

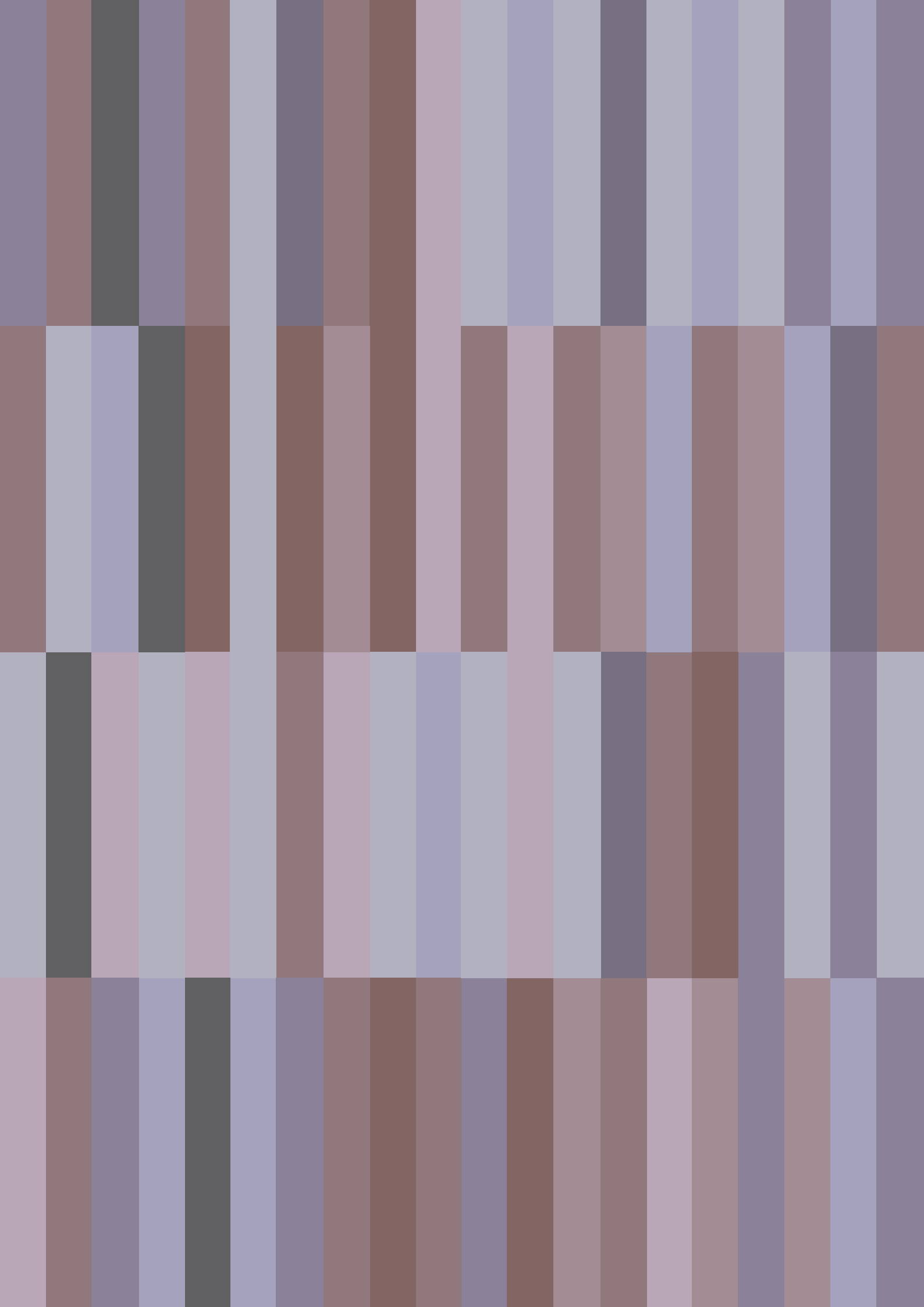


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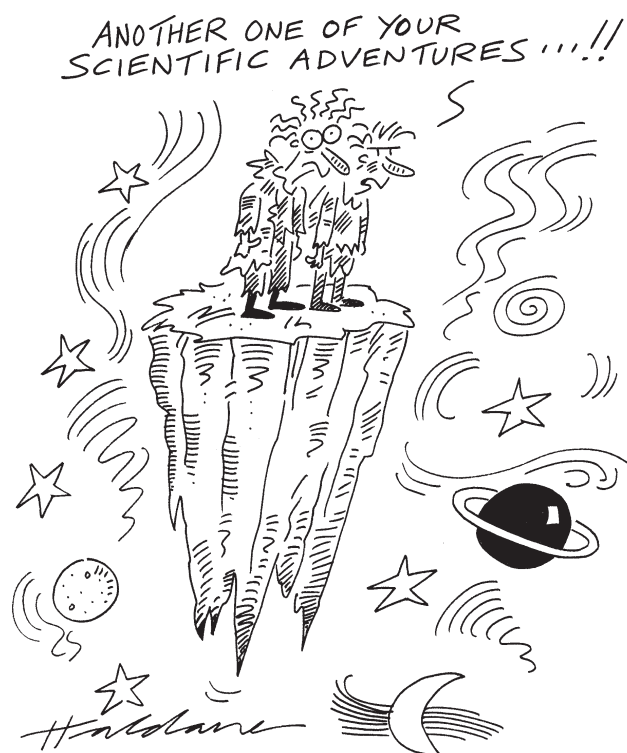
Rural Economy and
Land Use Programme

Adventures in Science:

Interdisciplinarity and knowledge exchange
in the Relu Programme



The Rural Economy and Land Use Programme is an unprecedented collaboration between ESRC, BBSRC and NERC. Running between 2003 and 2012, with a budget of £24m and additional funding from the Scottish Government and Defra, the programme was set up to deliver interdisciplinary research on the social, economic, environmental and technological challenges facing rural areas. So, how did this programme go about getting the natural and social sciences working together creatively? How has it engaged with non-academics interested in its work? And can research funders and future programmes learn useful lessons from the Relu approach?



Adventures in Science: Interdisciplinarity and knowledge exchange in the Relu Programme

What is Relu for?

Research aims to extend our knowledge and to give policymakers and practitioners the information and understanding they need to do things better in future. Relu has succeeded in feeding into a wide range of policy streams, informing key areas such as: sustainable food and farming; reform of the Common Agricultural Policy; strategic land use; policy for the uplands; targeting of the Water Framework Directive; local government and environmental governance; assessing UK strategy for energy crops; and policy making for the management of animal and plant diseases.

For example, government and public debate over land use in the UK has gained considerable momentum over the past three years, with Relu research making a major contribution. With over 20 research projects on various aspects of land use, Relu positioned itself to provide evidence and analysis to a series of major inquiries.

The programme successfully drew in public and expert contributions by means of the high profile, on-line “Great Land Use Debate” held during Science Week 2009. The pervasive influence of Relu can be seen in the broad analytical perspective taken on board by the inquiries in relation to:

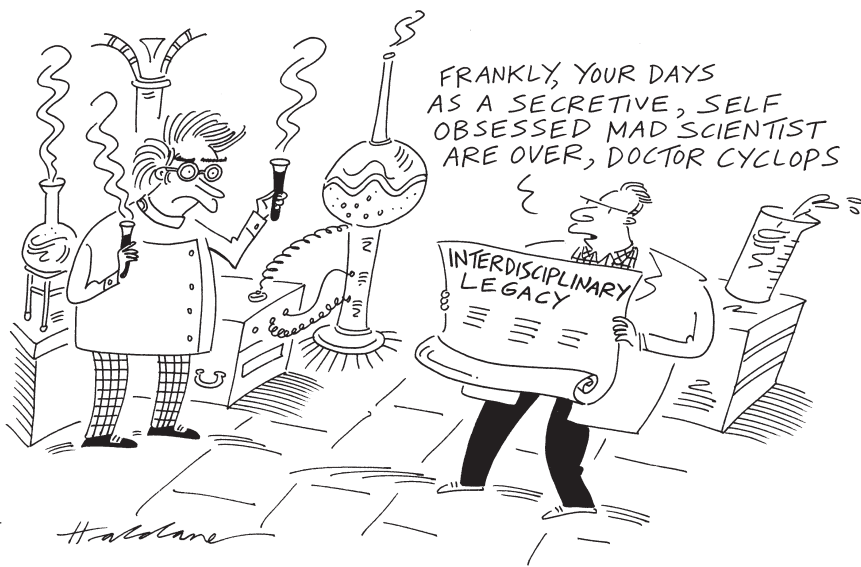
- The strategic significance of rural land and an integrated approach to the land system, transcending scales, and rural-urban divides.
- Encouragement of multifunctionality to accommodate the varied demands on the land base and of interdisciplinarity in understanding and valuing diverse land functions.
- Bringing ecosystems thinking systematically into analysing the value of land and decision-making.
- Encouragement of cooperation between landowners, managers and stakeholders to deliver efficiently an optimal mix of public and private benefits.
- Appreciation of the regional and landscape context of land use.

Energy crops:

Researchers have investigated the implications of large scale planting of energy crops: Miscanthus grass and short rotation coppice willow.

- GIS-suitability mapping and sustainability appraisal identified over 3 million hectares of lower grade land in England not subject to environmental constraints and suitable for growing biomass crops.
- Sufficient land is available to meet production up to the UK Biomass Strategy objective of 350,000 ha for electricity.
- The team found water use to be higher than that of permanent grass and winter wheat.
- Plant biodiversity was generally higher than in cereals, and field margins had more butterflies.
- Low returns on biomass mean it is unlikely to be the dominant enterprise on most farms. But predictability of returns make them attractive as a non-risky sideline.

Results are being used: by Natural England to revise the Energy Crops Scheme; by Department of Energy and Climate Change/Defra to advise policy on energy crop plantings; and by the National Farmers’ Union as evidence in the Campaign for the Farmed Environment.



“Relu had a significant influence over the approach to Foresight’s Land Use Futures Project. Their multidisciplinary approach... is crucial to helping to create a more sustainable land system. ...Relu’s work was also influential in showcasing the importance of working with communities and drawing on local knowledge, understanding the diversity of motivations amongst land managers when trying to influence change, and bringing ecosystems thinking more systematically into analysis on the value of land and decision-making.”
Nicola O’Connor, Foresight Land Use Futures project, Government Office for Science

Tree diseases:

Invasive diseases now pose a serious threat to trees, woodland and native plants in the UK. Despite early government action to reduce its impact the current outbreak of “Sudden Oak Death” continues to spread and other diseases are also proving difficult to control. But the challenges are not new. The researchers have looked back at the Dutch Elm Disease outbreak of the 1970s and reconstructed the epidemic, based on archival research, interviews with key informants and modelling. They have drawn out lessons for the current situation.

- Awareness of the risks is low and more public debate is needed. Environmental groups could play a bigger role.
- Experts need to develop a better and more critical understanding of the interlinked biology, economics and politics of biosecurity measures and the trade-offs that may have to be made.

The researchers developed close links with national policymakers in Defra and the Food and Environment Research Agency, and with biosecurity and other professionals working for the Forestry Commission, Natural England and the National Trust. The team was commissioned by Defra to undertake an independent review of its Emergency Sudden Oak Death Programme. The revised programme drew on their analysis and recommendations for improvements to the way the public are informed about biosecurity threats and for further work to understand the responses of garden owners and managers to biosecurity measures.

Water catchments:

Researchers have developed a hydrological-economic model to assess the costs and benefits of changing farming practices in the Humber catchment in order to produce a healthy river environment in line with the Water Framework Directive.

- The model links a land use module (which predicts the pattern of rural land use as a result of changes in environmental, market and/or policy drivers) with impacts on water pollution and water recreation demand.
- It provides cost-effectiveness measures and estimates of the financial cost to farms of alternative means to implement the Water Framework Directive.
- It is the first multinomial logit application to modelling land use in the UK to simulate the effects of climate change.

The research has had extensive impact. Uniquely, spatially explicit methodology gives decision-makers in Defra, the Environment Agency and water companies the ability to see where the most social benefits would be achieved in allocating scarce resources.

Local food:

Researchers set out to identify the advantages and disadvantages of growing vegetables locally in the UK compared to overseas, including environmental impacts, greenhouse gas emissions and consumer perspectives.

- The research found that for some UK crops, greenhouse gases produced were greater than emissions from transporting crops by truck from overseas.
- Carbon footprinting of produce is very complicated and a simplistic approach could be inaccurate and have unfair consequences for developing countries.
- The differences in nutritional quality of produce grown locally and overseas were not found to be sufficient to impact on people’s health.
- Consumer perspectives revealed an interest and support for local food but this was often balanced against the practicalities of access, cost and range of choice and variety.

The research has had a lot of influence, leading to scientific acceptance that food miles are a poor indicator of environmental impact, with widespread coverage in the media. The World Bank commissioned the researchers to set out recommendations on how to make emerging carbon labelling schemes fair for developing countries, and the project also carried out work for two trade organisations on carbon footprinting of products.

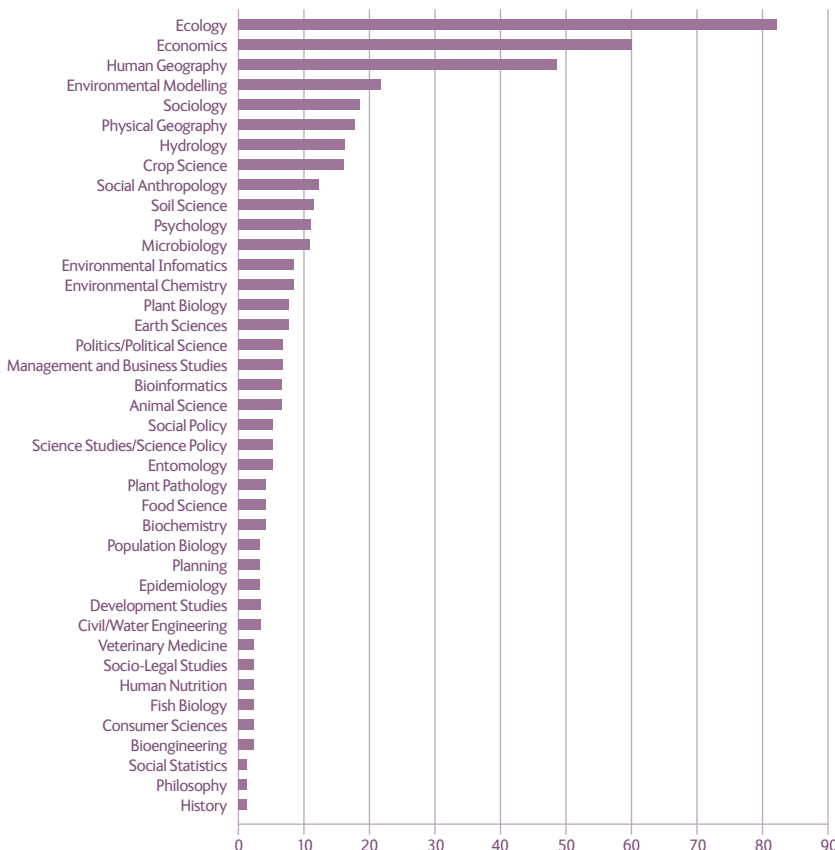
How has Relu done research differently?

Interdisciplinarity isn't a luxury in a time of financial austerity, but a sine qua non. Technical developments won't provide the answers on their own, especially to today's complex problems. By integrating social and natural sciences, Relu has introduced new outlooks on innovation that emphasise coupled socio-technical change rather than narrow technological outcomes. Relu has also been a radical experiment in project and programme management and capacity building for interdisciplinarity.

The projects:

- 94 projects; 50 institutions; 450 researchers; 40 disciplines.
- All projects have involved social and natural scientists.
- Relu has broadened and strengthened collaboration between environmental and social sciences, bringing together qualitative as well as quantitative disciplines and methods, and novel disciplinary collaborations e.g. hydrology and sociology; ecology and political science.
- Relu has forged new strategic links between the social and biological sciences, for example in the area of the management of animal and plant disease. The stand-off between social and biological sciences in the past seriously limited their ability to respond to cross-cutting issues of critical importance, such as in the field of plant/animal and human interactions, and distorted the evidence base on which policy could draw, to the detriment of both communities. In many fields of modern biology our science is world-leading, but that is often not followed through into successful applications because the research is not joined up with economic factors or put into a social context.
- Many projects integrated the contributions of different disciplines as well as of stakeholders, through joint scrutiny of concepts, approaches and evidence. Teams focused on interdisciplinarity from the planning stages of projects, by jointly framing research problems and strategies, through shared development of methodologies or collaborative data-gathering.
- Some projects have used geographic information systems, scenarios and visualisation methods to integrate social and natural science data, as well as stakeholder expertise; some have used linear or complex modelling approaches, combining environmental, biological, social and economic data; while others have developed appraisal frameworks and decision tools to combine and evaluate their results.

Disciplines in Relu



Biopesticides

Researchers have investigated the political and economic obstacles impeding the wider use of promising biopesticides. As fewer chemical pesticides are available, because of natural resistance or the withdrawal of products for regulatory or commercial reasons, there is a need for more of these mass produced, biologically-based agents to control pests, but few have been coming onto the market.

- Researchers identified barriers preventing them from being licensed.
- Many difficulties were due to the registration process having been designed for chemical pesticides.
- Researchers worked closely with Pesticides Safety Directorate (now the Chemical Regulation Directorate) advising on desirable changes to the licensing of biopesticides.

The UK now has a dedicated Biopesticides Scheme, offering reduced fees for registration, and has begun to lead the field in Europe for biopesticides approval.

Farmland biodiversity

Researchers investigated how land management strategies of UK arable farmers affect biodiversity, posing the questions: how can targets on bird populations be achieved? And with what social and economic consequences for farming?

- The project developed new methods for mapping weeds that may be a significant component of biodiversity on arable farmland, and for assessing how different ways of using the land affect weed populations.
- It modelled resultant variations in bird breeding abundance.
- Farm management and ecological outcomes were linked together with farmers' objectives and preferences into a predictive model of land use.

For a single farm the research can predict optimal management and weed and bird populations for altered management. For landscapes it can predict aggregate land use and ecological populations under different assumptions about farmer behaviour.

“Biopesticides have presented a fantastic challenge to both regulators and those developing alternative control measures. Working with the Relu team has helped people over that hurdle. They really enabled us to improve our technical skills and strengthened the scientific credibility of the PSD in this niche area. Our Biopesticides Scheme is now a pathfinder in Europe – no other member state has a scheme like this.”
Richard Davis, Director of Approvals, Pesticides Safety Directorate

Relu has brought social scientists into areas of technical research where they would not normally go, but where their skills and insights are needed. The traditional role of social sciences in technical innovation is as a 'back end fix' to problems of application. An upfront strategic role for social scientists is being demonstrated in scientific problem framing, the analysis of complex socio-technical systems and engagement of the public and stakeholders in science and technology agendas.

An analysis of ecologists, the largest grouping of natural scientists in the Relu programme, reveals collaboration with social scientists across a breadth of research activities spanning research design,

methodologies and publishing/dissemination. Collaboration with social sciences had helped to reframe ecological problems and prioritise research around societal challenges and opportunities. Two thirds thought their own ecology had been enhanced as a result.

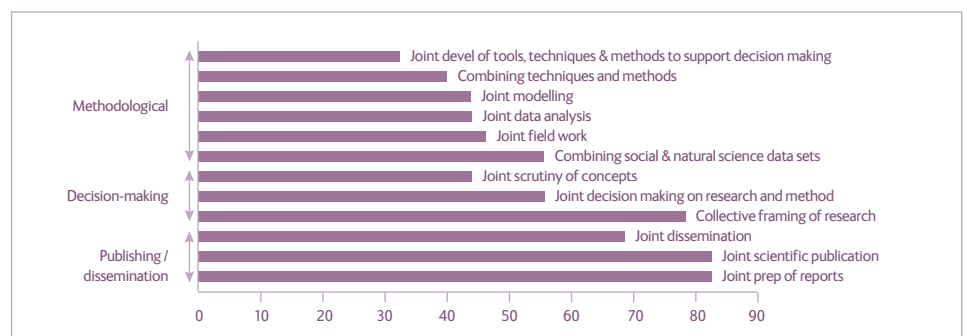
Projects have pioneered a range of analytical methods and approaches for collaboration between social and natural sciences. This has included integrated assessments of technologies and systems; diagnostic measures of system performance; synoptic perspectives on geographical areas; joint modelling and monitoring of systems; combined valuation approaches; and integration of social and natural datasets.

Ecosystem Health Report Card

An important outcome of collaboration has been the development of new aids for decision making, such as the Ecosystem Health Report Card which provides an easy to understand snapshot of the health of a catchment. It can be used to:

- Raise awareness of change over time.
- Build understanding of effectiveness of improvements in land and water management.
- Focus management efforts and resource allocation on priorities identified by a community.
- Demonstrate possible future scenarios.

Ecologists' collaboration with social scientists in Relu



Managing the Relu Programme

Relu brought together research communities with little if any experience of collaboration. The programme has improved the ability of researchers to operate in interdisciplinary contexts, apply learning from one field to another, combine techniques and data sets and cross-fertilise ideas and concepts.

“The seed-corn awards mobilised interest in the Relu programme, engaging diverse researchers ... A variety of “linking” activities were facilitated by awards, including informal links and networks between researchers, and between researchers and other stakeholders. ... Linkages between researchers and between disciplines were forged or strengthened. Indeed, a great many researchers continue to be involved in interdisciplinary research spanning social and natural science, with an enhanced understanding of other disciplines.”
Independent Review of the Relu Programme’s Seed-Corn Funding Mechanisms (2007)

Deliberate efforts were made to build capacity, requiring:

- Seed-corn funding mechanisms to forge links across disciplines and with stakeholders.
- Workshops and conferences carefully orchestrated to promote shared perspectives on cross-cutting strategic themes, to avoid researchers retreating into their disciplinary enclaves.
- Training and career development of researchers in cross-disciplinary working.
- Dedicated interdisciplinary studentship and early career fellowship schemes.

Relu has also taken its interdisciplinary insights into the wider science communities by arranging special interdisciplinary issues of prominent mono-disciplinary journals. Five have been completed: *Journal of Applied Ecology*, *Trends in Food Science and Technology*, *Journal of Agricultural Economics*, *Mammal Review*, *Philosophical Transactions of the Royal Society*. These are top journals in their respective fields, and are exploring for the first time the research interface between social and biological and environmental sciences.

Inter research council collaboration

Scientific institutions are often poorly set-up for enabling interdisciplinary research. Managing Relu called for strategic collaboration between councils, but also integrated structures and policies that should enable and inform future programmes, including:

- Pooling of resources.
- Requirement for all projects to involve social and natural scientists.
- Joint decision-making.
- Combined arrangements for applications, assessment and data management.
- Resourcing of a dedicated programme director and director’s office, with fully integrated responsibility for scientific leadership, knowledge exchange and communications.

Assessment of proposals was the most demanding stage in the process. It was found vital to distinguish two elements in the assessment of interdisciplinary projects:

- A rigorous peer review by relevant specialists of the strengths of the scientific components of a project.
- An overall assessment of the project in terms of the quality of integration and the strategic importance of its interdisciplinary collaboration. This needed assessors with a breadth of understanding, including experience of interdisciplinary research and its assessment.

Assessing interdisciplinary proposals

Assessing the quality of a project’s interdisciplinarity was a demanding but critical requirement, requiring specific guidance for assessors.

- Project teams were required to justify and pursue an approach that would combine research staff and perspectives to maximise integration, covering both scientific and methodological dimensions and project management.
- Assessors were asked to focus on the interdisciplinary justification and approach. It was stressed that whilst all aspects of the proposal had to be high quality, the source of innovation might be in the integration of disciplinary components.
- There is a need to recognise the additional resource requirements of interdisciplinary research associated with team building and communications.

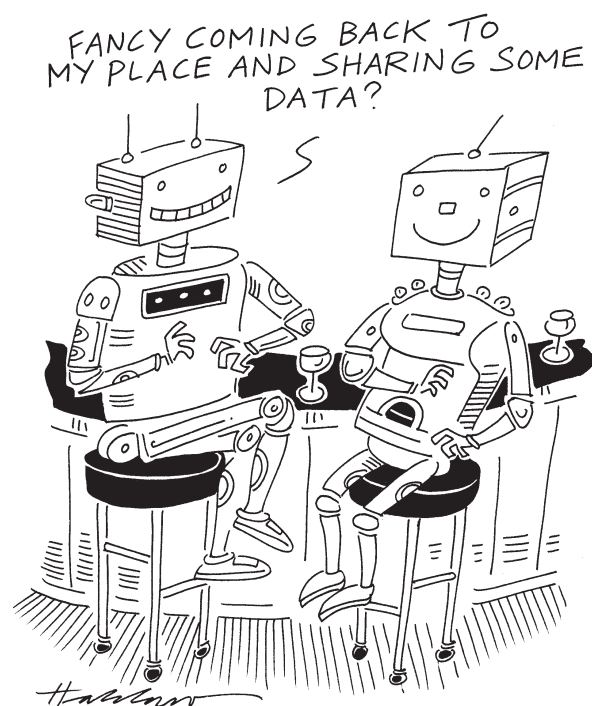
An interdisciplinary approach to data management

Relu faced the test of bringing together research communities with different cultures and experience of data management. The question of how to archive interdisciplinary data posed a specific challenge to the research councils. For the first time a cross-council data management policy was developed for a programme, based on best practice in data policy across the collaborating research councils, and operationalised through a dedicated cross-council Data Support Service. The service has advised researchers on data management and quality assurance, provided training and prepared projects for data archiving. Particular emphasis was placed on the specific requirements of qualitative and quantitative mixed data sets; guidance on legal and ethical aspects of data sharing; the practicalities of data archiving and high quality data documentation.

Relu was at the forefront of implementing data management planning for research projects. All the projects developed a data management plan, documenting the datasets to be created by the research. This mapped out how research data would be managed and stored, data quality assured, and how potential constraints on data sharing might be overcome. Based on the Relu experience, similar data management planning has now been adopted by the ESRC for all its research grants, and many institutional websites now refer to the Relu data management planning guidance.

Further innovations include a linked archiving system for interdisciplinary data collections and the first integrated knowledge portal, bringing together scientific outputs and research data. Relu data are being archived across the UK Data Archive and the Environmental Information Data Centre of the Centre for Ecology and Hydrology. Metadata schemes used by both data centres have been linked to enable cohesion and integration of datasets.

The Relu knowledge portal provides access to those archived research data, as well as to publications and outputs, held at the ESRC research catalogue. This linking of data and outputs, which means that the evidence and published analysis from research are jointly available, was made possible by metadata harvesting using the Open Access Initiative Protocol for Metadata Harvesting.



Relu's interdisciplinary legacy

All Relu's participating research councils have learned lessons from the programme's interdisciplinary approach. From the very early stages of commissioning research, to new approaches to data archiving, Relu has been built upon interdisciplinarity and stakeholder involvement.

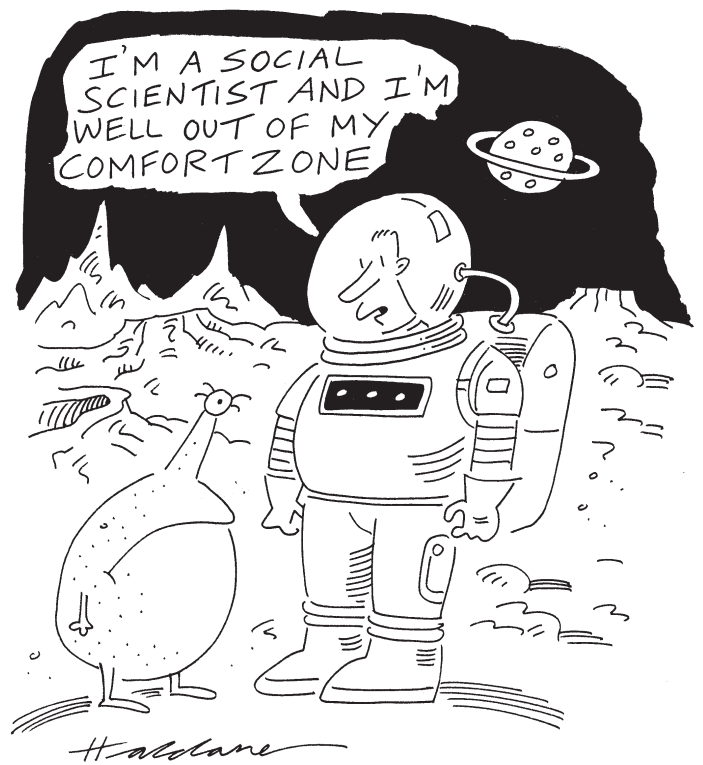
Relu's experience of interdisciplinary programme management and inter-research council collaboration has set a benchmark for the research councils to pursue in subsequent initiatives. The programme has established a strong reputation, especially across its three sponsoring research councils. However much more work is needed to ensure that Relu's procedural innovations are built into subsequent research programmes and inter-research council working more generally.

Relu has helped catalyse a cultural change in interdisciplinary outlook among other key stakeholders, who are recognising the need to develop their use of the social sciences and take an interdisciplinary approach. For example, research and analysis within Relu has informed Defra's Science Advisory Council in reviewing the role of social research in Defra, leading to a commitment to an expansion of the Department's social science capacity and support for greater interdisciplinarity being embodied in Defra's Evidence Investment Strategy. In particular Relu research is informing Defra's thinking on the management of animal and plant disease.

Relu and the management of animal and plant diseases

Relu has built a community of interest between researchers, stakeholders from the public and commercial sectors and senior policy makers interested in disease management to exchange expertise and experience.

- A review was conducted for Government and the veterinary profession by the Relu Director, of the future role of veterinarians in farming and food production, which focused on the crucial knowledge exchange activities of practising vets in animal health/disease management. The report has had a major impact on veterinary policy and the organisation of the veterinary profession, including the establishment of the Veterinary Development Council.
- Relu has conducted a review, funded by Defra, of the scope for interdisciplinary research in animal/plant disease management.
- Relu researchers investigating the risk of E coli O157 in rural communities were asked to provide written and oral evidence to the committee investigating a serious outbreak of the disease originating at Godstone Farm in Surrey. Their evidence was important in the final report and the research has contributed to new health protection policy making and advice, about the benefits and risks of farm visits.



“Experiences with Relu have been very informative in terms of developing approaches to all aspects of commissioning interdisciplinary research. We have used many of the lessons learned in Relu to commission subsequent interdisciplinary programmes and are now starting to home in on ‘best practice’. Relu really led the way for us.”
Pamela Kempton, Head of Research, NERC

“Relu is widely held in high regard as a model for future and evolving partnerships in, for example LWEC but also more widely as an exemplar for cross-council and other programmes such as Global Food Security. 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. The key lesson learnt in this regard is the need for flexibility amongst the funding partners in relation to processes.”
Paul Rouse, Research Team Leader, ESRC

“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, encouraged by Relu, to the framing of scientific questions in ways that enhance the relevance of research to policy and practice. Lessons learned from Relu now need to be applied to ‘grand challenges’ such as global food security and living with environmental change, and I would like to see the extension of its integrated approach to other areas of BBSRC-funded research.”
Brian Harris, Head of Agriculture and Food, BBSRC

“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. Relu’s publications help show how to embrace interdisciplinarity in both the scientific and the policy layers, through production of special scientific journal issues that create an interdisciplinary culture and through policy and practice notes that create messages for policymakers from across a range of projects.”
Ken O’Callaghan, LWEC Head of Directorate

Achieving innovation in knowledge exchange

If research is to have credibility and achieve effective knowledge transfer stakeholders must be involved throughout, not just at the end of the process. We need to add value and draw out the policy and practice implications of our strategic research programmes and find ways of getting them into mainstream thinking. Relu has aimed to enhance the impact of research on rural policy and practice by involving stakeholders at all stages. It has therefore taken on board calls for science to be more responsive to societal concerns, recognising that stakeholder engagement needs to be broadened and pushed upstream, to where research problems are framed and research priorities set. This has led the programme to develop novel approaches to knowledge exchange.

Promoting a new philosophy

- 4000 individual stakeholders have been involved in Relu projects.
- Of these, 38% are public sector, 36% private sector, 15% societal (public, consumers), 12% third sector.
- Prominent stakeholders include Defra, Scottish Government, Environment Agency, Natural England, National Farmers' Union, Country Land and Business Association, farming businesses, Royal Society for Protection of Birds, National Trust.

The programme has promoted a philosophy of knowledge exchange rather than just knowledge transfer, seeing effective research uptake as being built on a foundation of active stakeholder engagement during the research. Projects have therefore been experiments in collaborative knowledge production, recognising the contribution of multiple forms of expertise.

The Relu approach to knowledge exchange is based on these principles:

- Stakeholders must be engaged throughout the research, helping establish its focus, priorities and conduct.
- Non-academics have knowledge and expertise to contribute to a two-way process of knowledge exchange.
- An inclusive notion of stakeholders should be pursued encompassing policy-makers, practitioners, businesses and the public.
- Transfer of ideas and results happens through multiple channels, including informal networks and movement of people between research and practice.

Learning from environmental controversies

Researchers have drawn together computer modelling and local knowledge to address flood risk problems. The apparent predictive power of models often seems to give distant officials and experts knowledge and insights that are superior to those on the spot. But local knowledge can play an important role in improving models and making more effective use of them.

- Researchers formed the Ryedale Flood Research Group, made up of residents of the Yorkshire market town of Pickering, and scientists, to carry out the research collaboratively throughout the process of model building and application.
- This produced a customised computer model of local river systems, which enabled group members to try out their own ideas for managing local flood risk.

Locally derived proposals for upstream storage were nominated as a Defra demonstration project.

National stakeholder forums

“I have strengthened my network in this part of the science community... [and] have disseminated information about the Relu programme and the various activities to... the NFU membership.”

Helen Ferrier, National Farmers’ Union Chief Science and Regulatory Affairs Adviser

“The forum has “helped crystallise our thinking on how we approached catchment management.”

Julian Dennis, Director of Quality, Environment and Sustainability, Wessex Water

“I routinely delegated to my team follow up activities with researchers, particularly in waste, water and agrochemicals”. [The forum] “influenced procurement strategies. Other contact between my team and researchers has helped inform decisions.”

David Gregory, Former Technical Director, Marks and Spencer; Member of BBSRC Council and Assured Food Standards Board.

An experiment in approaches and mechanisms

Relu undertook extensive stakeholder consultation to inform the design of calls for research proposals. As well as the usual range of communication tools (newsletters, media contacts, academic publications, conferences, website etc.), the programme experimented with novel mechanisms and approaches that helped it build extensive networks for knowledge exchange.

The programme adopted a sustained approach to strategic influencing. ‘Core’ stakeholder communities (of 200 to 300 key stakeholders) were built around themed clusters of projects, with an orchestrated succession of workshops, targeted events, internal policy briefings, and synthesised outputs for each theme. The programme also actively recommended researchers as experts to key advisory and research positions. In this way, Relu has shaped the terms of debate for reporting scientific results from the programme.

Important features of this strategy have been Relu’s Strategic Advisory Committee and three national stakeholder forums on Food, People and the Rural Environment, and Animal and Plant Disease. The forums act as sounding boards on programme and project development and dissemination strategies. They include stakeholders from the public, private and voluntary sectors.

The approach has been replicated at project level. Each project has produced its own stakeholder engagement plan. Schemes for people exchange in the form of work shadowing and visiting fellowships

have played a key role. The placements are intended to build up links between stakeholders and strategic research projects, through which insights from the research can flow and stakeholders can in turn contribute to the wider strategic research.

Relu has developed a distinctive approach to science communication, using the skills of a dedicated science communication manager. This has enabled the programme to design a range of highly accessible written, electronic and communications that meet the needs of its audiences. They translate research findings into everyday language, and address the specific interests of groups of stakeholders.

However, producing publications and websites is not, in itself, sufficient. By developing its stakeholder databases Relu has created the means for getting research findings to the people who actually want particular information, both via written communications and at its events. These work together: with the publications providing useful materials for workshops, project events and face-to-face briefings for stakeholders; and Relu’s interactive events generating comment and discussion that feed into publications.

The programme has also communicated more widely, looking outside the immediate stakeholder groups and extending its reach. Press releases to the media have achieved wide coverage and articles by the researchers and the Director’s Office team have been published in a range of specialist and technical press. Web based communications are an essential resource, but quickly lose their credibility if they are not continually refreshed by the emerging research,

and by interactive features such as blogs and debates. Relu has achieved this by feeding in latest news drawn from its regular publications and promoting discussions. Overall, it is important for all the elements of the communications strategy to draw upon each other in complementary fashion.

Relu has held regular conferences and workshops but these events have not been modelled on traditional academic lines. Stakeholders have played a key role throughout and rather than being talked at, delegates have played an active part, with debate, “speed dating” sessions, video-box feedback and other interactive formats. These events have provided important forums for recruiting stakeholder visiting fellows to the programme and linking up researchers with organisations offering work shadowing opportunities.

Relu’s publications have also broken new ground. Policy and Practice Notes from each project draw out key messages for target audiences in an accessible non-academic format. Specialist versions are written specifically for local government and related groups and draw upon evidence across a series of projects, providing pointers on particular themes. The Briefing Paper series also links evidence from different waves of Relu projects, to address particular challenges, feeding into public debates on societal issues such as the sustainability of the food chain, Common Agricultural Policy reform and the Water Framework Directive.

This wealth of analytical and practical source material means that Relu has been able to provide pertinent evidence to multiple policy consultations, for which a timely response is essential.

The benefits of people exchange

Work shadowing

A scheme for researchers to spend up to a month in commercial, voluntary or public organisations where their research may be used. Thirty five to date:

Clinton Devon Estates, Commission for Rural Communities, Defra, East Anglia Food Link, Environment Agency, Environment Agency Wales, Farm Advisory Services Ltd, Food Standards Agency, Food Standards Agency (Scotland), Forestry Commission, Freshwater Fishfarms Ltd, Health Protection Agency, Institute of Grocery Distribution, National Farmers Union, National Federation of Anglers, Pesticides Safety Directorate, Pinguin Foods UK Ltd, Royal Society for Protection of Birds, Stag Inn, Tiverton.

Visiting fellowships

A scheme enabling key stakeholders to spend time with research teams, with a view to designing bespoke dissemination activity. Thirty one to date:

Association of River Trusts, Assynt Foundation, Biodiversity International Limited, East Riding of Yorkshire Council, Environment Agency Wales, Freelance farming journalist, Institute for European Environmental Policy, North East Rural Affairs Forum, Northumberland County Council, One North East Regional Development Agency, Otley College, Pesticides Safety Directorate, Natural England, Smiths Gore, IUCN, Scottish Government, Sustainable Development Commission, Health Protection Scotland, Defra, Royal Agricultural Society of England, Syngenta, Welsh Assembly Government.

For Researchers:

- It furthered understanding of the policy or commercial context for research, and the requirements of stakeholders.
- It provided privileged access and insights.
- Researchers were able to refine their research focus and methods.
- It prepared the ground for future dissemination, career choices and new research collaborations.

For Stakeholders:

- It provided an opportunity to inform the direction and focus of research.
- It brought an outside perspective that helped identify emerging issues and research needs.
- Analytical capabilities were enhanced, with impacts on policy and business development.

“The period at Defra proved to be an invaluable experience... we were exposed to the workings of policy implementation for the first time.”
(Researcher)

“Hugely beneficial... both as a means to enable access to resources and information that would otherwise be difficult to come by and, critically, to inform the content and direction of the project.”
(Researcher)

“A valuable contribution to the development of our forthcoming strategy for reducing Campylobacter.”
(FSA)

“The time spent with Relu... helped to encourage me to tackle some of our practical problems in a more logical and perhaps scientific manner... There are so many things that I now want to incorporate into our estate management policies.”
(Assynt Foundation)

[A] “challenge to the accepted ways of working from an alternative perspective, objective analysis of current policies.”
(Defra)



Reaching a wider audience

There are multiple examples of Relu researchers taking their interdisciplinary research insights and expertise into policy and practice through their own career moves at the end of projects.

Researcher pursues life cycle analysis into Unilever

Llorenç Milà i Canals worked for three years as a research officer on the Relu project doing environmental life cycle analyses of vegetable supply chains. When an opportunity to join Unilever came up he decided to give the commercial sector a try. He said:

“The level of the research debate in this industry is extraordinarily high, and given the current strong interest in sustainability issues along the food supply chain my experience in the Relu project has been very well received. In particular, the work with social scientists has helped me to better understand consumers’ expectations in relation to food, and working with soil scientists has proven key to grasping the uncertainties underlying the carbon footprints of food produce.”

The web has enabled Relu to interact with a wide audience of stakeholders and public.

Relu’s Great Land Use Debate

What is our rural land for and what do we expect from it? Should farmers be diversifying into energy crops or concentrating on feeding the nation? And is it reasonable to expect them to be competitive food businesses as well as managers and guardians of wildlife and landscapes? When floods overwhelm urban areas should that just be a problem for the individuals and businesses affected? Or should country dwellers be prepared to sacrifice rural land for flood storage? What is our long term vision for land use in the UK and do we need an extension of the planning system from town into countryside in order to realise it? These questions were featured in a unique on-line debate.

- Headline pieces were provided by leading thinkers in land management and the debate was kicked off by Secretary of State Hilary Benn. Around 100 comments were posted, reflecting a range of opinion and there were over 4,500 hits on the site from readers.
- The debate received extensive media coverage being featured in the Guardian, The Times, Guardian on-line, Farmers’ Weekly Interactive, Royal Institution of Chartered Surveyors’ Land Journal, Royal Agricultural Society’s magazine Rural Matters, NFU News on-line and BBC Radio 4 Farming Today, as well as numerous website and electronic newsletters.
- The debate heralded and helped to set the agenda for the Government’s Land Use Futures Project.

The processes and impacts of knowledge exchange

The programme is committed to stakeholder engagement throughout and sees this as a vital part of knowledge exchange. To document and refine the approach and to monitor the impact of Relu research, the Director's Office has developed a new tool called the Stakeholder Impact Analysis Matrix (SIAM). It tracks the annual involvement of several thousand stakeholders in Relu projects, what they bring to them and what they take away.

Researchers report a positive impact of stakeholders on the quality and relevance of research. They also identify impacts of their project on the stakeholders. Impacts on stakeholder knowledge outstrip impact on policies and practices, but this may be laying the foundations for future change. Individual projects are highly engaged with various fields of policy and practice. Of projects with potential to improve public policies or public services, 86% judged their actual contribution in 2010 to have been moderate or high. 78% considered their projects had improved the performance of existing businesses and 67% identified a moderate or high contribution to delivering highly skilled people to the labour market.

Work shadowing by researchers in policy and practice or bringing in stakeholders to projects as visitors or members of research advisory groups helps to promote mutual benefit, for both the research and stakeholder. Other relationships between stakeholders and research teams are rather one-sided. Thus stakeholders involved as research customers or event participants are more likely to be influenced by the research. In contrast, stakeholders involved as research

subjects or project partners typically exert influence more on the research. The most pronounced impacts on the research itself take place where stakeholders are contributing to objective setting, project design and knowledge production, and provide access to facilities or study sites. In contrast, gaining stakeholder feedback on findings and involving them in dissemination is associated more with generating impacts on their own practices and understanding.

Efforts to enhance knowledge exchange must overcome entrenched engagement tendencies in different sectors. Private and societal stakeholders who tend to be involved as research subjects need to be engaged more in project design and framing. On the other hand, public and third sectors should be encouraged to become more active in providing enabling functions within projects – for example, providing information, data or research access.

Relu Stakeholder Impact Analysis Matrix (SIAM)

SIAM is a diagnostic tool that helps us understand the how of knowledge exchange – what works, what doesn't – so that we can increase the efficiency of future approaches and the likelihood of mutual benefits (as the basis of effective 'pathways to impact'). It can:

- Enable stakeholder mapping and identification of key gaps in linkages.
- Hold data on all the stakeholder contacts of all Relu projects and how they are involved.
- Offer insights into the scale and extent of short term impacts of the research on stakeholders' knowledge and practices and impact of the stakeholders on research quality and relevance.
- Identify stakeholders around which to plan and seek feedback.
- Be based on annual reporting by project leaders.
- Be light touch and a routine part of data collection.
- Help target and account for long term impact analysis.

Relu's knowledge exchange legacy in science policy

Relu's approach to knowledge exchange has provoked much interest from many quarters. Too often research programmes are established that segregate scientific research and knowledge transfer functions. Relu's achievements are founded upon adopting a fully integrated approach within its research projects and programme structures.

[NERC] “uses Relu as an example of good practice in user engagement and knowledge exchange, in its own KE policy [and advice] it supplies to all new research programmes. NERC highlights Relu good practice in publishing briefings particularly targeted at policymakers... [and] 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 Exchange Team Leader

“Relu's innovative workshops have influenced the approaches taken in meetings for the development of other LWEC programmes and have helped the LWEC Directorate to be more creative in setting up opportunities for knowledge flow between academics and funders. Relu has helped to develop the LWEC Directorate's understanding of the value of fellowships.”

Ken O'Callaghan, LWEC Head of Directorate

“ESRC does in fact consider Relu to be a source of good practice [and] it 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. [Relu's] practical experience, both in terms of thinking about potential pathways and then implementing them, will I am sure inspire other researchers who might be otherwise daunted... In particular, we found [Relu] evidence that co-production has a positive impact on academic researcher as well as users, particularly enlightening.”

Fiona Armstrong, ESRC Head of Knowledge Transfer

Adventures in Science: Interdisciplinarity and knowledge exchange in the Relu programme

Relu briefing paper 16 by Jeremy Phillipson, Philip Lowe and Anne Liddon

Further Resources

Relu Briefing Papers may be downloaded from the website relu@ncl.ac.uk

1. Setting the research agenda
2. Rural economy and land use futures
3. The unfolding research agenda
4. The UK rural economy and land use debates
5. Power and responsibility – Who decides? You decide!
6. Common knowledge? An exploration of knowledge transfer
7. What is Relu?
8. Land to mouth: exploring the links between sustainable land use and the food we eat
9. Landmarks for policy
10. Telling stories: Accounting for knowledge exchange
11. Water Framework: Implementing the Water Framework Directive
12. Informing the reform and implementation of the Common Agricultural Policy
13. Shaping the Nature of England: policy pointers from the Relu programme
14. Growing concerns: animal and plant disease policy for the 21st century
15. Changing landscapes: some achievements of the Rural Economy and Land Use Programme

Relu special interdisciplinary issues:

Lowe, P., Phillipson, J., Green, L.E., Hunter, S., Jeger, M.J., Poppy, G.M. and Waage, J. (eds) (2011) Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases. Theme Issue of Philosophical Transactions of the Royal Society B, 366 (1573)

Phillipson, J., Lowe, P. and Bullock, J.M. (eds) (2009) Integrating Ecology and the Social Sciences. Special Profile in Journal of Applied Ecology, 46 (2)

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)

White, P. (ed.) (2008) Wild Mammals and the Human Food Chain. Special Issue of Mammal Review, 38 (2-3)

Phillipson, J. and Lowe, P. (eds) (2006) Rural Economy and Land Use: The Scoping of an Interdisciplinary Research Agenda. Special Issue of Journal of Agricultural Economics, 57 (2)



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