Transformative innovation:
What do applied innovation study solutions look like?

Innovation thought provoker by Dr Andy Hall
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Research and analysis of agricultural innovation processes and policies over the last 20 years has made a major contribution to scholarship on and the understanding of the nature of innovation. To an important, but much lesser degree this has also led to reframing practice at the research-innovation interface. Innovation studies (for want of a better word), like many branches of science, finds that it needs to deliver solutions across the full spectrum of discovery (concepts and theories) to application in both policy and practice domains. There is, however, a shift in the center of gravity of the discipline to a much more applied role, particularly where the discipline is housed as a value adding capability within applied research and innovation organisations like CSIRO, AgResearch New Zealand and possibly the CGIAR also.

This observation highlights a critical design challenge in a research and action program being developed on Transformational Pathways for New Zealand agriculture. Namely the need to find a balance of solutions across the discovery to practice domains, and the need to be able to articulate the nature of the solution both to inform the research and action design as well as to make a convincing funding case. This is particularly challenging at the theory into practice end of the spectrum where solutions look more like pervasive and progressive processes of institutional and practice change rather than prescriptions and widgets. More challenging, if we want to provide a solution to the question of how to we make innovation transformative, our solutions need to address capacity change across large swaths

of the innovation system. To use our own concept to explain the solution, it may well be that our solution is about how to enable new pathways to transformational pathways (gulp!). Our solutions are therefore more likely to be about prototyping catalytic change processes that others can then emulate in principle rather than prescription. And that needs to be explained in pragmatic language to funders and other stakeholders. Not easy ☺

The following tables attempt to depict different categories and examples of solutions. Table 1 describes 5 different solutions categories and their interrelationships and Table 2 tries to specify what these solutions might look like in more detail. Note that these solutions are not stand alone, nor are the means of developing them independent. Rather they iterate with each other in feedback loops. Trying to map this out not only reveals an ambitious agenda, but also underlines the difficulty in articulating solutions. However, the discipline of doing it forces one to think hard about what can be offered as a solution as well as where the emphasis needs to lie. I would put my money mostly on solution areas 3 (design solutions aka framing practice) and 4 (situated solutions aka making things happen in a context). That is not because I don't think that the foundation science aspect (1 and 2) are not important (and indeed there is a lot in those categories because of my own comfort zone). Rather because solutions 1 and 2 are a means to an end to deliver solutions in categories 3 and 4 and that is where solutions are most is needed. Solution 5 is obviously critical, but its major multi decade job.

Table 1: Different solutions and their inter-relationships

1. Science solutions	2. Resource solutions	3. Design solutions	4. Situated solutions	5. Systems framing solutions
Contributions to the science of transformative innovation	Practice and policy analytical frameworks	Testable theory based practice propositions	Situated practice. Institutional and policy solutions for live transformation cases	Principles for practice, organisational and policy change for transformation
	Data sets and case studies			
	Contextual / diagnostic analysis	Testable transformative pathway propositions		New patterns of stakeholder alignment and collaboration for transformation
	Tools and methods			
⇦⇨ **Constant iteration and learning loops** ⇦⇨				

Table 2: The different solutions explained in detail

Solution category	Why needed by who	Solution description, examples	Means of developing solutions	Notes
1. Science solutions				
Contributions to the science of transformative innovation.	Weakness in current conceptual constructs to adequately explain, analyse and guide transformational innovation in the agricultural sector. Need to adapt existing concepts to fit agriculture. **Who**: The science community	An overarching conceptual framework that explains the role and relationship between different elements of the transformation process. Could manifest as grand overarching paper (s) Or a portfolio including conceptual and case study based works.	Review of existing concepts, integration of existing concepts, iterated by testing with historical and live analysis of transformation processes. Peer review publication and allied contributions to the science community	Needs to be continuously revisited during life of the project

Solution category	Why needed by who	Solution description, examples	Means of developing solutions	Notes
2. Resource solutions				
Practice and policy analytical frameworks (including tools and methods)	Absence/ weakness of practical frameworks to explore practice and policy domains from a transformative innovation perspective. **Who:** Policy advisors and investment planners	Theory-backed guidance that frames the analysis of practice and policy performance in terms of transformational innovation capability. Examples include guidance on: • Analysis of transformational pathways • Analysis of scaling processes • Research investment portfolio analysis. • Indicators and measures of transformational innovation capacity and performance (benchmarking. • Evaluating transformational innovation investments. • Analysis of governance and political economy of transformational innovation.	Testing of applied analytical frameworks developed from theory on historical and contemporary cases of transformation. Stakeholder consultation to fine tune design parameters and focus on situated practice and policy challenges / co-develop. More like guidance documents than peer review, but needs peer review legitimization.	Feels like it includes tools and methods. Political economy of existing frameworks needs to be understood and worked with
Contextual / diagnostic analysis	Limited information policy and practice relevant information on the drivers and limitations to transformational innovation. **Who:** Policy makers, research managers, private sector and civil society organisations	Diagnostic analysis of transformational domains (i.e. live cases) as well as broader innovation system. Might include: • Identification of historically determined path dependences and lock-ins.	Research on performance of transformational domains and national settings. Uses comparative analysis across domains and countries as well as more targeted analysis	

Solution category	Why needed by who	Solution description, examples	Means of developing solutions	Notes
		- Explaining and learning lessons from historical transformational pathways. - Analysis of global and national business and policy trends and drivers shaping innovation. - Assessment of the performance of research investment patterns/ institutional arrangements/ governance arrangements.	Stakeholder consultation and co-development. Looks like a combination of authoritative reports, backed by peer review, but more important socialized through stakeholder consultation throughout.	
Data sets, evidence and lessons	Limited documentation of transformational innovation processes and impacts and limited evidence of the nature of transformational practices and polices. **Who:** Decision makers across practice to policy scales and the science community.	A portfolio of case studies, practice notes, most significant change stories, and impact assessments. Synthesis of lessons learnt from historical transformational pathways.	Historical and contemporary case studies. Reflections from practice. Impact assessment studies	
3. Design solutions				
Testable theory-based practice propositions. (*similar to Theory of change*)	Current practice, approaches and organizational designs framed by historical views of research and other stakeholder	Contestable, but practical guidance / roadmaps on approaches, ways of working and organizational designs needed to enable transformational	Needs to be developed contextually in live case domains to develop case specific practices, approaches etc. Co-development with stakeholders in domains.	This is the shape end of the second proposition below

Solution category	Why needed by who	Solution description, examples	Means of developing solutions	Notes
	engagement with innovation processes. **Who**: Research and farming practitioners and their partners.	innovation in selected domains. Looks like an action plan coupled to an appropriate ME&L system.		
Testable transformation pathway propositions	Limitations of current innovation pathways during historical origins, institutional and political economy lock in in. **Who:** Direction setting stakeholders from both policy and practice fields	A portfolio of scenarios for the transformation of selected domains and national systems developed and validated by key stakeholder groups. This might look like industry innovation road maps. Revisiting them annually would keep the conversation going and help track progress and changing contexts	A series of stakeholder consultations and multi-stakeholder scenario/ fore sighting exercises	This provides the framing for the more practice oriented propositions above.
4. Situated solutions				
Situated practice, institutional and policy solutions for live transformation.	Limited capacity to think and work systemically for transformational innovation. Institutional constrains in the function and configuration of existing innovation system. **Who:** Direction setting stakeholders from both policy and practice fields	• On specific live transformation cases: Systems mapping and diagnosis. • Capacity building for individual and collective action. • Mechanisms for convening stakeholder action across scales (farm to policy). • Mechanism for strengthening stakeholder alignment at macro/system level (direction setting).	Action research, implementation support and mentoring, support to reflection and learning. Targeted practice and policy analysis. **KEY RESEARCH QUESTION: How can transformational processes be catalysed?**	Practice, institutional and policy solutions needs to be evaluated in terms of social, economic and environmental performance

Solution category	Why needed by who	Solution description, examples	Means of developing solutions	Notes
		- Reconfigured governance arrangements. - Policy options - Relevant ME&L arrangements.		
5. System framing solutions				
Principles for practice, organisational and policy change for transformation.	Limited guidance on and appreciation of the principles of how (also when and if) to initiate, enable and catalyse transformative innovation pathways. **Who:** all stakeholders	Meta narrative of the principles of enabling transformational change. But also … A Coalition of interest / practice that progresses these ideas and principles across scale, but particularly at macro scales. (*This might be a stand-alone solution*).	Synthesis of principles from situated action research, historical cases and theory. The development of a much wider alliances beyond the research and agricultural community.	Huge political economy faced by this solution.

WANT MORE INFORMATION

For examples of the solutions referred to in this thought provoker:

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