

# Land Valuation and Decision Making

Proceedings of a  
Workshop

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Report prepared by:

Helena Posthumus, Joe Morris, Andy  
Angus and Anil Graves

*ForeSight*

*Land Use Futures*



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## 1 Overview

This report contains the proceedings of a one day workshop held on 22<sup>nd</sup> July 2009 in London on valuation and governance relating to rural land use sponsored jointly by the Foresight Land Use Futures project and the Rural Economy and Land use Programme (RELU). It was attended by representatives from the Foresight Project and by researchers engaged in valuation studies from the RELU programme. This report summarises the proceedings of the workshop, including summaries of presentations and points raised in discussion (Appendix 1 contains brief statements on the context purpose, approach and results for each project). Recommendations for follow-up action are made, including the production of a review paper to draw lessons from the RELU experience (Appendix 2). The support provided by the Foresight Land Use Futures Project and the RELU programme for the workshop is gratefully acknowledged.

### KEY MESSAGES

The following key messages were identified during the RELU/Foresight workshop on land valuation and governance:

- The valuation of land-based services is currently mainly policy driven as Government seeks to justify its interventions (such as agri-environment schemes) and is held accountable for its expenditure. Interest in valuation is also driven by a realisation that neoclassical economic frameworks fail to adequately value non-marketable ecosystem services.. The ecosystem approach as applied in the Millennium Ecosystem Assessment is thought to be suitably holistic and inclusive in its valuation approach.
- Valuation can serve a range of purposes such as assessing the impacts of land use change, informing discussions among stakeholders, exploring conflicts and misunderstandings, supporting decision making, and justifying policies.
- Current valuation research is dominated by methods developed in economics. Contributions from other social disciplines (e.g. behavioural sociologists) are relatively limited, yet it is thought that their contributions can help to facilitate a much improved understanding of stakeholders' values, as well as support ways of directly involving stakeholders in governance.
- The links between valuation of land based ecosystem services and governance mainly draw on conventional economic valuation methods, reflecting dominant stakeholder interests. The development and use of deliberative, participatory valuation methods could require considerable change to decision-making processes and the governance of natural resources.
- Major methodological challenges in valuation research concern the integration of quantitative and qualitative methods in order to provide more complete and reliable estimates of value, and how best to allow for variation in scale, time horizon, complexity and uncertainty with respect to different ecosystem services. This has implications for stakeholder involvement, namely: who should be involved, and how information on complex systems and historical aspects can be made available to them most usefully?
- It was felt that the RELU research projects have made good progress in terms of interdisciplinary research on and valuation of land resources that can support decisions to enhance benefits to society, there are still many outstanding challenges to address, namely :

- There is a need to improve the combined use and integration of quantitative and qualitative methods in valuation research.
- A better understanding of the relationship between valuation and governance is required, including the role of stakeholder participation in governance.
- There is a need to explore how integrated approaches to valuation can be accommodated in natural resource governance systems.

## 2 Introduction and Purpose

Rural land provides a wide range of benefits to people and communities. Some accrue directly to the occupiers of land, while others accrue to society at large, now and into the future. Some benefits are the subject of clearly defined property rights and entitlements, while others are not. The increasing and often conflicting demands placed on land as a resource is fuelling debate on questions such as ‘what is land for?’ and ‘who should decide and how?’

There are two interrelated challenges here, namely:

1. The valuation of land-based services, and
2. The incorporation of values into decision-making.

Both challenges are central to the land use debate. The first involves techniques to derive values and preferences, using a range of monetary and non-monetary methods. The second involves methods to support decisions, ranging from the type of cost benefit analysis of development used by ‘experts’ to the more deliberative and participatory methods which engage citizens directly in making decisions. It is likely that some approaches are more suited to some types of benefit and decision situations than others.

The Foresight Land Use Futures Project<sup>1</sup> has identified possible market and institutional failures that can affect the way that land is used and the consequence for people. This, for example, includes the failure to adequately recognise the values of non-market services from land, the synergy and conflicts amongst different benefits provided by land, and the need to represent such complexities and uncertainties in decision-making.

As part of a collaborative venture between the ongoing Foresight Land Use Futures project and the Rural Economy and Land Use (RELU) programme, a one-day workshop was organised by Prof. Joe Morris and Dr. Anil Graves of Cranfield University to explore issues relating to valuation and decision-making as they apply to the management of rural land.

Drawing on the collective experience of RELU research projects, the workshop addressed the following question:

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<sup>1</sup> <http://www.foresight.gov.uk/OurWork/ActiveProjects/LandUse/LandUse.asphas>

How can the value of land, as a stock of assets and a provider of flows of benefits to people and communities, be assessed and incorporated into decision-making processes for a range of applications, scales and time frames?

RELU researchers shared their understanding of methods, issues and priorities for the future through papers, presentations and discussions.

A list of the participants is given below:

Andy Angus (Cranfield University)

Sarah Brown (Defra): Foresight

Althea Davis (University of Stirling): RELU Foundations for the Future

Carlo Fezzi (University of East Anglia): RELU Modelling Impacts of WFD

Klaus Hubacek (Leeds University): RELU Sustainable Uplands

Liz Mattison (University of Reading): RELU Biodiverse Farming

Douglas MacMillan (DICE University of Kent): RELU Collaborative Deer Management

Joe Morris (Cranfield University): Foresight & RELU Integrated Floodplain Management

Lisa Norton (CEH): RELU Understanding and Acting at Loweswater

Helena Posthumus (University of Greenwich): RELU Integrated Floodplain Management

Jim Rouquette (University of Sheffield): RELU Integrated Floodplain Management

Daniel Sandars (Cranfield University): RELU Biodiverse Farming

Ian Shield (Rothamsted Research): RELU Energy Crops

Carys Swanwick (University of Sheffield): Foresight

Dugald Tinch (University of Stirling): RELU Moorland Landscapes (Sustainability of Hill Farming)

Steven Wolf (Imperial College)

### **3 RELU Projects - valuation and governance**

Table 1 contains a summary of the presentations made by 11 researchers covering 8 separate projects (see Appendix 1 for more details on the presentations). The projects covered a range of rural contexts including upland and lowland landscapes, a range of land and water management topics, a range of valuation and governance issues, and they used a variety of methods of valuation. In all cases, the broad purpose has been to derive values associated with land and related water use to inform decision making and policy, although the extent to which the link between values and governance has been developed varies amongst projects.

Table 2 contains a summary of the valuation methods used in the RELU studies. These range from quantitative bio-physical and economic modelling, through economic techniques to derive implicit prices for non market goods, attitudinal scoring methods through to more qualitative narratives and discourse analysis. These techniques involve different degrees of 'expert' and stakeholder/citizen participation.

**Table 1 Overview of presentations on RELU projects and valuation**

<b>Presenter</b>	<b>RELU project</b>	<b>Purpose of valuation</b>	<b>Methodology</b>	<b>Objective of method</b>	<b>Qualitative / quantitative</b>	<b>Stakeholder involvement in valuation</b>	<b>Valuation issues</b>
Helena Posthumus	Integrated Floodplain Management	Assessment of ecosystem services to support discussion and decision making on land use	Modelling impacts of land use on ecosystem services	Quantification and ranking of alternative scenarios	Quantitative	Identification and ranking of ecosystem services by policy makers and practitioners	Values of marketable goods sensitive to fluctuating prices Availability data & methods
Jim Rouquette	Integrated Floodplain Management	Assessment of different methods for valuation of nature conservation	Ecological Impact Assessment, Reserve Selection Criteria, Target-based Criteria, Stakeholder preferences, Expert criteria, Agri-environment payments, Contingent valuation	Derive (monetary) value	Quantitative	Dependent on methodology	Different valuation methods give different outcomes / values
Klaus Hubacek	Sustainable Uplands	To support stakeholders in developing adaptive management approaches	Quantification of ecosystem services, agent-based modelling based on participatory approaches	Quantification of alternative scenarios, reveal preferences	Quantitative	High involvement of stakeholders in development of model	Different issues relevant at different scales: who to involve Stakeholder participation implies uncertain and changing outcomes
Dugald Stinch	Sustainable Hill Farming	Valuation of recreational use of moorland before, during and after the experience	Contingent valuation	Reveal stakeholder preferences, derive monetary values	Quantitative	Valuation based on stakeholder preferences (general public)	Experience influences valuation; when should valuation be done, during or outside of the experience?

Liz Mattison	Biodiverse Farming	To understand how farmers trade-off different benefits provided by farmland	Stated preferences, MCDA including multi-attribute utility theory	Derive monetary values, derive tradeoffs between alternative preferences	Quantitative	Valuation based on stakeholder preferences (farmers)	Tradeoffs between objectives typically non-linear Difficult to reveal stated preferences in situations that are complex and involve continuous decision-making
Daniel Sandars	Biodiverse Farming	To assess the possible impacts of changes in policy and technology, especially those proposed intervention that are targeting at biodiversity, on the behaviour of the farming industry and resulting ecological consequences	Optimisation modelling	Prediction of the behaviour of farmers and the farming industry based on monetary and non monetary expected outcomes	Quantitative	Valuation based on stakeholder preferences (farmers)	Difficult to identify the underlying fundamental non-monetary objectives of farmers, Difficult to get a quantitative cause and effect relationship for all decisions for the non-monetary objectives. In such cases, the attribute that is modelled is a proxy that only approximates the objective of the decision maker.
Douglas MacMillan	Collaborative Deer Management	To verify drivers of behaviour with respect to deer management	Economic analysis, narratives	Derive drivers of behaviour (reveal preferences)	Quantitative & qualitative	Collection of narratives from stakeholders	Simplistic assumptions about economic incentives, prices & land values may hamper policy development where strong cultural, family or social factors are present. Numbers need to be explained by narratives.

Althea Davies	Foundation for the Future	To assess the value of long-term data as a tool for upland management	Choice experiments	Reveal preferences	Quantitative	Valuation based on stakeholder preferences (practitioners, policy makers and academics)	We recognise long-term environmental impacts of land use change, but think in human timeframes when valuing the environment or making decisions
Carlo Fezzi	Modelling WFD Impacts	To assess the welfare changes resulting from the river quality improvements envisaged with the implementation of the WFD	Land use modelling, contingent valuation, travel cost method, choice experiment	Derive monetary values	Quantitative	Valuation based on stakeholder preferences (general public)	Potential for using visualisation methods to translate spatially dispersed environmental goods into information for stakeholders. It is important to develop measures for environmental quality that people can relate to and take into account substitution effects.
Ian Shield	Energy Crops	To assess potential impacts of increased energy crop planting at different spatial scales	Choice experiments, farm modelling	Reveal stakeholder preferences	Quantitative	Valuation based on stakeholder preferences (general public)	Results of contingent valuation are dependent on context
Lisa Norton	Loweswater Catchment	To understand the relationship between ecological and agricultural quality of land and the resultant impacts of choice over land management	Farm modelling, catchment mapping, scenarios	Derive monetary values, reveal preferences and tradeoffs	Quantitative	Valuation agriculture based on farm accounts Stated preferences (farmers)	Despite good data availability and manageable catchment size, there are still many unknowns and unknowables. Quantitative and qualitative data will be used support valuations .

**Table 2 Overview of valuation methods applied in RELU projects**

Method	Objective	Qualitative / quantitative	Stakeholder involvement	RELU Projects	Issues
Modelling of ecosystem services	Quantification and potentially valuation of ecosystem services under different land uses; also modelling of tradeoffs.	Quantitative	Stakeholder can be involved to identify & prioritise or rank ecosystem services, and select indicators.	Integrated Floodplain Management Sustainable Uplands Modelling WFD Impacts	Values of marketable goods sensitive to fluctuating prices. Availability data & methods Different issues relevant at different scales: who to involve? Stakeholder participation implies uncertain and changing outcomes Potential for using visualisation methods to translate complicated environmental models into information for stakeholders.
Economic models	Optimisation of multiple objectives Deriving trends supply and demand	Quantitative	Stakeholders provide information on parameters in economic model	Biodiverse Farming Collective Deer Management Loveswater Catchment	Difficult to get a quantitative cause-effect relationship for non-monetary objectives. In such cases, the modelled attribute is a proxy that only approximates the objective of the decision maker. Simplistic assumptions about economic incentives, prices & land values may hamper policy development where strong cultural, family or social factors are present.
Choice experiments	To reveal stakeholder preferences and to derive tradeoffs	Quantitative	Valuation based on stakeholder preferences (typically general public or specific stakeholder group)	Foundation for Future Energy Crops Modelling WFD Impacts	We recognise long-term environmental impacts of land use change, but think in human timeframes when valuing the environment or making decisions. Results are dependent on context.
Multi Criteria Decision Analysis	To reveal stakeholder objectives and preferences, and derive tradeoffs	Quantitative, with contextual narratives	Stakeholders aid design. Valuation based on stakeholder preferences	Biodiverse Farming	Tradeoffs between objectives typically non-linear. Difficult to measure stated preferences in situations that are complex and involve continuous decision-making. Difficult to derive proxy metrics for intangibles
Contingent valuation	To derive monetary value	Quantitative	Valuation based on stakeholder preferences (typically general public)	Sustainable Hill Farming Modelling WFD Impacts	Experience influences valuation; when should valuation be done, during or outside of the experience? It is important to develop measures for environmental quality that people can relate to. Models should allow non-linear flexible functional forms rather than assuming linear-in-parameters structures
Travel Cost Method	To derive monetary value and actual stakeholder behaviour	Quantitative	Valuation based on stakeholder preferences (typically general public)	Modelling WFD impacts	Only use value, i.e. the ones related to actual recreation behaviour, can be elicited. It is not possible to derive any non-use values with this method.
Narratives	To understand discourse and drivers of behaviour	Qualitative	Narratives of stakeholders (semi-structured interviews)	Collaborative Deer Management	Narratives are important to explain numbers

## 4 Discussion

The short presentations identified a number of common themes associated with valuation and governance, namely:

- Motivation for valuation – policy driven or policy relevant?
- Qualitative / quantitative – integrating narrative and numbers
- Ecosystems – non market goods - understanding conflict and synergy
- Variation in space, scale and time
- Stakeholder analysis & engagement
- Systems and complexity
- Scenarios and handling uncertainty
- Historical perspectives
- Property rights and rewards
- Testing interventions

The discussion picked up on these themes as reported below. The reporting style here is to report on expressed views and opinions that are not necessarily statements of fact.

Initially, the discussion started around why we do valuation and who is engaged. It was thought that valuation seems to be driven by policy rather than the other way around. Valuation is often used to justify decisions made, rather than to inform new policy or decisions. Stakeholders are equally driven by the policy agenda.

Within most RELU projects, a mainly positivist approach underlies the valuation studies. In many cases, the researchers engaged with the ‘usual suspects’, particularly farmers and dominant landed interests, but there are many other stakeholders, including the ‘general public’ whose values may not be adequately included. Valuation can thus be biased, and the evidence base given to policy makers is limited as a result.

It was observed that most valuation studies have explored values for non-market goods, in many cases using the concept of environmental/ecosystem services and related benefits. Furthermore, from an economics point of view, valuation studies seek to derive estimates of welfare change associated with changes in ecosystem services. Governance, it was argued, however, often adopts a more limited and less complete assessment (from a welfare viewpoint – the concept of consumer surplus) of environmental change based on incomes lost or costs incurred. For example, legislation, it was argued, uses cost/income-based methods: for example fines are imposed or compensations are paid based on the damage costs incurred. Agricultural policy commonly applies cost-based methods, taking into account compensation to farmers for income foregone rather than the value of extra benefits to society. The point was made that decisions on land management are often shaped by law and policy rather than benefits to society so that in practice valuation and actual governance are not fully aligned. To complicate things further, it is difficult to get values, particularly in monetary terms, for non-market goods. Reliable estimates of welfare change (changes in consumer surplus) are more difficult to obtain, and perceived to be more liable to estimation error and bias, than those

based on estimates of changes in incomes and costs. Furthermore, society's values tend to change more quickly than governance systems, creating further tensions between the two.

The discussion proceeded around the following questions.

### **What are the drivers for valuation?**

First of all it was argued we need to define valuation. Valuation seems to mean different things in different research projects. We have to distinguish between value (pleasure, satisfaction, worth, utility), values (relative preferences, principles and criteria that guide choice) and valuation (process of deriving values). It was argued that values and valuation should be at the root of decision-making and policy, and it was felt that the RELU research programme was trying to make values from land more explicit and comprehensive.

Revisiting an earlier theme, there seemed to be a consensus amongst the researchers that Government policy has been the main driver for research on valuation. Much of this has been done to justify existing policy regimes, such as expenditure on agri-environment schemes, rather than to design and implement new ones. In this respect, valuation was mainly a product of, and gave endorsement to existing governance regimes and interests. In practice valuation, it was argued, seemed to be a response to governance rather than a driver of new systems of decision making. In this respect, although valuation has an important role to play in governance, its application is likely to be constructed out of existing dominant value systems and power relations. Its role as an instrument of change may in practice be limited. There was scope for exploring how changing values can promote changes in governance.

It was pointed out that interest in valuation by society or particular stakeholder groups may be driven by perceived threats, for example the abandonment of the uplands or the wider impact of the introduction of new crops (energy crops such as willow or miscanthus) into the landscape. Existing value and values might be compromised. More attention should be given, it was thought, to exploring opportunities for enhancing values – especially by identifying potential synergies of interest amongst stakeholders, such as water companies and upland farmers.

It was argued that there is a push towards valuation, especially in market terms, under the prevailing neo-liberal paradigm. Under this paradigm, the market is typically seen as a more efficient regulator than the state, but this is not necessarily true for non-market goods and services. There is an increasing realisation that current economic frameworks fail to put values on many of the non-market ecosystem services provided by land and therefore land resources are not managed in ways that maximise social welfare. The Millennium Ecosystem Assessment promoted the concept of ecosystem services to recognise the consequences of market (and policy) failures. There is also an increasing pressure on Government to be accountable for expenditure. There is also a drive to be inclusive. Society, it was argued, no longer accepts that policy makers and experts are the only decision makers – perhaps suggesting that some aspects of direct democracy are insufficiently representative of wider interests. It is these factors (combined with a better understanding of the link between welfare and environment) that have driven the increased interest in valuation of ecosystem services.

The question was raised whether the ecosystems paradigm was a fashion that might disappear, or whether the substance becomes integrated into policy even though the language may change – whether the terminology of ecosystems was sustainable. The concept was thought to provide a useful and timely basis for classification and valuation of the diverse services from land and their distribution amongst stakeholders.

Of course, it was pointed out that a main driver for researchers to engage in valuation studies has been available funding by Research Councils, especially as they seek to become more policy relevant. Indeed, some researchers have found new audiences for their work once they combine it with valuation and governance. This has required much more inter-disciplinary working, evident in the examples here. In the RELU examples, researchers see that they can support decision making by providing information on the effects of land management on ecosystem services and exploring stakeholders responses to these changes. This is important if research is going to have an impact.

### **What is the purpose of valuation?**

It was considered that, in the context of the RELU projects, valuation has several objectives:

- Predict impacts of land use change (e.g. RELU Biodiverse Farming, RELU Energy Crops)
- Inform discussions on land use (e.g. RELU Sustainable Uplands, RELU Integrated Floodplain Management)
- Support decision makers (e.g. RELU Integrated Floodplain Management)
- Justify current policies by expressing costs and benefits (e.g. RELU Modelling Impacts WFD)
- Explore conflict, tensions, misunderstandings and myths (e.g. RELU Collaborative Deer Management)

Where valuation is intended to support decision making, its effectiveness can be judged according to whether different decisions are made as a result and these decisions lead to an improvement in overall welfare. Valuations are efficient if they lead to decisions which maximise the difference between beneficial outcomes and costs. Valuations are equitable if they are sufficiently inclusive of the range of stakeholder interests.

It was noted that the valuation results of RELU projects represented here had, for the most part, not yet fed through to decision making and governance. This was intended as a next stage of the RELU programme to involve knowledge transfer and capacity building amongst end users of research products.

Once again, reference was made to the drivers of valuation studies: whether the main purpose of valuation to improve decision making or to justify current decision making processes. It was thought that Government agencies sometimes push for valuation because they want to include more aspects in their policy regimes in order to justify policy interventions. This results in policy-bounded valuation focussing on particular topics, stakeholder interests and the comparison of currently available options. There may be limited scope for innovative approaches which may require changes in the process of decision making itself, such as those that require integration of hitherto separate decision areas, such as biodiversity and arable farming. Furthermore, the emphasis on monetary

valuation (to the exclusion of other values and preferences) tends to favour established 'expert based' decision processes which use techniques such as cost benefit and cost effectiveness analysis. More deliberative, participatory methods, some of which have been reported here, attempt to elicit non monetary values from stakeholders as well as engage them directly in decision making. This type of approach to valuation requires a major change in decision making processes.

The researchers drew attention to the difference between quantification and valuation. Research can provide stakeholders with a framework for identifying changes in, for example, land use and management and the services generated by land. These can be quantified using set of indicators which in turn can be used in valuation studies to derive relative values for land management options, perhaps under different scenarios. A number of studies use indicators of ecosystem services for this purpose (e.g. RELU Sustainable Uplands, RELU Integrated Floodplain Management), scoring outcomes such as contribution to biodiversity, without necessarily eliciting a value. Subsequently stakeholders can attach values to the ecosystem services through discussion and negotiation. Thus, the outputs from the RELU projects can provide a systematic basis for discourse and deliberative democracy.

### **What are the issues regarding approaches or methods used for valuation?**

It was thought that the main challenge is to value non-market goods, although the variability of the prices of traded commodities such as agricultural produce presented its own challenges. The point was made that a variety of methods for the valuation of non market goods are reviewed in literature, showing that different methods produce different estimates of value. In relative few cases, however, have these estimates been applied to real-life situations in support of real policy decisions. As a result, it is difficult to assess the efficacy of policy decisions that have been based on valuation studies. It seems that there has been little monitoring and evaluation of changes in decisions that have been explicitly based on valuations. This seems to be a call for action research to show how valuation of ecosystem services can an important part in the various stages of the decision making processes, from initial identification, through appraisal to monitoring and evaluation. It may also be possible to review historical cases to see whether decisions would have been different if informed by valuation studies. There was some discussion regarding the choice of valuations methods based on revealed preference (such as hedonic and travel costs methods) and expressed preference (contingent valuation and choice experiments), both types being used in the RELU projects. Some felt that valuations were better informed by revealed preference and studies of actual behaviour, and that more research effort should go to develop these methods. Others felt that improving the use reliability of expressed preference methods was especially important for considering future changes in environmental qualities. It was recognised that the methods served different purposes but that there was scope to integrate their use, with revealed preference informing 'reality checks' on estimates derived from methods such as contingent valuation .

The differences and complementarities of quantitative and qualitative approaches to valuation were discussed. These two approaches were sometimes seen as incompatible and mutually exclusive, when they should be seen as complementary. It was pointed out that most valuation studies (including those done in the RELU programme) are done by economists who are inclined towards numbers, particularly concerning trade-offs between competing use of resources and outcomes. Behavioural sociologists, by comparison, try to derive 'understandings' of processes, synergies and

conflicts through discourse analysis, deliberation and direct stakeholder engagement. They reject numbers because they are considered too precise, often inaccurate and incomplete. Furthermore it was argued, many sociologists do not consider that valuation is of major concern – they are more concerned with understanding attitudes, behaviour, phenomena and processes of change, rather than deriving instrumental values that might be used to effect change. They tend, it was argued, to steer clear of value judgements, or of assembling values in a way that can be used for other purposes.

However, it was argued that there is merit in the integration of qualitative and quantitative approaches, combining narratives and numbers, meanings and metrics. Techniques can be combined, trying to get the numbers to be as accurate as possible, but using qualitative data and rich insights to understand the numbers, as reported by the RELU Collaborative Deer Management project. Scoring systems based on multi-criteria also serve this purpose, as reported by the Farming and Biodiversity project. It was noted that these approaches can be classified on a continuum, from soft (qualitative) to hard' (quantitative), but this distinction was not thought particularly helpful – they are approaches which serve different purposes and elements of both are used alongside each other. Integrating these approaches was considered to be a priority for future valuation and governance studies.

It was noted that politicians tend to place more importance on numbers than meanings as a basis for policy. It was also noted that different decision makers place different emphasis on types of values and hence methods of valuation. Land managers were shown to place particular importance on financial values (costs and revenues) modified by personal circumstances, cultural factors and social values. Politicians seem to prefer numbers to inform economic analysis of policy options.

Making rich qualitative data and understandings available and relevant for decision makers is a particular challenge. Qualitative insights tends to confirm the range and complexity of values and value systems, whereas numbers are often used to expediently reduce or simplify very complex issues and relationships, hiding the underlying variation and uncertainty. Thus, narratives and qualitative understandings are particularly challenging to incorporate into existing decision making processes and algorithms. Techniques such as Bayesian modelling, for example, can integrate quantitative and qualitative information, as well as expert and citizen perspectives in an uncertain environment. It cannot be assumed that decision makers have the capacity to use the results of qualitative (typically participatory) methods. Nor can it be assumed that stakeholders have the capacity to participate. These are important areas for knowledge transfer and capacity building.

It was thought that valuation studies were an important way of helping stakeholders to develop understandings of the processes of environmental change and the likely implications for them as individuals and members of communities. For example, understanding the causes and effects of changes in water quality by exploring how these processes interact with values and preferences, such as those associated with water use whether public water supply or river water quality for recreation.

Three particular issues were identified regarding valuation – variations in space, scale and time. It was noted that values and stakeholder interests and related governance issues varied spatially, for example within and between regions, between upland and lowland areas. Furthermore, values for different ecosystem services varied considerably according to scale – identifying the appropriate

scale of aggregation regarding, for example, management of water resources or biodiversity, is critical. It was noted that the larger scale, the greater the likely tensions amongst different stakeholder values and interests. Dependent on the ecosystem service, different stakeholder groups are impacted ranging from the local to the global scale. Furthermore, the greater the scale, the greater is the need for collective action and 'joined-up' governance.

Issues of spatial variation and scale, it was argued, constitute a common modelling problem, typically addressed in ecological assessment. It was noted that different systems operate at different scales and have different boundaries (e.g. economic versus hydrological systems). Upscaling bio-physical processes or systems, however, was perceived to be very complicated. Modelling at the correct scale of influence was critical to identify relevant stakeholders and interactions. This has implications for stakeholder involvement. Spatial variation, context and complexity all influence valuation.

Regarding time issues, it was mentioned that values vary over time, along with the processes of change that affect these. The RELU projects addressed this to various degrees, often using scenario and trend analysis, particularly associated with processes of climate and demographic change. It was felt that insufficient attention was given to the historical context on which cultural values are based. It was also felt that long term historical information could help better inform current value systems, helping to understand why we are where we are.

This raised the issue of stakeholder involvement. Many valuation studies involve key stakeholders who have well-defined values, and have a clear stake in current property regimes. It was noted that some stakeholders (including the 'general public') have more diffuse values, and some might be impacted at different scales and time periods than are being considered. Who is in and who is out, and who decides are critical issues in valuation and governance. What is the geographic and temporal boundary for analysis?

### **What lessons have we learned?**

It was noted that the RELU programme actively seeks to integrate natural, physical and social sciences. This integration is particularly evident during the identification and valuation of the different services provided by land under different policy and management options. In this respect, the ecosystems framework has facilitated the integration of scientific views. It was pointed out that this integration has typically been attempted through the use of bio-economic models, such as the modelling of farming and biodiversity in arable landscapes. Some researchers were critical, however, that integration has gone no further than natural scientists building their models, and economists subsequently putting an economic value 'on top'. Others were more satisfied with the degree of integration by combining different modelling approaches and that serious attempts had been made to achieve integration, rather than talk about it. It was argued that integrating economic, hydrological and land use models for example was challenging but satisfying: different disciplines started with different perspectives but reached mutual understanding during the project. It is important that researchers explain how the integration was achieved, as part of a learning process and in order building on success. For many researchers, the RELU project had provided new experience in integrated research.

It was argued that tensions remain between disciplines, especially regarding the appropriate degree of complexity. Disciplines underpinned by systems thinking, such as ecology and engineering, stress the complexity, whereas, it was argued, disciplines such as economics, seek to represent this complexity into simple numbers and relations that can be ranked or monetised in some way. It was argued for example, that choice experiments cannot adequately take the inherent complexity of a system into account, and therefore choices tend to be simplistic and incomplete. Furthermore, the non-specialist often does not fully understand the various assumptions and conditions required of modelling and valuation methods. Over-simplistic models thus reduce the real world relevance of valuation methods, although they may make them more user-friendly. Managing rather than avoiding complexity in valuation and decision making is a key area for further research.

## 5 Conclusions and Recommendations

RELU researchers have variously attempted to value ecosystem services using a mix of approaches drawn from different disciplines. Valuation of land and related ecosystem services remains challenging, but the RELU projects have taken on this challenge. It was generally felt that good progress has been made. A range of outstanding issues were identified relating to policy drivers, variations in space, scale and time, systems and complexity, stakeholder engagement, limitations of quantification and the subjectivity of values.

At present, the majority of the valuation techniques are heavily influenced by economic approaches, such as economic modelling, and techniques such as contingent valuation and choice experiments. It was observed that other social disciplines seem to be reluctant to assess 'value' as this often implies a reductionist or positivist approach. The main challenge is to integrate quantitative and qualitative methods to provide more robust, complete and inclusive assessment of value. The ecosystems framework was considered helpful for this purpose, making the link between changes in environmental quality and quality of life.

Research on the relationship between values of land-based ecosystems services and governance is in its infancy. Some RELU projects explored the existence of property rights, stakeholders' interests and power (often derived from property rights), and their values. However, in-depth analysis is still lacking.

It is apparent that there are two main approaches to valuation as this informs governance. The first is a predominantly economic, monetary based assessment derived by experts (with varying degrees of stakeholder involvement) to inform cost benefit analysis and hence decisions by politicians. The second approach involves participatory approaches that help stakeholders to articulate their expressed values and to 'deliberate' over policy options. Clearly these two approaches have major implications for the processes of governance, of representation, the balance of discretion given to experts, policy makers and citizens, and, presumably, the type of decisions made and outcomes obtained.

Given the observations made in the workshop regarding the role of valuation in an ecosystems/welfare framework, three recommendations are made.

- (i) There is a need to improve the combined use and integration of quantitative and qualitative methods to provide more reliable, complete and meaningful 'values' which recognise inherent variation and complexity in natural and human systems. Guidance is required on how this might be achieved.
- (ii) There is need to critically review the two way relationship between valuation and governance (decision making) – how valuation informs and influences governance, and how governance informs and influences valuation. The role of participatory methods in governance should receive particular attention.
- (iii) There is a need, to explore how, in practice, integrated approaches to the valuation of land-based ecosystem services can be accommodated in existing or new governance systems, ideally through some exemplar cases and experiments.

It was agreed that the participants of the workshop would produce a journal paper on land valuation and governance, drawing on the RELU experience and the issues raised in the workshop.

The paper will be framed in the context RELU Programme and the Foresight Land Use Futures Project. It will cover current approaches, issues, and future needs and opportunities.

A draft outline of the paper is given in Appendix 2. The new Journal of Natural Resource Policy Research was identified as a potential outlet. The paper is to be submitted for review by the end of 2009.

## Appendix 1      Summaries of Presentations

Summaries of the presentations are given below, in chronological order of presentation. Additional Supporting papers and slide presentations are available in pdf format.

### ***Helena Posthumus– Integrated Floodplain Management (Cranfield University / University of Greenwich)***

Agricultural Flood Defence Schemes in floodplain and coastal areas were once an important element of Government support for farmers in Britain. More recently, however, changing priorities in the countryside, concern about environmental quality and perceptions of increased flood risk in lowland areas have promoted a re-appraisal of land management options and policies for floodplain areas. In order to understand trade-offs and synergies between a range of ecosystem services, indicators and scenarios were developed to assess impacts of different land uses on ecosystem services.

As expected, there is a (relative) potential conflict between intensive agriculture and environmental outcomes such as water quality, greenhouse gas balance, habitat and species. There is a potential synergy between short duration flood storage and agricultural production. There is a conflict, however, between flood storage for flood risk management purposes and wetland habitats. An ecosystem approach can inform the discourse between stakeholders about what can and cannot be achieved and to assess the impact of management options on ecosystem services.

*Purpose of valuation:* to assess trade-offs and synergies between ecosystem services to support discussion and decision making on land use.

*Methods for valuation:* ecosystem services approach, modelling of indicators under different scenarios

*Stakeholder involvement in valuation exercise:* identification and ranking of ecosystem services done by practitioners and policy makers.

*Issues:*

- Some indicators are very sensitive to fluctuating world prices.
- Lack of data and established methods to value non-market services, limited understanding of the processes by which the values of non-market services to society are formed.
- Stakeholder engagement is required to reach agreement on indicators, metrics used and weighting of indicators, but also to understand institutional framework (property rights) and narratives of ecosystem services.
- Better insights are required on supply and demand side of ecosystem services, both present and future.

### ***Jim Rouquette– Integrated Floodplain Management (Open University / University of Sheffield)***

The ecosystem approach and evaluation of ecosystem services is gaining increasing attention from scientists, practitioners and policy makers. An important part of this process is to establish the 'value' of the nature-conservation assets within an area. This study assessed seven methods of valuing nature conservation interest. Three methods were based on pre-defined priorities: Ecological Impact Assessment, Reserve Selection Criteria (determined by experts), Target-Based Criteria (government targets). Two methods involved stated preferences of stakeholders: stakeholder preferences based on rarity, aesthetics, cultural history, personal preferences; expert ecological criteria taking stakeholders' preferences into account. A further two methods involved monetary valuation based on revealed and expressed preference: agri-environment scheme payments, and contingent valuation.

The results were broadly consistent in terms of relative values for each assessment method across the range of sites examined. But each method emphasized a different aspect of conservation value and some differences in results have strong implications for policy measures. Stakeholders valued the historical context of sites highly. The contingent valuation method placed greater value on wetland habitats, in contrast to agri-environment payments. Farmers receive little compensation for these habitats, but the other methods put a high value on them. The agri-environment payment regimes reflect income foregone rather than ecological value. It is concluded that the outcome of a valuation technique is influenced by the assumptions made.

*Purpose of valuation:* to assess different methods used to establish a value for nature conservation to support decision making.

*Methods for valuation:* ecological impact assessment, reserve selection criteria, target-based criteria, stakeholder preferences, expert criteria, agri-environment payments, contingent valuation.

*Stakeholder involvement in valuation exercise:* practitioners and policy makers developed valuation criteria, choice experiments with practitioners and policy makers.

*Issues:*

- Different valuation methods provide different answers. This matters if powerful stakeholder groups push a particular method to push specific answers.

***Klaus Hubacek– Sustainable Uplands  
(Leeds University)***

Upland regions in the UK, such as the Peak District, face various challenges related to demographic change, policy reforms and environmental problems. At the same time, tourism, due to the area's natural beauty and high regional population, plays an important role in the regional economy. In order to support stakeholders in adapting to the socio-economic, environmental and policy pressures, researchers and key stakeholder embarked in an iterative social learning process. This learning process was supported by simulating the impacts of management activities through computer models. Stakeholders proposed their own sustainability goals and suggested indicators that could monitor progress. Site-visits further stimulated discussions on land use change amongst the stakeholders that were used to develop models for future scenarios of change. After identifying the relevant issues and stakeholders and codifying and integrating stakeholders' inputs in the

conceptual model, a quantitative computational agent-based model was developed. The outcomes will be used to discuss innovative adaptation options that could help maintain livelihoods and the ecosystem services upon which they depend.

*Purpose of valuation:* to support stakeholders in developing adaptive management approaches.

*Methods for valuation:* agent-based modelling using participatory approaches, ecosystem services approach

*Stakeholder involvement in valuation exercise:* practitioners, land owners and policy makers developed indicators for ecosystem services to be incorporated in a land use model

*Issues:*

- Different stakeholder groups benefit from different services; e.g. population Midlands benefits from recreation, population London (high CO2 emissions) benefit from carbon storage. Which stakeholders to include in the valuation process?
- Stakeholder participation and adaptive management means that outcomes are uncertain and dynamic. This may make decision makers feel uncomfortable committing themselves to implement and resource unknown outcomes.
- Participatory model building requires a lot of time and effort.

### ***Dugald Tinch – Sustainability of Hill Farming (University of Stirling)***

Moorlands support traditional hill farming communities, are home to species of international conservation concern and provide emblematic landscapes with high recreational value. This RELU project assesses how moorland ecosystems in the Peak District can be managed in a way that delivers sustainable hill farming communities while also protecting the environment. In addition, valuation studies are carried out to reveal what it is that the general public values most about moorlands. However, the economic value of ‘experienced utility’ may differ from the ‘decision utility’. Choice experiments were carried out under four different treatments: 1) based on information presented to participants, 2) during an on-site visit, 3) immediate after the visit, and 4) four months after the visit.

Preliminary results suggest that experience has an impact on the utility associated with the moorland landscape. Individuals WTP for the current level of management intensity over more intensively management landscapes in moorland and upland farmland almost halved in the moment of experience (second experiment). However, values returned to the same levels after the experience (fourth experiment) as were found in the first experiment. It was also found that visitors had different preferences than locals for landscape management.

*Purpose of valuation:* to place a value on the recreational use of moorland, and to highlight any change in value given the experience of the resource.

*Methods for valuation:* choice experiment, contingent valuation

*Stakeholder involvement in valuation exercise:* choice experiments were carried out with general public.

*Issues:*

- Experience influences valuation (WTP) of landscapes, but memory mitigates the experience impact. When do we value? During the experience or when decision (e.g. voting) have to be made? If during the experience, how do you control for circumstances?

***Liz Mattison – Biodiverse Farming (Birds)***  
***(University of Reading)***

The concept of multifunctionality in agriculture has been increasingly focussed upon in recent years. This study seeks to determine how farmers see trade-offs between different land use priorities. A multi-criteria decision framing exercise and multi-attribute utility theory was used to explore the utility lowland arable farmers get from different land use values such as production, biodiversity and aesthetics.

Lowland arable farmers view the multifunctionality of their land to be heavily dependent upon production-related profitability. Generating land-based income was their most important objective and this was heavily reliant upon market prices. Farmers commented that if they could not maintain profitability then other objectives would suffer. Other objectives contributing to utility were: time for leisure, risk (farmers' orientation towards risk varied between individuals), complexity of management, recreational land use and appearance of the farm in terms of landscape structure (trees and hedges) and biodiversity.

*Purpose of valuation:* to understand how lowland arable farmers see trade-offs between different benefits provided by farmland and the implications for land use and management.

*Methods for valuation:* stated preferences, Multi-criteria Decision Analysis

*Stakeholder involvement in valuation exercise:* a design phase (identification of objectives) and stated preference survey were carried out with farmers.

*Issues:*

- Trade-offs are typically non-linear.
- Income is always the most important objective for farmers. However, the shape of the profit utility curves is dependent on attitudes (risk taking, risk averse, satisfaction). There is no obvious relationship between attitude and farmer characteristics.
- Few methods are able to reveal stated preferences in situations that are complex and involve continuous decision contexts.

***Daniel Sandars – Biodiverse Farming (Birds)***  
***(Cranfield University)***

Modelling land management decision making behaviour and associated ecological implications will enable a better *ex ante* impact assessment of changes in the business environment such as climate, policy and technology. Many stewardship interventions seek to create a land use that is intermediate between commercial arable production and semi-permanent estate features to deliver better environmental benefits such as biodiversity and aesthetics. A multiple objective optimisation model is used to predict decision-making of farmers. In addition to modelling the effects of coercion or exchange, policy makers try to impact farmer behaviour through persuasion and this can now be modelled as a change of the weights on the decision maker's (i.e. the farmer's) different objectives. After preference elicitation (see Mattison), the revealed trade-off utility curves were incorporated into Cranfield's Silsoe Whole Farm Model.

Preliminary results reveal that profit is typically the lead attribute. Moving from profit optimisation to multiple objectives, the aversion of farmers to in-field biodiversity measures (e.g. skylark plots) became evident.

*Purpose of valuation:* to assess the possible impacts of changes in policy and technology on farmers' behaviour.

*Stakeholder involvement in valuation exercise:* see Mattison.

*Methods for valuation:* see Mattison for the direct elicitation of the preference information on the decision making objectives. Economic/optimisation modelling (Silsoe Whole Farm Model) is also used to investigate the observed previous farming behaviour to reveal preference information

*Issues:*

- Extending an economic model to include outcomes (decision making objectives) other than profit presents challenges. It is more difficult to get a quantitative cause and effect relationship for non-monetary objectives. In such cases, the attribute that is modelled is a proxy that only approximates the objective of the decision maker.
- Modelling the competition between estate features (woodlands, hedgerows) and crops is site-dependent as their location is often determined by site-specific conditions such as topography.
- Modelling prescriptive policy interventions is complex as the rules often apply to individual crops or operations rather than universally to the farm.

### ***Douglas MacMillan – Collaborative Deer Management (DICE University of Kent)***

Many people that make their living from the countryside argue about how to make best use of ecological resources. The management of deer provides an ideal case study because there are many associated costs and benefits. Deer management provides jobs for stalkers on forestry and sporting estates and people 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, agricultural and forestry crops and even suburban gardens. It is generally thought that environmental problems caused by overgrazing by

wild deer can be 'solved' by incentivising landowners to shoot more deer by supporting the venison market.

The relationship between the price and supply of market goods can ostensibly be addressed econometrically by linking observable data on price and other economic variables with production decisions. However, in certain circumstances econometric analysis can be thwarted by inadequate data sets, econometric problems caused by mis-specified or unobserved variables, or by the abstruse nature of the production decision. Econometric and anthropological approaches can be blended to overcome to conclusively identify the relationship between price and supply of wild venison by Scottish landowners. However, this study found that culling intensity is determined by fundamental economic concerns about land values and esoteric socio-cultural factors rather than profitability of venison sales. This study shows how conventional econometric analysis can be enriched and developed through synthesis with qualitative data to help shed light on counterfactual contentions and to better understand fundamental but obscured economic realities.

*Purpose valuation:* to verify drivers of behaviour with respect to deer management (demystify assumption that deer management is regulated by venison price)

*Methods for valuation:* quantitative (price and supply trends) and qualitative (narratives)

*Stakeholder involvement in valuation exercise:* narratives from land owners and managers were collected to explain and enrich economic analysis

*Issues:*

- Simplistic assumptions about economic incentives, prices & land values may hamper policy development where strong cultural, family or social factors are present. There is a need for numbers *and* narratives.

***Althea Davies – Foundation for the future: learning from the past  
(University of Stirling)***

Understanding long-term processes that formed current landscapes may influence how society appreciates these landscapes. Using palaeo-environmental records, changes in upland landscapes are traced back over the past 500 years. Semi-structured interviews were carried out to establish stakeholder views on landscape change and preferences for change, and to assess their response to long-term evidence of change using choice experiments.

The long-term data showed that the biggest losses of biodiversity happened in recent centuries. Early results of the interviews suggest that many stakeholders have strong visions which are not easily swayed. However, many were keen to know more about the history of their landscape and some wished to use the long-term evidence to support their interests. It was also found that national and EU legislation provide limited scope or flexibility for conservation agency staff to incorporate additional information such as long-term data into their policy making process.

*Purpose of valuation:* to assess the value of long-term data as a tool for upland management

*Methods for valuation:* choice experiments

*Stakeholder involvement in valuation exercise:* choice experiments were carried out with practitioners, academics and policy makers.

*Issues:*

- We recognise long-term environmental impacts of land use change, but think in human timeframes when valuing the environment or making decisions. Are the current methods we use to put a value on ecosystems good enough? Or are we too much led by human perceptions? How do we get long-term perspectives into policy framework?
- Introducing unfamiliar techniques and evidence into the land use debate is a challenge.

***Carlo Fezzi – Modelling Impacts of the WFD (ChREAM & SEER projects)  
(University of East Anglia)***

Agricultural and environmental policies, such as the EU Water Framework Directive, are likely to affect agricultural activities concerning fertilisers, pesticides and faecal matter, impacting upon incomes within already fragile farming communities. This project combines natural and socio-economic insights to assess the costs (typical on the rural enterprise) and benefits (including both recreational uses and non-use values), of these policies. By linking various models on land use, farm income, and water environment, the implications of policy changes for land use and water environment, and their associated costs and benefits, are examined. A 'water quality ladder' was developed to convey the modelling results into information easily comprehensible to the public and, therefore, that could be used in benefit valuation surveys. Households have been interviewed regarding their preferences for river water quality improvements, the frequency of their visits to, and their quality assessment of, river locations and the travel costs involved. By combining these datasets, trade-offs between water quality, travel costs and other expenses can be modelled, providing insights into the value individuals place upon improving water quality.

*Purpose of valuation:* to assess the welfare changes resulting from the river quality improvements envisaged with the implementation of the WFD

*Methods for valuation:* land use modelling (including agricultural incomes, land use choices, input applications and output supplied, and water environment); travel costs, contingent valuation, choice experiment to measure river quality change impacts on the welfare of the general public.

*Stakeholder involvement in valuation exercise:* choice experiments were carried out with general public.

*Issues:*

- It is important to develop an integrated, holistic framework for valuation. The integration of different disciplines is important, but also a challenge which requires additional effort and commitment of the researchers.
- Potential for using visualisation methods to translate spatially disperse and complex environmental goods into easily accessible information to be used for valuation exercises with stakeholders. It is important to develop measures for environmental quality that people

can relate to, such as water environmental features, and that take into account the spatial aspects in order to include existing substitutes in the valuation process.

***Ian Shield – Impacts of Increasing Land Use under Energy Crops  
(Rothamsted research )***

Future policies are likely to encourage more land use under energy crops: principally willow, grown as short rotation coppice, and a tall exotic grass miscanthus. These crops will make an important contribution to the UK's commitment to reducing CO2 emissions. However, it is not clear how planning decisions based on climate, soil and water should be balanced against impacts on the landscape, social acceptance, biodiversity and rural economy. There are two types of energy crops envisaged for UK farmland, coppiced trees or grasses (miscanthus). These crops are physically different to current rural land uses, modifying the rural landscape. The public acceptability of such a changing landscape was assessed through questionnaires and stakeholder consultations. The impacts on hydrology, biodiversity and economy were modelled.

The stakeholder consultations revealed little public concern about the crops themselves with 85% of respondents thinking that the crop fitted into the landscape. But when the prospect of a biomass fired power station being sited in the area was added, 53% respondents had no concerns. Annual water use of miscanthus is higher than willow or conventional crops because of greater interception losses. Energy crops seem to offer a more bio-diverse system than arable break crops. The economic analysis revealed that energy crops are very different to manage than arable crops, resulting in wide variations in practice, yields and profitability.

*Purpose of valuation:* to assess potential impacts of increased energy crop planting at different spatial scales

*Methods for valuation:* choice experiments, focus groups, environmental models, farm economic analysis

*Stakeholder involvement in valuation exercise:* choice experiments were carried out with general public.

*Issues:*

- Results of contingent valuation are dependent on context – people had limited concerns about introduction of energy crops, but huge concerns if combined with power station.
- Biodiversity data should be compared to a wider range of common land uses than arable break crops. It should be made clear when the crop types themselves are being compared and when the interactions between the crop and the field margin is being compared.

***Lisa Norton – Community management of Loweswater catchment  
(Centre for Ecology and Hydrology)***

This project combines the expertise of and encourages collaboration between scientists, institutional stakeholders and residents to achieve sustainable management of the Loweswater catchment. Loweswater suffers from regular toxic blue green algal blooms which are unsightly, potentially

dangerous to swimmers and animals, may affect tourism as well as potentially impacting upon the adjacent SSSI Crummock Water. This project tries to determine the value of land from both ecological and economic / agricultural perspectives to understand the trade-offs between land management choices. The rationale behind this is the potential impact of farming within the catchment on lake quality as evidenced by periodic toxic algal blooms but takes into account a holistic view of the catchment as a place of high ecological, landscape and cultural value for which agricultural production in its current form is central but financially marginal.

Data collection has been finished recently. Ecological data has been collected at field level, but the economic and agricultural data has to be analysed at farm level. The project hopes to find a relationship between productive and ecological value. It is expected that low incomes for farmers will result in reduce farm maintenance, in particular landscape features.

*Purpose of valuation:* to understand the relationship between ecological and agricultural quality of land and the resultant impacts of choice over land management (researcher-driven)

*Methods for valuation:* catchment mapping (Countryside Survey), farm accounts, scenarios

*Stakeholder involvement in valuation exercise:* interviews with farmers to reveal preferences and farm accounts.

*Issues:*

- Economic vs ecological valuation (differences in thinking, methods, language, objectives).
- Despite good data availability and manageable catchment size, there are still many unknowns and unknowables.
- There exist discrepancies between stated attitude and behaviour.

## Appendix 2      Draft outline for paper on land valuation and governance

### Abstract

**Key words:** valuation, land use, policy, stakeholders, governance

### Introduction

- Background paper: RELU & Foresight land use futures
- Neo-liberal thinking (market = in, state = out) + accountability = markets for ecosystem services
- MEA, EFTEC report
- Is it a temporary fashion?

### Conceptual framework

***What do we mean with valuation?*** Define terms 'value', 'values' and 'valuation'

***Why do we value?*** Purpose:

- to predict the impacts of future land use changes on welfare
- to inform discussion and support decision making
- to improving understanding of conflicting parties (different interests / values)
- to include interests of people affected by land use (change) but don't have a say over it.
- in reality: to justify ex-post decision-making and policy? Policies are made based on implicit values; valuation tries to make these values more explicit. Need to put value on ecosystem services to justify agri-environment schemes (see multifunctionality debate)

***How do we value?*** Methods:

- ecosystems approach, indicators & scenarios to measure performance
- monetary approaches: costs, WTP
- preferences: choice experiments, stated preferences, MCDA
- Valuation of land use tends to be done by economists looking for numbers based on positivist thinking.
- Can systems be expressed in single numbers? What about changes in systems?
- Numbers vs narratives / discourse

### ***Whose value counts?***

- Stakeholder involvement. Policy makers vs experts vs Joe public vs providers (e.g. land managers) vs beneficiaries – whose value counts?
- When valuing, only the values of the select / usual suspects are taken into account, that is, known stakeholder groups with well-defined values. What about Joe public who have non-articulated diffuse values? Should they be taken into account? Is valuation biased when only the obvious stakeholders are involved?

### ***When do we value?***

- Experience vs decision utility
- Historical perspective

### ***Valuation & governance***

- Valuation tends to be done to justify policy – it is thus policy driven. Stakeholders are also driven by policy agenda
- Property rights
- How to value (and govern) non-market public goods
- Fundamental barrier between valuation and legislation? Law and legislation are based on compensation costs, whereas valuation methods pursue value of benefits (e.g. WTP).
- Valuation, decisions and democracy
- Agricultural policy also based on compensation for investment costs or income foregone (agri-environment payments), not on value of benefits for society.
- Knowledge Exchange and Capacity building

### ***Case studies (RELU projects)***

- Introduction case study
- Purpose of valuation
- Valuation methods & application
- Issues, gaps & uncertainties, lessons learned

**Conclusions and recommendations:** synthesize lessons learned - implications for future research; so what? what to do?