Institution: Newcastle University

Unit of Assessment: 16 Architecture, Built Environment and Planning

Title of case study: The RELU Programme: Closing the Gap between Environmental Research and Practice

1. Summary of the impact

Research needs to engage with global environmental challenges more effectively. How to achieve this has been the focus of studies by academics at Newcastle with their expertise recognised in the appointment in 2003 of Philip Lowe and Jeremy Phillipson to lead the £26million Rural Economy and Land Use Programme (Relu), funded by three Research Councils, the Department for Environment Food and Rural Affairs (DEFRA) and the Scottish Government. The Directorship allowed Lowe and Phillipson to experiment with innovative processes for the conduct of research in 94 projects funded under the programme, in particular through instigating ideas of interdisciplinarity and co-production, and to develop techniques for assessing the efficacy of such methods. The insights gained from this effort have had significant and widespread impact on science policy and on organisations responses to environmental challenges such as government departments and agencies (DEFRA, Scottish Office and Food Standards Agency, for example), PLCs (including Wessex Water and M&S), environmental Trusts and more.

2. Underpinning research

There has been a growing recognition that single discipline research leads to the partial framing of problems. This recognition is accompanied by calls for the 'democratisation' of science such that it is more transparent and responsive to public concerns. In addition a series of 'rural' crises demanded new approaches to make research better oriented to the problems. An example was the management of the 2001 outbreak of Foot and Mouth Disease (FMD) in the UK which was investigated by Newcastle University's Centre for Rural Economy. This study provided influential evidence of the need for more integrated socio-technical approaches to the development of rural economies and the management of animal diseases. Funded by an ESRC grant, and carried out by Professors Lowe and Ward (employed 2004-2008) and Research Associates Donaldson (later Lecturer, Senior Lecturer) and Phillipson (later Reader), its findings had high profile media coverage and were used as evidence in 2001 and 2002 to national and European Inquiries into the impact and implications of FMD. The research made a significant contribution to the case for a major national research programme on rural economies and land use (Relu) and to its interdisciplinary design.

The Relu programme 2003–2013 was devised as a cross-research council interdisciplinary programme that would involve stakeholders throughout. Requiring strategic collaboration across three research councils (ESRC, BBSRC, NERC) with 94 projects involving over 450 social and natural scientists and more than 4000 stakeholders from the public, private and third sectors, it provided an ideal test bed for interdisciplinary collaboration between natural and social scientists, and for devising methods for effective stakeholder engagement, policy exchange, and practice involvement in interdisciplinary research. Indeed, one of its main purposes was "to enhance the impact of research on rural policy and practice by involving stakeholders in all stages of Relu, including programme development, research activities and communication of outcomes" (p.9) **(1)**.

The process of developing and assessing the Relu experiment fell to the Relu Director's office (Lowe and Phillipson) **(1)**. They utilised their position as participants in, and observers of, the programme process to develop insights into effective interdisciplinary working and knowledge exchange between stakeholders, and to experiment further with different approaches that could enhance the relevance and impact of research into environmental challenges. As well as their participant-observation approach throughout the programme, they conducted large scale national surveys of stakeholder engagement methods in research and of interdisciplinary research practices, and pioneered the development and use of the SIAM (Stakeholder Impact Analysis Matrix) method of stakeholder analysis. They also conducted in-depth research into the role of knowledge exchange mechanisms and intermediaries between research and practice **(2)** through an ESRC funded research project, *Science in the Field* (2008-2011: Phillipson, Lowe, Donaldson and Proctor).

The findings from all this research were distilled into a sophisticated understanding of interdisciplinary research and knowledge exchange activities which were published in a series of articles and edited special issues of prominent journals (for example, **3, 4, 5, 6**). Overall key findings from this research have included:

- Identifying the range of analytical methods and approaches for collaboration between social and natural scientists, including the various roles of social scientists within interdisciplinary research projects and their input into socio-technical research agenda setting.
- Highlighting the benefits of interdisciplinary research spanning the social and natural sciences in enabling socio-technical innovation, in such areas as the management of animal and plant diseases, sustainable food chains and rural land use.
- Providing a systematic understanding of the mechanisms for effective knowledge exchange between research, policy and practice; the ways in which research findings impact on policy and practice, and the importance of stakeholder engagement during the process of knowledge production itself.
- Establishing the institutional obstacles and requirements for effective interdisciplinary research programmes and policies within the UK Research Council system and beyond.

3. References to the research

1. Phillipson, J. and Lowe, P. (2006) Reflexive Interdisciplinary Research: The Making of a Research Programme on the Rural Economy and Land Use *Special Issue of the Journal of Agricultural Economics* 57 (2) p.165-184, DOI: 10.1111/j.1477-9552.2006.00045.x
2. Proctor A, Donaldson A, Phillipson J, Lowe P. (2012) Field expertise in rural land management. *Environment and Planning A*, 44(7), 1696-1711. DOI: 10.1068/a44352. REF2 output: 175865.
3. Phillipson, J. and Lowe, P. (eds) (2008) Towards Sustainable Food Chains: Harnessing the Social and Natural Sciences. Special Issue of *Trends in Food Science and Technology*. 19 (5). DOI: 10.1016/S0924-2244(08)00083-6
4. Phillipson, J., Lowe, P. and J.M. Bullock (eds) (2009) Special Profile: Integrating Ecology and the Social Sciences in *Journal of Applied Ecology*, 46 (2). DOI: 10.1111/j.1365-2664.2009.01625.x
5. Lowe P; Phillipson J. (2009) Barriers to research collaboration across disciplines: scientific paradigms and institutional practices. *Environment and Planning A*, 41(5), 1171-1184. DOI: 10.1068/a4175. REF2 output: 149736.
6. Phillipson, J, Lowe, P., Proctor, A and Ruto, E. (2012) Stakeholder Engagement and Knowledge Exchange in Environmental Research. *Journal of Environmental Management*, 95(1), 56-65. DOI: 10.1016/j.jenvman.2011.10.005 REF2 output: 179767.

4. Details of the impact

The 'value-added' of Lowe and Phillipson to the overall social and economic impact of the Relu programme was highlighted by the Independent Evaluation of the programme's impacts commissioned by the Research Councils. Of note here is that it sees "influence in the research and science policy arenas, particularly in growth of acceptance of interdisciplinarity in policy relevant research and in a shift from a model of "Knowledge Transfer" to two-way "Knowledge Exchange" as a significant legacy from the programme, along with "Evidence of a set of approaches that can deliver research impacts". It stresses how the Directorate experimented "in ways to foster Knowledge Exchange and related impact-generation" (p.6) **(IMP1)**.

The innovations in knowledge exchange and interdisciplinary research practice that were developed and tested as 'pathways to impact' by the Relu Director's office had a significant effect on many organisations involved in addressing rural land use problems. The Relu national stakeholder forums acted as sounding boards on programme and project development and dissemination strategies. For Wessex Water, a project forum "helped crystallise our thinking on how we approached catchment management" (**IMP2)**; for the former technical director at Marks and Spencer it "influenced procurement strategies" **(IMP2)**. The Assynt Foundation, following involvement in a Relu Visiting Fellowship, said that it "helped to encourage me to tackle some of our practical problems in a more logical and perhaps scientific manner" (**IMP2)**. Relu's use of digital technology enabled widespread interaction with stakeholders and the public. For example, Relu's Great Land Use Debate attracted around 100 comments and 4500 hits, and helped to set

the agenda for the Government's Land Use Futures Project (**IMP2)**.

As their research and experimentation progressed, Lowe and Phillipson were very active in transferring their insights into wider science policy with subsequent downstream impacts on later research and its impacts. Numerous high-level presentations and briefings led to changes in UK science policy and practice, including to the Government Chief Scientist, a meeting of all of the UK Chief Scientists, House of Lords, the G8 Research Assessment Group, Food Standards Agency, Natural England, the Food and Environment Research Agency and major research partnerships such as the Living with Environmental Change (LWEC) and Global Food Security (GFS) Programmes. A significant briefing of the research councils in May 2012 led to Lowe, Phillipson and Liddon (Relu Science Communication Manager from 2006) being invited to work with the Chief Executives of ESRC, BBSRC and NERC to change their ways of working in the light of findings from Relu.

Approaches and tools developed by Lowe, Phillipson and Liddon as part of the Relu experiment have been used within ESRC and NERC knowledge exchange and impact best practice guides **(IMP3, IMP4)** and within many national Research Council research programmes to enhance practical impacts. These include mainstreaming of work shadowing and visiting fellowship schemes, stakeholder forums, a national Policy and Practice note series, and highlighting a new tool for measuring research impact (the Stakeholder Impact Analysis Matrix - SIAM) that they developed and tested. By linking together engagement and the impact parts of the SIAM dataset it is possible to investigate what encourages successful knowledge exchange and what kinds of stakeholder relationships are associated with what kinds of impact. Phillipson has held briefings with Knowledge Exchange officials in the research councils on its wider application and it is now used to inform new research programmes. Evidence of impact on knowledge exchange strategy include the following testimonials:

- *"building on the success of Relu's workshadow scheme, NERC also now offers a workshadow option - a more bottom-up approach, through which we have supported some very successful placements" (*Faith Culshaw, NERC Knowledge Transfer team) **(IMP2)**;
- *"*[Relu insights] *will be used to highlight the innovative ways in which Knowledge Exchange and Communications tools can be used to develop and deliver a pathway to impact. In particular, we found* [Relu] *evidence that coproduction has a positive impact on academic researcher as well as users, particularly enlightening"* (Fiona Armstrong, ESRC Head of Knowledge Transfer) **(IMP2)**;
- *"LWEC has learned from Relu that focussing on the aims of research with stakeholders from the outset shifts emphasis away from discrete scientific disciplines and onto the problems that the research aims to solve"* **(IMP2)**.

The insights from the Relu programme also convinced Research Councils of the value of interdisciplinary research and provided them with an understanding of the constraints as well as knowledge of a range of techniques for enabling this approach. The design of major new programmes, including interdisciplinary commissioning, assessment, programme design and decision making have been highly influenced by these insights. For example:

- *"One of the most significant impacts of Relu has been its facilitation of the engagement of biologists with social scientists. BBSRC values the new cross-cutting approaches,…to the framing of scientific questions in ways that enhance the relevance of research to policy and practice …* [which] *now need to be applied to "grand challenges" such as global food security and living with environmental change"* (Head of Agriculture and Food, BBSRC) **(IMP2)**.
- BBSRC's review of biological research relevant to climate change recommended: "*research should build on experience from Relu… to study the interactions of social and economic factors with management for biodiversity in agricultural systems"* **(IMP5)**.
- *"Experiences with Relu have been very informative in terms of developing approaches to all aspects of commissioning interdisciplinary research"* (NERC Head of Science) **(IMP2)***.*
- Relu is regarded "*as a model for future and evolving partnerships...Essential to creating a strong environment to allow interdisciplinary research to flourish under the programme has been the way in which peer review has been conducted"* (Senior ESRC officer) **(IMP2)**.
- In 2012 Phillipson became the first Strategic Land Use Fellow of the LWEC programme with a

brief to embed experience on interdisciplinary and knowledge exchange procedures.

In a similar vein, government science funders embedded the findings into new funding programmes and science strategies, such as in the Foresight Land Use Futures Project and in Defra science policy and sub-programmes. The Scottish Government's Rural and Environmental Research Programme included a commitment to build on Relu's approach to impact assessment, and the Social Strategy of the Marine Management Organisation makes specific reference to building on Relu, based on insights from Phillipson **(IMP6).** Lowe, through his membership of Defra's Science Advisory Council, helped instigate a review of Defra social research, drawing extensively on Relu research findings. The review recommended a significant expansion of Defra's social science capacity to support greater interdisciplinarity, embodied in the Defra Evidence Investment Strategy and influencing many areas of Defra's science policy **(IMP7, IMP8)**. Further endorsement of Relu's insights have been provided by Phillipson's appointment to the Defra-DECC Social Science Expert Panel, and to the Strategic Research Programme Board of the Scottish Government where he provides expertise in knowledge exchange and the management of large, multi-disciplinary research programmes **(IMP9)**.

In conclusion, according to Sir Howard Newby (Chair of the Relu Strategic Advisory Committee; Vice Chancellor of University of Liverpool) "The experimentation and research of Lowe and Phillipson during the Relu programme have provided science funders and policy makers with insights into effective approaches for enhancing the impact of research, viz, the structuring of interdisciplinary research programmes and policies, interdisciplinary research methods, and collaborative knowledge exchange. These findings were disseminated widely during the Relu programme, and a cultural shift in the approaches of science policy and key funders of research in the UK towards further interdisciplinarity and knowledge exchange are not only apparent but also acclaimed as emanating from these insights" **(IMP10)**.

5. Sources to corroborate the impact

IMP1 Meagher, L (2012) Report - Rural Economy and Land Use Programme (Relu). Societal and Economic Impact Evaluation (REFERENCE PS110020). Available at: http://www.relu.ac.uk/news/Evaluation.htm

IMP2 Relu (2011) *Adventures in Science: Interdisciplinarity and knowledge exchange in the Relu Programme*. Relu Briefing Paper 16. Available at: http://www.relu.ac.uk/news/briefings/BRIF%2016%20Adventures%20in%20Science/RELU%20Adventures%20in%20Science%20WEB%20(3).pdf.

IMP3 NERC Science into Policy Guidance. Available at: http://www.nerc.ac.uk/publications/corporate/policy.asp.

IMP4 LWEC Knowledge Exchange Good Practice Guidelines, demonstrating impact of Relu. Available at: http://www.lwec.org.uk/ke-guidelines.

IMP5 BBSRC (2008) *Review of BBSRC Research Relevant to Environmental Change*. BBSRC, Swindon. (see pp 4, 15, 18, 20, 25). Available at: http://www.bbsrc.ac.uk/web/FILES/Reviews/0810_environmental_change.pdf.

IMP6 Personal Communication from Head of Evidence, Data and Knowledge Management, Marine Management Organisation (2012) describing Phillipson's inpact on their *Social Research Strategy*. Available on request.

IMP7 Defra Science Advisory Council (2007) Social Research in Defra, Social Science Sub-Group (SAC-SOC). Paper SAC (07) 33. Available on request.

IMP8 Defra (2010) *Evidence Investment Strategy: 2010-2013 and Beyond*. Defra. Available on request.

IMP9 Invitation letter to join Scottish Government Strategic Research Programme Board. 29.8.12. from Head of Rural and Environment Science and Analytical Services Chief Researcher. Available on request.

IMP10 Personal communication from Chair of Relu Strategic Advisory Committee and Vice Chancellor of University of Liverpool. Available on request.