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Beyond Randomised Controlled Trials - expanding the horizon for experimental research techniques in the social sciences

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Version: Published Version

Online resource:

Breckon, Jonathan and Sutherland, Alex (2020) Beyond Randomised Controlled Trials - expanding the horizon for experimental research techniques in the social sciences. Impact of Social Sciences Blog (21 Jan 2020). Blog Entry.

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Four principles for practising and evaluating co-production – a view from sustainability research.

The co-production paradigm has become commonplace across many disciplines as a means of orchestrating the production of useful knowledge aligned to different social needs. Drawing on the expertise of 36 co-production practitioners in the field of sustainability research, Dr Albert Norström, Dr Chris Cvitanovic, Dr Marie F. Löff, Dr Simon West and Dr Carina Wyborn, present a new working definition of co-produced research and suggest how different elements of successfully co-produced knowledge can be understood and evaluated.

The archetypal model of academic knowledge production can be described as follows: Lone researchers identify issues or problems, they carry out research to address them, then reveal this new knowledge to society, where it is ultimately adopted. The process is linear and individualised.

In recent years the deficiencies of this model in addressing all manner of contemporary issues, as well as sustainability problems, such as; water scarcity, food security, and biodiversity loss, have become all too clear. Plagued by social and political uncertainty and involving multiple actors with different knowledge, needs and interests, sustainability research has increasingly turned to co-production as a means to produce 'useful' knowledge.

However, knowledge co-production is defined and operationalised in diverse, and sometimes contradictory, ways. Notably, frameworks to assess its quality or success are lacking. This is hampering the ability to compare and learn from the outcomes of existing co-production process and improve its practice.

To address this issue, we [mobilised](#) the experiences and perspectives of 36 leading researchers and practitioners from across the globe to generate the following definition of knowledge co-production for sustainability research:

“an iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future.”

Drawing on our expertise, we argue that successful knowledge co-production is more likely if it adheres to the four following principles:

- *Context-based*: The process should be grounded in an understanding of how a challenge emerged, how it is affected by its particular social, economic, political, and ecological contexts, and the different beliefs and needs of those affected by it.
- *Pluralistic*: The process should explicitly recognise a range of perspectives, knowledge, and expertise and consider gender, ethnicity, and age in development.
- *Goal-oriented*: The process should articulate clearly defined, shared and meaningful goals that are related to the challenge at hand
- *Interactive*: The process should allow for ongoing learning among actors, active engagement and frequent interactions

Engaging in meaningful co-production

Beyond being a purely theoretical exercise, we also wanted to provide concrete, practical guidance and insights for researchers and practitioners trying to set up their own co-production processes. By digging deeper into three case-studies (from Colombia, Papua New Guinea, and Canada) we explicitly highlight some of the practical nuances, and challenges, in applying these principles.



A key feature of successfully co-produced research is the amount of “advance work” – such as building trust and revealing tensions and expectations between collaborators – that is needed before knowledge-generation begins. In fact, this advance work can have profound effects, as knowledge co-production processes are heavily influenced by the circumstances of their creation. This includes prior collaborations with researchers, conceptual insights obtained in previous projects, long established research sites, or earlier interactions with stakeholders.

Further, successful knowledge co-production processes often require a political window of opportunity or ‘hooking point’ to provide a tangible starting place for the process. For example, in Colombia, a national process to revise the management framework for Colombian protected areas, together with international commitments, provided opportunities for a co-production process focusing on new ways of understanding and managing Colombian protected areas in the face of ongoing ecological change.

Finally, we also tapped into the growing literature on evaluating research impact to provide broad evaluation strategies for context-based, pluralistic, goal-oriented, and interactive knowledge co-production. We summarise those below:

- *Assessing the Context-based principle:* Capture the degree to which a co-production process is effectively situated within a particular place, set of relationships, or an issue. For example, did the request for co-production originate from an actor already encountering the problem addressed? Are the goals of the co-production process linked to the existing priorities and activities of partners working in the context? Participatory evaluation frameworks and methods are useful to assess this principle.
- *Assessing the Pluralistic principle:* Capture different elements of diversity within a co-production process (e.g. inclusiveness, procedural justice, diversity in knowledge systems). Use qualitative indicators and approaches (e.g. written reflections, narrative indicators, and recurring surveys) to record whether the knowledge and perceptions of different participants are properly mobilised and included in the process.
- *Assessing the Goal-oriented principle:* Focus on the degree to which a co-production process enables the generation, revision, and achievement of desired goals, outcomes, and impacts. For example, is knowledge generated directly informing management or policy decisions. Outcomes such as building new understandings, relationships, and social networks can be captured through evaluation approaches that measure contribution to change throughout a process.
- *Assessing the Interactive principle:* Capture the nature, frequency, and quality of interactions between participants through simple quantitative tools (e.g. meeting minutes) or richer qualitative approaches (e.g. interviews and surveys). Assessing this principle should also focus on capturing learning, how the perceptions of actors change throughout the process, and the degree to which a shared perspective on the problem emerges.

Conclusion

We welcome the rapid gain in currency that knowledge co-production has achieved. Compared to disciplinary research processes, knowledge co-production provides a richer, more diverse, and more legitimate understanding of the multiple drivers, interdependencies and complexities of global sustainability challenges, as well as of the decision contexts in which research will be applied. This suggests that co-produced knowledge is better able to contribute to the development of robust solutions and their effective, equitable implementation. Our four principles seek to guide and inspire researchers, practitioners, programme managers, and funders seeking to engage in co-produced sustainability research. They should not be seen as a definitive list, and we hope that they serve as a stimulus for further discussion and their continued refinement.

*This post draws on the authors' paper, [Principles for knowledge co-production in sustainability research](#), published in *Nature Sustainability*.*

About the authors



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Dr Chris Cvitanovic is a Transdisciplinary Marine Scientist working to improve the relationship between science, policy and practice to enable evidence-informed decision-making for sustainable ocean futures. In doing so Chris draws on almost ten years of experience working at the interface of science and policy for the Australian Government Department of Environment, and then as a Knowledge Broker in CSIRO's Climate Adaptation Flagship. Find Chris on Twitter [@ChrisCvitanovic](#).



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Dr Simon West is a postdoctoral researcher in sustainability science at the Stockholm Resilience Centre, Stockholm University. His research explores the ways in which people generate, share and use knowledge in relation to complex social-ecological issues. He is currently engaged in two collaborative research projects: working with the Arafura Swamp Rangers in Northern Australia to co-produce an intercultural monitoring and evaluation system, and with the Village of Wainwright in North Slope Alaska to explore human responses to ecological regime shifts. Find Simon on Twitter

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