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Five principles for the practice of knowledge exchange in environmental management

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ABSTRACT

This paper outlines five principles for effective practice of knowledge exchange, which when applied, have the potential to significantly enhance the impact of environmental management research, policy and practice. The paper is based on an empirical analysis of interviews with 32 researchers and stakeholders across 13 environmental management research projects, each of which included elements of knowledge co-creation and sharing in their design. The projects focused on a range of upland and catchment management issues across the UK, and included Research Council, Government and NGO funded projects. Preliminary findings were discussed with knowledge exchange professionals and academic experts to ensure the emerging principles were as broadly applicable as possible across multiple disciplines. The principles suggest that: knowledge exchange needs to be designed into research; the needs of likely research users and other stakeholders should be systematically represented in the research where possible; and long-term relationships must be built on trust and two-way dialogue between researchers and stakeholders in order to ensure effective co-generation of new knowledge. We found that the delivery of tangible benefits early on in the research process helps to ensure continued motivation and engagement of likely research users. Knowledge exchange is a flexible process that must be monitored, reflected on and continuously refined, and where possible, steps should be taken to ensure a legacy of ongoing knowledge exchange beyond initial research funding. The principles have been used to inform the design of knowledge exchange and stakeholder engagement guidelines for two international research programmes. They are able to assist researchers, decision-makers and other stakeholders working in contrasting environmental management settings to work together to co-produce new knowledge, and more effectively share and apply existing knowledge to manage environmental change.

1. Introduction

The last twenty two years since the Earth Summit in Rio in 1992 have seen a proliferation in environmental management research that can be used to guide policy and practice (Fazey et al., 2005; Felton et al., 2009; Lawler et al., 2006). However, simply creating and accumulating more knowledge does not necessarily translate into better practice (Fazey et al., 2014). The extent to which knowledge generated through research is likely to inform policy and practice depends on its relevance, legitimacy and accessibility (Leviton and Hughes, 1981; Pullin and Knight, 2001; Pullin et al., 2004; Contandriopoulos et al., 2010; Stringer and Dougill, 2013). These aspects in turn depend on how knowledge is produced, shared with and between those who might use it, translated and/or transformed as it is shared, and the social context in which people learn about new knowledge (Reed et al., 2010, 2013). In this paper we refer collectively to such processes as 'knowledge exchange' (KE). KE typically takes place between three, usually highly heterogeneous, groups (knowledge producers, intermediaries and those who use the knowledge; Contandriopoulos et al., 2010), and may lead to impacts on policy and practice that may be conceptual (raising awareness and changing beliefs or thinking), instrumental (direct changes to policy or practice) or symbolic (justifying existing policy or practice) (Rudd, 2011). Enabling more effective KE

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between research producers and users has the potential to significantly enhance the impact of environmental management research, policy and practice.

This is of crucial importance to the generation of evidence-informed policy and practice relating to environmental management (Rudd, 2011). Evidence-based policy is often considered in simplistic ways given its positivist assumptions and reliance on a technical approach to policy-making (Stanhope and Dunn, 2011; Geyer, 2012), and lacks the sophistication necessary for complex policy areas like environmental management. However, the rapid rise in popularity of the evidence-based approach has put pressure on policy-makers to search for evidence far and wide, sometimes transferring policies and their associated evidence bases across continents (Legrand, 2012). The growing importance attached to research by policy-makers and practitioners in environmental management requires an increasingly close relationship between researchers and those who are likely to use their findings. However, those who wish to use research, often express frustration at the barriers they face, for example poor communication and dissemination of research, lack of technical expertise to interpret and apply research findings to their decision-making context, and the mismatch in timescales between research and policy cycles (e.g. Hyder et al., 2011; Fazey et al., 2013).

Although there is a growing body of experience emerging in KE for environmental management, there has been very little consolidation of what has already been learnt and what needs to be done to improve the practice of KE. Consequently, KE is often conducted on an *ad-hoc* basis, based on 'what seems to work' with little theoretical, methodological, or empirical grounding, and without any systematic evaluation. Although there is growing interest in tracing the pathways through which research influences decisions in policy and practice (Holmes and Clark, 2008), results are not reported in a way that can assist the wider community to learn how to build better KE processes in future (Fazey et al., 2014). Thus, despite considerable conceptual understanding of the kinds of KE processes that work well, in environmental management there is still a distinct lack of both understanding of KE pathways and limited empirically founded guidance available for researchers who wish to facilitate KE to achieve beneficial impacts from their work. This paper addresses this gap by eliciting and synthesising the expertise of practitioners to identify key principles for the practice of KE in diverse multi-stakeholder research projects related to environmental management.

This paper systematically analyses experiences of KE activities from the perspectives of 32 researchers and stakeholders involved in 13 environmental research projects working on catchment management and uplands in the UK. By focussing on projects working in similar contexts, it was possible to ensure that stakeholders and barriers to KE were likely to be broadly similar between projects. This enabled the research to distinguish the effects of different approaches to KE, rather than focusing on the effects of doing KE in different contexts. Catchment management and uplands were chosen as a research context that typically requires interdisciplinary and transdisciplinary working, spanning a variety of different knowledges and stakeholders, where there was a range of projects currently or recently engaged in KE. Our research identifies the factors and conditions that enhance or inhibit KE and identifies how KE can be designed and implemented more effectively to support environmental management. The findings from the research provide guiding principles for KE in environmental management, which are of value to researchers, policy-makers, practitioners and other stakeholders working in environmental management. They have been used to develop KE guidelines for the UK's largest funder of environmental research, the Living with Environmental Change partnership (LWEC, 2012). They have also directly informed the development of the EU Biodiversa programme's Stakeholder Engagement Toolkit (BiodivERsA, 2014). The paper first outlines the research design and methodology. The results then explain the principles, while the discussion draws out the relevance of the principles for KE at two scales: in single projects and multi-projects (programmes).

2. Methods

Fig. 1 provides a schematic overview of the methodology employed. First, peer-reviewed and grey literature was critically reviewed (Evely et al., 2012). From this, a set of initial questions was developed and key experts were identified for inclusion in an initial Delphi structured process (see Linstone and Turoff, 1975). The Delphi process culminated in an expert workshop with twenty KE specialists representing a range of disciplines, for example education, linguistics, communication, ecology, human geography and international development (for detailed methods, see Fazey et al., 2013). This aimed to gain a deeper theoretical understanding of KE and to refine the research questions to ensure they targeted key knowledge gaps.

The finalised research questions were then turned into a semi-structured interview guide (see supplementary material), and one-hour long interviews were conducted with 32 respondents (including 8 principal investigators, 11 project managers, 4 researchers, 8 non-academic stakeholders and 1 facilitator) from across the 14 upland and catchment management research projects selected for the research (Table S1, supplementary material). Projects were selected to: represent a range of geographical contexts from across the UK; investigate a range of issues linked to catchment management and/or uplands; include those that explicitly incorporated processes to undertake KE; and represent research funded by a range of bodies (we contrasted projects funded by an interdisciplinary programme designed to feed into policy and practice[1] with projects funded by other research funders, Government and NGOs). These were supplemented with two key informant interviews with employees of UK research funding bodies with significant experience in facilitating and managing KE within the context of large-scale research programmes. Data were analysed using thematic analysis techniques based on a Grounded Theory Analysis approach (see Charmaz, 2006; Braun and Clarke, 2006).

Findings were then presented for feedback in a workshop comprising self-selected members of the original group of KE experts (a total of five out of the original twenty who attended the first workshop described above), supplemented by members of the research funder, policy and practitioner community interested in KE (making a group of 25 people who attended this second workshop). The workshop included discussion about how the findings from the analysis could be generalised across different disciplines and sectors, and made more relevant for the design of KE at research programme level.

3. Results

Approximately 50 themes were identified and sorted into broader themes as part of this analysis, to reach the smallest possible number of distinct themes, which formed the basis for each of the principles (see Fig. 2 and Table S2, supplementary material). The five principles are summarised in Table 1. There is some overlap between the principles and they are thus deliberately not presented in a step-wise manner, even though some principles underpin the application of others.

[1] The Rural Economy & Land Use (RELU) programme: www.relu.ac.uk.