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Enhancing adaptive capacity through co-production of knowledge in New Zealand

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Abstract:

Climate Changes, Impacts and Implications for New Zealand (CCII) is a four year interdisciplinary research project 2012-2016 with the overall remit of updating and improving the relevance of projections of climate trends, variability and extremes across New Zealand for enhancing the adaptive capacity of decision-makers. A unique aspect to the project is the strong focus it places on engaging with co-production of knowledge methods in order to achieve its aims of enhancing adaptive capacity and increasing co-ordination to support decision-making in New Zealand. Co-production of knowledge sees scientific knowledge as being produced through engagement with the scientific method while considering the social context. It challenges the traditional scientific model practiced in the physical sciences where the social context - in this case the decision-making practices of private and public stakeholders in relation to climate change adaptation - is not considered. The co-production of knowledge approach thus places demands on both the research project scientists and the stakeholders involved to rethink the *modus operandi* in traditional science research processes. The learning outcomes presented in this paper are drawn from an interview held with members of the CCII research team tasked with the implementing the co-production of knowledge aspects of the project and engaging others in this process. Key learning outcomes internal to the project team include the importance of learning how to have different kinds of conversations on how science is practiced, building trust, and the importance of interpersonal relationships and existing networks. Key learning outcomes for the stakeholder to researcher interactions include the importance of initial conversations with stakeholders in shaping the research, creating the space for this type of discussion to take place, and working within exiting decision-making frameworks,

such as those related to business risk and public sector responsibilities that are challenged by changing climate.

Keywords:

Collaborative learning, Decision-making, Governance, Climate change knowledge.

1. Introduction

This paper explores the application of the co-production of knowledge approach (Jasanoff, 2004) for increasing adaptive capacity as applied in a New Zealand-based national-scale research project.

Climate Change, Impacts and Implications for New Zealand (CCII) is a four year interdisciplinary, multi-agency research programme (2012-2016) with the overall aim of updating and improving projections of climate trends, variability and extremes across New Zealand, generate new knowledge about potential impacts of climate change on natural and socio-economic systems and increase the relevance of climate science and decision-making capacity to consider climate risks through collaborative learning processes. The project comprises of five interrelated research aims including climate modeling, futures scenario development, case studies based on geographic domains from the mountains to the sea, integrative national-scale systems modeling, and understanding and developing decision-making capacity (Figure 1).

The paper outlines the concept of collaborative learning as realised through the co-production of knowledge model in Section 2. Section 3 presents the research methods. Key learnings to this point associated with the application of the co-production of knowledge approach are presented in Section 4. Conclusions and further work can be found in Section 5.

2. Collaborative Learning Methods

Co-production of knowledge was developed within the field of Science and Technology Studies (STS) and views both the social context and the scientific method as integral to the creation of scientific knowledge (Jasanoff, 2004). Roger Pielke (2007) points out that climate science often pays little interest to the importance of the co-production of knowledge especially when it enters the policy-making space. He argues the importance of being upfront about the implicit political nature of climate change assessments and promotes the idea of being an “honest broker” when it comes to the co-production of science and policy. The CCII project attempts to address this issue by engaging in a co-production of knowledge or social learning process (Steyaert and Jiggins, 2007). Social learning is concerned with transforming given problems into concerted action. It realises this process through facilitating learning processes and

coordination among stakeholders. Facilitation here is understood as the combination of skills, activities and tools used to support and guide learning processes among stakeholder groups.

3. Research Methods

We conducted a semi-structured interview with three researchers from the research project team who are focused on enhancing capacity and increasing co-ordination to support decision-making (Research Aim 4). The aim of the interview was to determine the effectiveness of the co-production of knowledge approach both internally within the project research team itself and externally between the research team members and stakeholders or practitioners. The interviewees were asked to explain the different ways researchers and practitioners are interacting in the project, to identify learning outcomes in the project to date associated with undertaking a multi-disciplinary project such as CCII and in understanding the decision-making contexts of external participants in the research in a climate change context. We wanted to critically assess if the co-production of knowledge approach is responsible for developing new knowledge.

4. Learning Outcomes

4.1 Learning Outcomes within the Project Research Team

We found that making the co-production of knowledge approach explicit at the start of the project was critical to its integration across the project research components. The interviewees spoke of past involvement with projects where stakeholder involvement and related co-production of knowledge was not fully integrated throughout the research. Consequently they failed to provide any meaningful co-generated new knowledge that had value for the research or built capacity amongst the stakeholders.

The framing of the CCII project in a co-production of knowledge context presented some challenges to members of the internal project research team. The CCII project team includes a large range of scientists with diverse backgrounds in the biological sciences, physical sciences and social sciences. For many of these researchers their conceptions of the practice of science did not encompass a co-production of knowledge approach and was outside their experience. The standard scientific method where scientists pose a research question of interest, apply a technical methodology and then produce results often does not require inputs from stakeholders or external practitioners. In such a model the research outputs are presented to the stakeholders after their generation, but are not shaped by them and can then lack relevance. In the co-production of knowledge approach the stakeholders or practitioners form part of the research process through regular interactions which helps to shape the research questions, the research approach, and the format and content of the final outputs. The framing of the CCII project to contain a

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strong focus on the co-production of knowledge has thus created the need for the scientists on the project team to “buy into” and be participants in the research process. This has resulted in an ongoing and iterative conversation within the research team around how to carry out the research programme. This has also been challenged by researchers being located in a number of different research organisations that have different organisational objectives quite apart from the different research disciplines at play.

“Buy-in” relies upon building trust within the project research group. Trust is a factor that takes time to grow and develop in groups and is an important component of successful interdisciplinary, inter-agency research projects (Few *et al.*, 2007). It can be gradually built up within a research team over the life of the project or, if possible, developed through previous working relationships. A strong sense of trust within the group can facilitate internal conversations and help to get “buy in” from the research team members on the project goals and methods for achieving them. This is especially important when definitions and concepts need to be carefully defined and agreed upon between a large team of scientists coming from a range of research backgrounds, rather than just assumed. This challenge has been ongoing throughout the first half of the programme.

The final learning outcome was associated with narrative development through the internal interactions of the research team. This focused on generating a comprehensive narrative for the project through communities of practice across five geographically located case studies across New Zealand which are generating decision-relevant knowledge to inform the modelling. The value of the narrative to contextualise the modeling of impacts is based on qualitative climate and non-climate issues that inform stakeholder decision-making

4.2 Learning Outcomes between the Project Research Team and Stakeholders or Practitioners

We found that some of the initial conversations with stakeholders helped to shape the research carried out in the project. For example business decisions to fish or not fish were strongly driven by the prevailing wave and wind conditions factors that had not been identified by the modellers initially in their modeling work. These interactions through workshop or interview format allowed the research scientists and stakeholders or external practitioners to discuss key elements and expected outputs of the CCII project. Through sharing their expectations of the research outputs the external stakeholders and practitioners were able to engage with the scientists and learn more about the range of impacts and implications of climate change relevant to their sector or interest. At the same time these external stakeholders and practitioners were able to inform the research scientists of some of their specific interests and concerns. There were also instances of the practitioners and external stakeholders sharing data and model outputs

with the research project scientists. The research questions and modelling approaches were influenced through these interactions.

A focus of the CCII project is building the capacity of stakeholders to include consideration of climate change in their decision-making processes. One of the learning outcomes relevant to this aim is that any climate change impacts and implications considerations need to fit within that organisation's existing management systems. This makes it much more likely that climate change impacts and implications will be considered and appropriate actions taken through existing business risk management activities and plans.

Another learning outcome identified is the importance of the facilitation of a discussion space for stakeholders and practitioners amongst themselves. Many of the stakeholders involved in the project have reported that the discussions with the research project scientists and other stakeholders have provided an invaluable forum for them to engage with. These discussions provide an opportunity for them to interact with and share information with stakeholders who may have similar interests or concerns but who they would normally not have the opportunity to meet with.

Finally, the co-production of knowledge approach has allowed stakeholders and external practitioners to take ownership and shape the creation of research outputs to a much greater degree than in the traditional model of science knowledge production that has minimal or no stakeholder engagement. The sense of ownership and increased knowledge of the impacts and implications generated has empowered stakeholders and external practitioners by allowing them to move from viewing climate change impacts and implications in the problem space to moving them into a solution space.

5. Conclusions and Considerations for Further Work

These initial learnings suggest that engagement with the co-production of knowledge approach in the CCII research project poses both considerable challenges and also significant potential rewards.

The challenges have been internal and external to the programme. Internal challenges are centred around achieving "buy-in" for the co-production of knowledge method from the research scientists involved. External challenges have focused on managing stakeholder expectations as they become involved in the research process. Moving the stakeholders into a position of ownership in relation to the research process without raising their expectations of the outcomes has been challenging. The co-production process enables their engagement in the research design and execution but the ability to tailor the research outputs specifically to their needs will be challenging and this needs to be communicated effectively.

Potential rewards achieved by engaging with the co-production of knowledge approach are also evident on both the project team side and with the external interactions between the project team and stakeholders and practitioners. From the project team side the co-production of knowledge method can help to increase the usability and relevance of the climate science outputs generated in the CCII project. It can create a higher standard of research output that captures interactions and system externalities more completely as outputs have already been checked against the range of concerns on the ground during the research process. This gives an explicit success factor at the end of the project, rather than relying on transfer of knowledge at the end of the research process. From an external interactions perspective, by engaging the research scientists with stakeholders and practitioners, the scientific outputs can be framed in a manner that is more accessible and relevant to the stakeholders.

Such learnings from the co-production of knowledge process will be captured in an evaluation framework based by classifying stakeholder groups into actors with private, public or influencer interests to gain an understanding of the different types of decision-making drivers at play when considering climate changes.

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Bio:

Stephen received his Bachelor of Commerce International (German) from the University College Dublin (UCD) Quinn School of Business in 2004. He obtained a MA in European Studies from the UCD School of Politics and International Relations (SPIRe) in 2007, writing his MA thesis on the EU Emissions Trading Scheme (EU ETS). He also holds a postgraduate Diploma in Statistics from Trinity College Dublin (2008) and a Practitioner Level PRINCEII Professional Certificate in Project Management. He successfully defended his doctorate at the Irish Climate Analysis and Research Units (ICARUS) at the National University of Ireland, Maynooth in August 2012. His thesis title is: "Climate Change and Potential Economic Impacts in Ireland: The Case for Adaptation". The PhD thesis explores a number of key economic impacts associated with climate change in Ireland.

Stephen is currently working as a Postdoctoral Research Fellow at the Climate Change Research Institute (CCRI) in Victoria University of Wellington, New Zealand. His research is focused on climate change adaptation, communication and decision-making associated with the interdisciplinary Climate Changes Implications and Impacts (CCII) project.

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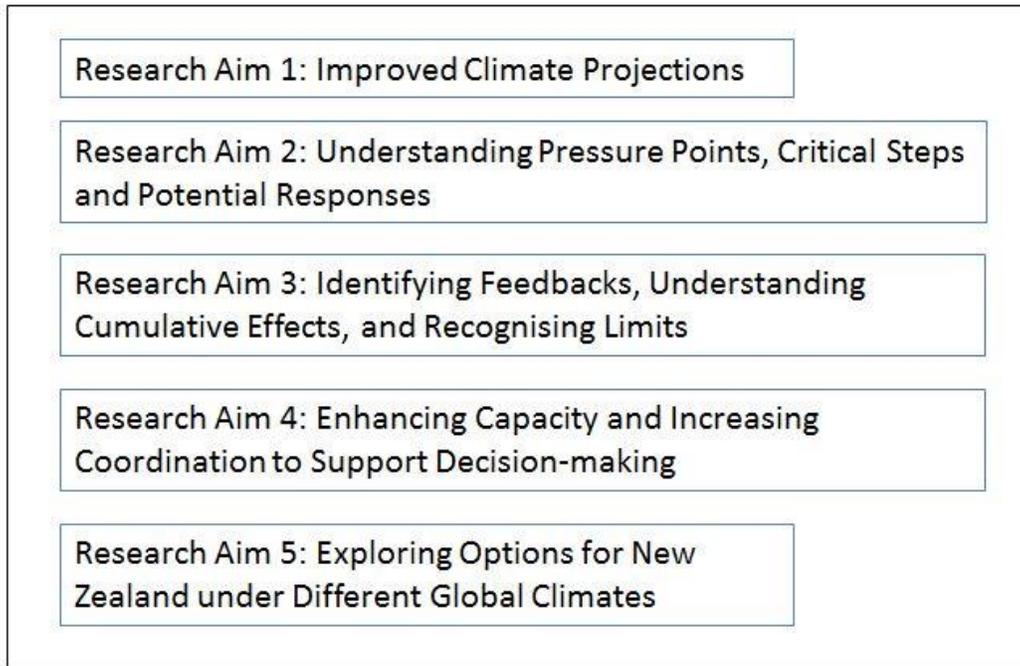


Figure 1: The Five Research Components of the Climate Changes, Impacts and Implications for New Zealand Project.