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**PROGRAMME  
DIRECTOR'S  
ANNUAL REPORT FORM**

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**PROGRAMME DIRECTOR'S ANNUAL REPORT 2006**

**Programme Name:** RURAL ECONOMY AND LAND USE PROGRAMME

**Programme Director:** Professor Philip Lowe, University of Newcastle  
**Assistant Director:** Jeremy Phillipson, University of Newcastle

**Reporting period:** from 1 January 2006 to 31 December 2006

**Number of Projects funded under the Programme:** 53 projects

**Total ESRC budget for Programme:** £22,000,000

**Co-funding amount:** £1,750,000  
(Individual projects attracted £693,709 of co-funding during 2006)

**Total amount of Director's Award including any supplements:** £913,764

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## Executive Summary

During 2006 the succession of funding calls was completed which meant that the full portfolio of RELU's major projects was formed. The Programme has attracted researchers from an unprecedented range of disciplines (over 40), including leading social scientists, biologists, and environmental scientists drawn by the challenge it presents of new ways of doing science. There are 29 large research projects in all. In 2006 8 projects funded under RELU's First Call on Sustainable Food Chains entered their second year; while 10 major Second Call projects got underway on the broad theme of People and the Rural Environment; and the assessment process was conducted for RELU's Third Call, with £7 million allocated conditionally to 10 projects on the themes of the Management of Animal and Plant Diseases and Sustainable Rural Development.

There were 32 journal articles published during the year and 118 presentations given at conferences and workshops. RELU's newsletter appeared quarterly and has a subscription list of 2000 researchers and stakeholders. Two programme-level briefing papers were published as well as a Special Issue of the *Journal of Agricultural Economics* reviewing the substantive scope and interdisciplinary foundations of RELU.

RELU is demonstrating the potential of fresh approaches to knowledge transfer built upon a philosophy of knowledge *exchange* and a sophisticated understanding of *innovation as a combined socio-technical process*. During 2006 researchers took part in a novel work shadowing scheme which allowed them to work alongside staff inside commercial organisations, voluntary bodies and public agencies. RELU held a major conference on the theme of "*Enabling Knowledge Exchange*" which explored approaches and mechanisms for knowledge transfer. A major workshop was also held to consider the implications of RELU research for rural and regional development and involving regional development agencies and interests from throughout the UK. Finally, the second of RELU's stakeholder forums – on people and the rural environment – was launched, comprising senior figures from commerce, government and the voluntary sector.

In Social Science/National Science Week 2006 RELU organised a set of high profile public debates on key issues facing the rural economy. They captured the essence of RELU's commitment to addressing contemporary challenges that draw in perspectives of scientists, social scientists and stakeholders. With Social Science Week and Science Week for the first time coterminous, RELU events were the ones that transcended the divide, demonstrating the programme's significance and potential for civic science.

There have been an increasing number of invitations to address conferences, especially regarding RELU's approach to interdisciplinarity and knowledge transfer. International interest continues to be strong with the Programme receiving visitors from the US, Australia, Korea, China and Chile. The Programme has contributed to rural policy debates. In 2006 David Miliband met with the Director to discuss the future of rural policy. The Programme continues to be a conduit for learning among the Research Councils. In 2006, BBSRC drew on RELU's experience to assist in their thinking about how interdisciplinarity might be mainstreamed within the Council. An independent review was also commissioned of RELU's efforts to build interdisciplinary capacity through seed-corn funding, to inform the design of subsequent programmes.

## 1. Introduction

**Aims and objectives of the Programme:** The Rural Economy and Land Use Programme (RELU) aims to advance a holistic understanding of the major social, economic, environmental and technological challenges facing rural areas. Its specific objectives are:

- to deliver integrative, interdisciplinary research of high quality that will advance understanding of the social, economic, environmental and technological challenges faced by rural areas and the relationship between them;
- to enhance capabilities for interdisciplinary research on rural issues, between social, environmental and biological sciences;
- to enhance the impact of research on rural policy and practice by involving stakeholders in all stages, including programme development, research and communication of outcomes.

**Summary of Key Performance Indicators:** A set of KPIs has been agreed for the Director's Office. The broad categories are: scientific quality; interdisciplinarity; user engagement, knowledge transfer and impact; research capacity and training; data collection and management; programme management; and added value (see Section 6).

**Start and end dates of phases within the Programme:** The reporting period covers the start of the second wave of research projects, and the commissioning of the third wave (Fig 1).

**Number of researcher and related posts:** There have been 305 researcher and related posts in the programme to date in 52 projects. The Programme Director's Office is an interdisciplinary team comprising: *Director*: Professor Philip Lowe (80% FTE); *Assistant Director*: Jeremy Phillipson (60% FTE); and *Communications Manager*: Post Vacant during 2006 (100% FTE).

**Number of projects started before, during and after the reporting period:** 42 projects (of which 34 small seed corn projects were completed in 2005) and 5 PhD studentships started prior to the reporting period. 10 large research projects and 5 PhD studentships, commissioned under the Second Call, commenced their research during 2006. 11 large projects (including one funded under the Second Call and 10 awarded, some subject to conditions, under the Third Call) will commence in 2007, as will 3 interdisciplinary fellowships related to the Programme and a studentship funded under the Second Call.

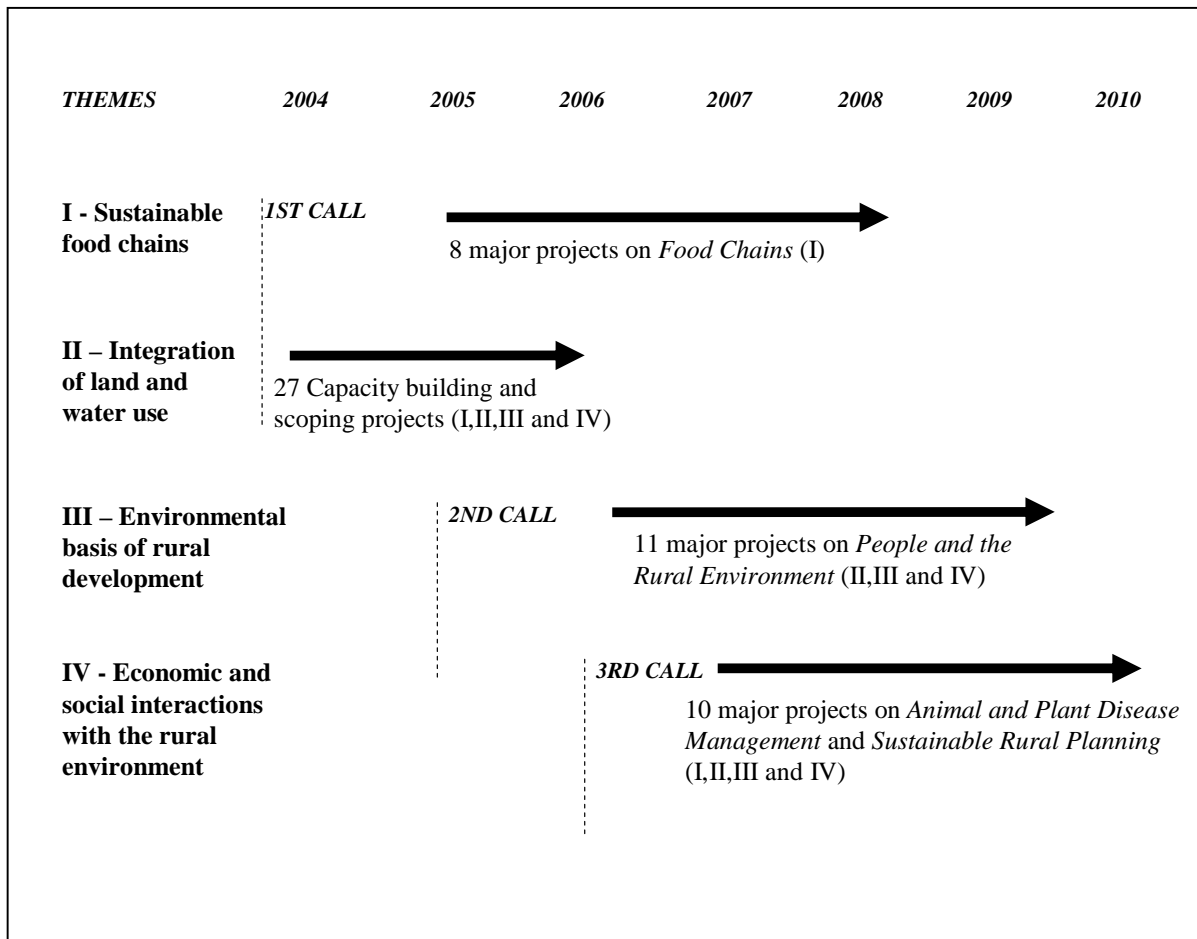
### **Year of the Programme: Year 3 (2006)**

**Co-funding and collaboration during the year:** The programme is a collaboration between the ESRC, BBSRC and the NERC. It has a budget of £24m, including co-funding of £750k from the Scottish Executive Environment and Rural Affairs Department and £1m from the Department for Environment, Food and Rural Affairs. A further £693k has been brought in from a number of organisations (see Section 8).

**Highlights:** Highlights for the year are presented in Section 2.

**PLEASE NOTE THAT THE REPORT IS STRUCTURED ACCORDING TO GUIDANCE AND EVALUATION CRITERIA SPECIFIC TO RELU**

Figure 1: The Shape of RELU



## 2. Overview of Year

2006 was the year that the RELU Programme came of age. The succession of Funding Calls was completed which meant that the full portfolio of RELU's major projects was formed. The 8 projects from the First Call on the Sustainability of Food Chains were in their second year of research. 10 out of the 11 projects from the Second Call on the broad theme of People and the Rural Environment commenced. Finally, 10 projects were chosen for conditional awards (with a total value of circa £7 million) from 99 applications in the Third Call, on the themes of Animal and Plant Disease Management and Sustainable Rural Development.

### **New Wave of Research to Inform Management of Animal and Plant Diseases**

A major element of Programme Management was completion of the assessment for the Third Call of funding (Section 3.1). The two-stage selection process was intensely competitive (1 in 10 funded). Ten new RELU projects were successful in obtaining £7 million of funding (some subject to conditions). Six of the projects bring together teams of natural and social scientists to research the management of animal and plant diseases in the UK. They aim to find strategies for preventing and dealing with these problems and are considering a wide range of issues involved in outbreaks, including the effect of changes in the countryside, technological developments, increasing globalisation, and the part played by public perceptions and concerns. Negotiations are ongoing with Defra regarding additional funding to Third Call projects.

### **RELU: A Unique Experiment in Interdisciplinarity**

Now that the full portfolio of RELU projects is formed, the nature of the programme as a large-scale experiment in interdisciplinarity is manifest, with 40 disciplines across 29 large projects (funding range £300k - £1million). The new (third) wave of funding has brought in another tranche of disciplines, grouped together in largely unprecedented combinations (see Figure 3, Section 3.2). The scientific ambitions of the Programme have attracted leading social scientists, biologists, and environmental scientists drawn by the challenge it presents of new ways of doing science. While a fundamental requirement for winning funding under the Programme was to combine creatively natural and social sciences, the approach, form and techniques of interdisciplinary integration were left completely open. Not only have the projects responded to this challenge imaginatively but they have done so in a variety of ways, such that the Programme presents a kaleidoscope of interdisciplinary research methods. It is evident that the Programme has stimulated a variety of methodological innovations, and an active internal debate has begun about how we should make the most of this unique learning opportunity.

### **RELU: 'A Landmark for the Future'**

Increasingly RELU is being recognised as a model for future research. The Sustainable Farming and Food Research Priorities Group described RELU as "a landmark for the future", positing that "the nature of the programme is effective in promoting cross-discipline collaboration at the project and programme level, in changing "hearts and minds" in the research community, and that it is "demonstrating the benefits that accrue from interdisciplinary work"<sup>1</sup>. The RELU Programme was also highlighted as an

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<sup>1</sup> *The Second Report of the Sustainable Farming and Food Research Priorities Group*, pp 12 and 19.

example of best practice in the Sustainable Development Research Network report to the Environment Research Funders Forum 'Securing the Future: The Role of Research...' to Support the UK Sustainable Development Strategy'<sup>2</sup>.

### **Pioneering New Approaches to Knowledge Exchange**

Given the criticisms that the Research Councils' efforts at knowledge transfer have attracted, it is a distinct advantage that not only can RELU draw upon and cross-fertilise the good practice where it exists in each of the Councils, but also that RELU is well positioned to demonstrate the potential of fresh approaches. On the one hand, the Programme's commitment to inclusive stakeholder engagement entails embracing a philosophy of knowledge *exchange*. On the other hand, the Programme's interdisciplinarity facilitates a sophisticated understanding of *innovation as a combined socio-technical process*. RELU thus breaks from the prevailing tradition of linear knowledge transfer and its simplistic technology-push or society-pull models.

During the year the Programme placed significant emphasis on building capacity for knowledge exchange among researchers and research users. RELU researchers took part in a novel work shadowing scheme which has allowed them to work alongside staff inside commercial organisations, voluntary bodies and public agencies (Section 4.4). The scheme has been so successful during 2006, that it has been extended into 2007 to enable outside practitioners to visit research teams and explore the implications of the research for their own work. RELU also held a major three day conference on the theme of "*Enabling Knowledge Exchange*" (Section 4.2). The conference, involving 160 researchers and stakeholders, explored approaches and mechanisms for exchanging information and knowledge between research, policy and practice. A major workshop was also held to consider the implications of RELU research for rural and regional development and involving regional development agencies and interests from throughout the UK (Section 4.2). Finally, coinciding with the start of RELU's second wave of research, the programme rolled out its second national stakeholder forum. The forums bring together key individuals from public, commercial and voluntary organisations to help evaluate and disseminate the implications of RELU research (Section 4.3).

### **Scientific Output**

Over 118 presentations and papers were given by RELU researchers at conferences and workshops, including 13 by the Programme Director and Assistant Director (Annex B). Publications from the Programme are also beginning to flow, with 32 journal articles published in 2006. Most of this work is appearing in high status disciplinary journals such as *Science of the Total Environment*, *Advances in Agronomy*, *Meat Science*, *Ecological Economics* and *Pest Management Science*. Indeed, it should not be overlooked that, although the distinctive characteristic of RELU is its interdisciplinarity, the Programme is funding a great deal of valuable basic research within the individual projects (see Section 5). RELU has also published and widely distributed its first major collection of papers: *Rural Economy and Land Use: The Scoping of an Interdisciplinary Research Agenda*. This special issue of the Journal of Agricultural Economics (v.57 no.2)

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<sup>2</sup> *Securing the Future: The Role of Research. Interdisciplinary, Cross-cutting and Strategic Research Needs to Support the UK Sustainable Development Strategy*. An SDRN report to the Environment Research Funders Forum (ERFF). February 2006. p. 15.

explores the range of methodological and conceptual challenges presented by the Programme (see Section 4.1).

### **RELU and Public Debate**

As part of the ESRC's Social Science Week and the British Association's National Science Week 2006, RELU invited opinion leaders, policy makers, academics and members of the public to a set of high profile public debates on key issues facing the rural economy: Energy crops running out of steam? Were any lessons learned from Foot and Mouth? Farming's no place for wildlife; and Food miles - should we be buying food from abroad? (Section 4.2) The debates attracted considerable general radio and newspaper publicity. They captured the essence of RELU's commitment to addressing contemporary challenges that draw in the perspectives of scientists, social scientists and stakeholders. Indeed, with Social Science Week and Science Week for the first time coterminous, RELU's events were the ones that transcended the divide, demonstrating the programme's significance and potential for civic science. Written up and published afterwards, they have been much in demand.

### **RELU Influencing**

The profile of RELU has grown and there has been an increasing number of invitations to address conferences and workshops, especially regarding its approaches to interdisciplinarity and knowledge transfer. International interest in learning from the Programme continues to be strong with various requests to contribute to the thinking of a number of EU research programmes and with the Programme receiving scientific visitors from the United States, Australia, Korea, China and Chile. The Programme has also contributed



actively to agriculture and rural policy debates. The Secretary of State for Environment, Food and Rural Affairs, David Miliband met with the Programme Director in July. The meeting covered the handling of rural affairs by Defra, the vision for a progressive rural policy, and new opportunities in the field of rural economic development.

### **Research Highlight I: The Scope for Energy Farming**

The search for clean, reliable sources of energy is beset with difficulties. One partial solution scores well on several counts: grow energy on the farm. Biomass energy production is close to carbon neutral, the technology is proven and the benefits demonstrated. It is already well established in several countries around the world, but uptake in the UK has so far been extremely limited. In 2003 the UK had some 2,000 ha of land producing energy crops: principally miscanthus grass, short rotation coppice willow and poplar. There is an official target to contribute 6% of UK electricity by 2020, and, given the level of policy support that now exists, a much greater area of land is likely to be covered by these crops in the future. However, a large-scale change to biomass crops



will have wide ranging implication for the countryside. Dr Angela Karp is leading the RELU research project “Social, Economic and Environmental Implications of Increasing Rural Land Use Under Energy Crops”. Using the East Midlands and South-West regions as study areas, this interdisciplinary project is conducting state-of-the-art social, economic, hydrological and biodiversity research to develop an integrated framework for Sustainability Appraisal of the medium and long term conversion of land to energy crops. The results of the research will show how and where decisions to convert the land - based on climate, type of soil and the availability of water - could be tempered by considerations of the consequences for the countryside and the public acceptability of the changes. There is considerable political and government interest in the work of the project. It is intended to benefit not only farmers, but also energy producers, planners, regional development agencies and the public (see Section 5.2 RES-227-25-0020 Social, Economic and Environmental Implications of Increasing Rural Land Use Under Energy Crops).

### **Research Highlight II: Regulating Bugs**

Naturally occurring insect-pathogenic fungi can be used to control insect pests of crop plants. Although they promise to displace chemical pesticides, changes in regulations might be needed to encourage a move towards active use of such bio-pesticides. Political scientists at the University of Warwick are working closely with the Pesticide Safety Directorate (PSD) to support their efforts to improve the registration process for bio-pesticides. One area of concern is the environmental sustainability of bio-pesticides, which is the focus of the research of Warwick biologists who are working alongside the political scientists in a RELU project. Nested clade analysis has been used to investigate the structure of natural populations of insect-pathogenic fungi. This new technique enables the influences of concurrent ecological factors (in this case, habitat type) to be separated from past evolutionary events and thus provides a theory-based understanding of how microbial control agents released into the environment will interact with natural and diverse populations of the same species. It is now clear that geographical factors influence the structure of natural populations of microbial control agents and this is likely to be a significant factor in determining the fate and behaviour of microbial inoculants applied to soil as biopesticides. The fate and behaviour of microbial control agents appears to be gaining greater prominence in PSD’s thinking, and the findings of the research enable this to be developed in a structured and coherent way (see Section 5.1 RES-224-25-0048 The Role of Regulation in Developing Biological Alternatives to Pesticides).

### **Dissemination Highlight: RELU Team Guide Implementation of the Water Framework Directive**

The UK Government is currently in the process of implementing the Water Framework Directive. This ambitious legislation aims to ensure that the water in our rivers, lakes, beaches and drinking supplies is of the highest possible quality, and could mean major changes in the way land is used and managed in river catchments. A RELU project is working on “Modelling the Impacts of the Water Framework Directive”. As this is the most sophisticated exercise of its kind currently taking place, the work is proving invaluable to officials in Defra and the Environment Agency, who are responsible for implementing the Directive. Meetings were held at an early stage so that the researchers could explain their approach, and the officials could explain the options they were

considering for putting the Directive into practice. This meant that the researchers could prioritise their tasks in line with policy requirements. Defra has provided additional funds to enable the project to address specific policy questions, including an early analysis of how alternative proposals for implementing of the Water Framework Directive would impact on farm incomes, in advance of forthcoming Government decisions (see Section 5.2 RES-227-25-0024 Modelling the Impacts of the Water Framework Directive).

### **3. Capacity Building and the Research Environment**

#### **3.1 Scientific Quality**

##### *Research commissioning*

RELU's Third Call for research funding built on the experience of earlier calls and was structured as a two stage process - of concept notes and full applications – in order to improve the quality of final bids. From 99 concept notes submitted, 25 were encouraged to prepare full proposals. Those applicants who went through to the second stage received feedback from the Assessment Panel and advice from the Programme Director and were invited to a briefing workshop in advance of their submission of full proposals. Prospective project leaders were advised on the submission process and what the assessment panel was looking for: namely strategically important research with strong natural and social science components that would be creatively integrated through careful attention to research methods and project management, and due regard to stakeholder engagement and data management.

The full applications were subjected to a thorough disciplinary peer review and then judged by the assessment panel. A mix of natural and social scientists as referees for each project ensured that the scientific components of research projects were rigorously scrutinised. Assessing the quality of a project's interdisciplinarity was a demanding but critical requirement, and specific guidance was developed for referees and assessors. The assessment panel was charged with making the final judgement about the overall quality of integration and strategic importance of the interdisciplinary collaboration. The following 10 proposals were recommended for funding (a 1 in 10 success rate overall):

1. Social and environmental inequalities in rural areas (Dr M Huby, University of York)
2. Memory and prediction in plant disease management: a comparative analysis of Dutch Elm Disease and 'Sudden Oak Death' in the UK (Dr C Potter, Imperial College London)
3. Assessing the potential risk of, and possible responses to, zoonotic diseases on the development of recreational use of British forests and wild-lands (Dr C Quine, Forest Research)
4. Understanding and acting within Loweswater: a community approach to catchment management (awarded subject to funding conditions) (Dr C Waterton, Lancaster University)
5. Developing a catchment management template for the protection of water resources: exploiting experience from the UK, Eastern USA and nearby Europe (awarded subject to funding conditions) (Mr L Smith, Imperial College London)
6. Reducing *Escherichia coli* O157 risk in rural communities (awarded subject to funding conditions) (Professor K Killham, University of Aberdeen)
7. Growing risk? The potential impact of plant disease on land use and the UK rural economy (Professor P Mills, University of Warwick)

8. Lost in translation: a cross-disciplinary analysis of knowledge exchange and effectiveness in animal disease management (awarded subject to funding conditions) (Professor B Wynne, Lancaster University)
9. Decision-making frameworks in management of livestock disease: interaction of epidemiology, economics and politics (Professor G Medley, University of Warwick)
10. Integrated systems for farm diversification into energy production by anaerobic digestion: implications for rural development, land use and environment (awarded subject to funding conditions) (Professor C Banks, Southampton University)

#### *Scientific output*

Over 118 presentations and papers were given by RELU researchers at conferences and workshops (Annex B). Publications from the programme are also beginning to flow, with 32 journal articles published in 2006. Most of this work is appearing in high status disciplinary journals such as *Science of the Total Environment*, *Advances in Agronomy*, *Meat Science*, *Ecological Economics* and *Pest Management Science*.

### **3.2 Interdisciplinary Reach**

40 disciplines are represented in the RELU Programme (see Figure 2). Every project includes natural and social scientists. The most prominent disciplines are economics, ecology, human geography, physical geography, hydrology, sociology, environmental modelling, environmental chemistry, microbiology, human psychology, crop science and management and business studies. An intention in designing the Third Call was to further broaden the scope of the Programme to fill some disciplinary gaps, and several disciplines absent from RELU's First and Second Calls are to be funded, including plant pathology, epidemiology, veterinary medicine, socio-legal studies, science studies, bioinformatics, social statistics and bioengineering (see Figure 3).

The RELU Programme has ambitions not only to explore different ways of doing science, but different ways of conceptualising pressing problems. Towards this end, a plenary session at the RELU Conference focussed on thematic concepts for sustainability science, with speakers giving a synoptic view of challenges for rural economy and land use from a broad sustainability perspective. RELU also sponsored a debate on "Reaching across the natural/social science divide: challenges for critical research", involving Prof Stuart Lane, Durham University and Prof Susan Owens, Cambridge University. In this and other ways, RELU is setting an interdisciplinary conceptual and analytical agenda.

Figure 2: Number of investigators by discipline in the Programme overall (Scoping Studies, Capacity Building Awards and Large Research Projects)

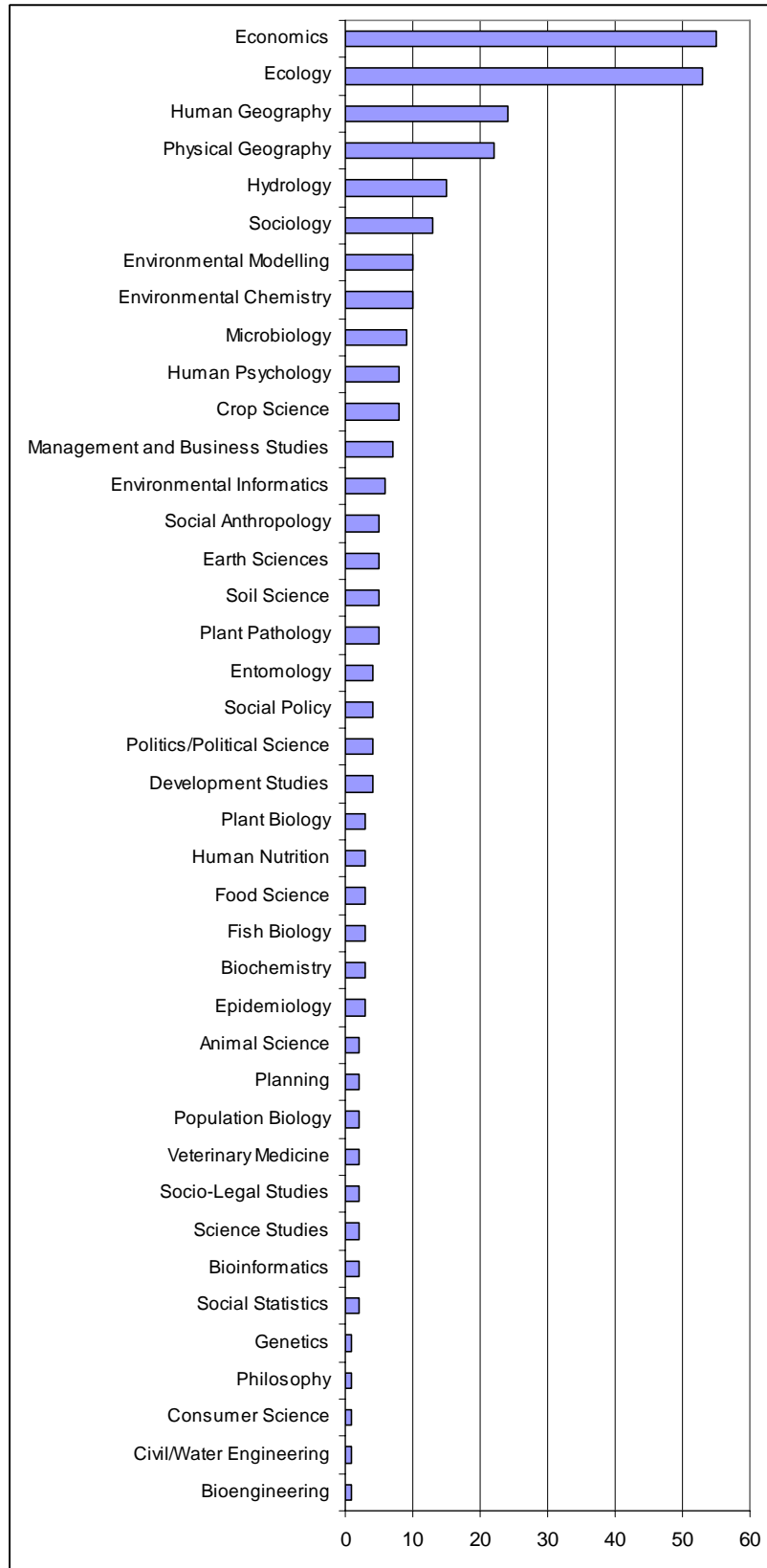
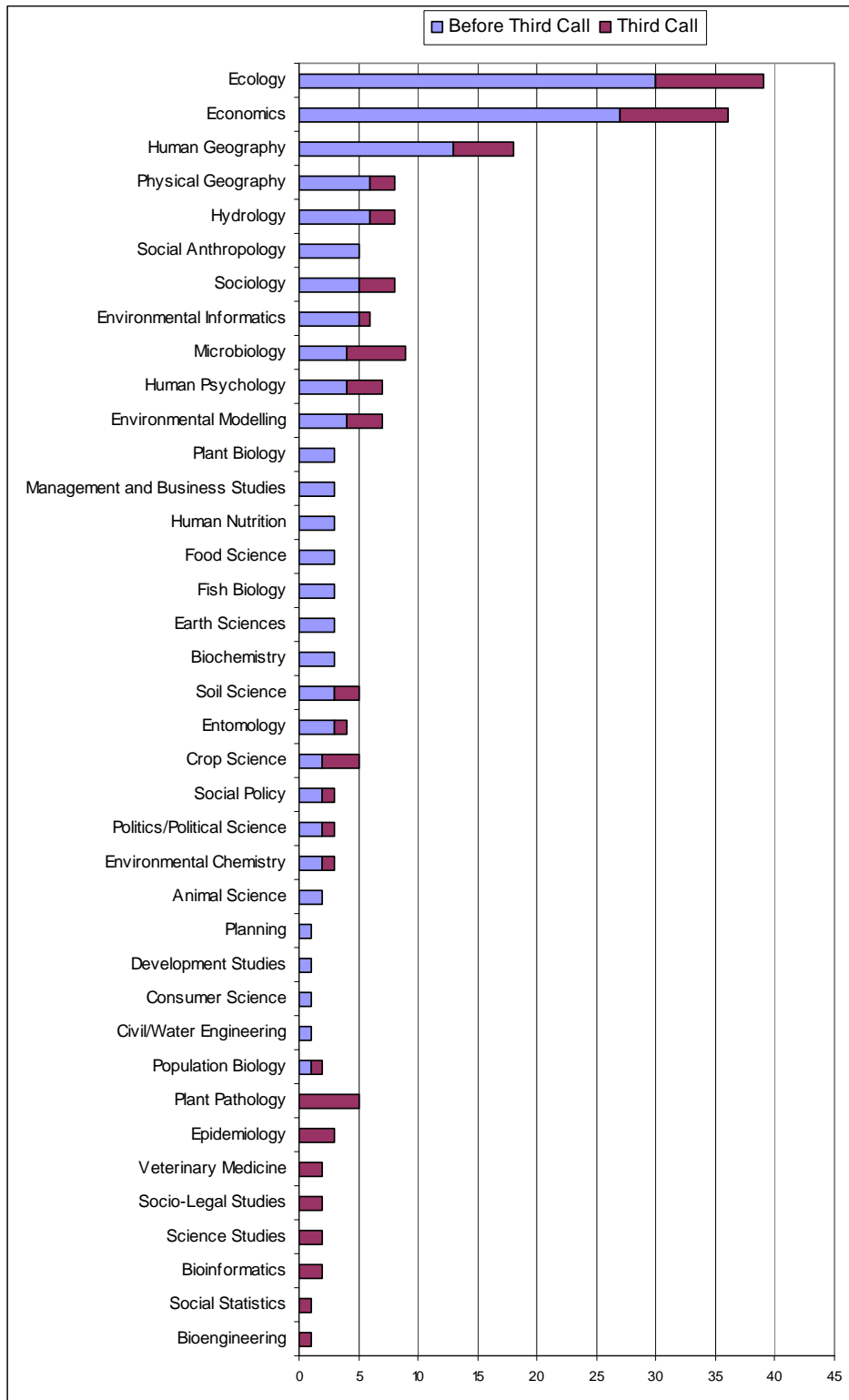


Figure 3: Number of investigators by discipline in the Large Research Projects, before and after the Third Call



### 3.3 Programme Wide Events and Networking

Seven Programme-wide events were organised by the Director's Office: *Enabling Knowledge Exchange* - January 2006 (see Section 4.2), the 4 *UK Rural Economy and Land Use Debates* - March 2006 (see Section 4.2), the *Third Call Workshop* - April 2006 (see Section 3.1), and *Sustainable Food Chains and Rural and Regional Development* - May 2006 (see Section 4.2).

Key items of expenditure include: £62,235 on the January Conference, £4,535 on the 4 debates, £1,168 on the April Workshop, £2,712 on the May workshop, £8,667 on networking/liason meetings and £3,614 on Research Council meetings.

### 3.4 Research Capacity and Training

One of RELU's primary objectives is to enhance and expand capabilities for integrative, interdisciplinary research on rural issues between the social, biological and environmental science communities. The following activities took place in 2006 to achieve this objective:

#### *Interdisciplinary studentships*

The RELU PhD studentship scheme is open to applications competitively from the major research projects. The rationale is that research students will benefit from the diversity of scientific expertise and research experience that these major interdisciplinary endeavours have to offer. In assessing proposals, particular attention is given to the quality and integration of the research training and supervision. 5 studentships allocated under the First Call entered their second year of study in 2006:

- Mary Fredlund, *Sustainability and Animal Welfare*, University of Exeter
- Alison Hodge, *Knowledge for Environmentally Sustainable Agriculture: Farmers, Scientists and Food Retailers*, University of Exeter
- Elizabeth York, *Evaluating Farmer Perceptions to the Environmental Cost of Local Versus Overseas Food Production*, University of Wales, Bangor
- Paul Cross, *Assessment of the Individual and Social Costs and Benefits of Pesticide Use in Horticultural Systems in the UK and Kenya*, University of Wales, Bangor
- Alan Poots, *Modelling Inter-relationships between Biodiversity, Land Use and Landscape: Quantifying Ecological and Economic Value of Land Use Patterns in the Chilterns*, University of Reading

6 studentships were awarded to Second Call research projects in 2006:

- Anders Kristian Munk, *Environmental Knowledge Controversies: Flood Risk Mapping, Insurance Zoning and the Politics of Rural Property*, University of Oxford
- Dugald Tinch, *Moorland Landscapes: What Do People Want, Who Wants It, and Can They Have It All*, University of Stirling
- Stephen Emery, *Rhetoric, Agency and Farmer's Knowledge in the Management of Upland Environmental Processes*, University of Durham
- Ben Moore, *Restoring Floodplain Grasslands: Reconciliation of Multiple Objectives*, Open University
- Gareth Clay, *The Impacts of Heather and Grassland Burning in the Uplands*, University of Durham

- To be appointed, *Moral Hazard in Agroecosystems: Risks and Benefits of Weed Control Strategies*, University of Reading

#### *Interdisciplinary fellowships*

The Research Councils launched an Interdisciplinary Early Career Fellowship competition. The objective was to support outstanding early career researchers interested in pursuing interdisciplinary research and careers, and at the same time to foster the development of interdisciplinary research capacity in selected priority areas, including RELU. Following the competition three fellowships were awarded to researchers linked to the RELU Programme:

- Dr Althea Davies, *Foundations for Future Land Use: Learning from the Past, through Environmental History*, Stirling University
- Dr Evan Fraser, *Integrating Economic and Land use Models to Anticipate Rural Vulnerability to Climate Change*, University of Leeds
- Dr Abigail Woods, *Reinventing the Wheel? Farm Health Planning 1942-2006*, Imperial College London

#### *Training activity*

A workshop bringing together RELU researchers was organised to scope RELU's training agenda. The subsequent report was considered by the RELU projects and the Programme's Strategic Advisory Committee.

In 2006 a number of Programme-level training activities were organised:

- Training workshops were organised on 'Qualitative and Quantitative Research Methodologies'; 'Pursuing the Public Interface'; and 'Integrating Spatial Data' at the Programme Conference.
- Projects took part in Research Council Training Events, including ESRC's 'Getting Research into Practice' sessions.
- In collaboration with the ESRC communications team a dedicated training workshop was held for RELU researchers on Media and Communications led by an array of leading national journalists and correspondents. Subsequent feedback from RELU researchers indicated how extremely helpful they had found the training.
- RELU supported a workshop 'Working together across Disciplines: Challenges for the Natural and Social Sciences', organised by one of the project leaders, Professor Wyn Grant, with financial support from the British Academy.

On an ongoing basis RELU projects offer fertile ground for on-the-job training and work experience for research staff and students, particularly in familiarising them with different methods and techniques as well as with interdisciplinary project management. The interdisciplinary training and research career development experience provided by projects are a specific element of assessment and monitoring.

#### *Building interdisciplinary capacity*

At the outset of the Programme, as part of the First Call (2004), RELU sought deliberately to build interdisciplinary research capacity through small Capacity Building, Scoping Studies, Development and Networking Awards. In 2006 an independent review was commissioned of these seed-corn funding mechanisms. Carried out by Laura



Meagher (Technology Development Group) and Catherine Lyall (Information Browser Ltd), the review was based on a survey of researchers and interviews with stakeholders. It found that:

“The seed-corn awards mobilised interest in the RELU programme, engaging diverse researchers in its issues. ... [A] variety of “linking” activities were facilitated by awards, including informal links and networks between researchers, and between researchers and other stakeholders. ... Hallmarks of the awards were the linkages between researchers and between disciplines that 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. ... An important contribution of the scheme has been the enhancement of researchers’ ability to participate in other, future interdisciplinary collaborations.”

The review makes a number of practical suggestions of ways a future seed-corn exercise of this kind could be improved. However, it concludes that:

“seed-corn funding can play very important roles in catalysing interdisciplinarity and the building of interdisciplinary communities with increased capacity to tackle complex problems. ... At a time when society looks to interdisciplinary research to tackle its complex problems, this practical learning thus represents a national resource”.

Some 163 researchers were involved in seed-corn projects. Subsequently, within RELU, they stood double the chance of gaining major funding from the Programme than other applicants. Indeed, approximately one third of them eventually appeared in major research projects, funded under RELU Second and Third Calls, where they represent *circa* one fifth of researchers.

### **3.5 Data Collection and Management**

RELU has its own Data Support Service (DSS) - the first one to operate across the Research Councils - to ensure that different types of data from its projects are properly collected, managed and stored. RELU data management is advised by a sub-group of the Strategic Advisory Committee which met on 1 occasion during 2006. During the year the DSS maintained a one-stop-shop support service, in spite of a formal contract not being in place. The service works in close contact with the Director’s Office to oversee the data management policy for the Programme and in approving data management plans required at the outset from each project. Advice to successful Call 2 award holders was provided on preparation of their data management plans via the help desk and correspondence. Individual advice was also provided to Call 3 applicants via the help desk and a briefing session on data management in April. A printed booklet with RELU house-style and branding style was also produced on *Best Practice in Data Management*. The DSS web site was modified to include a database providing



information about key third party data sources of interest to the RELU community. In March 2006, the RELU-DSS contributed to an ESDS conference on Best Practice in Data Sharing where ESRC, NERC, BBSRC and PPARC representatives spoke about progress in data sharing. The RELU model was highlighted as a successful one.

### **3.6 Programme Management**

#### *Programme management and project oversight*

Project Communication and Data Management Plans (PCDMPs) provide a basis for quality assurance within the Programme. PCDMPs were submitted by Second Call projects and reviewed by the Director's Office and Data Support Service. The plans are updated annually and form a basis for monitoring progress as well as discussion at project visits.

#### *Assessment activity*

The Director's Office provided assessments of the End of Award reports for 27 seed-corn projects funded under RELU's First Call – the first of RELU's awards to complete. Additional assessments were provided, but prospectively, for 99 concept notes and 24 full proposals submitted to the Third Call, and two assessment panel meetings were supported with advice and analysis on how these proposals would fit the programme (see Section 3.1). Finally, the Director evaluated 6 applications to the Interdisciplinary Early Career Fellowship Competition, serving on the assessment panel and taking part in interviews with shortlisted candidates (see Section 3.4).

#### *Advisory committee meetings*

The Director's Office provided briefing, advice and background analysis for: three assessment panel meetings; one meeting of the RELU Strategic Advisory Committee; one meeting of the RELU Management Advisory Group; and one meeting of the RELU data management sub-group. Papers were prepared on: RELU's Training Agenda; Analysis of Third Call Proposals; and Review of RELU Programme Development Funding Modes. A Communication Plan for 2006-2010, which had originally been presented in draft form to the Management Advisory Group and Programme Management Group in November 2005, was approved by them in May 2006 and then tabled to the Strategic Advisory Committee in July.

### **3.7 Added Value**

#### *Promoting synergy between research projects*

Effecting coordination between the projects so that the work of the Programme achieves its fullest impact involves effort at a variety of levels. Examples include:

- assisting in orchestrating a joint launch of two closely related projects exploring upland change (RELU projects RES-227-25-001 and RES-227-25-0028 based at Sheffield and Leeds Universities);
- support and encouragement for inter-project training and research seminars (such as the workshop on 'Working together across the Disciplines' organised by RELU project leader Professor Wyn Grant, at the British Academy);

- convening joint planning meetings (A group planning meeting covering training, knowledge transfer and dissemination activities was held in May with all the Food Chain projects funded under RELU's First Call).

All the Programme-level meetings (Section 4.2) were consciously designed to foster and build upon inter-project synergies (through such means as cross-cutting workshops and joint presentations). The ease with which they were able to do so reflected the deliberate efforts of previous years to build a RELU research community. The first fruits of those efforts was the special issue of the *Journal of Agricultural Economics on Rural Economy and Land Use: The Scoping of an Interdisciplinary Research Agenda* (v.57 no.2). This collection of papers was collaboratively produced between social and natural scientists and between projects.

#### *Making international connections*

The RELU Programme funds basic and strategic research of relevance to UK rural economy and land use. It is crucial though that the research done is of international standard, addresses global challenges and learns from experience from outside the UK. The Director's Office has therefore sought to help RELU projects make appropriate international connections.

Several RELU projects have been successful in attracting international visiting researchers to comment and add comparative perspectives to their research. In addition, at Programme level, RELU made a successful application to the competitive ESRC-SSRC Visiting Fellowship Scheme. Professor Clare Hinrichs from Pennsylvania State University was awarded a fellowship to study the "Relocalization of agri-food systems in USA and UK". She made extended visits to four RELU food chain project teams in May–July 2006. The Fellowship provided valuable opportunities to compare research questions and emerging findings regarding transnational changes in agri-food systems, and to build international research links.

Thematic sessions placing RELU research in its international context were held at the RELU Conference. Delegates were invited from North America and continental Europe to address themes of Food Chain Localisation (covering the issues of food miles, the arguments for local foods, and the relative advantages of imported and domestically produced food) and the Implementation of EU Directives (exploring what the new wave of RELU research funded under the Second Call could potentially contribute).

#### *Engaging researchers with practitioners and policy makers*

RELU's Communication Plan emphasises continuous and extensive engagement of stakeholders to ensure their active involvement and interest in shaping the Programme through all its stages. Key activities in 2006 included:

- Holding two meetings each of the RELU Food Chain Forum and the RELU People and the Rural Environment Forum (Section 4.3)
- Operationalising RELU's suite of stakeholder engagement plans (Section 4.3).
- Implementing a RELU work shadowing scheme to raise understanding among RELU researchers of the policy and practice context for their work (Section 4.4).
- Running a major conference on the theme of *Enabling Knowledge Exchange* (Section 4.2).

- Running a workshop with Advantage West Midlands on the implications of the research of the Sustainable Food Chains projects for national regional and rural development professionals (Section 4.2).

RELU's inclusive outlook on stakeholder engagement underpins its cutting-edge approach to knowledge exchange.

#### *Raising the public profile of RELU research*

RELU was without a Communication Manager throughout 2006. However, the following activities were sustained:

- Producing and distributing RELU publications and newsletters (Section 4.1).
- Maintaining an up to date website (Section 4.1).
- Holding in collaboration with the ESRC communications team a training workshop for RELU researchers on Media and Communications (Section 3.4).
- Running a series of national debates on key challenges facing the rural economy (Section 4.2).

RELU's debates proved to be amongst the highlights of national Science/Social Science week (see Section 4.2). As well as attracting specific publicity and introducing RELU researchers and their work to national opinion formers, the debates served as a launch pad for media attention to the various RELU projects that were showcased. Project leader, Gareth Edwards-Jones, has given the following account of what followed from his appearance in the RELU debate 'Food miles – should we be buying food from abroad?'

“Taking part in the RELU debate led to an invite to write for BBC Green Room. That brought at least 100 public responses and was well viewed by many people. This led to me being invited to write another Green Room article rebuffing some of the accusations put by the public (e.g. I'm stupid, in the pay of an oil company, mediocre etc.). A range of journalists saw the Green Room article and this led to a few TV appearances last summer on the matter of local food, as well as articles in some odd magazines like 'Shipping News'. Perhaps the most important outcome was an article in The Economist in December. This led in turn to a slot on World at One on Radio 4, and a few interviews on radio Wales, as well as an invited letter to the London Evening Standard. That further burst of publicity landed an invite to speak in May at a conference for retailers dealing with carbon accounting/footprinting in the food chain.”

#### *Influencing Research Council policy and practice*

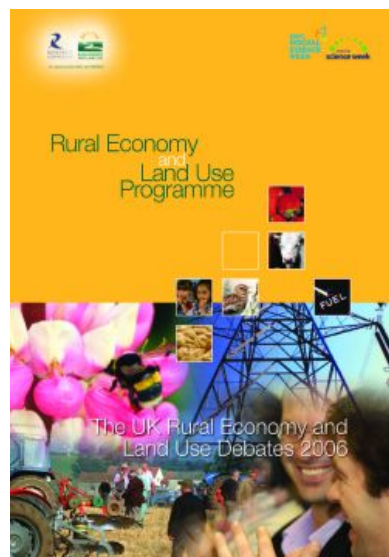
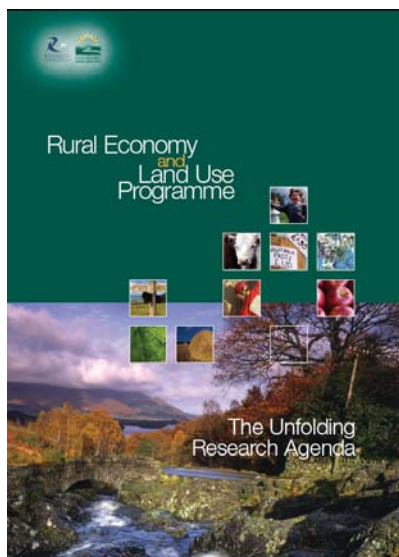
The RELU Programme continues to be a conduit for learning between the Research Councils and a testing ground for inter-Council collaboration and new methods of working. A seminar was held between the BBSRC Sustainable Agriculture Panel, biologists leading RELU projects and the Programme Director to assist in thinking about how interdisciplinarity might be mainstreamed within BBSRC. An independent review has been commissioned of RELU's efforts to build interdisciplinary capacity through seed-corn funding, to inform the design of subsequent programmes (Section 3.4). RELU data sharing has been recognised as a model approach to cooperation on data management between the Research Councils (Section 3.5). Finally, RELU is breaking new ground for the Research Councils in promoting knowledge exchange (Sections 2 and 4).

## 4. External Communication

### 4.1 Significant Publications

In 2006 RELU published two Programme-level briefing documents:

- **No 3** *The Unfolding Research Agenda*. The briefing paper profiles the research commissioned under the first and second waves of funding within the Programme.
- **No 4** *The UK Rural Economy and Land Use Debates 2006*. The briefing paper captured the discussions at the RELU Debates which formed part of the ESRC's Social Science Week and the British Association's National Science Week (see Section 4.2).



The briefing papers were distributed to approximately 1400 people on the RELU mailing list including Civil Servants, think tanks, academics, NGOs, politicians and RELU researchers.

The RELU website was further developed during 2006 ([www.relu.ac.uk](http://www.relu.ac.uk)) to include sections on: the Second and Third Call, stakeholder engagement plans, work shadowing and new research in the Second Call. Four newsletters were prepared and distributed to the RELU mailbase, which comprises 2000 researchers and stakeholders.

RELU has also published and widely distributed its first major collection of papers: *Rural Economy and Land Use: The Scoping of an Interdisciplinary Research Agenda, Special Issue of the Journal of Agricultural Economics 57 (2)*. RELU had been invited by the journal to put together the special issue at the outset of the programme, to provide an insight into the opportunities presented by an interdisciplinary approach and explore the range of methodological and conceptual challenges presented by the Programme. The following peer-reviewed papers were included in the special issue, all collaboratively

produced between social and natural scientists from projects funded under the First and Second Calls:

- Phillipson, J, and Lowe, P. *'Special issue guest editorial: The scoping of an interdisciplinary research agenda'*
- Lowe, P. and Phillipson, J. *'Reflexive Interdisciplinary research: the making of a research programme on the rural economy and land use'*
- Marzano, M., Carss, D.N. and Bell, B. *'Working to make interdisciplinarity work: investing in communication and interpersonal relationships'*
- Matthews, R. and Selman, P. *'Landscape as a focus for integrating human and environmental processes'*
- Tiffin, R., Traill, W.B. and Mortimer, S. *'Food choice in an interdisciplinary context'*
- Bateman, I.J, Brouwer, R., Davies, H., Day, B.H., Deflandre, A., Di Falco, S., Georgiou, S., Hadley, D., Hutchins, M., Jones, A.P., Kay, D., Leeks, G., Lewis, M., Lovett, A.A., Neal, C., Posen, P., Rigby, D., and Turner, R.K. *'Analysing the agricultural costs and non-market benefits of implementing the Water Framework Directive'*.
- Lane, S.N., Brookes, C.J., Heathwaite, A.L. and Reaney, S. *'Surveillant science: challenges for the management of rural environments emerging from the new generation diffuse pollution models'*
- Dougill A.J., Fraser E.D.G, Holden J, Hubacek K., Prell C., Reed M.S., Stagl S.T. and Stringer L.C. *'Learning from doing participatory rural research: Lessons from the Peak District National Park'*,
- Waterton, C., Norton, L. and Morris, J. *'Understanding Loweswater: interdisciplinary research in practice'*
- Huby, M., Cinderby, S., Crowe, A.M., Gillings, S., McClean, C.J., Moran, D., Owen, A. and White, P.C.L. *'The association of natural, social and economic factors with bird species richness in rural England'*
- Shepherd, R., Barker, G., French, S., Hart, A., Maule, J., and Cassidy, A. *'Managing food chain risks: integrating technical and stakeholder perspectives on uncertainty'*
- Harvey, D.R. (2006) *'RELU special issue: editorial reflections'*.

#### **4.2 Significant Engagement Conferences**

*Enabling Knowledge Exchange, 18-20 Jan 2006, Manchester Conference Centre, University of Manchester*

This major three day conference focussed on the theme of knowledge exchange. The conference brought together scientists, policy makers and potential users of the research, including farmers, environmentalists, consumers and rural development groups. It explored approaches and issues at the interface between research, policy and practice. The overall aim was to introduce participants to the importance and possibilities of knowledge exchange, and to help them think about the right means and partners in this endeavour. In advance of the conference a discussion paper was circulated to inform debate and to seek views about models and mechanisms of knowledge exchange appropriate for RELU. A series of interactive workshops on themes such as Research and Policy for Land Management Advice, and Mechanisms for Commercialisation was held, each led by a key knowledge broker in the field of rural economy and land use. Of the 156 delegates, 25% were key stakeholders. Keynote addresses, presentations and

facilitation roles were provided by senior representatives of the Environment Agency, Welsh Assembly, Scottish Executive, Meat and Livestock Commission, Defra, Rural Development Service, One North East Regional Development Agency, Food Ethics Council, European Environment Agency and the Royal Institution for Chartered Surveyors. Participants uniformly praised the Conference: its various facets were judged of good or excellent quality by the large majority of attendees: including handouts (88%); the organisation of the event (93%) and the overall quality and value of the conference (78%).

*The UK Rural Economy and Land Use Debates, March 2006, London*

As part of the ESRC's Social Science Week and the British Association's National Science Week 2006, over 160 opinion leaders, policy makers, academics and members of the general public met at the Royal Academy of Engineering, London to discuss four key issues facing the rural economy: Energy crops running out of steam?; Were any lessons learned from Foot and Mouth?; Farming's no place for wildlife; and Food miles - should we be buying food from abroad? In bringing leading scientists, social scientists and stakeholders together to ponder contemporary challenges in the relationship between science, technology and society, the RELU debates peculiarly and uniquely captured the spirit of the week which, for the first time, saw a collaboration between Social Science Week and Science Week. The RELU debates attracted considerable general radio and newspaper publicity. They were particularly prominent within the overall offer of Science/Social Science week – out of ESRC's 71 research networks, centres and programmes, RELU organised the second highest number of events during the week. 99% of participants rated the debates as interesting and topical. 85% thought the debates would help them in their work. 98% felt the debates were well structured and 54% said they had made useful contacts through the events.

Complementing the national debates, the RELU Sustainable Uplands team at Leeds University offered local residents and secondary and higher education groups a series of guided walks in the Peak District National Park entitled "Moorland Perspectives", involving discussions with researchers and land managers about how land is managed. These guided walks were designed to promote understanding of the complex and often controversial issues surrounding moorland use and conservation. Each walk was led in turn by three different land managers (a conservationist, a farmer, a gamekeeper), providing three very different perspectives about how the land should be managed.

*Sustainable Food Chains and Rural and Regional Development, May 11 2006, Birmingham*

This workshop, hosted by Advantage West Midlands Regional Development Agency, explored the implications for regional and rural development of several major RELU research projects on sustainable food chains. Three themes were covered: Risk Management and the Food Chain, Food Marketing and Rural Development and Diversification and New Market Opportunities. The audience consisted of RELU researchers and national, regional and rural development professionals from across the UK. Stakeholders (who represented 50% of participants) acted as discussants and gave feedback on the research including: Environment Agency, Sustainable Development Commission, Defra, Rural Development Service, Countryside Agency, North West Food Alliance, Countryside Council for Wales and the Food Processing Knowledge Transfer

Partnership. Participants uniformly praised the Conference: its various facets were judged of good or excellent quality by the large majority of attendees: including handouts (89%); the organisation of the event (100%) and the overall quality and value of the conference (100%).

### **4.3 Programme-Level Meetings with Potential Research Users**

Stakeholder engagement in RELU is as deep and dense as it is extensive. Figure 4 merely records the formal involvement of stakeholders at the Programme level.

RELU is advised by a **Strategic Advisory Committee (SAC)**, chaired by Sir Howard Newby, which includes representatives from Defra, Environment Agency, Countryside Council for Wales, Countryside Agency, Scottish Environment Protection Agency and the Joint Nature Conservation Committee. The SAC met on one occasion in 2006.

The **RELU Food Chain Forum** held two meetings during 2006 at which RELU projects presented their work. The forum includes representatives from Unilever, Food from Britain, Marks and Spencer, Food Ethics Council, Advantage West Midlands Regional Development Agency, National Farmers' Union, Commission for Rural Communities, Countryside Council for Wales, Defra and the BBC. During the year the Forum shifted its attention to the consideration of early results arising from the research projects and to advising the programme on the package of dissemination activities for this cluster of projects.

The first meetings of the **RELU People and the Rural Environment Forum** were held in 2006. The Forum includes members from Welsh Assembly Government, Environment Agency, Royal Institution of Chartered Surveyors, Institute for European Environmental Policy, Joint Nature Conservation Committee, Peak District National Park, Clinton Devon Estates, Association of Rivers Trusts, National Trust, RSPB, YHA, Natural England, UK Water Industry Research, Wessex Water, ONE Regional Development Agency and a number of farm businesses.

The members of the forums were consulted on RELU's Communication Plan 2007-2010. The forums will in future act as critical sounding boards for the Programme's new Policy and Practice Note series, helping ensure that the messages are appropriately honed and targeted.

In 2006, following a review and positive feedback from the respective stakeholders, RELU continued to operationalise its suite of Stakeholder Engagement Plans (SEPs) with Defra, UK Water Industry Research, Scottish Executive Rural Affairs Department, Environment Agency and Welsh Assembly Government. The SEPs specify clear, simple and bespoke terms of engagement between the Programme and key stakeholders and provide a means to secure close and sustained involvement in RELU.

Bilateral meetings were held at programme level with many stakeholder organisations (see Annex A).



Figure 4: Formal Stakeholder Engagement in RELU at the Programme Level

Stakeholder	Stakeholder Engagement Plan established	Representation on Programme Management Group or Strategic Advisory Committee	Representation on national stakeholder forum	Representation on Assessment Panel (as observer or assessor)	Attendee at Programme Conference or Workshop
ADAS					√
Advantage West Midlands RDA					√
AEA Technology Environment					√
Agri-food Partnership			√		
Association of National Parks					√
Association of Rivers Trusts			√		√
BBC			√		√
British Nutrition Foundation			√		
British Trust of Ornithology				√	
Clinton Devon Estates			√		
Commission for Rural Communities			√		
Country Land and Business Association					√
Countryside Agency		√	√		√
Countryside Council for Wales		√	√		√
DAH Associates					√
Dept for Environment Food and Rural Affairs	√	√	√	√	√
Dept of the Environment Northern Ireland					√
Dillington Farms			√		
Downs Farm				√	
Eastbrook Farm Organic Meat (organic farmer)			√		
English Nature			√		√
Entrading (James Curran)			√		
Environment Agency	√	√	√	√	√
European Environment Observatory					√
Fast Ltd					√
Fields Farm			√		
Food Ethics Council			√		√
Food from Britain			√		
Food Processing Knowledge Transfer Network/Food Processing Faraday Partn'ship Ltd					√

Grassroots Food Network					√
Henley Centre (futures / marketing consultancy)			√		
Ian Brown (diversified tenant farmer)			√		
Information Browser					√
Institute for European Environmental Policy			√		
International Inst' for Environment & Dev't			√		
Joint Nature Conservation Committee		√	√		
Marks and Spencer			√		
Meat and Livestock Commission					√
National Farmer's Union			√		√
National Non-Food Crops Centre					√
National Trust			√		
North West Food Alliance					√
One North East Regional Development Agency			√		√
Pareto Consulting				√	
P.C. Tinsley Ltd (cereal/vegetable farmer)			√		
Peak District National Park			√		
Pembrokeshire Fish Farms			√		
Royal Institution of Chartered Surveys			√		√
Royal Society for the Protection of Birds			√		√
Rural Development Service					√
Scottish Environment Protection Agency		√		√	√
Scottish Executive Rural Affairs Department	√	√		√	√
Scottish Natural Heritage					√
Shropshire Hills AONB					√
South West RDA					√
Sustainable Development Commission					√
UK Water Industry Research	√		√		
Unilever			√		√
Welsh Assembly Government	√		√		
Wessex Water Company			√		
Youth Hostel Association			√		

c - Many stakeholders were also engaged in refereeing research applications.

#### 4.4 Work Shadowing Scheme

In 2006 the Programme rolled out its novel work shadowing scheme which has allowed RELU researchers to work alongside staff inside commercial organisations, voluntary bodies and public agencies. The scheme encourages knowledge exchange between researchers and the people and organisations that can benefit from their research. Locations for placements have ranged from pubs, fish farms and horticultural consultants through to bodies such as Defra, the Food Standards Agency, Health Protection Agency and the Pesticides Safety Directorate. An evaluation of individual work shadows was completed in 2006 by each researcher and work shadow host. Some typical examples of participant feedback include:

“The period at Defra proved to be an invaluable experience. ... As researchers we were exposed to the workings of policy implementation for the first time and were able to gauge considerable differences with regard to how policy negotiators and researchers view research project data. The scientific framework with which we design and conduct experiments became less important when decisions regarding new policy were to be made. Instead, we learned that Defra are more focussed on the end-result of research - the specific answer to a specific research question. The underlying science, techniques, complexities and difficulties are effectively left behind. This was incredibly insightful”.

Work shadow researchers: Chris Hodgson and David Oliver  
(RELU Project: “Sustainable and Safe Recycling of Livestock Waste”  
RES-224-25-0086)

“We found the experience very useful. It is rare for policy officials to have scientists on their doorstep to discuss things with and get some flows going on various issues”.

Host: Defra

“The time spent with the FSA helped to develop focus group protocols and questionnaire design investigating consumers’ perceptions of healthy eating with attention on impediments to behavioural change”.

Work shadow researcher: Alexandra Lobb  
(RELU Project “Implications of a Nutrition Driven Food Policy for the Countryside”  
RES-224-25-0073)

“Dr Lobb gathered a lot of information about the objectives, methods, and positions of the Agency that may help reinforce the policy relevance of the RELU research in which she is involved. Meanwhile, the FSA gained some understanding of the food-related research being carried out within RELU and is looking forward to the publication of the results. ... It is important for the FSA to maintain contacts with academics in order to stay in touch with the latest research and Dr Lobb’s visit was, from that point of view, very useful.”

Host: Food Standards Agency

The scheme has proved so successful during 2006, that it is to be rerun in 2007 and extended to enable outside practitioners to visit research teams and explore the implications of the research for their own work.

#### **4.5 Project-Level Meetings with Potential Research Users**

Some 79 presentations were given specifically to stakeholders during the year (Annex B). Individual research projects ran over 10 major workshops which engaged a wide range of stakeholders (see Table 1). These included examples of stakeholders helping to steer and interpret the research. There was also experimentation in different forms of participatory research.

For example, the RELU project “Integration of Social and Natural Sciences to Develop Improved Tools for Assessing and Managing Food Chain Risks Affecting the Rural Economy” (RES-224-25-0090) held a workshop on pesticide residues in food, which involved stakeholders, members of the public and consumer organisations, and explored attendees’ views on pesticides, and processes for their participation in risk management.

In other cases, stakeholder engagement represented a crucial step in knowledge transfer. For example, RELU researchers (RES-224-25-0048) convened a one-day workshop on 'Biopesticides: the Way Ahead' at the Royal Agricultural Society of England on 18 October. This opened up a new dialogue among a range of stakeholders from regulators through manufacturers, consultants, retailers to growers, and is helping to prime the emergence of a new industrial sector around bio-pesticides.

#### **4.6 Relevance of Research and Potential Impact**

The Director of the programme has been able to inform key policy circles of the importance of the Programme through his membership of the following fora: Countryside Agency (Board Member), including its operating division the Commission for Rural Communities (Board Member); English Market Towns Advisory Forum (Chairman); English Nature’s Socio-Economic Advisory Group (Member); and Defra’s Science Advisory Council (Member).

Analysis of the projects shows that the Programme is providing insights of relevance to key policy domains, notably water management, sustainable farming and food, rural development policy, biodiversity and landscape protection policy. Examples of research impact include:

*RELU team advises multinational agri-business company*  
(RELU project RES-224-25-0048 The Role of Regulation in Developing Biological Alternatives to Pesticides)  
Syngenta plc invited RELU researchers from Warwick to present their work on “Biological alternatives to chemical pesticides”. Syngenta is a worldwide agribusiness employing more than 19,000 people in over 90 countries.

Table 1: Project-Level Stakeholder Engagement Workshops

<b>Project</b>	<b>Workshop</b>
<b>RES-224-25-0041</b>	<i>Stakeholder day</i> held at the University of Exeter, 14 <sup>th</sup> June.
<b>RES-224-25-0044</b>	<i>Symposium on Local Food</i> held in Bangor, 11 <sup>th</sup> July. Visiting academic Clare Hinrichs from Pennsylvania State University shared some transatlantic perspectives on local food initiatives. Around 25 academic and local food stakeholders attended.
<b>RES-224-25-0048</b>	<i>Biopesticides: the Way Ahead</i> , Royal Agricultural Society of England, Stoneleigh Park, 18 <sup>th</sup> October. Presentations by project team, consultant, biological control agents manufacturer, Pesticides Action Network and retailer, followed by discussion. Main audience was growers, consultants, manufacturers and regulators.
<b>RES-224-25-0090</b>	<i>Involving Stakeholders in the Management of Food Chain Risks in the Rural Economy. Case 1: Dietary Pesticide Exposure of Young Children Phase 1: Issue Formulation</i> , London, 8 <sup>th</sup> March. Audience included a mix of stakeholders including the public, FSA, NFU, PSD, HPA, CPA, PRC, AFS, Consultants, Farmers, and Academics. <i>Involving Stakeholders in the Management of Food Chain Risks in the Rural Economy. Case 1: Dietary Pesticide Exposure of Young Children Phase 3: Evaluation</i> , 30 <sup>th</sup> June 2006. Audience included a mix of stakeholders including the public, FSA, PSD, CPA, PRC, AFS, CSL, BCPC, Consultants, Farmers, and Academics.
<b>RES-227-25-0001</b>	Project Launch <i>Learning to Manage Future Change in UK Uplands</i> , Castleton, February. Approximately 80 individuals representing a range of Government agencies, conservation organisations, land manager organisations, water utilities and Universities. <i>Moors for the Future Partnership members mini-conference</i> (May). As above, approximately 60 present. <i>Moors for the Future Annual Conference 2006</i> , Upland Ecosystem Services, Castleton, Derbyshire, 9 <sup>th</sup> -10 <sup>th</sup> November. 110 delegates were registered for the conference representing 28 different stakeholder organisations and 14 different research institutions.
<b>RES-227-25-0020</b>	<i>South-West stakeholder meeting</i> , Exeter University, March 9th Engagement of stakeholders in the S-W region in the Biomass Sustainability appraisal <i>East-Midlands stakeholder meeting</i> , Kegworth, March 20th Engagement of stakeholders in the E-M region in the Biomass Sustainability appraisal
<b>RES-227-25-0024</b>	<i>Meetings with Local and Regional Environment Agency for the case study area</i> Yorkshire. 19 <sup>th</sup> July. Mainly concerned with establishing links with EA staff, obtaining access to data and understanding EA interest regarding project outputs. <i>Participation at stakeholder workshop organised by RELU projects at The Moors for the Future Annual Conference</i> , Upland Ecosystem Services, Peak District National Park Study Centre, 9-10 November. Audience: Local stakeholders, land owners, farmers, local decision makers, local NGO's and academics <i>Meetings with National level Defra, Environment Agency and Country Land and Business Association</i> representatives, London, July 2006. Mainly concerned with establishing links, obtaining access to data and understanding their interests regarding project outputs.
<b>RES-227-25-0028</b>	<i>Project Launch</i> Castleton, 27 <sup>th</sup> February. Joint project launch run in collaboration with the Hubacek-led RELU project and Moors for the Future. 80 delegates registered for the meeting representing 25 stakeholder organisations and 10 research institutions. <i>Historical Drivers of Change Workshop at the Moors for the Future: Upland Ecosystem Services Conference</i> . Castleton, 10 <sup>th</sup> November. In collaboration with the Hubacek-led RELU team, parallel RELU workshop sessions were organised. The project team ran a workshop for half of the delegates in which stakeholders and scientists worked together to build historical time-lines of land use and agricultural change in the Peak District. 110 delegates were registered for the conference representing 28 different stakeholder organisations and 14 different research institutions.

*Comparative pesticide hazards of imported and home-grown vegetables explained to regulators*

(RELU project RES-224-25-0044 Comparative Merits of Consuming Vegetables Produced Locally and Overseas)

Papers written by the team on pesticide hazard in imported and home-grown vegetables were discussed at the September meeting of the Advisory Committee on Pesticides.

*Pesticide regulators assisted in turning to biocontrols*

(RELU project RES-224-25-0048 The Role of Regulation in Developing Biological Alternatives to Pesticides)

The project team have actively supported the efforts of the Pesticides Safety Directorate to develop a flexible network of persons with expertise relevant to, and experience of, biopesticide registration.

*Developing organic-farmed fish*

(RELU project RES-224-25-0066 Warmwater Fish Production as a Diversification Strategy for Arable Farmers)

In September, product placement trials featured tilapia on the menu in a restaurant and a pub in Devon, to gauge both chefs' and customers' reaction to tilapia in their normal working and dining environment. Interviews followed with various fish suppliers, processors, fishmongers and restaurant chefs to obtain a broader spectrum of knowledge and reaction to high quality, locally farmed tilapia in Devon. One such interview and introduction to the product has resulted in a new market channel being developed for an industrial partner in Devon. Communication with numerous farmers and entrepreneurs interested in the project continued throughout 2006. Some farmers have since commenced tilapia farming. Knowledge transfer meetings were held with the Scottish Collaboration Innovation Programme, the Seafish Industry Authority, SEERAD's Farm Business Officers', and Perth Business Gateway.

*Getting farmers to clean up their act*

(RELU project RES-224-25-0086 Sustainable and Safe Recycling of Livestock Waste)

In terms of deliverables and dissemination, Chris Hodgson and David Oliver have been invited to present the monitoring and risk tool results at the first England Catchment Sensitive Farming Delivery Initiative Conference in January 07. This invite is the direct outcome of the RELU work shadowing experience they both had at Defra (Water Quality).

*Updating regulators' understanding of risk communication*

(RELU project RES-224-25-0090 Managing Food Chain Risks)

Following presentation of a research seminar at the Pesticides Safety Directorate, the group is developing a possible collaboration involving transfer of knowledge on risk communication to the PSD.

*International study of degradation hotspots uses RELU-tested methodology*

(RELU project RES-224-25-0001 Sustainable Upland Management)

The methodological framework developed by the Leeds based RELU study “Sustainable Uplands” is to be rolled out through a 7 million Euro EU-funded project covering Africa, southern Europe, USA, Australia, China and South America. The project “Desertification Mitigation and Remediation of Land” aims to establish alternative land strategies, based on close collaboration between scientists and stakeholders, for degradation hotspots around the world.

*Guiding implementation of the Water Framework Directive*

(RELU Project RES-227-25-0024 Modelling the Impacts of the Water Framework Directive)

The work is proving invaluable to officials in Defra and the Environment Agency, who are responsible for implementing the Directive. Defra has provided additional funds to enable the project to address specific policy questions, including an early analysis of how alternative proposals for implementing the Water Framework Directive would impact on farm incomes, in advance of forthcoming Government decisions.

## **5. Progress of Projects**

42 projects (of which 34 small seed corn projects were completed in 2005) started prior to the reporting period. 10 large research projects commissioned under the Second Call, commenced their research during 2006. 11 large projects (including one funded under the Second Call and 10 awarded, some subject to conditions, under the Third Call) will commence in 2007. A progress and planning meeting was convened in May with all 8 Food Chain projects funded under RELU's first call. Individual visits to all 11 projects funded under the Second Call are scheduled for early in 2007.

### **5.1 First Call Projects on Sustainable Food Chains**

**RES-224-25-0041, Prof H Buller, University of Exeter**

**01 Jan 05 - 30 June 07**

**Eating Biodiversity: An Investigation of the Links between Quality Food Production and Biodiversity Protection**

*This project is examining how environmental conservation of grasslands can be maintained and encouraged by linking it with the production and marketing of high quality food. The project is working closely with a number of initiatives managing semi-natural grassland, as well as with specialist producers and suppliers of animals raised on biodiverse vegetation.*

A sample of 15 lamb, 15 beef and 15 cheese farms across the UK have been involved in ecological and social surveys. A sub-sample of these have provided product samples for food quality analysis. Data collection and analysis of the first, lamb phase, of the research, has been completed, and is underway for the beef and cheese phases. A series of interviews with nature conservation/land use professionals and visits to food fairs and Farmers Markets have been conducted. Five focus groups with consumers have been held.

The ecological, social and meat analyses are all showing important relationships between animal pasture, land management and product quality within value-adding production systems. The focus groups provided significant insights into consumer behaviour and attitudes towards 'local' and 'quality' food acquisition and marketing. Interviews with land managers and organisations reveal shifts in attitudes towards a more integrated approach to biodiverse grassland management for conservation and food production.

A series of conference papers and presentations at technical and professional meetings have been undertaken. A major stakeholder conference was held in June 2006, at which some 30 stakeholders participated. Excellent feedback came from this conference and contacts have been maintained throughout the duration of the project with these stakeholders. Presentations were given by members of the project team to the annual conference of the Farmers' Retail and Marketing Association (FARMA) and to a one-day event organised by Advantage West Midlands, Birmingham, 11th May 2006. On the strength of the project's dissemination and stakeholder engagement, the project has been



contacted by a large number of farmers and farmer organization seeking information on the research and its findings.

**RES-224-25-0044, Prof G Edwards-Jones, University of Wales, Bangor**

**01 Dec 04 – 30 Nov 07**

**Comparative Assessment of Environmental, Community and Nutritional Impacts of Consuming Vegetables Produced Locally and Overseas**

*The research project is comparing local and imported vegetables for their social costs, carbon budgets, consumer acceptability, and health impacts. Field work is being carried out in Uganda, Spain and the UK with a variety of vegetables, including beans, peas, brassicas, leafy/salad vegetables, potatoes and onions.*

The project is posing the question ‘Which is best; to produce fruit and vegetables in the UK, or to import produce from overseas?’ To answer this question, it is comparing a range of characteristics of fruit and vegetables produced in UK, Spain and Uganda, relating to the environment, economy, consumer perception, nutrition and community. From an environmental perspective, it is considering whether fewer greenhouse gases are released by producing food in the UK, or by importing it from Spain and Uganda. This requires measuring gases released from vegetable fields in the three countries and estimating the gases released during transport from field to final consumer. The project is also considering the nutritional value of fresh imported food, compared with UK produced food which may need to be stored for several months prior to consumption. Finally the social and economic advantages of home and overseas produced food are being considered, by undertaking a large survey of consumers, and also by working in a more detailed way with 3 rural case study communities. All these results will be brought together in one case study site.

Data collection for both the natural and science components of the project is nearing completion. Data analysis is in progress, with a view to identifying the overall advantages and disadvantages of the home and overseas produced fruit and vegetables. Life Cycle Analysis (LCA) have been done of the production of a number of vegetables (including chicory, lettuce and potatoes). Reports have also been prepared on pesticide impact assessment and a comparison of farm worker health between the three countries.

The LCA reports and assessment studies are being sent to the farmers participating in the study both to promote knowledge transfer, and to elicit feedback, to refine the data collected and its interpretation. Presentations on the project were given to the Countryside Council for Wales (June, 2006) and the Technical Services Division of the Welsh Assembly Government (October, 2006). Papers from the project on pesticide hazard were discussed in September at a meeting of the Advisory Committee on Pesticides.

**RES-224-25-0048, Prof WP Grant, University of Warwick**

**01 Nov 04 – 31 Oct 07**

**Biological Alternatives to Chemical Pesticide Inputs in the Food Chain: An Assessment of Environmental and Regulatory Sustainability**

*The project is based on insect pathogenic fungi, which are naturally widespread in the environment and can be used to control insect pests of crop plants. Fungal bio-pesticides have been produced in the past, but little work has been done on their environmental sustainability. The project is also examining the rules governing the introduction of bio-pesticides in the UK, Europe and the USA to assess whether changes in regulations might encourage a move towards bio-pesticide use.*

The principal methods used are field research, including collection of samples and the cultivation of lettuce; laboratory work; semi-structured interviews and observation. The project team has sought to work closely with the Pesticide Safety Directorate (PSD) to support their efforts to improve the registration process for biopesticides. Insights from these interactions have informed the project's understanding of regulatory innovation.

The inadequacies of the current system of biopesticide registration have been specified and work has started on outlining the design principles of a revised system and on specifying the costs and benefits of biopesticides. The fate and behaviour of microbial control agents appears to be gaining greater prominence in PSD's thinking, and the findings of the research enable this to be developed in a structured and coherent way. Nested clade analysis has been used to investigate the structure of natural populations of entomopathogenic fungi. This new technique enables the influences of concurrent ecological factors (in this case, habitat type) to be separated from past evolutionary events and thus provides a theory-based understanding of how microbial control agents released into the environment will interact with natural and diverse populations of the same species. It is now clear that geographical factors influence the structure of natural populations of microbial control agents and this is likely to be a significant factor in determining the fate and behaviour of microbial inoculants applied to soil as biopesticides.

The research team organised a one day workshop on Biopesticides: the Way Ahead at the Royal Agricultural Society in October 2006. The high attendance and the extensive coverage given to the event in the trade press demonstrated the considerable interest of a wide range of practitioners, including growers, manufacturers and consultants. The meeting was the focus of a professionally made iCast video which is available through YouTube. In April 2006 a presentation on the project was given to the research division of Syngenta plc, attracting a large audience from within this leading life sciences company. The research team has participated actively in the work of the EU REBECA policy action on biological control agents, presenting a paper at its conference in Germany in September 2006. A good working relationship has also been established with AgraQuest, a leading US manufacturer of biological control agents, and there has been a regular informal exchange of views on regulatory practice.

**RES-224-25-0066, Dr DC Little, Stirling University**

**03 Jan 05 – 31 Dec 07**

**Warmwater Fish Production as a Niche Production and Market Diversification Strategy for Organic Arable Farmers with Implications for Sustainability and Public Health**

*This project aims to develop technical guidelines for a sustainable system for tilapia culture as a potential diversification strategy for farmers in the UK. A comprehensive analysis of the practicality, sustainability and viability of the system is being gained through laboratory and on-site investigations and trials with two commercial partners.*

Research techniques have used mixed qualitative, quantitative and case study approaches. Production units within conventional recirculating aquaculture systems (RAS) are being compared with those managed with activated suspension technology (AST) that promise improved efficiencies, enhanced animal welfare and greater accessibility for conventional farms. Data developed through the technical trials at the Institute and with a commercial partner in Thailand are being used to inform testing by commercial partners in the UK. The costs and benefits of using organic, and /or traceable and locally produced feed are also being assessed. Potential markets have been explored by means of consumer focus groups and in-depth interviews with organisational channel members, including processors, retailers, and foodservice interests. These components are leading to an improved understanding of production alternatives and existing perceptions of food safety, health and dietary communications. Health and sustainability impact assessments – worker, consumer, environmental – are being used to combine current knowledge with evidence from the technical trials, to predict the impacts of tilapia culture in the UK.

The second and third phase of trials in Thailand are now complete and have confirmed that the AST systems are less robust and efficient than conventional RAS systems. Chronic levels of tilapia mortality and poor growth and feed utilisation efficiency correlate with increasing floc densities in AST systems. Acute mortalities were thought to be floc density independent, instead they appear to be related to the influence of water exchange rate on floc flora composition. An economic evaluation comparing AST and RAS production systems has led to the conclusion that AST systems are not currently a commercially viable option for farmers in the UK. The research is now focusing on developing feeding strategies that can utilise on-farm feed ingredients within RAS systems. It is also evaluating the potential for periphyton (attached micro-algae and associated biota) within biological filtration and as a feed additive to improve the efficiency of RAS tilapia production systems.

An investigation into farmer entrepreneurship and attitudes towards diversifying from conventional agriculture was undertaken with agricultural farmers and their families in Central Scotland and Angus, to further understanding of the potential adopters of the process. A range of experimental marketing activities were undertaken and the results support the initial premise of there being a number of niche markets for tilapia produced from local, small-scale environmentally-friendly units. Consumer focus groups conducted in Glasgow, Stirling and London explored participants' attitudes towards fish

consumption and sustainable food production and their awareness of tilapia. In September 2006, product placement trials featured tilapia on the menu in a restaurant and a pub in Devon, to gauge both chefs' and customers' reaction.

Knowledge transfer meetings have been held with the Scottish Collaboration Innovation Programme, the Seafish Industry Authority, SEERAD's Farm Business Officers', and Perth Business Gateway. Presentations about the project have been given to the Aquaculture Today Conference (Edinburgh, March 2006), the Good Food Up North Conference (Bradford, June), and the International Institute of Fisheries Economics and Trade Conference (Portsmouth, July). Numerous farmers and entrepreneurs have been in contact with the project, including some who have since commenced tilapia farming.

**RES-224-25-0073, Prof B Traill, University of Reading**

**01 April 2005 - 30 April 2008**

**Implications of a Nutrition Driven Food Policy of Land Use and the Rural Environment**

*Common Agricultural Policy reform is shifting farm policy away from traditional production support; meanwhile concern with diet-health relationships will move nutritional goals to the policy front-line, with major implications for food demand and land use. This project draws on economics, psychology, ecology, crop science, animal science and human nutrition to assess the potential for improvements in the nutritional quality of soft fruit, lettuce, and meat and milk, and the possible implications for both human health and the countryside.*

The project is testing whether more biologically diverse pastures can produce healthier milk and meat with a lower proportion of saturated fat and more of the beneficial n-3 fats. With respect to soft fruit (strawberries, blueberries, raspberries) and lettuce, the research is assessing the extent to which new ultra-violet transparent films for polythene tunnels can enhance the levels of a range of phytochemicals known to have antioxidant (cancer protecting) properties. The project is also investigating consumers' attitudes to healthy eating, the demand for healthier products and the public support for policies to promote their consumption. Finally, the land-use implications will be analysed using the Land Use Allocation Model.

In the pasture diversity research, the monoculture plots of the 13 biodiverse plant species, established in 2005, have yielded plant material for analysis to determine the effect of factors such as plant species, plant part and maturity on the fatty acid content and profile of the plant. Findings so far from the research on soft fruit suggest that as a whole the nutritionally relevant phytochemical contents are little affected by the uv regime under which the crops are grown. However indications are that with strawberry higher uv levels may be accelerating fruit ripening. Future work is designed to determine the consequence of this effect for the nutritional value of marketed fruit particularly in relation to commercial post harvest storage. For the lettuce crop the uv transparency of the plastic has dramatic effects on anthocyanin levels.

Focus groups were held on consumer attitudes and willingness to pay for functional agricultural products and attitudes and factors influencing healthy eating. Consumers are prepared to pay substantial premiums for locally produced lamb and strawberries, but are reluctant to make extra shopping trips to purchase them. However the premium may justify supermarkets stocking more local foods. Modelling of the consumption implications of following healthy eating guidelines was also completed. If everyone in the UK followed healthy eating guidelines, fruit and vegetable consumption would increase by 50%, cheese would fall by 75%, milk and meat consumption by 15%.

**RES-224-25-0086, Dr D Chadwick, IGER, North Wyke**

**01 Feb 2005 - 01 Sept 2008**

**Sustainable and Holistic Food Chains for Recycling Livestock Waste to Land**

*Dairy and beef farmers provide consumers with reliable sources of milk and meat, but the animal waste generated poses environmental and social risks. This project is evaluating the changes needed in management practices to limit the risk of pathogen transfers from grazing livestock, manures and other farm wastes to water courses. The effect of these changes on the economics and practicalities of farming are being investigated as well as the 'knock-on' effects for local communities and industries reliant on clean water supplies.*

Research to date has focussed on determining current farm management practices in the Taw catchment area, Devon, through a survey of 77 livestock farmers in the catchment. 12 months of FIO monitoring has also been completed at 10 key farms in the catchment, with intensive monitoring periods targeted at times of manure and livestock management deemed to pose an increased risk of transfer.

A core aspect of the work has been the development of a field and farm scale risk indexing tool. A consortium of experts helped to set weightings for the relative contribution of FIOs (faecal indicator organisms) from different sources within the farming landscape. Topographical, land use, rainfall and soil classification datasets have been used to parameterise the risk tool for each farm. The risk tool has been further refined and tested against the information from the 10 monitored farms.

The project had a very positive response from farmers and the public at the IGER open day in summer 2006. There were two stakeholder meetings in 2006, with representatives from the SW RDA, the EA, NFU, and shell fisheries. Work shadowing with Defra (Water Quality) resulted in an invitation to present potential mitigation methods at the first England Catchment Sensitive Farming Delivery Conference in January 2007 aimed at providing briefing for the 39 catchment officers required to deliver advice to farmers to protect water quality. Additional funding from the Society for Applied Microbiology enabled a student to spend 8 weeks working on the project on FIO survival following slurry application to grassland and the effect of application technique. The project has been presented to a BBSSRC Sustainable Agriculture Panel where the merits of interdisciplinary research were discussed.

**RES-224-25-0090, Prof R Shepherd, University of Surrey**

**01 Feb 2005 – 31 Jan 2008**

**Integration of Social and Natural Sciences to Develop Improved Tools for Assessing and Managing Food Chain Risks Affecting the Rural Economy**

*In recent crises in food and agriculture (e.g. BSE, E. coli, Foot and Mouth Disease) a narrowly technical perspective has too often been taken: the social, political and economic issues have been addressed too late in the process with the result that many people lose confidence in the authorities' management of the situation. The project therefore is incorporating the thinking and values of stakeholders into the scientific modelling of risks. The research is centred on three contrasting case studies: a chemical contamination, a microbial contamination and a mock crisis scenario. The project is developing ways to handle uncertainties in the estimates of risk, taking account of the complexity of contemporary food chains and the possible reactions of consumers to information on food safety. Various groups, including producers, NGOs, regulators, risk managers and members of the public, are helping define each of the problems and discussing their understanding of risk. This will enable examination of the effectiveness of different forms of risk communication.*

Focus groups have been run with key stakeholders from the rural economy (e.g. farmers; urban and rural communities; pressure groups; scientists; food industry), in order to understand their perceptions of food-chain risks and ways that they should be mitigated. The project ran a series of workshops on pesticide residues on fruit (the first risk case study). They included a range of stakeholders, including government authorities concerned with pesticides (PSD, FSA), the pesticide industry, NGOs, farmers and consumers. Following the initial workshops different assumptions on the estimates of risk were put into an existing risk model to assess the impact, and the results were used in the subsequent workshops. A questionnaire study was conducted with parents of toddlers examining the impact of presenting information in different ways on the amounts of fruit consumed by the toddlers, along with examining the roles of trust and personality in this effect. This was replicated in a sample of adults examining their own fruit consumption.

The focus groups on perceptions of food-chain risks have been completed across a range of stakeholders. In analysing the results, a conceptual approach has been used that brings together social representation theory and the mental models approach. An innovative visually-based methodology has been developed for deriving stakeholder conceptualisations of the food chain, the primary risks involved and the ways in which they should be mitigated. In addition, this methodology has been developed as a web-based tool appropriate for on-line research and is being further developed as a support system to facilitate stakeholder understanding of food chain risks.

The project contributed to an exhibit on research supporting quantitative risk assessment at public open days at the Institute of Food Research which, in turn, was part of the BA Annual Meeting in Norwich. Following presentation of a research seminar at the Pesticide Safety Directorate, the project is developing a possible collaboration involving transfer of knowledge on risk communication to PSD. The project's website has been developed to include an interactive forum for discussion among participants in the

workshops and others who register with the site. It also includes an electronic version of the ‘fuzzy felt’ method developed for visualising the food chain.

**RES-224-25-0093, Dr AS Bailey, Imperial College London**

**01 Feb 05 – 31 Jan 09**

**Re-Bugging the System: Promoting Adoption of Alternative Pest Management Strategies in Field Crop Systems**

*This project is investigating both the efficacy of alternatives to chemical pesticides and issues for producers in switching to them. Two alternatives are being explored: habitat manipulations to encourage predators and parasites and semiochemical odours (natural smells) to manipulate predator distribution. By choosing an established and a new technology, the aim is to look backward and forward in developing effective tools to evaluate and promote the adoption of alternative pest control technologies in UK agriculture.*

Field trials have been conducted to clarify the role of a range of semiochemicals – including *cis*-Jasmone (a volatile compound which can be used to switch on plant defence against pest insects) and nepetalactone (a component of aphid sex pheromones detectable by parasitic wasps ) – to inform optimal deployment strategies. Experiments have been conducted using a model wheat-aphid-predator system to isolate the components of diversity and examine the relative contributions of natural enemy richness or abundance to suppress herbivore populations. Field studies conducted at 14 sites were established to examine whether landscapes with varying proportions of non-crop habitat were affecting the levels of cereal aphid control and the mechanism by which this was occurring. The aerial movement of natural enemies was examined within this experimental framework. Impact of parasitoids compared to other aerial natural enemies was examined using a novel parasitoid repelling chemical. The socio-economic analysis is focusing on the path dependency of technological change in farms, considering factors such as private costs of adoption, consumer preference and retailer led supply chain governance. A pilot survey on IPM portfolio adoption among cereal farmers has been conducted and the full survey has been designed. Interviews with cereal farmers, agronomy advisors and other key stakeholders have begun.

The semiochemical field trials have shown that different wheat varieties respond differently to *cis*-jasmone treatment: this implies genetic variation in inducible defences and improves the scope for practical use of *cis*-jasmone. In the process of the work, new sustained release formulations of semiochemicals have been developed. The mode of action of nepetalactone on aphid parasitic wasps (parasitoids) has been elucidated: it acts as an arrestant, retaining these key aphid natural enemies in crops. Aphid parasitoids have been shown to avoid negative interactions with ladybirds by leaving plants contaminated with chemical “ladybird footprints”: the semiochemicals involved have been identified.

In the experiments on complexity, diversity and abundance using a model wheat-aphid-predator system, pest control showed a positive relationship with density and negative relationship with predator richness over a range of species compositions, indicating that

habitat manipulations for biological control should aim to enhance densities of the most effective natural enemy. However, predator-predator interference was more limiting in single than multiple species assemblages, suggesting a threshold density when the addition of another species will increase pest control function more effectively. Additionally, lower variability in multi-species assemblages may ensure more reliable pest control. The impact on aphid populations of the order in which species assemble in natural enemy communities was examined in a subsequent experiment. A strong effect of arrival time on the pest population dynamics was observed; control was maximised when the most effective predator arrived early. The field-scale ecological studies have identified groups of aerial predators hitherto unrecognised as important in the control of cereal aphids.

Discussions on the project were held with farmers at Cereals 2006. The work was also presented at Rothamsted Research Association Farmer Workshop on Orange Wheat Blossom Midge control, (May 2006). Demonstrations of the work at Rothamsted Open Weekend were attended by more than 10,000 people.

## **5.2 Second Call Projects on People and the Rural Environment**

**RES-227-25-0001 Dr K Hubacek, University of Leeds**

**01 Mar 06 to 28 Feb 09**

**Managing Uncertainty in Dynamic Socio-Environmental Systems: An Application to UK Uplands**

*The uplands in Britain are facing a time of considerable change, and it is important that these biodiverse areas, which provide much of Britain's drinking water, as well as being a valuable resource for tourism, sheep farming, game, fishing and other recreation, are managed in a sustainable and acceptable manner. This project aims to help people identify the most appropriate ways to adapt to changes in a socially and environmentally sustainable way, and to monitor progress. Focusing on three upland areas, the Peak District, Nidderdale in the Yorkshire Dales and Galloway in Scotland, it seeks to encompass the diverse pressures on land use and livelihoods, as well as the range of visions for a sustainable future held by those who live and work there.*

The research is developing an adaptive learning process that can rapidly and effectively integrate knowledge from stakeholders and researchers from different disciplines to: identify sustainable rural futures that different stakeholders would like to see develop; identify drivers of change and model likely future scenarios; develop innovative adaptive management and policy options that could facilitate multiple sustainable rural futures under different scenarios; model the environmental, economic and social implications of these options; and develop sustainability indicators to monitor and further adapt management and policy to achieve sustainable multiple land use.

The carbon model which has been developed shows that the Peak District National Park is a major source of carbon. The models suggest that the loss of carbon will increase from UK peatlands generally, a development that is likely to be exacerbated by future climate



change. Since the majority of UK carbon is stored in peats (more than in the forests of France and Germany combined), this is a major concern for climate change mitigation. The research suggests that blocking peatland drainage ditches could sequester carbon, which could finance upland restoration via the Kyoto mechanisms, although the models question the permanence of any resulting carbon storage. Nevertheless, gully blocking is essential for ecological and hydrological restoration of many peatlands and through additional funding from the Moors for the Future partnership, the project has developed a hydrological model to prioritise which gullies should be blocked to effect greatest changes.

Together with the Moors for the Future partnership, the project has established a stakeholder network of about 70 individuals from around 30 organisations in the Peak District and have also made first contacts with key stakeholders in Nidderdale and Galloway. The team took part in a joint launch with the RELU project “The sustainability of Hill Farming” in February in Castleton. Biophysical data collection has been completed for the Peak District National Park.

Through a combination of interviews and literature reviews, the research has provided improved understanding of the likely changes that will take place in UK uplands, and how environmental management may affect upland ecological and hydrological processes. A new method has been developed, “visual discourse analysis”, to explore more effectively differences between the ways that different stakeholder groups perceive these system dynamics. Data from the Peak District have been used to show how Social Network Analysis can enhance stakeholder analysis.

The project has generated 4 peer reviewed journal articles and 16 presentations at national or international conferences/workshops. It has provided information to Defra for their review of the Heather and Grass Burning Code and has supplied the Soils Division with information on soil carbon in relation to burning regulations. During 2006 the project contributed to DEFRA’s Soil Carbon Discussion Meeting, Natural England Climate Change Discussion Meeting, and to the Moors for the Future Partnership mini-conference. Presentations were also given at Framework for Change/Natural England: Sharing Best Practice for Environmental Projects held by Yorkshire Forward and to the Steering Committee of Natural England’s Yorkshire and Humber Environmental Pathfinder Project.

The project team supported an ESRC Inter-disciplinary Fellowship application from Dr Evan Fraser, who has now been appointed to a Fellowship.

**RES-227-25-0002 Dr E Oughton, University of Newcastle**

**1st Mar 06 to 28<sup>th</sup> Feb 09**

**Angling in the Rural Environment: Social, Economic, Ecological and Geomorphological Interactions**

*Angling contributes an estimated £6 billion to the UK economy every year and will be increasingly important as the rural economy moves from being dominated by production*

*(agriculture, forestry), to being dominated by consumption (leisure, tourism). But rivers are under further pressure from other human activities, so their ability to sustain flora and fauna may be at risk. Bringing together researchers from natural and social sciences, as well as stakeholders from government, NFOs and the local community, this project analyses the complex relationships between river, fishing, biodiversity and institutions of governance and practice. Results will be used to inform policy on integrated development of the rural river environment.*

The team has designed a comprehensive angler questionnaire survey linking angling activities with socio-economic characteristics of anglers and begun to use this in the sample areas. The governance structures of angling are being revealed as complex and dispersed, with commercial fisheries and the shift from club-based to commercial (particularly still water) angling increasingly important.

Focus groups and interviews are continuing to reveal new stakeholders. Excellent working contacts are now being built with key individuals in stakeholder organisations. A launch event was held with project partners and stakeholder representatives at Fountains Abbey Yorkshire in June. The overall project was reviewed and the sites for research on the Rivers Swale and Esk were determined.

A member of the research team has been invited to join The River Esk Salmon and Pearl Mussel Advisory Body. The researchers presented a paper and a poster at the International Salmonid Conference, Gateshead.

**RES-227-25-0006 Dr S Stagl, University of Sussex**

**1<sup>st</sup> Jan 06 to 31<sup>st</sup> Dec 09**

**An Integrated Analysis of Scale Effects in Alternative Agricultural Systems**

*Changing land cultivation from conventional to organic practices can have significant impacts on environmental factors such as wildlife, soil and water quality, as well as changing the ways in which food is supplied, the economics of farm business and indeed the attitudes of farmers themselves. However, we know much less about how these factors depend on the scale and concentration of alternative farming systems across the landscape, from local, up to the national scale. This project investigates what causes organic farms to be arranged in clusters at local, regional and national scales, rather than be spread more evenly throughout the landscape and assesses how the ecological, hydrological, socio-economic and cultural impacts of organic farming may vary due to neighbourhood effects at a variety of scales. It will map out some alternative scenarios for future growth of the organic sector in the UK, and evaluate the potential positive and negative effects that different patterns of organic cultivation might have, at a variety of scales, in the future.*

The project has selected matched pairs of organic/non-organic farms in areas of high and low concentrations of organic farming in different parts of the country in order to assess how the ecological, hydrological, socio-economic and cultural impacts of organic farming may vary due to neighbourhood effects. The complexity of the choice of site

selection criteria, involving such a range of disciplines, took longer than anticipated but furthered considerably the interdisciplinary understanding of the project team. The analysis of the data from the small sample that were collected for protocol testing has enabled the biodiversity researchers within the project to refine their research hypotheses. Initial literature reviews for the biodiversity, assessment criteria, farm efficiency, organic subcultures and distribution networks have been completed and research protocols for the cultural study, farm business survey and study of distribution networks are being developed.

The project team are actively engaging a variety of stakeholders in the design, development and evaluation of future scenarios to ensure their relevance, focus, value and potential for further development for a range of land use interests. The initial stages of stakeholder involvement - scenario development and definition of assessment criteria – have gone smoothly and the researchers are expecting a fruitful exchange in the scenario development and selection of assessment criteria.

The team has given poster presentations at the European Organic Conference in Odense, Denmark and the COR Organic Conference, Edinburgh.

**RES-227-25-0010 Dr J Bullock, CEH Dorset**

**1<sup>st</sup> Oct 06 to 31<sup>st</sup> Sep 11**

**Improving the Success of Agri-Environment Initiatives: The Role of Farmer Learning and Landscape Context**

*The study is considering how well wildlife habitats are created under agri-environment schemes. So far these schemes have had limited effects, possibly because of a combination of less than optimal management by landowners and the inability of plants and animals to colonise new habitats, either because they are already so rare, or because of obstacles in the landscape. Researchers will examine the effects of training on farmers as well as the availability of different species and habitat types in the wider landscape, to enhance the biodiversity benefits of agri-environment schemes.*

Detailed surveying and monitoring of selected farms is to be undertaken: to assess whether, and how, training of farmers changes attitudes towards agri-environment schemes and improves biodiversity outcomes; and to quantify the extent to which landscape factors (poor species pools or barriers to dispersal) constrain development of biodiversity under agri-environment schemes. Appropriate farms have now been located in Eastern and Western England, using information from Natural England on the uptake of agri-environment schemes. The research team has made contact with farmers who might potentially get involved. They have also started the planning of the ecological methodologies. The next stage will be to carry out semi-structured interviews with the farmers.

**RES-227-25-0014 Dr J Irvine, Macaulay Institute**

**1<sup>st</sup> Feb 06 to 1<sup>st</sup> May 09**

**Collaborative Frameworks in Land Management: A Case Study on Integrated Deer Management**

*The management of deer provides a useful case study for the use of ecological resources in the countryside, because there are so many associated costs and benefits. It provides jobs for stalkers on forestry and sporting estates and for workers in the meat industry; tourists are drawn to particular landscapes which deer help to create, and to see the deer themselves. However, in some areas, high deer numbers are causing overgrazing and damage to sensitive natural habitats, to agricultural and forestry crops and even to suburban gardens, and are often involved in road traffic accidents. This project will investigate how well people involved in deer management work together and how this can be improved so that the costs of managing deer are minimised and the benefits maximised. The researchers will also look at how these lessons might apply to the management of other natural resources where multiple management objectives exist.*

The project is using an innovative mix of methods, including surveys, informal and formal meetings, discussions and workshops with stakeholders, at six case study locations across England and Scotland.

The first stage of the research has involved analysing more than 60 national level stakeholder organisations that have an interest in deer as a natural resource reveals a wide variety of objectives which highlight the breadth of interest in deer. Results from questionnaires pinpoint the problems of balancing the priorities of different stakeholder groups, for example, the low deer densities needed to achieve habitat protection compared to the higher requirement for sustainable hunting and harvesting. A network analysis showed wide variation in terms of how connected or central organisations are perceived to be to the 'deer world'. There are a large number of organisations that have moderate to high influence on deer management, suggesting that the sector is not dominated by single organisations. Interestingly, although government bodies were thought to have the highest influence, Non Governmental Organisations were also thought of as very influential, indicating some evidence for a degree of power in the hands of practitioner bodies.

The project is also investigating the venison market to determine its value to local and national economies. This work looks at the barriers to marketing venison and the role of price in management decisions. Initial findings reveal a wide variation in the degree to which collaboration between the producers and the processors is used to optimise the supply chain and in adding value to products.

Local level stakeholder engagement is well underway in case study sites. People at all levels including gamekeepers, estate managers, landowners, and government agency staff have been extremely supportive of the project. Informal work shadowing has involved three research assistants spending time with deer managers out in the field.

Protocols have been developed for interdisciplinary activities including discrete choice experiments and a participatory Geographical Information System. The project is developing a new approach to landscape issues, investigating how different stakeholder groups value landscape and then articulating the biodiversity value and associated deer density information. This will help the researchers to explore how people's perceptions vary, and also how they respond to ecological knowledge.

**RES-227-25-0017 Professor J Morris, Cranfield University**

**Project starts 2006 (May 06 – Oct 08)**

**Integrated Land and Water Management in Floodplains: The Experience of Agricultural Flood Defence Systems in England and Wales**

*Agricultural Flood Defence Schemes in floodplain and coastal areas were once an important element of Government support for farmers. However, concern over environmental quality and increased sensitivity towards flood risks and their effects on non-farming interests, have promoted a re-appraisal of land management options and policies. This project is exploring changes that have occurred over the past 40 years, in areas which were 'defended' under flood defence schemes. Case studies of selected schemes, first studied by the research team in the early 1980s, will show how land use has changed in the meantime and the consequences for livelihoods and the management of flooding problems. The project will help inform decisions about the future management of floodplains.*

Initial field work confirms that changing agricultural and agri-environment policies over the last 20 years, combined with continuing structural adjustment in the farming sector, have led to a polarisation of farming systems in some of the areas studied in the 1980s. Some appear to have retained a commitment to intensive commercial farming, especially where 'good' soils and managed water levels provide clear comparative advantage. In others, where soils and drainage conditions are less favourable and farming has been particularly dependent on production subsidies, there appears to have been a move towards more extensive systems, in some cases taking up the environmental options available to floodplain farmers. Farmer motivation, often shaped by the presence of a successor for the family farm, appears to be a key factor influencing land and water management. The number of hobby and lifestyle farms appears to have increased in floodplains, especially on the urban fringe. Discussions with farmers confirm the critical influence that government policy has had on the management of land and water in floodplain areas. It is apparent that farmers are just as likely to respond to policies to promote 'ecosystem services' including flood regulation, conservation management and public access, as they did previously to production incentives, provided the proposals are feasible and appealing.

A preliminary assessment of stakeholder interests/influence in integrated floodplain management has been carried out, and this will further inform engagement with stakeholders and the wider public. The team has compiled a questionnaire for interview surveys with land managers and piloted it in the Beckingham Marshes. This is now being

used for the whole project. They have also completed farm surveys on two of the eight selected sites.

The team has made presentations at various events, including the annual conferences of the British Hydrological Society, The Institute of Agriculture Engineers and the River Restoration Centre. The project benefited from the endorsement of a number of key stakeholders: including DEFRA, the Environment Agency, Natural England, the Farming and Wildlife Advisory Group, the Royal Society for the Protection of Birds, the Wild Life Trust, the Association of Drainage Authorities and The National Farmers' Union.

**RES-227-25-0018 Professor S Whatmore, Oxford University**

**Project starts 2007**

**Knowledge Controversies in Rural Land Management: Science, Democracy and Environmental Expertise**

*The GM saga shows the difficulties generated by the ways in which scientific knowledge is variously used and understood by policy-makers and citizens. Scientific activities that were once hidden in laboratories and journals have become more open to public scrutiny through technologies like the internet. This means that scientists, and those who use their work, have to think again about how science should inform democratic decision-making. This project studies flooding and water pollution as pressing rural land management problems that are controversial among scientists and the public, especially those directly affected. To explore these environmental 'knowledge controversies', the project develops cutting edge tools and approaches that pinpoint which practices result in which impacts, and account for how environmental science is produced, used and disputed. The project sets out to develop a different way of "doing science" that involves social and natural scientists working closely together, and with local people, in 'Competency Groups'. The team will evaluate this approach and identify lessons for other kinds of controversial areas of science (e.g. nanotechnology and climate science).*

**RES-227-25-0020 Dr A Karp, Rothamsted Research**

**1<sup>st</sup> Jan 06 to 31<sup>st</sup> Dec 08**

**Social, Economic and Environmental Implications of Increasing Rural Land Use Under Energy Crops**

*The government is keen to see a major expansion of energy crops, such as miscanthus and short rotation coppice willows. To be viable they will need to be grown in geographical concentrations. The decisions on appropriate areas are likely to be based on climate, soil type and water availability that would ensure good growing conditions. However, it is not clear how such considerations should be balanced against the possible impacts on the environment and the rural economy, and the public acceptance of consequent changes to the countryside. This project is developing an integrated framework for sustainability appraisal of the medium and long term conversion of land to energy crops. The researchers aim to model future planting scenarios to test against targets of carbon dioxide emissions, biodiversity, landscape character etc, and present these in terms that could feed into future policy development.*

Two regions have been chosen as the main study areas: South-West England and the East Midlands. Plantings have been located for miscanthus and willow, where biodiversity and hydrology are to be measured. Measurements of weed and invertebrates have already been made for the first of two successive sampling years. Data have not been analysed yet but observations indicate patchiness for weeds within sites and variability between sites, which is probably related to management. Both crops do have weed and invertebrate diversity, including moths. The first bird studies for miscanthus are being conducted now and have also revealed birds within the crop. The spreadsheet for a large economic survey has been constructed and this work is being carried out over the winter.

Scoping activities for a large social survey suggest that in many areas the public have little knowledge of energy crops, so it may be difficult to conduct opinion surveys in a truly meaningful way, without also informing people about the crops. The team has therefore taken photographs of planted areas in different locations and prepared factual information to use in the surveys. GIS suitability mapping for energy crop plantings has been initiated for both regions.

Stakeholder meetings have been held to start the process of sustainability appraisal and objectives for each region have been drawn up and compared with objectives for the regional strategy. Indicators and targets are now being identified for further consultation.

The project featured in one of the RELU debates for Science Week 2006.

**RES-227-25-0024 Professor I Bateman, UEA**

**1<sup>st</sup> Jan 06 to 30 Apr 10**

**Catchment Hydrology, Resources, Economics and Management: Integrated Modelling of WFD Impacts upon Rural Land Use and Farm Incomes**

*The project is developing a hydrological-economic model to assess the costs and benefits of changing farming practices in the Humber catchment area in order to produce a healthy river environment with good amenity value in line with the European Water Framework Directive. The modelling will seek to anticipate the effects of both Common Agricultural Policy reform and climate change. The project will also incorporate surveys of decision-making by farmers, to provide guidance on alternative strategies, and to estimate the consequences for farm incomes and fragile rural economies.*

The project has made excellent progress in assembling the various databases required, including a very high quality database of farm businesses across space across Britain, over more than twenty years. This includes a subset of highly detailed records covering farms in the Humber catchment, for which they are integrating business data with small area specific geographic and environmental data, allowing them to characterise the physical-environment constraints upon farm decision-making.

The work has involved considerable cross-disciplinary learning which has enabled the whole team to collaborate in the development of a methodology for integrated hydrological-economic modelling.

They have also developed a novel approach to measuring the value that the public, both those who make use of waterways for various leisure activities, and those who do not, put on clean rivers. Virtual reality facilities are being used to assist people to visualise land use change and its implications.

From the outset, the researchers have worked closely with both DEFRA and the Environment Agency. A series of meetings with high level DEFRA officials have been very productive in terms both of disseminating understanding of the project and in influencing prioritisation of tasks and shaping the nature of planned research outputs. Both DEFRA and the Environment Agency have provided additional funds for extensions of this work to address specific policy questions, including an analysis of fertiliser application across a sample of farms. DEFRA has requested early analysis of how alternative proposals regarding the implementation of the Water Framework Directive will impact upon farm incomes.

Work done for DEFRA, together with other work conducted by the team on the visualisation of environmental change, formed the focus of a presentation to a large audience of policy makers (including DEFRA, Environment Agency, water companies, etc.) at the DEFRA seminar *Economic Valuation of the Environment: Policy Applications*, London.

**RES-227-25-0025 Professor W Sutherland, University of Cambridge**

**25 Sep 06 to 21 Dec 09**

**Evaluating the Options for Combining Economically, Socially and Ecologically Sustainable Agriculture**

*The variation in management of farms is a key determinant of differences in biodiversity. This study is linking together models of the dynamics of weed and bird populations and farm management decision-making. These will then be applied to help us to understand how the variability in arable farming practices, and intensity affect biodiversity and farm livelihoods. The work will be used to determine the most effective ways of targeting agri-environment schemes.*

The first stage of the project has been developing the methodologies, selecting the farms, carrying out initial surveys and preparing the models. A lot of progress has been made in structuring plant population models and selecting farms for the study. This has been used to guide the selection of farms in Lincolnshire, Norfolk and Bedfordshire. Key criteria for the selection of farms included: farmed area, number of years as farmer, soil type, cropping, participation in agri-environment schemes and membership of conservation and other organisations.



A methodology for stakeholder analysis and mapping has been developed, which enables the team to identify stakeholder interests, interactions and influences on farmland bird populations and related biodiversity management. Initial feedback indicates that the tool which the team has developed could be used successfully with stakeholders in workshops.

The project has also made considerable progress in linking the farm economics model with the ecological models. Similar progress has been made with incorporating the social aspects into the economic model.

A large amount of data about birds, mammals and habitats is being assembled, and volunteers from the British Trust for Ornithology/Joint Nature Conservation Committee/Royal Society for the Protection of Birds Breeding Bird Survey are involved in this, collecting information over around 2,500 one-kilometre squares. This will be invaluable in the building of the bird-habitat models.

**RES-227-25-0028 Professor P Armsworth, University of Sheffield  
1<sup>st</sup> Jan 06 to 31<sup>st</sup> May 09**

**A Landscape-scale Analysis of the Sustainability of the Hill Farming Economy and Impact of Farm Production Decisions on Upland Landscapes and Biodiversity**

*Taking the Peak District as a case study, the project is examining how hill farmers are likely to respond to the major changes that the Common Agricultural Policy is undergoing. The effects on the uplands and its wildlife will depend not just on individual farming decisions but on the interactions between ecological and economic factors at a larger scale. Ecological-economic models will be set up to anticipate these wider effects and to evaluate the capability of farm-level policy interventions to satisfy the multiple functions of moorlands.*

The delayed start to the grant meant that the project was not able to have staff in place in time for the full 2006 ecological field season. However, the researchers used what was left of the season to pilot techniques in preparation for 2007. In the autumn, the structure of the farm-scale models was also developed, which formed the basis for designing a detailed questionnaire survey for local hill farmers and the recruitment of sample farms.

The project has made considerable efforts to reach out to the local stakeholder and policy community in their first year. This is critical for creating a model in which local stakeholders and policy makers are able to feed into the research design.

The team took part in a joint launch with the RELU project “Sustainable Uplands: Frameworks for Adaptive Learning” in February 2006 in Castleton. The Peak District National Park Authority and RELU Programme Directorate also took part. Twenty five different stakeholder organisations and 10 different research institutions were represented and the launch was reported by BBC Radio Sheffield and High Peak Radio.

In November, the project ran a RELU workshop session at the Moors for the Future (MFTF) Moorlands Research Forum, again in collaboration with Hubacek-led project

team, involving 28 different stakeholder organisations and 14 research institutions. Radio Sheffield has also broadcast subsequent items about the project, involving interviews with stakeholders.

The project team participated alongside the RSPB and Game Conservancy Trust in a Moorland Birds meeting in Edale and also took part in the MFTF Moorlands Research Forum. There has been a continuing programme of small-group meetings with key stakeholder groups and policy-makers throughout the year (including for example the National Farmers' Union, DEFRA, Peak District National Park Authority, etc.).

The project team supported an ESRC Inter-disciplinary Fellowship application from Dr. Althea Davies, who has now been appointed to a Fellowship.

### **5.3 Third Call Projects on the Management of Animal and Plant Diseases and on Sustainable Rural Planning**

**RES-229-25-0004 Dr M Huby, University of York**  
**To start in 2007**

Social and environmental inequalities in rural areas

**RES-229-25-0005 Dr C Potter, Imperial College London**  
**To start in 2007**

Memory and prediction in plant disease management: a comparative analysis of Dutch Elm Disease and 'Sudden Oak Death' in the UK

**RES-229-25-0007 Dr C Quine, Forest Research**  
**To start in 2007**

Assessing the potential risk of, and possible responses to, zoonotic diseases on the development of recreational use of British forests and wild-lands

**RES-229-25-0008, Dr C Waterton, Lancaster University**  
**To start in 2007 (awarded subject to funding conditions)**

Understanding and acting within Loweswater: a community approach to catchment management

**RES-229-25-0009 Mr L Smith, Imperial College London**  
**To start in 2007 (awarded subject to funding conditions)**

Developing a catchment management template for the protection of water resources: exploiting experience from the UK, Eastern USA and nearby Europe

**RES-229-25-0012 Professor K Killham, University of Aberdeen**  
**To start in 2007 (awarded subject to funding conditions)**

Reducing Escherichia coli O157 risk in rural communities

**RES-229-25-0013 Professor P Mills, University of Warwick**

**To start in 2007**

Growing risk? The potential impact of plant disease on land use and the UK rural economy

**RES-229-25-0015 Professor B Wynne, Lancaster University**

**To start in 2007 (awarded subject to funding conditions)**

Lost in translation: a cross-disciplinary analysis of knowledge exchange and effectiveness in animal disease management

**RES-229-25-0016 Professor G Medley, University of Warwick**

**To start in 2007**

Decision-making frameworks in management of livestock disease: interaction of epidemiology, economics and politics

**RES-229-25-0022, Professor C Banks, Southampton University**

**To start in 2007 (awarded subject to funding conditions)**

Integrated systems for farm diversification into energy production by anaerobic digestion: implications for rural development, land use and environment

## 6. Key Performance Indicators

The Tables present the Key Performance Indicators for Year 3 of the Programme. All indicators and measures were satisfactorily achieved or exceeded.

KPI	Programme Target/Measure	Director's Office Target/Measure	Statement of Achievement
<b>1. Scientific Quality</b>			
1.1 Intellectual leadership		To play a leading role in the development of the research field	The focus of intellectual leadership in 2006 was on: preparation of a scientific publication covering the First Call projects (Section 4.1); assessment of third call proposals and provision of advice to assessment panels (section 3.6); elaboration and dissemination of RELU's perspective on interdisciplinarity and knowledge exchange (Annex B).
1.2 RELU applications and awards	Over 17% EOA reports rated outstanding and less than 10% rated problematic <sup>3</sup>		PMG to report
1.3 Refereed journal articles	Number in 2006		32 articles were published (Annex B).
1.4 Books authored	Number in 2006		A RELU special issue of Journal of Agricultural Economics was published incorporating 12 articles (Section 4.1)
1.5 Conference papers	Number in 2006		118 conference papers were given by RELU researchers, including 13 by the Director and Assistant Director (Annex B).
<b>2. Interdisciplinarity</b>			
2.1 To ensure that the Programme engages the wide range of disciplines within the natural and social sciences that can make important contributions to its research	To engage under-represented disciplines in the third call.	A discipline analysis to be prepared when shortlisted applicants prepare their full proposals.	A discipline analysis was presented to the RELU Assessment Panel in October, which highlighted the successful engagement of under-represented disciplines.
2.2 Facilitation of interdisciplinary training and advice opportunities		1 interdisciplinary training workshop, to scope RELU's interdisciplinary training requirements.	6 training workshops were held in 2006, including one which scoped RELU's training agenda (Section 3.4).
2.3 Number of disciplines engaged in		Commentary on range and combination of	A discipline analysis has been prepared and is presented in Section 3.2.

<sup>3</sup> These % figures reflect the current average evaluation grades under ESRC Programmes

RELU		disciplines involved under each call	
<b>3. User Engagement, Knowledge Transfer and Impact</b>			
3.1 Stakeholder engagement plans		SEPs to be reviewed early in 2006	SEPs reviewed in 2006 (Section 4.3)
3.2 Meetings or events involving stakeholders		<p>a) 1 Conference and 1 workshop</p> <p>b) 2 meetings of Food Forum</p> <p>c) 2 meetings of People and the Rural Environment Forum</p> <p>d) Membership of forums and SAC</p> <p>e) Number of bilateral meetings with stakeholders</p> <p>f) Number conferences attended by Director or Assistant Director</p> <p>g) Number of presentations to stakeholders by Director and Assistant Director</p>	<p>a) 1 Major Conference (Jan), 1 workshop (May) and 4 RELU debates (March) – see Section 4.2</p> <p>b) 2 meetings were held of the RELU Food Chain Forum (Section 4.3)</p> <p>c) 2 meetings were held of the RELU People and the Rural Environment Forum (Section 4.3)</p> <p>d) Forum membership is steady (Section 4.3)</p> <p>e) 10 bilateral meetings were held between the Director’s Office and stakeholders (Annex A).</p> <p>f) 27 conferences were attended by the Director or Assistant Director (Annex C).</p> <p>g) 9 presentations were given to stakeholders by the Director and Assistant Director (Annex B)</p>
3.3 Links created between award holders and stakeholders		Commentary on actions taken to engage stakeholders with award holders.	Commentary provided in Sections 3.7 and 4.
3.4 Work shadowing		5 work shadows set up and completed	8 work shadows set up, completed and reviewed (Section 4.4).
3.5 Informing public policy	To make a substantive Programme input (eg written or oral responses) to major relevant policy reviews/ consultations during the life of the Programme	Number of responses to policy reviews/ consultations	The programme contributed actively to agriculture and policy debates during 2006, which included advice to the Secretary of State for the Environment Food and Rural Affairs (Section 2). Individual projects made substantial inputs into several policy domains (Section 4.6). Specific written submissions were made by the Director’s Office to 3 consultations: the NERC Technology Strategy; the SDRN consultation on research needs for sustainable development; and the Environment Research Funders Forum study into the interpretation of research findings for use in UK environmental policy and regulation.
3.6 Project Communication and Data Management	To be completed 3 months after start of award	Director to oversee preparation of PCDMPs for all 11 2 <sup>nd</sup> Call projects	10 projects started their research during 2006. 10 plans were submitted, 8 have been signed off by the Director’s Office and the Data Support Service and 2 are under

Plans			review. All 8 first call project PCDMPs were updated at the end of 2006.
3.7 Media coverage of research and outputs		Number press releases issued	The Director's Office issued 3 press releases in 2006. An extensive list of RELU publicity during the year is listed in Annex B.
3.8 Reports or briefings produced for stakeholders		2 programme briefings prepared and distributed	2 programme briefings were prepared and distributed (Section 4.1). 79 presentations were given specifically to stakeholders and 25 working papers and briefing papers published (Annex B).
3.9 RELU website		Director to maintain up to date website	The website was developed and updated regularly throughout 2006 (Section 4.1)
3.10 RELU Newsletter		4 newsletters prepared and distributed	4 newsletters were prepared and distributed to the RELU mailbase.
<b>4. Research Capacity and Training</b>			
4.1 Training workshop		Director to organise 1 interdisciplinary training workshop, to scope RELU's interdisciplinary training requirements.	6 training workshops were held in 2006, including one which scoped RELU's training agenda (Section 3.4).
<b>5. Data Collection and Management</b>			
5.1 Data Support Service	Progress of Data Support Service		PMG to report
5.2 Deposition of Data	Project data deposited within 3 months of end of awards		PMG to report
<b>6. Programme Management</b>			
6.1 Commissioning	Complete commissioning of 3 <sup>rd</sup> call	Review proposals and provide advice at third call concept note panel and full proposals assessment panel meetings	The Director's Office provided assessments of 99 concept notes, 24 full proposals and 6 Fellowship applications and provided advice at 3 assessment panels (Section 3.6).
6.2 Applicants and Award holders		a) Provide telephone and email advice to applicants and award holders b) Meet with second call award holders to discuss progress	a) Extensive advice was given to Third Call applicants (Section 3.1) and to award holders (Section 3.7). b) Meetings with Second Call projects were rescheduled for early in 2007 due to delays in finalising their contracts and in the appointment of RELU's Science Communication Manager.
6.3 Annual Report		Prepare annual report for 2005, to include report on progress of projects.	Submitted to ESRC by Director's Office. All 18 of the active RELU projects submitted annual reports.
6.4 SAC Meetings	Number of meetings held		PMG to report

<b>7. Added Value</b>			
7.1 Support effective networking between project teams		Hold 1 annual award holders meeting and 1 workshop, and other networking activities as appropriate	1 Major Conference (Jan), 1 workshop (May) and 4 RELU debates (March) were held – see Section 4.2. Additionally the Director’s Office actively encouraged inter-project linkages (Section 3.7).

## 7. Forward Look

During 2007 several of the major research projects addressing sustainable food chain themes will enter their final phase of research. A major dissemination conference for these projects will be held in November on the theme of *Unlocking Change in the Food Chain*. 11 major research projects addressing People and the Rural Environment themes will embark on the second year of their investigations and 10 major research projects commissioned under RELU's third and final round of funding will begin their research.

The Programme will be running a series of debates on the theme of *Power and Responsibility - Who Decides : You Decide* as part of National Science and Engineering Week/Festival of Social Science 2007. The debates will consider three major issues: The environment would be fine, if only scientists were in charge; Consumers cannot be left to themselves to decide what to eat; and Farmers should be responsible for controlling livestock diseases.

Planning is also well underway for a major conference *Research on Rural Resource Management and the Rural Economy: Addressing the Local Dimension*, to be held in Edinburgh in May. The conference, organised in collaboration with the Local Authority Research Council Initiative and the Northern Rural Network, will explore the local and regional dimensions of the Programme. It is targeted at policy, planning and research staff from local and regional government as well as from public agencies and practitioners in the private and voluntary sectors.

Planned and potential activities and outputs for the year include:

January 2007	RELU Newsletter 8
	Planning meeting of first call projects
February 2007	Project visits to second call projects
March 2007	Project visits to second call projects
	National Science and Engineering Week/Festival of Social Science: RELU debates
	Third meeting of RELU People and the Rural Environment Forum
	Annual Report 2006
April 2007	RELU Newsletter 9
May 2007	RELU Conference: Research on Rural Resource Management and the Rural Economy: Addressing the Local Dimension
	Fifth meeting of RELU Food Chain Forum
	Induction meeting for third call projects
	Planning meeting of second call projects
June 2007	Briefing Paper on Enabling Knowledge Transfer
	Briefing Paper on RELU Debates
July 2007	RELU Newsletter 10
September 2007	Training event
	Briefing Paper reviewing suite of RELU Research
October 2007	Fourth meeting of RELU People and the Rural Environment Forum
	Sixth meeting of RELU Food Chain Forum
	Project visits to third call projects to begin
	RELU Newsletter 11
	Launch of RELU Policy and Practice Note series
November 2007	RELU Conference: Unlocking Change in the Food Chain
	Review of Work Shadowing and Visiting Fellowship scheme 2007



## 8. Budget Matters

There are no matters of concern to report. However, several projects were very successful in 2006 in bringing in over £693,709 of additional co-funding to extend their research and strengthen knowledge transfer.

RES-224-25-0048 Biological Alternatives to Chemical Pesticide Inputs in the Food Chain: An Assessment of Environmental and Regulatory Sustainability	£1,500 from AgraQuest towards costs of holding practitioners workshop
RES-227-25-0014 Collaborative Frameworks in Land Management: A Case Study on Integrated Deer Management	£20,000 to project from Forestry Commission plus £46,521 staff costs from 1 <sup>st</sup> Jan to 31 <sup>st</sup> Dec 2006
RES-227-25-0001 Managing Uncertainty in Dynamic Socio-Environmental Systems: An Application to UK Uplands	<ul style="list-style-type: none"> <li>• £10,000: Moors for the Future, gully blocking model development</li> <li>• £103,000: Premier Waste Ltd., carbon model development</li> <li>• £99,867: Yorkshire Water, Developing an agricultural land management strategy for Yorkshire Water's catchments</li> <li>• £1,000: Moors for the Future, Analysing visitor perceptions of the Peak District National Park through ethnicity</li> </ul>
RES-227-25-0020 Social, Economic and Environmental Implications of Increasing Rural Land Use Under Energy Crops	£374,963 Defra have approved a three-year project to expand the project research on biodiversity by: (1). Evaluating, modelling and testing predictions for weed and invertebrate biodiversity changes with the scale of planting; (2). Measuring the dynamics of biodiversity through the succession from previous crops to well established plantations; (3). Manipulating the time of harvest to identify biodiversity impacts of cutting date; (4). Evaluating bird use of miscanthus in relation to scale and changes in vegetation structure.
RES-227-25-0024 Catchment Hydrology, Resources, Economics and Management: Integrated Modelling of WFD Impacts upon Rural Land Use and Farm Incomes	DEFRA have provided £15,000 additional funds for extensions of the project to address specific policy questions relating to (i) the way in which values for non-market goods should be aggregated across relevant populations (ii) the quantity and value of fertiliser application across a sample of farms, and (iii) how alternative proposals regarding the implementation of the WFD will impact upon farm incomes. The Environment Agency has provided £21,858 to explore the best way to conduct cost-effectiveness analysis of measures under the WFD.

## ANNEX A: PROGRAMME CHRONOLOGY

Month	Programme Events	Project Start/End Dates
<b>Jan 06</b>	RELU Conference “ <i>Rural Economy and Land Use: Enabling Knowledge Exchange</i> ”, Manchester. (Presentation by Assistant Director on “ <i>Knowledge Exchange and RELU</i> ”)	Start date project RES-227-25-0006 <i>An Integrated Analysis of Scale Effects in Alternative Agricultural Systems</i> (Stagl), Sussex
	RELU Briefing Paper 3 “ <i>The Unfolding Research Agenda</i> ”	Start date project RES-227-25-0020 <i>Social, Economic and Environmental Implications of Increasing Rural Land Use under Energy Crops</i> (Karp), Rothamsted Research
		Start date project RES-227-25-0024 <i>Integrated Modelling of WFD Impacts upon Rural Land Use</i> (Bateman), UEA
		Start date project RES-227-25-0028 <i>A Landscape-Scale Analysis of the Sustainability of the Hill Farming Economy and Impact of Farm Production Decisions on Upland Landscapes and Biodiversity</i> (Armsworth), Sheffield
<b>Feb 06</b>	English Nature’s Socio-Economic Advisory Group meeting. (Presentation by Director on “ <i>The Progress of RELU Research</i> ”)	Start date project RES-227-25-0014 <i>Collaborative Frameworks in Land Management: A Case Study on Integrated Deer Management</i> (Irvine), Macaulay Institute
	Twin RELU Project Launch, Losehill Hall, Peak District National Park Study Centre, Castleton, in collaboration with the Moors for the Future Partnership (Presentation by Director on “ <i>The Rural Economy and Land Use Programme</i> ”)	
	Third Call Concept Notes Assessment Panel, London	
<b>Mar 06</b>	Agricultural Economics Society/Société Française d’Economie Rurale Conference, Paris (Member of Round table on possible avenues of research and future challenges for agriculture and rural areas)	Start date project RES-227-25-0002 <i>Angling in the Rural Environment: Social, Economic, Ecological and Geomorphological Interactions</i> (Oughton), Newcastle
	Agricultural Economics Society 80 <sup>th</sup> Annual Conference, Paris (Presentation by Director on “ <i>Interdisciplinary Research: The Challenge for Agricultural Economics</i> ”)	Start date project RES-227-25-0001 <i>Managing Uncertainty in Dynamic Socio-Environmental Systems: An Application to UK Uplands</i> (Hubacek), Leeds
	The UK Rural Economy and Land Use Debates, National Science / Social Science Week, Royal Academy of Engineering, London -13 March “ <i>Energy crops running out of steam?</i> ” -15 March “ <i>Where any lessons learned from Foot and Mouth?</i> ” -16 March “ <i>Farming’s no place for wildlife?</i> ” -17 March “ <i>Food miles: should we be buying food from abroad?</i> ”	
	Third meeting of RELU’s Food Chain Forum, London	
	RELU Newsletter January – March 2006	

<b>Apr 06</b>	Roots Conference, the Rural Research Conference of the Royal Institution of Chartered Surveyors, Wadham College, Oxford ( <i>Keynote address by Assistant Director on "RELU: Knowledge Transfer and the Unfolding Research Agenda"</i> )	
	Third Call Concept Note Workshop, Centre for Life, Newcastle	
<b>May 06</b>	British Academy Workshop "Working Together Across Disciplines: Challenges for the Natural and Social Sciences" , London ( <i>Presentation by Director on "Interdisciplinary Research and the Rural Economy and Land Use Programme"</i> )	Start date project RES-227-25-0017 <i>Integrated Land and Water Management in Floodplains: Experience of Agricultural Flood Defence Schemes in England and Wales</i> (Morris), Cranfield
	Sustainable Development Research Network/Royal Institution of Chartered Surveyors lecture series, London ( <i>Presentation by Director on "Sustainable Rural Economies"</i> )	
	Meeting with Tyne Rivers Trust, Newcastle on potential collaboration between RELU and the rivers trust movement	
	First meeting of RELU's People and the Rural Environment Forum, UKWIR Headquarters, London (co-sponsored by UKWIR)	
	RELU Workshop in collaboration with Advantage West Midlands Regional Development Agency " <i>Sustainable Food Chains and Rural and Regional Development</i> ", AWM, Birmingham	
	Dissemination planning meeting with First Call researchers, Birmingham	
	Briefing meeting with ESRC/SSRC Visiting Fellow Clare Hinrichs, London	
	RELU Management Advisory Group Meeting, London	
<b>Jun 06</b>	Meeting of ESRC's Energy, Environment and Climate Change Key Research Challenge Sub-Group, London, to discuss future ESRC funding programmes	
	Meeting of historians and sociologists of science and veterinarians from Newcastle, Manchester and Imperial to discuss the nature of veterinary expertise and the history of animal disease regulation, Newcastle	
	Meeting with Faraday Food Processing partnership to discuss commercialisation issues arising from RELU	
	North Yorkshire URBAL Interreg Conference "Connecting Town and Country", Harrogate ( <i>Presentation by Director on "Sustainable Rural Economies in Peri-Urban Areas – the UK Experience"</i> )	
	RELU Briefing Paper 4 " <i>The UK Rural Economy and Land Use Debates 2006</i> "	
	RELU Newsletter April – June 2006	
<b>Jul 06</b>	RELU Journal of Agricultural Economics Special Issue published.	

	European Environment Agency Expert Meeting, Copenhagen “Classifying land use trends and rural areas in an environmental perspective” ( <i>Presentation by Director on “The Rural Economy and Land Use Programme”</i> )	
	ESRC Seminar Series: New Rural Economies – Building Researcher-User Alliances across the Devolved Territories, London ( <i>Presentation by Director on “The Making of Interdisciplinary Rural Studies”</i> )	
	Water, Environment and Society Seminar, Sheffield ( <i>Presentation by Assistant Director on “Knowledge Transfer and Exchange: the Example of the Rural Economy and Land Use Programme”</i> )	
	BBSRC Sustainable Agriculture Panel, London	
	RELU Strategic Advisory Committee	
	Foundation for Science and Technology Dinner/Discussion “Sustainable development – how should policy and business decisions reflect pressures on natural resources and global climate?”, Royal Society, London	
<b>Sept 06</b>	English Nature’s Socio-Economic Advisory Committee Meeting, Peterborough	Start date project RES-227-25-0025 <i>Evaluating the Options for Combining Economically, Socially and Ecologically Sustainable Agriculture</i> (Sutherland), Cambridge
	Science and Technology Policy Research (SPRU) Conference on ‘The Future of Science, Technology and Innovation Policy: Linking Research and Practice, Bristol ( <i>Presentation by Director and Assistant Director on “Social Sciences and the Social Shaping of Agri-Food Technology”</i> )	
	RIMIPS/Latin American Centre for Rural Development Rural Territorial Dynamics meeting, London ( <i>Presentation by Director on “The RELU Programme and its Unfolding Research Agenda”</i> )	
	Meeting with Nigel Birch, Scientific Councillor for UK Embassy China to discuss potential Chinese scientific interest in the RELU programme	
<b>Oct 06</b>	Second meeting of RELU’s People and the Rural Environment Forum, Royal Horseguards Hotel, London	Start date project RES-227-25-0010 <i>Improving the Success of Agri-Environment Initiatives: the Role of Farmer Learning and Landscape Context</i> (Bullock), CEH, Dorset
	Meeting with Dr Cheol Hi Lee, Director Farm Management Bureau, Rural Development Administration, Republic of Korea to discuss the RELU Programme and potential links.	
	“European Foods Systems in a Changing World” ESF Forward Look, Wageningen, the Netherlands	
	Meeting with Dr Michael Lester, Manager, Social and Institutional Affairs, Land and Water Australia to discuss the RELU Programme and potential links.	
<b>Nov 06</b>	Fourth meeting of RELU’s Food Chain Forum, London	

	7 <sup>th</sup> IPPR Launch Conference on Rural Policy, Brussels	
	Adult Learning in Rural Areas: Learning, Employment and Rural Need, Sheffield ( <i>Presentation by Director on "The Ageing Countryside"</i> )	
	Interviews for RELU Science Communications Manager	
	Interdisciplinary Early Career Fellowships Panel, MRC London	
	Women in Rural Enterprise (WiRE) seminar, Askham Bryan College, York ( <i>Presentation by Director on "The Changing Prospects in the Rural Economy"</i> )	
<b>Dec 06</b>	ESRC Energy, Environment and Climate Change Sub Group meeting, Cardiff	
	Future Directions: A New Research Agenda for Rural Development, Queen's University Belfast ( <i>Presentation by Director on "Rural Sociology and Geography"</i> )	
	The Diversity of Rural Areas in the Enlarged EU: Characterisation, Typology and Modelling Workshop, Seville, (jointly organised by Joint Research Centre (JRC), the Institute for Prospective Technological Studies (IPTS) and Directorate General for Agriculture and Rural Development (DG AGRI) ( <i>Presentation by Director on "Harnessing the Social and Natural Sciences for Sustainable Rural Development"</i> )	

## Annex B: PROJECT PUBLICATIONS

### JOURNAL ARTICLES

- Azim, M.E. and Little, D.C. (2006) 'Intensifying aquaculture production through new approaches to manipulating natural food'. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources* 1, No. 062, 23 pp.
- Bateman, I.J., Brouwer, R., Davies, H., Day, B.H., Deflandre, A., Di Falco, S., Georgiou, S., Hadley, D., Hutchins, M., Jones, A.P., Kay, D., Leeks, G., Lewis, M., Lovett, A.A., Neal, C., Posen, P., Rigby, D., and Turner, R.K. (2006) 'Analysing the agricultural costs and non-market benefits of implementing the Water Framework Directive'. *Journal of Agricultural Economics*, Vol. 57, 2: 221-237.
- Bateman, I.J., Day, B.H., Georgiou, S. and Lake, I. (2006) 'The aggregation of environmental benefit values: Welfare measures, distance decay and total WTP' *Ecological Economics*, 60(2): 450-460. DOI: <http://dx.doi.org/10.1016/j.ecolecon.2006.04.003>.
- Beale, M.H., Birkett, M.A., Bruce, T.J.A., Chamberlain, K., Field, L.M, Huttly, A.K., Martin, J.L., Parker, R., Phillips, A.L., Pickett, J.A, Prosser, I.M., Shewry, P.R., Smart, L.E., Wadhams, L.J., Woodcock, C.M. and Zhang, Y. (2006) 'Aphid alarm pheromone produced by transgenic plants affects aphid and parasitoid behavior'. *PNAS* 103: 10509-13.
- Belton, B., Little, D. and Young, J. (2006) 'Red tilapia cage culture in central Thailand'. *Aquaculture Asia*. Vol.11, No.3, pp.28-29.
- Cross, P. and Edwards-Jones, G. (2006) 'Variation in pesticide hazard from vegetable production in Great Britain from 1991 to 2003'. *Pest Management Science*, 62(11):1058-1064.
- Cross, P. and Edwards-Jones, G. (2006) 'Variation in pesticide hazard from arable crop production in Great Britain from 1992 to 2002: Pesticide risk indices and policy analysis'. *Crop Protection*, 25(10): 1101-1108.
- Dougill, A.J., Fraser, E.D.G, Holden, J., Hubacek, K., Prell, C., Reed, M.S., Stagl, S.T. and Stringer, L.C. (2006) 'Learning from doing participatory rural research: Lessons from the Peak District National Park', *Journal of Agricultural Economics* 57, 2: 259-275.
- Edwards-Jones, G. (2006) 'Good Food' Editorial *The Economist*, December 9<sup>th</sup>.
- Edwards-Jones, G. (2006) 'Voting with your trolley' Special Report *The Economist*, December 9<sup>th</sup>.
- Givens, D.I., Kliem, K.A. and Gibbs, R.A. (2006) 'The role of meat as a source of n-3 polyunsaturated fatty acids in the human diet'. *Meat Science* 74: 209-218.
- Harvey, D.R. (2006) 'RELU special issue: editorial reflections' *Journal of Agricultural Economics*, 57, 2: 329-336.
- Huby, M., Cinderby, S., Crowe, A.M., Gillings, S., McClean, C.J., Moran, D., Owen, A. and White, P.C.L. (2006) 'The association of natural, social and economic factors with bird species richness in rural England' *Journal of Agricultural Economics*, 57, 2: 395-312.

- Hopkins, A. and Holz, B. (2006) 'Grassland for agriculture and nature conservation: production, quality and multi-functionality'. *Agronomy Research*, 4, 3-20.
- Hubacek, K., Prell, C., Reed, M.S., Bonn, A., Boys, D. and Dean, C. (2006) 'Using stakeholder and social network analysis to support participatory processes'. *International Journal of Biodiversity Science and Management* 3: 249-252.
- Hutchins, M.G., Deflandre, A. and Boorman, D.B. (2006) 'Performance benchmarking linked diffuse and in-stream water quality models'. *Archiv fur Hydrobiologie Supplement*, 161 (Large Rivers 17, 133-154).
- Lane, S.N., Brookes, C.J., Heathwaite, A.L. and Reaney, S. (2006) 'Surveillant science: challenges for the management of rural environments emerging from the new generation diffuse pollution models' *Journal of Agricultural Economics*, 57, 2: 239-258.
- Lowe, P. and Phillipson, J. (2006) 'Reflexive interdisciplinary research: the making of a research programme on the rural economy and land use' *Journal of Agricultural Economics*, 57, 2: 165-184.
- Marzano, M., Carss, D.N. and Bell, B. (2006) 'Working to make interdisciplinarity work: investing in communication and interpersonal relationships' *Journal of Agricultural Economics*, 57, 2: 185-198.
- Matthews, R. and Selman, P. (2006) 'Landscape as a focus for integrating human and environmental processes' *Journal of Agricultural Economics*, 57, 2: 199-212.
- Nakashima, Y., Birkett, M.A., Pye, B.J. and Powell, W. (2006) 'Chemically-mediated intraguild predator avoidance by aphid parasitoids: inter-specific variability in sensitivity to semiochemical trails of ladybird predators'. *Journal of Chemical Ecology*, 32, 1989-1998.
- Neal, C., Jarvie, H.P., Neal, M., Hill, L. and Wickham, H. (2006). 'Nitrate concentrations in river waters of the upper Thames and its tributaries'. *Science of the Total Environment*, 365 (1-3), 15-32.
- Neal, C., Hilton, J, Wade, A.J., Neal, M. and Wickham, H. (2006) 'Chlorophyll-a in the rivers of eastern England', *Science of the Total Environment*, 365 (1-3), 84-104.
- 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.
- Phillipson, J. and Lowe, P. (2006) 'Special issue guest editorial: The scoping of an interdisciplinary research agenda' *Journal of Agricultural Economics*, 57, 2: 166-164.
- Porter, K.S. (2006) 'Fixing our drinking water: from field and forest to faucet', *Pace Environmental Law Review*
- Reed, M.S., Fraser, E.D.G. and Dougill, A.J. (2006) 'An adaptive learning process for developing and applying sustainability indicators with local communities', *Ecological Economics* 59: 406-418.
- Selman, P. and Knight, M. (2006) 'On the nature of virtuous change in cultural landscapes: exploring sustainability through qualitative models', *Landscape Research*, 31(3), 295-308.
- Shepherd, R., Barker, G., French, S., Hart, A., Maule, J., and Cassidy, A. (2006). 'Managing food chain risks: integrating technical and stakeholder perspectives on uncertainty'. *Journal of Agricultural Economics*, 57, 2: 311-327.

- Stringer, L.C., Prell, C., Reed, M.S., Hubacek, K., Fraser, E.D.G. and Dougill, A.J. (2006) 'Unpacking 'participation' in the adaptive management of socio-ecological systems: a critical review'. *Ecology & Society* 11: 39.
- Tiffin, R., Traill, W.B. & Mortimer, S. (2006) 'Food choice in an interdisciplinary context'. *Journal of Agricultural Economics*, 57, 2: 213-220.
- Waterton, C., Norton, L. and Morris, J. (2006) 'Understanding Loweswater: interdisciplinary research in practice' *Journal of Agricultural Economics*, 57, 2: 277-296.

## **BOOKS AND BOOK CHAPTERS**

- Pickett, J.A., Bruce, T.J.A., Chamberlain, K, Hassanali, A, Khan, Z.R., Matthes, M.C., Napier, J.A., Smart, L.E., Wadhams, L.J. and Woodcock, C.M. (2006) 'Plant volatiles yielding new ways to exploit plant defence'. In Dicke, M. and W Takken, W. (eds) "*Chemical Ecology: from Gene to Ecosystem.*" Springer, Wageningen, the Netherlands. Ch. 11. pp. 161-173.

## **CONFERENCE PAPERS AND PRESENTATIONS**

- Armsworth, P. and Dallimer, M. (2006). "*Hill farm economics, landscapes and biodiversity in the Peak District*". Presentation to Breeding Birds of the Peak District Moorlands, Edale.
- Armsworth, P. et al. (2006) "*A landscape-scale analysis of the sustainability of the hill farming economy and impact of farm production decisions on upland landscapes and biodiversity*". Poster presented at Rural Economy and Land Use: Enabling Knowledge Exchange Conference, Manchester.
- Armsworth, P. (2006) "*A landscape-scale analysis of the sustainability of the hill farming economy and impact of farm production decisions on upland landscapes and biodiversity*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Armsworth, P. et al. (2006). "*Hill farm economics, upland landscapes and biodiversity*". Presentation to Moors for the Future: Upland Ecosystem Services, Castleton.
- Arnoult, M., Lobb, A. and Tiffin, R. (2006) "*Consumers' attitudes towards origin, seasonality and ethical attributes of food products: an application to lamb and strawberries in the UK.*" Presentation to 80<sup>th</sup> AES Conference, INA-PG, Paris, France, 30-31 March.
- Azim, M.E. and Little, D.C. (2006) "*Production of microbial protein using activated suspension technique (AST) in artificial ponds*". Poster presented at AQUA 2006, Florence, Italy, 9-13 May and awarded 1<sup>st</sup> prize for the best poster presentation.
- Azim, M.E., Little, D.C. and Bron, J.E. (2006) "*Production of microbial protein using activated suspension technique (AST) in indoor tanks*" Poster presented at Marie Curie Conference, Manchester, UK, 10-12 April.
- Barker, G. and Shepherd, R. (2006) "*Food safety management and its impact on the rural economy*". Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.



- Bateman, I.J., Day, B., Jones, A.P., Jude, S., and Lovett, A.A. (2006) “*Valuing environmental preferences: New tools for policy appraisal*” Presentation to DEFRA seminar ‘Economic Valuation of the Environment: Policy Applications’, London, 30th October.
- Bateman, I.J., Day, B.H., Dupont, D. and Georgiou, S. (2006) “*Incentive compatibility and procedural invariance testing of the one-and-one-half-bound dichotomous choice elicitation method: Distinguishing strategic behaviour from the anchoring heuristic*” Presentation to 16th Annual Meeting of Canadian Resource and Environmental Economists, Acadia University, Wolfville, Nova Scotia, Canada, September 29th to October 1st.
- Bateman, I.J., Day, B.H., Dupont, D. and Georgiou, S. (2006) “*Incentive compatibility and procedural invariance testing of the one-and-one-half-bound dichotomous choice elicitation method: Distinguishing strategic behaviour from the anchoring heuristic*” Presentation to *The 2006 AAEA Annual Meeting*, Long Beach, California, 23-26 July (Ref # 155717).
- Bateman, I.J., Day, B.H., Georgiou, S. and Lake, I. (2006) “*The aggregation of environmental benefit values: welfare measures, distance decay and total WTP*” Presentation to Third World Congress of Environmental and Resource Economists, Kyoto International Conference Hall, Japan, 3-7 July 2006.
- Bateman, I.J., Jones, A.P., Jude, S. and Day, B.H. (2006) “*Reducing gains/loss asymmetry: A virtual reality choice experiment (VRCE) of land use change*”. Presentation to Applied Environmental Economics Conference (Envecon 2006), the Royal Society, London, 24 March.
- Bateman, I.J., Jones, A.P., Jude, S. and Day, B.H. (2006) “*Reducing gains/loss asymmetry: A virtual reality choice experiment (VRCE) of land use change*” Presentation to 3rd Symposium on Risk Management and Cyber-Informatics: RMCI06, The 10th Multi-conference on Systemics, Cybernetics and Informatics: WMSCI 2006, July 16-19, 2006, Orlando, Florida (USA).
- Bateman, I.J., Jones, A.P., Jude, S. and Day, B.H. (2006) “*Reducing gains/loss asymmetry: A virtual reality choice experiment (VRCE) of land use change*” Presentation to Third World Congress of Environmental and Resource Economists, Kyoto International Conference Hall, Japan, 3 – 7 July.
- Bateman, I.J., Jones, A.P., Jude, S. and Day, B.H. (2006) “*Reducing gains/loss asymmetry: A virtual reality choice experiment (VRCE) of land use change*” Presentation to ESRC Preference Elicitation Group seminar Responding to Anomalies in Stated Preference Studies, University College London, 12 May.
- Bracken, L.J., Bubb, D.H., Lucas, M.C., Mills, C., Robinson, K. and Warburton, J. (2006) “*Spatial patterns of fine sediment transfer and influence on Salmonids: the river Esk, North York Moors, UK*” Presentation to International Conference on Salmonids, Newcastle, October.
- Bruce, T.J.A., Hooper, A.M., Jones, O.T., Martin, J.L., Oakley, J, Smart, L.E. and Wadhams, L.J. (2006) “*Development of monitoring traps for the orange wheat blossom midge, *Sitodiplosis mosellana*, in the UK*”. Presentation to Abstracts International Society of Chemical Ecology meeting Barcelona 15-19 July.

- Buller, H. (2006) "*Paradoxes of place in European food chains*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Buller, H. (2006) Presentation to the FARMA national conference, Torquay, November.
- Bullock, J. (2006) "*Improving the success of agri-environment initiatives*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Burt, T.P., Benedetti, M., Major, E., McDonnell, J.J., Turcq, P., and Dias, R. (2006) "*Dissolved organic matter: biogeochemistry to hydrology at molecular to catchment scales*". Presentation to American Geophysical Union, Fall Meeting, San Francisco, December, Session B31E.
- Cassidy, A. and Maule, A.J. (2006) "*All we have to do is make them partners...*" *Investigating knowledge of food chain risks*' Presentation to New Perspectives on Risk Communication Conference, University of Gothenburg, Sweden, 31 August-2 September.
- Cassidy, A. and Maule, A.J. (2006) "*Implementing public engagement in risk communication: researching knowledge of food chain risks*", Presentation to European Association for the Study of Science and Technology (EASST) Conference, University of Lausanne, 23-26 August.
- Chadwick, D. (2006) "*Assessing the risk of farm management practices on stream FIO loads using an evidence based approach*" Poster presented at Bathing Waters Symposium, Newcastle, Northern Ireland – 22/23 November 2006.
- Chadwick, D. (2006) "*Interdisciplinary research projects - Sustainable and holistic food chains for recycling livestock waste to land*" Presentation to the BBSRC Sustainable Agriculture Panel.
- Chadwick, D. (2006) "*Sustainable and holistic food chains for recycling livestock waste to land*" Poster presented at Rural Economy and Land Use: Enabling Knowledge Exchange Conference, Manchester 18-20 January.
- Chadwick, D. (2006) "*Mitigation and current management attempts to limit pathogen survival and movement within farmed grasslands*" Presentation to Defra – during work shadowing week.
- Cooke, I., (2006) "*Model farms*" Presentation to the Conservation and Ecology Meeting, Selwyn College, Cambridge, 18 December.
- Day, G. and Truninger, M. (2006) "*The contribution of local food cultures to rural development*". Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.
- Dunn, R.M., Hopkins, A., Buller, H., Jones, O., Morris, C., Wood, J.D., Whittington, F. and Kirwan, J. (2006) "*Eating Biodiversity – a means of meeting the ecological challenges of agriculture*" Presentation to British Ecological Society Annual Conference, University of Oxford, September.
- Edwards-Jones, G., Hounsome, B. and Cross, P. (2006) "*Rural health and the future of farming*". Presentation to Organic farming – more farmer friendly? Conference Llanelwedd, Builth Wells, October.
- Edwards-Jones, G. (2006) "*Food ethics: it's more than the mileage*" Keynote Address at Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.

- Firth, C., and Philipps, L. “*An integrated analysis of scale effects of alternative agricultural systems*” Poster presented at the European Organic Conference, Odense, Denmark, 30-31 May.
- Firth, C., and Philipps, L. “*An integrated analysis of scale effects of alternative agricultural systems*” Poster presented at the COR Organic Conference, Edinburgh, September.
- Garcia-Macias, P., Ordidge, M., Vysini, E., Waroonphan, S., Gordon, M.H, Lovegrove, J.A., Battey, N.H., Hadley, P., John, P. and Wagstaffe, A. (2006) “*Effects of growing strawberries under UV spectral filters on phenolic content and antioxidant activity*”. Presentation to the 23<sup>rd</sup> International Conference on Polyphenols, August 22-25, Winnipeg, Canada.
- Grant, W. (2006) “*Getting your voice heard in government*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Grant, W. (2006) “*Working with biological scientists: the EU dimension*” Presentation to UACES Workshop on Interdisciplinary Studies, University of Bristol, November.
- Grant, W. and Chandler, D. (2006) “*Working together across disciplines: challenges for the natural and social sciences*” Presentation to British Academy Workshop on Interdisciplinarity, May.
- Grant, W. and Greaves, J. (2006) “*How pesticides can help the rural economy*” Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.
- Greaves, J. (2006) “*Biopesticides, regulatory innovation and the regulatory state*”, Presentation to ECPR/CRI Conference, ‘Frontiers of Regulation: Assessing Scholarly Debates and Policy Challenges’, University of Bath, September.
- Hadley, P. (2006) “*Overview of the application of novel films to the production of horticultural crops under protection*”. Presentation to Advanced Climate Control Conference, University of Reading 27-28 September. [Organised by British Polythene Industries Visqueen Horticultural Product]
- Hanley, N., Aftab, A. and Black, A. (2006) “*Economic incentives, non-point pollution and integrated catchment management: testing for the transferability of policy choice across catchments*” Presentation to Agricultural Economics Society annual conference, Paris.
- Hanley, N. and Colombo, (2006) “*Valuing the uplands*”. Presentation to Moors for the Future: Upland Ecosystem Services. Castleton.
- Holden, J., Burt, T.P., Chapman, P.J., Dougill, A., Hubacek, K., Irvine, B., Jin, N., Kirkby, M., Reed, M., Turner, A. and Worrall, F. (2006) “*Managing soils in sustainable uplands.*” Poster presented at the British Soil Science Society Annual Conference, Leeds, September.
- Hubacek, K., Prell, C., Reed, M.S., Burt, T., Chapman, P., Cornell, S., Dougill, A.J., Fraser, E.D.G., Holden, J., Irvine, B., Jin, N, Kirkby, M., Kunin, W., Quinn, C.H., Ritsema, C., Jetten, V., Sendzimir, J., Stagl, S.T., Stringer, L.C., Taylor, M.J., Termansen, M., Turner, A. and Worrall, F. (2006) “*Combining formalised and non-formalised methods to stimulate social learning in resource management*”. Presentation to Formalised and Non-Formalised Methods in Resource

- Management: Knowledge and Learning in Participatory Processes, Workshop, 21-22 September, Osnabrück.
- Hubacek, K., Prell, C., Quinn, C.H. and Reed, M.S. (2006) “*Stakeholder selection as precondition for successful participatory processes*” Presentation to Conference on the Human Dimensions of Global Environmental Change: ‘Resource Policies: Effectiveness, Efficiency, and Equity’, Berlin 17-18 November.
- Hubacek K., Prell C., Reed M. and Quinn C.H. (2006) “*Using stakeholder and social network analysis to support participatory processes*”. Presentation to Sustainable Uplands: Future Scenarios for People, Environment, and Landscape: A Future Vision Conference and workshop for the Uplands, 30 May - 1 June, Kendall, Cumbria
- Hubacek, K., Prell, C. and Reed, M.S. (2006) “*Stakeholder identities and stakeholder mappings in futures research*”. Presentation to Rural Citizen Conference, Plymouth, April.
- Hubacek, K. et al. (2006) “*Sustainable uplands: frameworks for adaptive learning*”. Presentation to Moors for the Future Conference: Upland Ecosystem Services, 9-10 November, Loosehill Hall, Castleton, Derbyshire.
- Hubacek K. and Reed M. (2006) “*Sustainable uplands: managing uncertainty in dynamic socio-environmental systems*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Irvine, J. (2006) “*Collaborative resource management*”, Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, January, 18-20 January.
- Ivashikina, N., Grail, B. and Tomos, D. (2006) “*Application of TiO<sub>2</sub> MALDI-TOF-MS for plant metabolome analysis*”. Presentation to Mass Spectrometry Workshop, University of Wales, Bangor, 21 July.
- Ivashikina, N., Grail, B. and Tomos, D. (2006) “*Nutritional quality of vegetables studied using FT-ICR-MS*” Presentation to Mass Spectrometry Workshop, University of Wales, Bangor, 21 July.
- Ivashikina, N., Grail, B. and Tomos, D. (2006) “*Nutritional quality of vegetables studied using FT-ICR-MS*”. Presentation to Bruker User Meeting, Coventry, UK, 6-7 September.
- Ivashikina, N., Kemp, H., Al-Zubaidi, K., Burrell, M., Clench, M., Croft, A.K., Grail, B.M. and Tomos, A.D. (2006) “*Use of an inorganic matrix MALDI-TOF for metabolite analysis*” Presentation to Annual Symposium of Plant Science Wales, Bangor, 5-6 January.
- Jones, O., Buller, H., Morris, C., and Kirwan, J. (2006) “*Forward to the new past? New formations of farmer knowledges in ecologically founded alternative agri-food networks (AAFNS)*” Presentation to Royal Geographical Society/Institute of British Geographers Annual Conference, 30 August – 1 September.
- Jones, O., Buller, H., Morris, C., and Kirwan, J. (2006) “*The case of the missing ecologies: really embedding alternative/local food networks within nature in the pursuit of ecological and social sustainability*”, Presentation to Royal Geographical Society/ Institute of British Geographers Annual Conference, 30 August – 1 September.

- Karp, A. (2006) "*Social, economic and environmental implications of increasing rural land use under energy crops*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Kirkby, M., Irvine, B. and Chapman, P. (2006). "*The relevance of coarse scale erosion modelling for upland Britain*" (Soil erosion and sediment delivery in the uplands); Presentation to BHS Pennines Group; Lancaster June.
- Lane, S. (2006) "*On selling yourself to the highest bidder: a wet scientist's engagement with the Water Framework Directive, rural land management and research*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, January, 18-20 January.
- Little, D. et al. (2006) "*Warm water fish production as a niche market & diversification strategy for UK farmers*", Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May (by Dave Little and Kathleen Grady but joint team authorship).
- Lowe, P. (2006) "*Interdisciplinary research: the challenge for agricultural economics*" Presentation to Agricultural Economics Society 80<sup>th</sup> Annual Conference, Paris, 29-30 March.
- Lowe, P. (2006) "*Interdisciplinary research and the Rural Economy and Land Use Programme*" Presentation to British Academy Workshop "Working Together Across Disciplines: Challenges for the Natural and Social Sciences", London, 12 May.
- Lowe, P. (2006) "*Sustainable rural economies*" Sustainable Development Research Network/Royal Institution of Chartered Surveyors lecture series, London, 16 May.
- Lowe, P. (2006) "*Sustainable rural economies in peri-urban areas – the UK experience*" Presentation to North Yorkshire URBAL Interreg Conference "Connecting Town and Country", Harrogate, 15 June.
- Lowe, P., Phillipson, J. and Lee, R. (2006) "*Social sciences and the social shaping of agri-food technology*" Presentation to Science and Technology Policy Research (SPRU) Conference on 'The Future of Science, Technology and Innovation Policy: Linking Research and Practice, Bristol, 11-13 September.
- Lowe, P. (2006) "*The Rural Economy and Land Use Programme*". European Environment Agency Expert Meeting, Copenhagen "Classifying land use trends and rural areas in an environmental perspective", 3-4 July.
- Lowe, P. (2006) "*The ageing countryside*" Presentation to Adult Learning in Rural Areas: Learning, Employment and Rural Need, Sheffield, 15 November.
- Lowe, P. (2006) "*The changing prospects in the rural economy*". Presentation to Women in Rural Enterprise (WiRE) Seminar, Askham Bryan College, York, 29 November.
- Lowe, P. (2006) "*Rural sociology and geography*" Presentation to Future Directions: A New Research Agenda for Rural Development, Queen's University Belfast, 13 December.
- Lowe, P. (2006) "*Harnessing the social and natural sciences for sustainable rural development*" Presentation to The Diversity of Rural Areas in the Enlarged EU: Characterisation, Typology and Modelling Workshop, Seville, (jointly organised by Joint Research Centre (JRC), the Institute for Prospective Technological

- Studies (IPTS) and Directorate General for Agriculture and Rural Development (DG AGRI), 14-15 December.
- Lowe, P. (2006) "*The making of interdisciplinary rural studies*" Presentation to ESRC Seminar Series: New Rural Economies – Building Researcher-User Alliances across the Devolved Territories, Defra, London , 12 July.
- Lyon, F. (2006) "*Stakeholders and relationships in knowledge production: researchers, brokers and farmers*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester , 18-20 January.
- Malakar, P.K. and Baranyi, J. (2006) Presentation to Modelling food safety and risk assessment, Workshop on Modelling Food Safety and Risk Assessment, March 2nd 2006, Kasertsat University, Bangkok.
- Malakar, P.K. and Barker, G.C. (2006) Presentation to UK China Workshop on Food Safety, 11-13 December, Zhengzhou, China.
- Malakar, P.K. and Barker, G.C. (2006) "*Modelling food safety: Predictive microbiology, risk assessment and QMRA*" Presentation to Department of Food Science and Technology, University Putra Malaysia, Serdang, Malaysia, 13th March 2006.
- Malakar, P.K. and Barker, G.C. (2006) "*Probabilistic modelling in food safety assessment*" Presentation to Lectures on Probabilistic Modelling in Food Safety Assessment, February 28th 2006, Kasertsat University, Bangkok.
- Malakar, P.K. and Barker, G.C. (2006) "*Network representation of disease risk from foods*" Poster presented at 2nd International Risk Assessment Conference on Microbial Risk Assessment: Foodborne Hazards, 20-23 February, Sydney, Australia.
- Malakar, P.K. and Barker, G.C., (2006) Presentation to Introduction to Microbiological Risk Assessment, Chamber of Turkish Food Engineers Association (TMMOB-GMO) conference, May 4th, Istanbul, Turkey.
- Milà I Canals, L., Cowell, S.J., Hospido, A., Jones, D., Koerber, G., Cross, P.A., Hounsome B. and Edwards-Jones, G. (2006) "*LCA of horticultural crops including impacts on soil quality and pesticide rating*". Presentation to 16<sup>th</sup> SETAC (Society of Environmental Toxicology and Chemistry) Europe Annual Meeting. The Hague, The Netherlands, 7-11 May.
- Morris, C. (2006) "*Marketing natural foods*". Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.
- Morris, C. (2006) "*Society and rural natures*". Presentation to Centre for the Environment: Research (Capability Briefing) University of Nottingham, 18 December.
- Morris, J. (2006) "*Ecosystems functions and regulation (including flood management)*" Presentation to Institute of Agric Engineers Annual Conference, Silsoe, Bedford, 15 March.
- Morris, J. (2006) "*Integrated floodplain management.*" Presentation to River Restoration Centre, 7<sup>th</sup> Annual Conference, Edinburgh, May.
- Morris, J. (2006) "*Integrated land and water management in floodplains*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.

- Oaten, H. (2006) Posters presented at British Ecological Society Annual Meeting and Association of Applied Biologists Post-grad Conference.
- Oliver, D. (2006) “*Systematically assessing risk in the farming landscape*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Ordidge, M. (2006) “*The RELU Project – assessing the effect of uv transparent and uv blocking films on the nutritional content of soft fruit and lettuce*”. Presentation to the Advanced Climate Control Conference, University of Reading 27,28 September. [Organised by British Polythene Industries Visqueen Horticultural Product].
- Petkov, M. and Shepherd, R. (2006) “*How will personality affect the risks you take? – A closer look into food risks and consumer behaviour*” Presentation to RiskCom 'New Perspectives on Risk Communication: Uncertainty in a Complex Society', Gothenburg, 31 August - 2 September.
- Phillipson, J. (2006) “*Knowledge Exchange and RELU*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Phillipson, J. (2006) “*RELU: Knowledge transfer and the unfolding research agenda*” Keynote Address at Roots Conference: The Rural Research Conference of the Royal Institution of Chartered Surveyors, Wadham College, Oxford, 5 April.
- Phillipson, J. (2006) “*Knowledge transfer and exchange: the example of the Rural Economy and Land Use Programme*”. Presentation to Water, Environment and Society Seminar, Sheffield, 11 July.
- Posthumus, H. and Morris, J (2006) “*CAP-reform, land management and flood risk*” BHS annual meeting, Silsoe, Bedford, 22 March.
- Posthumus, H. and Morris, J. (2006) “*Rural land use and flood risk management: socio-economic and policy aspects*”. Presentation to Third Annual Assembly FRMRC, Sheffield, 10-12 July.
- Powell, W. (2006) “*Pest management outlook for cereals and oilseeds based on recent and new research*”. Presentation to Home-Grown Cereals Authority (HGCA) R&D Conference. 25-26 January.
- Powell, W. (2006) “*The use of catmint-derived semiochemicals for manipulating beneficial insects*”. Presentation to Link Seminar on ‘Phytochemicals: plant products for health, wealth and beauty’. Rothamsted Research, 9-10 May.
- Powell, W., Pell, J., Nakashima, Y., Baverstock, J. and Birkett, M. (2006) “*Functional biodiversity of aphid natural enemies: positive intra-guild interactions*”. Presentation to IOBC Working Group on Landscape Management for Functional Biodiversity. Zurich-Reckenholz, Switzerland, 16-19 May.
- Reed, M.S. and Dougill, A.J. (2006) “*Integrating and sharing local and scientific knowledge bases to assess land degradation*”. Presentation to Future of Drylands Conference, International Scientific Conference on ‘Desertification and Drylands Research Commemorating 50 Years of Drylands Research’, Tunis, Tunisia, 19-21 June.
- Reed, M.S., Dougill, A.J., Fraser, E.D.G., Burt, T., Chapman, P.J., Cornell, S, Holden, J., Hubacek, K., Irvine, B., Jin, N., Kirkby, M., Kunin, B., Prell, C., Quinn, C.H., Ritsema, C., Jetten, V., Sendzimir, J., Stagl, S.T., Stringer, L.C., Taylor, M.,

- Termansen, M., Turner, A. and Worrall, F. (2006) "*An adaptive learning process for developing and applying sustainability indicators with local communities.*" Poster presented at Participatory Approaches in Science & Technology (PATH) Conference, 4-7 June, Edinburgh, Scotland.
- Reed, M.S., Prell, C. and Hubacek, K. (2006) "*Communication and representation in water resource management: using social network analysis and stakeholder analysis to support social learning*" Presentation to ESRC/NERC Transdisciplinary Seminar, Water Environment and Society Series, University of Sheffield, 11 July.
- Suckall, N., Cooper, T., Fraser, E. and Quinn, C.H. (2006) "*Visitors and environmental awareness: perceptions of the Peak District National Park*". Presentation to Moors for the Future Conference: Upland Ecosystem Services, 9-10 November, Loosehill Hall, Castleton, Derbyshire.
- Sutherland, W. (2006) "*Evaluating the options for combining economically, socially and ecologically sustainable agriculture*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Tatchell, M. "*Cycles and chains*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange Conference, University of Manchester, 18-20 January.
- Tomos, D., Ivashikina, N., Moritsuka, N., et al. (2006) "*Sampling cells and soils in picolitre volumes using glass micropipettes and their subsequent analysis*" Presentation to Society for Experimental Biology Annual Meeting, Canterbury, UK, 2-7 April. [Abstract Comparative Biochemistry and Physiology V 143A, N4, S121.]
- Traill, W.B. (2006) "*Are consumers willing to pay for healthier agricultural products?*" Presentation to the International Food and Health Innovation Conference, Malmo, Sweden, October.
- Traill, B. (2006) "*Consumer sovereignty and healthy eating: dilemmas for research and policy*" Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Traill, B. (2006) "*Healthy eating implications for rural development*" Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.
- Truninger, M., and Day, G. (2006) "*Investigating the 'local' in food consumption habits*". Presentation to 3<sup>rd</sup> Annual Colloquium of Welsh Network of Development Researchers, Gregynog, Wales, 25<sup>th</sup>-27<sup>th</sup> January.
- Truninger, M., and Day, G. (2006) "*Investigating the 'local' in food consumption habits*". Presentation to Joint Annual Meeting of the Association for the Study of Food and Society (ASFS) and the Agriculture, Food and Human Values Society (AFHVS), Boston, USA, 7<sup>th</sup>-11<sup>th</sup> June.
- Wagstaffe, A. (2006) "*The Soft Fruit Technology Group – the growing importance of plastic films within the sector*". Presentation to Advanced Climate Control Conference, University of Reading 27,28 September. [Organised by British Polythene Industries Visqueen Horticultural Product]



- Ward, N. (2006) “*Developing human capital to strengthen rural economies: reflecting on the Northern Rural Network*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Whatmore, S. (2006) “*Understanding environmental knowledge controversies*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Whittington, F.M., Dunn, R., Nute, G.R., Richardson, R.I. and Wood, J.D. (2006) “*Effect of pasture type on lamb product quality*”. Presentation to 9<sup>th</sup> Annual Langford Food Industry Conference, ‘New Developments in Sheepmeat Quality’ 24-25<sup>th</sup> May, Bristol, UK. Proceedings of the British Society of Animal Science, P. 27-31.
- Winter, M. (2006) “*Research for regional and rural development: a practitioner’s perspective*” Presentation to Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
- Winter, M. (2006) “*Sustainable waste management in dairy farming: implications for the rural economy*” Presentation to RELU/AWM Workshop on Sustainable Food Chains and Rural and Regional Development, Birmingham, 11 May.
- Worrall, F., Burt, T.P. and Adamson, J.K. (2006). “*Towards a complete DOC budget for peat-covered catchments – accounting for upscaling and in-stream processes*”. Presentation to American Geophysical Union, Fall Meeting, San Francisco, December.
- Worrall, F. and Burt, T.P. (2006) “*The flux of dissolved organic carbon from UK Rivers*” Poster presented at American Geophysical Union, Fall Meeting, San Francisco, December.

## CONFERENCE PROCEEDINGS

- Bailey, A. (2006) Anon. Proceedings of the conference – Biodiversity Serving Agriculture. European Commission, Joint Research Centre, Ranco. Italy.
- Holland, J.M., Southway, S., Birkett, T. and Moreby, S. (2006) “*The relative merits of field and boundary habitats for conservation biocontrol*”. In Rossing, W.A.H., Eggenschwiler, L. and H-M. Poehling (eds). IOBC/WPRS Bulletin, 29 (6) pp.57-60.
- Kliem, K.E., Deaville, E.R., Morgan, R. and Givens, D.I. (2006). “*Do biodiverse pastures have the potential to improve the fatty acid profile of ruminant meat?*” Proceedings of the British Grassland Society 8<sup>th</sup> Research Conference, Cirencester, 4-6 September 2006, pp. 87-88. [Awarded best poster presentation].
- Whittington, F.M., Dunn, R., Nute, G.R., Richardson, R.I. and Wood, J.D. (2006) “*Effect of pasture type on lamb product quality*”. [Presentation to 9<sup>th</sup> Annual Langford Food Industry Conference, ‘New Developments in Sheepmeat Quality’ 24-25 May, Bristol, UK.] Proceedings of the British Society of Animal Science, P. 27-31.
- Young, J.A., Grady, K., Little, D., Watterson, A. and Murray, F. (2006) “*Multidisciplinary perspectives on an emergent fish product: the tank of British tilapia*”. In: Proceedings of the Thirteenth Biennial Conference of the International Institute of Fisheries Economics & Trade, July 11-14, 2006, Portsmouth, UK: Rebuilding Fisheries in an Uncertain Environment. Compiled by

Ann L. Shriver. International Institute of Fisheries Economics & Trade, Corvallis, Oregon, USA, 2006. CD ROM. ISBN 0-9763432-3-1

## WORKING PAPERS AND BRIEFING PAPERS

- Bateman, I.J., Jones, A.P., Jude, S. and Day, B.H. (2006) *Reducing gains/loss asymmetry: A virtual reality choice experiment (VRCE) valuing land use change*. CSERGE Working Paper EDM-2006-16, Centre for Social and Economic Research on the Global Environment, University of East Anglia.
- Bateman, I.J., Day, B.H., Dupont, D. and Georgiou, S. (2006) *Incentive compatibility and procedural invariance testing of the one-and-one-half-bound dichotomous choice elicitation method: Distinguishing strategic behaviour from the anchoring heuristic* Commerce Department Working Paper Series, Lincoln University, Canterbury, New Zealand.
- Bateman, I.J., Day, B.H., Georgiou, S. and Lake, I. (2006) *The aggregation of environmental benefit values: Welfare measures, distance decay and total WTP* Commerce Department Working Paper Series, Lincoln University, Canterbury, New Zealand.
- Bateman, I.J., Brouwer, R., Davies, H., Day, B.H., Deflandre, A., Di Falco, S., Georgiou, S., Hadley, D., Hutchins, M., Jones, A.P., Kay, D., Leeks, G., Lewis, M., Lovett, A.A., Neal, C., Posen, P., Rigby, D., Sheldon, E., Turnbull, D. and Turner, R.K. (2006) *Catchment Hydrology, Resources, Economics And Management (ChREAM): "A research programme for integrated modelling of rural land use & farm income impacts of the Water Framework Directive (WFD) and its potential non-market benefits"*, Centre for Social and Economic Research on the Global Environment, University of East Anglia.
- Davies, B. (2006) *"Sustainability criteria for assessing agricultural systems: a summary of the literature"* RELU SCALE Working Paper 4, Aberdeen: Macaulay Institute. [www.sussex.ac.uk/spru/scale](http://www.sussex.ac.uk/spru/scale).
- Daymond, J., Lowe, P. and Phillipson, J. (2006) *"The unfolding research agenda"* RELU Briefing Paper 3.
- Daymond, J. and John, L. (2006) *"The Rural Economy and Land Use debates 2006"* RELU Briefing Paper 4.
- Gabriel, D. and Sait, S. (2006) *"Farmland biodiversity: a summary of the literature and methodology"* RELU SCALE Working Paper 3, Leeds: University of Leeds.
- Gabriel, D., Kunin, W. and Sait S. (2006) *"Study site selection: a summary of the methodology"* RELU SCALE Working Paper 1, Leeds: University of Leeds.
- Irvine, J. (2006) *"Understanding wild deer management : an introduction to the project for stakeholders at all levels but particularly case study sites"* Macaulay Institute. See <http://www.macaulay.ac.uk/RELU>.
- Irvine, J. (2006) *"Collaborative frameworks in land management: a case study on integrated deer management"* Project Newsletter Number 1. Macaulay Institute. December.
- Mulatu, A. and Rigby, D. (2006) *"Efficiency of organic farming: summary of the literature"* RELU SCALE Working Paper 2, Manchester: University of Manchester.

- Phillips, M., Page, S., Saratsi, E., Tansey, K. and Moore, K. (2006) "*Diversity, scale and green landscapes in the gentrification process*", Gentrifying Nature: Working Paper 4, Department of Geography, University of Leicester.
- Phillips, M. (2006) '*Rural gentrification and nature*' Gentrifying Nature: Working Paper 3, Department of Geography, University of Leicester.
- Porter, K. S. et al. (2006) "*Scientific work based on a farmed drainage basin and a control basin*". Report. Ithaca, New York State Water Resources Institute, Cornell University.
- Saratsi, E., Phillips, M., and Page, S. (2006) "*Gentrification as a driver of ecological change in the countryside*" Gentrifying Nature: Working Paper 2, Department of Geography, University of Leicester.
- Saratsi, E., Phillips, M., and Page, S. (2006) "*Studies of residential green space*" Gentrifying Nature: Working Paper 1, Department of Geography, University of Leicester.
- Small, L. and Brown, K. (2006) "*Development of organic subcultures: a summary of the literature and methodology*" RELU SCALE Working Paper 6, Aberdeen: Macaulay Institute. [www.sussex.ac.uk/spru/scale](http://www.sussex.ac.uk/spru/scale).
- Stagl, S. (2006) "*Organic food distribution networks: a summary of the literature*" RELU SCALE Working Paper 5, Brighton: University of Sussex.
- Traill, B. (2006) "*Extensive ruminant production systems for healthy fatty acid profiles: summary of approach and research results for year 1*". Report 5, University of Reading, May.
- Traill, B. (2006) "*Food consumption changes in the UK under compliance with dietary guidelines*" Report 2, University of Reading, June.
- Traill, B. (2006) "*Phytochemical rich soft fruit and lettuce: summary of research and research results in year 1*". Report 4 University of Reading, May.
- Traill, B. (2006) "*Willingness to pay for and consumers attitudes to local, national and imported foods: a UK survey*" Report 3, University of Reading, June.
- Watkins, J., Howard, D., McKay, H. and Murray, A. (2006) "*Review of the countryside information system and its use in Countryside Survey Data Dissemination*" Report to the Countryside Survey Steering Group.

## **PRESENTATIONS TO STAKEHOLDERS AND SUBMISSIONS TO STAKEHOLDER CONSULTATIONS**

- Armsworth, P. et al. (2006) "*A landscape-scale analysis of the sustainability of the hill farming economy and impact of farm production decisions on upland landscapes and biodiversity*". Rural Economy and Land Use Programme Project Launch, Castleton, February.
- Armsworth, P. et al. (2006) "*Hill farm economics, upland landscapes and biodiversity*". Presentation to Second meeting of RELU People and the Rural Environment Forum, October.
- Bailey, A. (2006) Project Team and Steering Group Meeting, Game Conservancy Trust, Fordingbridge, Hants, May.

- Bailey, A. (2006) Stakeholder range finding exercise. Project overview presentation to Agricultural Industries Confederation: National Agronomist Association, Confederation House, East of England Showground, Peterborough, July.
- Bateman, I.J., Day, B., Jones, A.P., Jude, S., and Lovett, A.A. (2006) “*Valuing environmental preferences: New tools for policy appraisal*”, presented at the DEFRA seminar Economic Valuation of the Environment: Policy Applications, Mary Ward House, Tavistock Place, London, 30th October.
- Bond, A. (2006) “*RELU-biomass sustainability appraisal*” Presentation to South-West stakeholder meeting, Exeter University, March.
- Bond, A. (2006) “*RELU-biomass sustainability appraisal*” Presentation to East-Midlands stakeholder meeting, Kegworth, March.
- Bond, A. (2006) “*Sustainability analysis in the RELU-Biomass project*” Presentation to SSFF non food crops meeting, Strathdon Hotel, Nottingham, July.
- Bradbury, R., Pywell, R. and Stoate, C. (2006) Presentation at RELU Debate *Farming’s No Place for Wildlife* in National Science Week / Social Science Week, March.
- Buller, H. (2006) “*An investigation of the links between quality food production and biodiversity protection*” Presentation to Third meeting of RELU Food Chain Forum, March.
- Buller, H. (2006) South West Food, Farming and Tourism Conference: South West Excellence – Leading the Way in Food, Farming & Tourism, Thursday 30th March.
- Buller, H. (2006) Exploring Pastures New; 10<sup>th</sup> Anniversary Workshop; sustainable Livestock (SLP) Link Programme, Thistle Hotel, Whitehall, London, Wednesday, 21st June.
- Buller, H. (2006) Farm visit with Devon Wildlife Trust officer; Friday August 11<sup>th</sup>, 2006, Little Dart Raffe Farm, Devon.
- Chadwick, D. (2006) “*Sustainable and holistic food chains for recycling livestock waste to land*” Presentation to Fourth Meeting of RELU Food Chain Forum, November.
- Chandler, D. and Grant, W. (2006) “*Biopesticides – the way ahead*”, presentation at workshop held at RASE, October.
- Chandler, D. and Grant, W. “*Biological alternatives to chemical pesticides in the food chain*”, Syngenta plc, Boars Hill, April.
- Edwards-Jones, G. (2006) “*Environmental management and local food*”. Presentation to Countryside Council for Wales, 13 June.
- Edwards-Jones, G. (2006) “*Food ethics: it’s more than the mileage*”. Presentation at RELU Debate “*Food Miles : Should we be Buying from Abroad*” in National Science Week / Social Science Week, March.
- Edwards-Jones, G. (2006) “*Trade-offs in local and imported food*”. Presentation to the Technical Services Division of the Welsh Assembly Government, 18 October.
- Gill, B. (2006) “*Energy crops running out of steam?*” Presentation to RELU Debate in National Science Week / Social Science Week, March.
- Grant, W. (2006) Presentation to Fourth Meeting of RELU Food Chain Forum, November.
- Hanley, N. (2006) “*Farming for the birds*” Presentation to RELU Debate *Farming’s No Place for Wildlife* in National Science Week / Social Science Week, March.

- Hospido, A. and Milà i Canals, L. (2006) LCA Report. "*Lettuce Production UK2*". Centre for Environmental Strategy, Surrey University, August.
- Hubacek K. and Reed M. (2006) "*Learning to manage future change in UK uplands*". RELU Project Launch, Losehill Hall, Castleton, February.
- Hubacek, K. (2006) "*Moorland hydrology and management impacts*." Yorkshire Dales Rivers Trust, Middleham, June. Presented on behalf of the project team by Joseph Holden
- Hubacek, K. (2006) Moors for the Future Annual Conference 2006, Upland Ecosystem Services, 9-10 November, Loosehill Hall, Castleton, Derbyshire.
- Hubacek, K. (2006) Moors for the Future Partnership members mini-conference, May.
- Hubacek, K., (2006) Invited presentation to Steering Committee of Natural England's Yorkshire & Humber Environmental Pathfinder Project, October.
- Hubacek, K., Quinn, C.H., Hubacek, K., Reed, M., Burt, T., Chapman, P., Cornell, S., Fraser, E., Dougill, A., Holden, J., Irvine, B., Jin, N., Kirkby, M., Kunin, B., Prell, C., Sendzimir, J., Stagl, S., Termansen, M., Turner, A. and Worrall, F. (2006) "*Sustainable uplands: sustainable upland management for multiple benefits*". Framework for Change/Natural England: Sharing Best Practice for Environmental Projects, 13 October, Yorkshire Agricultural Society Offices, Harrogate (Invited paper)
- Irvine, J. (2006) "*The RELU deer project*", Cairngorms & Speyside Deer Management Group, May.
- Irvine, J. (2006) "*The RELU deer project*", West Sutherland Deer Management Group, April.
- Irvine, J. and Dandy, N. (2006) East England Deer Forum meeting, Bury St Edmunds, October.
- Irvine, J. and Dandy, N. (2006) "*The RELU Deer Project*" Deer Initiative Officers Meeting, July.
- Irvine, J. (2006) Project team, Discussions with Heartwoods Case study area managers, May.
- Irvine, J. and White, P. (2006) Presentation to RELU People and the Rural Environment Forum, London, October.
- Irvine, J., MacMillan, D. and Phillip, S. (2006) FCS/DCS/DMRT Research Workshop, September.
- Irvine, J., Dandy, N. and Arne, R.G. (2006) DI Partner meeting, October
- Irvine, J. and Dandy, N. (2006) Bernwood DI meeting, September.
- Karp, A. (2006) "*Energy crops running out of steam?*" Presentation to RELU Debate in National Science Week / Social Science Week, March.
- Karp, A. (2006) "*Bioenergy crops-environmental implications*" Presentation to RRA Bioenergy Workshop, Rothamsted Research, Harpenden, 23 November.
- Karp, A. (2006) "*RELU-Biomass: social, economic and environmental implications of increasing rural land use under energy crops*" Presentation to South-West stakeholder meeting, Exeter University, March.
- Karp, A. (2006) "*RELU-Biomass: social, economic and environmental implications of increasing rural land use under energy crops*" Presentation to East-Midlands stakeholder meeting, Kegworth, March.

- Karp, A. (2006) "*RELU-Biomass: Social, economic and environmental implications of increasing rural land use under energy crops*" Presentation to Northern Rural Network Seminar, King Head Hotel, Darlington, October.
- Landeg, F. (2006) "*Foot and Mouth Disease 2001 lessons learnt*" Presentation at RELU Debate "*Were Any Lessons Learnt from Foot and Mouth*" in National Science Week / Social Science Week, March.
- Lillford, P. (2006) "*Biomass and energy - the commercialisation Issues*" Presentation to RELU Debate "*Energy Crops Running Out of Steam?*" in National Science Week / Social Science Week, March.
- Little, D. et al. (2006) "*A new approach to tilapia in the UK – based on activated suspension technology and niche market*" Meeting with SEERAD Farm Officers, Stirling University, June. Presented by James Young, Kathleen Grady and Sarath Kodithuwakku.
- Little, D. et al. (2006) "*A new approach to tilapia in the UK – based on activated suspension technology and niche markets*" Institute of Aquaculture Seminar, Stirling University, May.
- Little, D. et al. (2006) "*A new approach to tilapia in the UK – based on activated suspension technology and niche markets*" Aquaculture Today Conference, Edinburgh, March.
- Little, D. et al. (2006) "*Microbiol update*" presented by Ekram Azim; "*NamSai Update*" presented by Dave Little; "*AST-RAS Costing*" presented by Will Leschen and Kathleen Grady, Consultation Committee Meeting, Stirling, July.
- Little, D. et al. (2006) "*Tilapia UK...OK?*" Meeting with SCIP Technical Transfer Executives, University of Stirling, December. Presented by Dave Little, Will Leschen, Kathleen Grady and Francis Murray.
- Little, D. et al. (2006) "*Tilapia UK...OK?*" Good Food Up North Conference, Bradford, June.
- Little, D. (2006) "*Warm water fish production as a niche market and diversification strategy*" Presentation to Third Meeting of RELU Food Chain Forum, March.
- Lowe, P. (2006) "*The progress of RELU research*" English Nature's Socio-Economic Advisory Group meeting, Peterborough, February.
- Lowe, P. (2006) "*The Rural Economy and Land Use Programme*" Losehill Hall, Peak District National Park Study Centre, Castleton, in collaboration with the Moors for the Future Partnership. February.
- Lowe, P. (2006) "*Sustainable rural economies*" Sustainable Development Research Network/Royal Institution of Chartered Surveyors lecture series, London, 16 May.
- Lowe, P. (2006) "*Sustainable rural economies in peri-urban areas – the UK experience*" Presentation to North Yorkshire URBAL Interreg Conference "Connecting Town and Country", Harrogate, 15 June.
- Lowe, P. (2006) "*The Rural Economy and Land Use Programme*" European Environment Agency Expert Meeting, Copenhagen "Classifying land use trends and rural areas in an environmental perspective", 3-4 July.
- Lowe, P. (2006) "*The ageing countryside*" Presentation to Adult Learning in Rural Areas: Learning, Employment and Rural Need, Sheffield, 15 November.

- Lowe, P. (2006) *"The changing prospects in the rural economy"*. Presentation to Women in Rural Enterprise (WiRE) Seminar, Askham Bryan College, York, 29 November.
- Lowe, P. (2006) *"Harnessing the social and natural sciences for sustainable rural development"* Presentation to The Diversity of Rural Areas in the Enlarged EU: Characterisation, Typology and Modelling Workshop, Seville, (jointly organised by Joint Research Centre (JRC), the Institute for Prospective Technological Studies (IPTS) and Directorate General for Agriculture and Rural Development (DG AGRI), 14-15 December.
- Mehra, M. (2006) Presentation at RELU Debate *"Food Miles: Should we be Buying Food from Abroad"* in National Science Week / Social Science Week, March.
- Milà i Canals, L. (2006) LCA Report. *"Potato production UK3"*. Centre for Environmental Strategy, Surrey University, October 2006.
- Milà i Canals, L. and Cowell, S.J. (2006) LCA Report. *"Chicory production and retail UK1"*. Centre for Environmental Strategy, Surrey University, March 2006.
- Morris, J. (2006) *"Integrated land and water management in floodplains: revisiting agricultural flood defence schemes in England and Wales"* Presentation to First meeting of RELU People and the Rural Environment Forum, May.
- Oughton, E. (2006) Launch of AIRE project to partners and invited stakeholders Fountains Abbey, Yorkshire, June.
- Oughton, E. (2006) *"Angling in the rural environment: social, economic, ecological and geomorphological interactions"* Presentation to First meeting of RELU People and the Rural Environment Forum, May.
- Phillipson, J. (2006) *"RELU: Knowledge transfer and the unfolding research agenda"* Keynote Address at Roots Conference: The Rural Research Conference of the Royal Institution of Chartered Surveyors, Wadham College, Oxford, 5 April.
- Posen, P. et al. (2006) *"Integrated modelling of WFD impacts upon rural land use and farm incomes"*. The Moors for the Future Partnership Conference, Upland Ecosystem Services, Peak District National Park Study Centre, November. Royal Academy of Engineering, London.
- Stagl, S. (2006) *"An integrated analysis of scale effects in alternative agricultural systems"* Presentation to First meeting of RELU People and the Rural Environment Forum, May.
- Sutherland, W. (2006) Presentation at RELU Debate *Farming's No Place for Wildlife* in National Science Week / Social Science Week, March.
- Traill, B. (2006) *"Attitudes and behaviour towards functional foods: focus groups Report 6"* University of Reading, November.
- Traill, B. (2006) Presentations to stakeholder platform, Nov 2006
- Traill, B. (2006) *"Implications of a nutrition driven food policy for land use and the rural environment"*. Presentation to Third meeting of RELU Food Chain Forum, March.
- Waage, J. (2006) *"Were any lessons learnt from Foot and Mouth – a science perspective"* Presentation at RELU Debate *"Were Any Lessons Learnt from Foot and Mouth"* in National Science Week / Social Science Week, March.
- Ward, N. (2006) Presentation to RELU Debate *"Were Any Lessons Learnt from Foot and Mouth"* in National Science Week / Social Science Week, March.

White, P. (2006) “*Collaborative frameworks in land management: a case study on integrated deer management*” Presentation to Second Meeting of RELU People and the Rural Environment Forum, October.

Winter, M. (2006) Presentation to RELU Debate “*Food Miles : Should we be Buying from Abroad*” in National Science Week / Social Science Week, March.

## PRESS AND PUBLICITY

<b>January</b>	Seafood Intelligence	‘ <i>Novel Species: Scientists looking at potential of tilapia farming in UK; Niche production &amp; market diversification</i> ’. Seafood Intelligence, 12 <sup>th</sup> January 2006. Press Coverage in Seafood Intelligence daily online news updates. <a href="http://www.seafoodintelligence.com">www.seafoodintelligence.com</a> . (RES-224-25-0066 PI Little)
<b>February</b>	BBC Radio 4. Changing Places	‘ <i>Eating biodiversity</i> ’ 3 February <a href="http://www.bbc.co.uk/radio4/science/changingplaces_20060203.shtml">http://www.bbc.co.uk/radio4/science/changingplaces_20060203.shtml</a> (RES-224-25-0041 PI Buller)
	ESRC Society Today – What’s On	Science Week debates
	NFU Science and Technology News Issue 3	Stakeholder workshop ‘ <i>Involving stakeholders in the management of food chain risks in the rural economy</i> ’ (RES-224-25-0090 PI Shepherd) Report on Rural Economy and Land Use: Enabling Knowledge Exchange, University of Manchester, 18-20 January.
<b>March</b>	13-16 March 2006	Science Week – Energy Food Crops Debate 10 Mar Press release 13 Mar Farming Today (interview with Angela Karp) (RES-227-25-0020) 13 Mar Radio Verulamium (interview with Angela Karp) (RES-227-25-0020) 16 Mar Herts Advertiser (interview with Angela Karp) (RES-227-25-0020) 1 Apr EnAgri Issue 1, April 2006 (report on debate)
	16 March 2006	Science Week – Farming’s No Place for Wildlife Debate 13 Mar Press release 16 Mar BBC News 24 Interview with Philip Lowe
	17 March 2006	Science Week – Food Miles Debate 16 Mar Press release: 17 Mar BBC Green Room: Viewpoint (Gareth Edwards-Jones) (RES-224-25-0044)
	High Peak Radio and BBC Radio Sheffield	‘ <i>Safeguarding rural life in the Peak District</i> ’ University of Sheffield Media Centre. The press release led to a radio interview with High Peak Radio and BBC Radio Sheffield. (RES-227-25-0028 PI Armsworth)
	Rural Focus	“ <i>£1 million to secure a better future for uplands</i> ”. Article reviewing Peak District focused RELU research projects. (available at: <a href="http://www.env.leeds.ac.uk/sustainableuplands/documents.htm">www.env.leeds.ac.uk/sustainableuplands/documents.htm</a> ) (RES-227-25-0001 PI Hubacek)
<b>April</b>	BBSRC Business	RELU Briefing Paper 3 “ <i>The unfolding research agenda</i> ” advertised.
<b>May</b>	British Academy News	Report on BA workshop ‘ <i>Working together across disciplines: challenges for the natural and social sciences</i> ’ convened by Wyn Grant ( <a href="http://www.britac.ac.uk/news/release.asp?NewsID=199">www.britac.ac.uk/news/release.asp?NewsID=199</a> )



	NFU Science and Technology News	'CEH project on farmer attitude and training' (RES-227-25-0010 PI Bullock) 'New wave of RELU research' (Third Call) RELU Science Week debates
<b>June</b>	Farmers Weekly	'Pasture type might be marketing tactic' Moorland pasture has winning taste. 22 June 2006 (Whittington, F) (RES-224-25-0041 PI Buller)
	BBSRC e-newsletter	Mention of RELU Discussion Lunch 6 July (www.bbsrc.ac.uk/media/pressreleases/04_06_28_Royal_Show2.htm)
<b>July</b>	BBC Radio Wales	"Local food". Radio interview for BBC Radio Wales, 4 <sup>th</sup> July, 2006. (RES-224-25-0044 PI Edwards-Jones)
	University of Reading Press Release	'Suppose we all ate a healthy diet'. <a href="http://www.relu.rdg.ac.uk">www.relu.rdg.ac.uk</a> (and University press page). Extracts taken up by several farming/food outlets. (RES-224-25-0073 PI Traill)
	The Jellied Eell, London Food Link	Zeenat Anjari, July 2006 "Truly sustainable fish". <a href="http://www.sustain.org">www.sustain.org</a> . (RES-224-25-0066 PI Little)
	RCUK News	'Across the boundaries: Rural Economy and Land Use'
	RCUK What's New	RELU Briefing Paper 4 "UK Rural Economy and Land Use Debates" 20 July.
	Social Sciences News from the ESRC	RELU Briefing Paper 3 "The unfolding research agenda" Issue 63, p.13.
	ESRC Annual Report and Accounts 2005-6	Case study by Philip Lowe, p.33. (+ other references to RELU)
	ESRC Summer Reception	RELU Director manned display stand, 12 July.
<b>August</b>	BBC Radio Wales	'Local food and the environment'. Television interview with G. Edwards-Jones 15 <sup>th</sup> August (RES-224-25-0044)
	Devon Farming and Food News	'Eating biodiversity'. Devon County Council/Devon Rural Network; Edition 1; August 2006: p.1. (RES-224-25-0041 PI Buller)
	Devon Rural Voice	'Eating biodiversity' Issue 10, August 2006 (RES-224-25-0041 PI Buller)
<b>Summer</b>	GAP News	"Eating biodiversity". GAP News, Grazing Animal Project, Summer 2006: p. 37. (RES-224-25-0041 PI Buller)
	NERC Planet Earth	Advert for RELU Briefing Paper 4 "The Rural Economy and Land Use debates"
	The Organic Way	'Biodiversity on your plate'. Vol, 884, Summer 2006, Henry Doubleday Research Association (Jones, O). (RES-224-25-0041 PI Buller)
<b>September</b>	Farmers Weekly	'Plants have impact on fatty acid' (RES-224-25-0073 PI Traill)
	Legal TV	Ten minute interview with Wyn Grant on project, 25 September. (RES-224-25-0048 PI Grant)
<b>October</b>	BBC Radio Wales	"Climate change and agriculture". Television interview for 30 <sup>th</sup> October, 2006. (RES-224-25-0044 PI Edwards-Jones)
	University of Reading Press Release	'How much are we prepared to pay for locally produced foods?' Press release <a href="http://www.relu.rdg.ac.uk">www.relu.rdg.ac.uk</a> (and University press page). Extracts taken up by several farming/food outlets. (RES-224-25-0073 PI Traill)
	The Grower	'PSD gets credit for positive UK biopesticide future', 26 October 2006. (RES-224-25-0048 PI Grant)

	RCUK News	'News from the Rural Economy and Land Use Programme'
	NFU Science and Technology News	'The future of bio-pesticides' (RES-224-25-0048 PI Grant) 'Defra co-funds biomass project' (RES-227-25-0020 PI Karp)
<b>Autumn</b>	Grass and Forage Farmer	'Tasty Lamb'. British Grassland Society; No 86; Autumn 2006, p. 6. (Whittington, F) (RES-224-25-0041 PI Buller)
	ESRC Social Sciences	The UK Rural Economy and Land Use debates Issue 64, p.15
<b>November</b>	Sheep Farmer, Specialist Review	'Eating Biodiversity' Nov/Dec 2006: p.2 (F.M. Whittington. R. M. Dunn and J.D. Wood) (RES-224-25-0041 PI Buller)
	HDC News	'UK set to lead Europe in biopesticides', November 2006, p.3 (RES-224-25-0048 PI Grant)
	RCUK News	'RELU opens its doors to knowledge transfer'
<b>December</b>	Farmer's Guardian	Fred Worrall was quoted in the Farmer's Guardian in December after contributing to a Natural England meeting about soil carbon. (RES-227-25-0001 PI Hubacek)
	HDC News	'All R and no D keeps bio agents under wraps', pp. 14-15 (RES-224-25-0048 PI Grant)
	The Economist	'Good food', Editorial 9 <sup>th</sup> December. (RES-224-25-0044 PI Edwards-Jones)
	The Economist	'Voting with your trolley', 9 <sup>th</sup> December, (RES-224-25-0044 PI Edwards-Jones)
<b>Winter</b>	NERC Planet Earth	'Economics of healthy eating and land use' (in NEWS, p.5) (RES-224-25-0073 PI Traill)
<b>2006</b>	South West Rural Enterprise Gateway website	'Eating Biodiversity: an investigation into the links between quality food production and biodiversity protection', online article and calls for interest 'News' South West Regional Enterprise Gateway ( <a href="http://www.sw-gateway.com/index.html?news.cfm~mainframe">http://www.sw-gateway.com/index.html?news.cfm~mainframe</a> ) (RES-224-25-0041 PI Buller)
<b>2006</b>	Eat the View Website, Countryside Agency	'Eating Biodiversity' Project summary and links, Eat the View Website, Countryside Agency ( <a href="http://www.countryside.gov.uk/LAR/Landscape/ETV/What/index.g">http://www.countryside.gov.uk/LAR/Landscape/ETV/What/index.g</a> ) (RES-224-25-0041 PI Buller)

## Annex C: CONFERENCES/WORKSHOPS ATTENDED BY MEMBERS OF DIRECTOR'S OFFICE

<b>January</b>	RELU Conference “ <i>Rural Economy And Land Use: Enabling Knowledge Exchange</i> ”, Manchester
<b>February</b>	Twin RELU Project Launch, Losehill Hall, Peak District National Park Study Centre, Castleton, in collaboration with the Moors for the Future Partnership
<b>March</b>	Agricultural Economics Society/Société Française d'Économie Rurale Conference, Paris
	“ <i>Agricultural Economics Society 80<sup>th</sup> Annual Conference</i> ”, Paris
	The UK Rural Economy and Land Use Debates, National Science / Social Science Week, Royal Academy of Engineering, London -13 March “ <i>Energy Crops Running Out of Steam?</i> ” -15 March “ <i>Where any Lessons Learned from Foot and Mouth?</i> ” -16 March “ <i>Farming's no Place for Wildlife?</i> ” -17 March “ <i>Food Miles: Should we be Buying Food from Abroad?</i> ”
<b>April</b>	<i>Roots Conference 2006</i> The rural research conference of the Royal Institution of Chartered Surveyors, Wadham College, Oxford
	Third Call Concept Note Workshop, Centre for Life, Newcastle
<b>May</b>	British Academy Workshop “ <i>Working Together Across Disciplines: Challenges for the Natural and Social Sciences</i> ”, London
	Sustainable Development Research Network/Royal Institution of Chartered Surveyors lecture series, London
	RELU Workshop in collaboration with Advantage West Midlands “ <i>Sustainable Food Chains and Rural and Regional Development</i> ”, AWM, Birmingham
	ESRC Seminar Series: <i>New Rural Economies – Building Researcher-User Alliances across the Devolved Territories</i> , London
	North Yorkshire URBAL Interreg Conference “ <i>Connecting Town and Country</i> ”, Harrogate
<b>July</b>	European Environment Agency Expert Meeting, Copenhagen “ <i>Classifying Land Use Trends and Rural Areas in an Environmental Perspective</i> ”
	Water, Environment and Society Seminar “ <i>Representing and Communicating</i> ”, Sheffield
	Foundation for Science and Technology Dinner/Discussion “ <i>Sustainable Development – How Should Policy and Business Decisions Reflect Pressures on Natural Resources and Global Climate?</i> ”, Royal Society, London
	ESRC Seminar Series: “ <i>New Rural Economies – Building Researcher-User Alliances across the Devolved Territories</i> ”, London.
<b>September</b>	Science and Technology Policy Research (SPRU) Conference on “ <i>The Future of Science, Technology and Innovation Policy: Linking Research and Practice</i> ”, Bristol
<b>October</b>	“ <i>European Foods Systems in a Changing World</i> ” ESF Forward Look FL05-011, Wageningen, the Netherlands
<b>November</b>	“ <i>Adult Learning in Rural Areas: Learning, Employment and Rural Need</i> ”, Sheffield
	“ <i>Women in Rural Enterprise</i> ” (WiRE) seminar, Askham Bryan College, York
	7 <sup>th</sup> IPPR Launch Conference on Rural Policy, Brussels
<b>December</b>	“ <i>Future Directions: A New Research Agenda for Rural Development</i> ”, Queen's University Belfast
	“ <i>The Diversity of Rural Areas in the Enlarged EU: Characterisation, Typology and Modelling Workshop</i> ”, Seville, (jointly organised by Joint Research Centre (JRC), the Institute for Prospective Technological Studies (IPTS) and Directorate General for Agriculture and Rural Development (DG AGRI)