systemic Inquiry - considered how research practice mediates adaptation planning and action by looking at participants' different

- constructions of knowledge need,
- conceptual models of research,
- valuing of such concepts,
- connections between research activities and
- changes on the ground.

It offers a view of how, if at all, DPI achieves what it sets out to do as a CCA researching system.

Strategic shift toward developing partnerships

- Strategically there has been a stated shift away from a corporate approach to business management in the DPI towards developing partnerships and engagement with industry, community and other stakeholders.
- A new strategic goal of enabling government performance, in alignment with community expectations, e.g., in areas of economic, social and environmental outcomes that include attention to community safety and wellbeing and sustainable resource management, has been articulated.
- Our research suggests this strategic shift is yet to be fully mirrored in the project development process. It remains to be seen if this linguistic shift in policy is accompanied by on-the-ground change.

Understanding threat and addressing need

capabilities for dealing with climate uncertainty and less predictability in farming systems

- Perceived climate change threats:
  - retaining productivity and food security,
  - mental health and community wellbeing,
  - competitiveness and business sustainability, and
  - reactionary rather than anticipatory politics.
- As a result better
  - understanding of environmental interactions,
  - recognising social-economic consequences,
  - improving capacity for shared responsibility,
  - building local relevance of policy and science, and
  - facilitating new research relationships.

Research on the ground and how its valued

- Research is moving from a static environment of knowledge production focused on underlying causes to a dynamic one of understanding complex interactions and the patterns they give rise to.
- At the moment research is valued in a diversity of ways from the traditional, focused on ongoing production efficiencies, to concerns linking present decisions with future outcomes.
- Value is also placed on:
  - realising the conditions for optimising innovation,
  - facilitating a shared vision for investment, and in
  - developing dynamic modelling capability

… that can support an understanding of the interaction between changing biophysical and social realities

Opportunities for organizational learning

Opportunities for developing capabilities for dealing with climate uncertainty and less predictability that also builds CCA research practice through a model of organisational learning were identified:

- recognising the difference between formal and informal research networks;
- recognition of new biophysical and sociocultural relationships through research,
- rewarding +ve and –ve feedback and collaboration with research users;
- connecting across disciplines, concepts and models; and
- organisational structures to support integration (Artioli et al 2016).

Emergent properties and interpretive capabilities

- Against the certainties and stabilities of past research performance management through improved productivity (and publication rates) there is a need for better techniques for understanding and managing uncertainty and risk as emergent properties of complex interactions.
- To become more open to and realise emergence, and the opportunities for new ways of stabilising livelihoods against a more dynamic global market and climate, there is need to focus on knowledge resources as interpretive capabilities (and not just information flows).

Transforming research management practice

- DPI is undergoing a transformation towards accommodating a greater range of engagement with industry, community and other stakeholders and an enabling of wider departmental performance.
- Processes cannot be assumed to occur as intended in written documents - involving diverse stakeholding and novel relationships require conditions for building trust, recognising and accommodating differences.
- Closer research engagement requires a set of practices that existing management structures may not be equipped to coordinate - some structures of line management are inappropriate for open and contingent decision contexts, where outcomes cannot be known in advance.

Systemic and adaptive research management

Opportunities for design and development of systems thinking in practice (STiP) to support CCA research management:

- Connecting research up to decision makers in policy, business and communities;
- Increasing dialogues within internal and external communities of interest to engage with CCA research issues;
- Facilitating co-research with farmers and others willing to innovate as a device for opening up areas of leadership in CCA; and
- Facilitating social learning (Ison et al 2007) for increasing capacity in research management of complex issues.

Wicked problems … skills and capabilities

additional core skills (e.g., working cooperatively)

increasing understanding and stimulating a debate

effectively engaging stakeholders and citizens

understanding of behavioural change

holistic, not partial or linear thinking

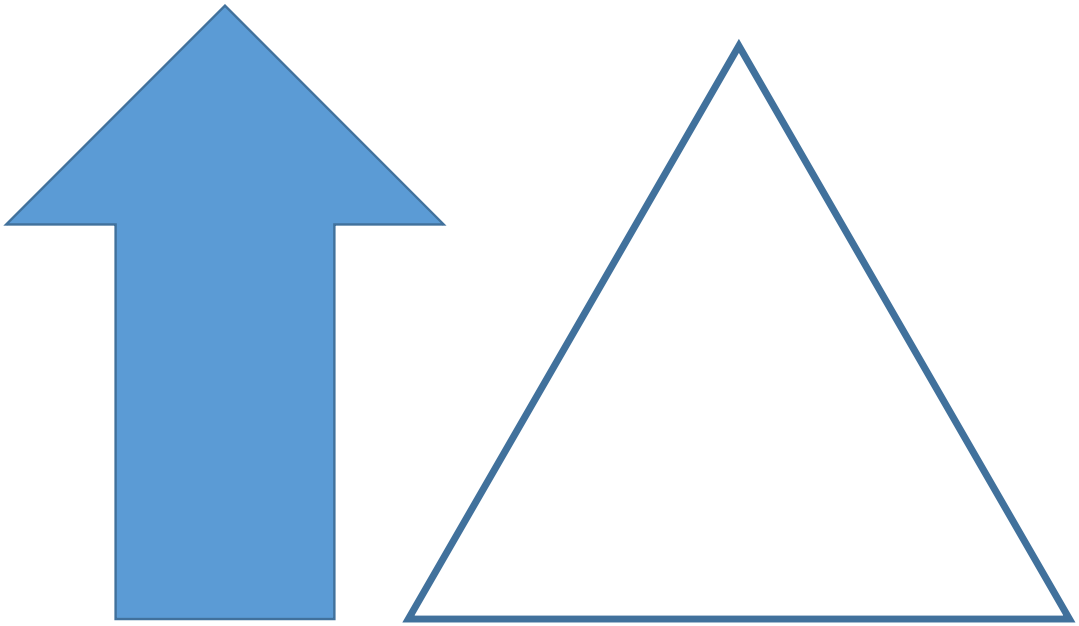
innovative and flexible approaches

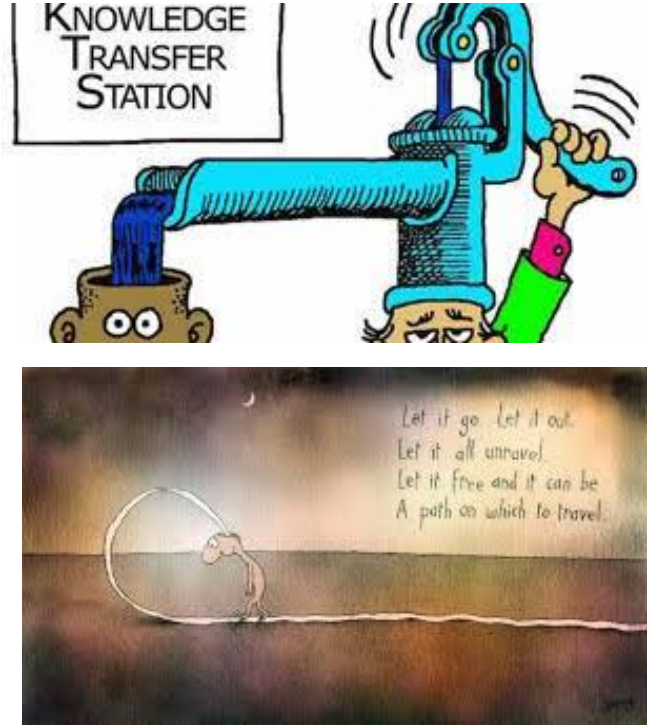
the ability to work across agency boundaries

comprehensive focus and/or strategy

(Australian Public Service Commission, 2007).

Why reconsider technology transfer





We need to amplify our rate of learning, to be more commensurate with the impact our technologies are having - both the desired and undesired

References

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