

## **Bridging the outcome gap – Can we learn anything from failing to influence policy and practice?**

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**Abstract:** This paper reflects on the gap between the rhetoric and reality of using environmental modelling and software to support or influence policy. The paper first briefly rehearses the existing arguments on the nature and causes of the *outcome gap* from some key literatures (decision support, integrated-assessment and science-and-society) and from previous iEMSs and MODSIM conference sessions and workshops. The issues of the outcome gap are illustrated, using as a lens a recent research-consultancy undertaken for the European Commission. The wider context for this project was the development of *policy grids* for the EU Rural Development Plan. Policy grids are logic models of how payments are calculated and software to organise complex sets of calculations. Grids are used by regional or national government to justify levels of payments in for example agri-environment schemes, organic production, forestry and animal welfare measures. Policy grids are thus an example of software that could be termed decision justification systems. This paper focuses on the integrated assessment process that supported the development of the software grid. This used outputs from macro-economic analyses and farm-scale bio-economic modelling as the basis for a critical deliberation with a range of stakeholders on the options for differentiation of support payments. The integrated assessment process tested assumptions underpinning the logic models and grid software.

The paper concludes by returning to the principles – and reflecting on how these played out in practice. In addressing the outcome gap our conclusion is that environmental modelling and software continues to have significant potential to contribute to crucial choices facing policy makers and wider society. There is an increasingly strong theoretical and practical understanding of the appropriate processes for developing and applying environmental models and software. The outcomes of research are, however, often much less tangible than the outputs, so the evidence base is limited. The magnitude and nature of their influence are subject to significant contestation by stakeholder interests and the indirect nature of influence may mean that definitive cause and effect cannot be determined. The tools can be used effectively but we are perhaps failing to recognise and value all the outcomes of research. The increasingly managerialist paradigm seen in EU and other administrations also means that there are unreasonable expectations from research funders that research will provide definitive answers that eliminate the need for normative political choices. The information deficit model still pervades research commissioning agencies and means that research is seen to systematically fail to provide solutions. Addressing the outcomes gap requires realism from research commissioners in the expectations that they can have for the resources committed. Finally there is the need for institutions that promote deep cooperation between research and policy agencies rather than purchaser provider relationships that promote market-based, lowest-cost provision of research that leaves a widening gap between rhetoric and reality.

**Keywords:** *integrated assessment, policy, evaluation, decision support, modelling*

## 1. INTRODUCTION

The key idea this paper highlights is the remaining, and arguably widening, *outcomes gap* when environmental modelling and decision support seeks to influence policy and practice. Outcomes will be a familiar concept to those researchers writing proposals for applied or policy relevant research to EU and national research funders. Outcomes are changes in the real world that can be attributed to use of the outputs of the research (papers, software, participatory processes and knowledge). The emphasis on outcomes derives from research funders' need to answer the question – “Why are we funding this research”? Counts of research outputs are no longer considered sufficient and research proposals now anticipate outcomes and lay claim to past influence. Outcome-based assessment of research has some benefits. In particular it forces researchers to engage with policy and/or practitioners and avoids a curiosity led drift into the esoteric. That said there are very serious negative consequences. For example factors beyond the control of research providers may mean that there is no outcome of the research no matter how well conducted or insightful. Research is after all only one of the factors influencing decision making and actions. In any case in a complex social-ecological system it is unlikely that there will be clarity of attribution that links cause and effect. Even where consequences can be measured and attributed the nature of the consequences will be contested; a positive outcome for one interest is likely to be a negative outcome for others. There is also the potential for researchers not to focus on rigour of research but to go for a quick-fix that delivers early outcomes. This further reinforces the short-termism of contract based research. Most damagingly though, outcome based assessment of research, when combined with competitive tendering, promotes outcome inflation – every project becomes a world changing event. Short term both sides collude in this farce since it is in their interests to do so but at the expense of a steady erosion of the credibility of both sides in the eyes of taxpayers and the wider public, the exact opposite of the intended outcome.

This paper reflects on the lessons for delivering policy relevant research using as a case study the AgriGRID project.

## 2. PROGRESS AND PRINCIPLES

For complex societal problems (such as agreeing levels of support or compensation), the issue of how best to undertake research such that it is both rigorous and inclusive is one that continues to tax both research and policy maker communities (McNie, 2007; Scottish Executive, 2005). Marginalisation of either stakeholder experiential or research-based knowledge in important debates can leave the way open for politically powerful vested interests to dominate decision making to the detriment of wider society. The influence of research, however, depends on three closely related factors *salience*, *legitimacy* and *credibility* (Cash and Buizer, 2005).

Salience means that research outputs must be seen by stakeholders as relevant to their decision making process. Salience can be seriously compromised when research outputs refer to geographic, temporal or organisational scales that do not match those of decision making. Research outputs thus have to be couched in units that make sense to stakeholders' management practices. The localisation of research outcomes through the use of appropriately scaled case-studies has been shown to be a key factor in increasing the apparent salience of research outcomes (Carberry *et al.*, 2002). Other limits on the salience of research may, however, be more fundamental. French and Geldermann (2005) identify four issue types, known, knowable, complex and chaotic. For the latter two types all that the outputs of research may be able to deliver is a range of options or a framing of the issues rather than a single definitive solution.

Yet even for *knowable* problems, researchers have questioned whether more or better quality information inevitably results in better decisions or altered behaviours<sup>1</sup> (McCown, 2002b; McCown *et al.*, 2005). McCown's comparison of two mature research fields, industrial and agricultural decision support, concluded that the outcomes of research on complex issues need to be tailored to fit *within* the social processes of decision making, taking a role that do not detract from the agency of the decision maker. That is for research to be influential it must be seen by stakeholders as *legitimate*, supporting or empowering decision making *processes* rather than dictating *outcomes*. Legitimacy is further complicated when issues involve multiple stakeholders each with direct or indirect interests and influence. For such cases, subjective decisions on the selection and assessment of evidence may be as important as the accuracy of the measurement or forecasting of particular phenomena. In a milieu with conflicting interests, researchers cannot simply deliver discrete packages of evidence but need to provide support for inclusive processes that support *deliberation* (reasoned-based debate) on particular issues (Dryzek, 2000). The role for research is in making explicit the trade-offs

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<sup>1</sup>An *information deficit model* of science-stakeholder interactions.

either between outcomes, or between stakeholders (Matthews *et al.*, 2006a). Failure to include stakeholder views by adopting technocratic processes of decision making simply means that both the legitimacy of the process and any decisions are simply challenged through other channels such as the courts or in the media (Stilgoe *et al.*, 2006).

However the interactions between researcher, stakeholder and decision maker are organised, a key factor in the research being influential is credibility (McCown, 2002a). While the credibility of research based forecasts may partially be met by formal processes of validation and peer review there is also the need for outcomes not to contradict existing stakeholder knowledge of systems gained through experiential learning (Carberry *et al.*, 2002). Credibility has also been seen to depend on the transparency of the methods used and on adequate auditing and quality assurance of models and data (Hutchins *et al.*, 2006; Scholten and Kassahun, 2006). While transparency is often used to imply simplicity, this would be to misunderstand what is desired by stakeholders. It is the openness of assumptions (what was excluded as well as what was included), that may be the key to transparency and thus credibility. Two credibility challenges are apparent. The first is overcoming the idea that all uncertainty is the result of errors or mistakes within research processes rather than an inevitable outcome of bounded knowledge, scenarios chosen, model parameterisation, model structure, how the system is represented and practical limits on the availability of data (Rauschmeyer and Wittmer, 2006). The second is that, however good the research is, it is still only the currently best available answer, and may be a partial answer where systems are complex. Together these challenges mean researchers need to be careful in managing stakeholders' expectations. This is particularly problematic when vested interests can exploit uncertainty to sensationalise an issue or to preserve the *status quo*.

Where researchers are seeking to influence or even inform communities of practice and policy the issues of salience, legitimacy and credibility pose challenges for both content and design of processes. When both researcher and stakeholder knowledge is partial there are opportunities for *cooperation* and *knowledge sharing*. In these processes the role of research-based information is not as an outcome to be communicated but as a *boundary object* (Star and Griesemer, 1989) through which information can be exchanged. Researchers can have a key role facilitating such interactions but need to recognise that the role(s), institutions and epistemologies of an experimentalist, hypothetico-deductive paradigm are much less useful in *participatory*, *action* and transdisciplinary research and that alternative ways of conducting research, are more appropriate (Gunderson and Holling, 2002; Kay *et al.*, 1999; Walker and Salt, 2006). In this regard an over-simplification or idealisation of the process through which policy change is initiated, developed, implemented and evaluated is very damaging since it causes a huge gap between the rhetoric of research commissioners and the reality of what researchers can deliver. This is not to say that researchers are not progressively delivering ever more sophisticated analyses, but recognising that with market driven research provision rhetoric will always outpace reality.

### 3. AGRIGRID

#### 3.1. Background

In the EU an increasing proportion (20%) of payments to land managers are made through Pillar 2 of the CAP. This includes agri-environment, less favoured areas, forestry, animal welfare, etc. Any payments should compensate only for *income forgone* or *additional costs* and member states are required to have the payment rates approved by the EU. This is a potentially thorny issue since the range and diversity of biophysical and socio-economic circumstances that occur within the EU27 mean that there are a wide range of measures and payments rates to be assessed. The complexity of the assessments is further increased by the increasing use of payment *differentiation*. Differentiation, classifying recipients (usually based on biophysical criteria e.g. productivity of land) and modifying their payments is used to increase budgetary efficiency by reducing or eliminating windfall payments. Windfalls occur when businesses receive more compensation than the additional costs or income forgone. This is usually the result of payment calculations using average productivity or financial performance figures when in reality both vary considerably. As well as inefficiency, undifferentiated payments have implications for who participates, discouraging the more efficient land managers. The EU commissioned the Agrigrid consortium (7 countries) to undertake both an analysis of the options for payment differentiation and to develop a software tool (the "grid" within Agrigrid) to support the development of payment schemes by policy makers in member states. The objective was support the standardisation of differentiated payment calculations to better meet WTO prescriptions across the EU27.

Payment grids are bespoke, standalone software that implement logic models that define flexible but standardised ways to design differentiated payments and to report how particular rates are justified. The grids ensure consistency and completeness of the justification and document the data sources used. They depend for their inputs on information collected by EU or national statistical agencies and thus the levels of detail in differentiation that can be supported will vary between member states.

### 3.2. Integrated Assessment supporting the GRIDs

In addition to the development of the Agrigrid software (reported by Schwarz *et al.* 2008) a multi-scale, integrated assessment (MSIA) process was undertaken (see Figure 1). This sought to combine the outputs from macro-economic and farm-scale case-study analyses of payment differentiation in a multi-perspective, workshop-based, deliberation with relevant stakeholders. The rationale for the use of the case-study approach was, to provide a facility for *testing* some of the *key assumptions* in a payment calculation to see in which circumstances they are valid. The localised case-study would also serve as a focus for discussion of the *acceptability*, to farmers/land managers, of differentiated calculation methods. This was argued by the research team to be essential if the measures are to be *effective* as well as *efficient*. The efficiency of the measures can be addressed by macro-level assessments but effectiveness – both on *uptake and implementation* of measures runs into a range of technical and socio-cultural factors that need to be assessed through a structured *dialogue* with stakeholders.

As can be seen in **Error! Reference source not found.** the MSIA starts from scoping and proceeds through sequential phases of macro and farm-scale analysis, workshop based presentation and analysis, enhanced analysis based on elicited stakeholder knowledge, documentation of stakeholder aspirations, expectations and likely adaptive responses; synthesis of this information into alternative future scenarios, post-hoc scenario analysis and generalisation. The process has the potential to be iterative with the outcomes of the research shaping the scoping of subsequent rounds.

The scoping phase sets the bounds on the topics considered within the integrated assessment. This can be particularly difficult where there are many factors that impinge on decisions or the range of possible options. The aim is to set up subsequent analyses that are effective in illustrating *ex ante* the consequences of alternative decisions, without swamping the process participants with excessive quantities of detailed material or being so rigidly structures that participants are effectively excluded from influencing *how* the research is carried out or interpreted. For the differentiation of payments the choice of case study was partially driven by necessity (there being only organic conversion and production support common to all partners) yet this was also seen as desirable since it encompasses in a single measure many of the issues relevant to other measures. Previous experience (Matthews *et al.*, 2006a; Matthews *et al.*, 2008) has also shown that using cases that are “real” without being personal is an effective way of eliciting stakeholders views, while minimising inter-stakeholder conflict and enhancing the potential for compromise and cooperation. The farm-level case study was thus scoped with expert consultants from both organic and conventional production sectors and used a concrete example of conversion in a region and for a farm-type that would highlight a broad range of issues (mixed farming in the uplands/mid-hills of central Scotland). The scoping document served to refine the analysis in the farm-level modelling and to shape the questions raised in the workshop phase.

The macro-analysis for this process had two roles. First it was directly presented *within* the workshop process. This contrasts with previous processes run by the authors where the macro-analysis served as an input to the farm-scale analysis, providing quantitative inputs that defined scenarios of change defined in qualitative terms in the scoping phase (Matthews *et al.*, 2006b; Matthews *et al.*, 2008). The second role was in highlighting some of the possible factors that the farm-level analysis needed to be able to address. The

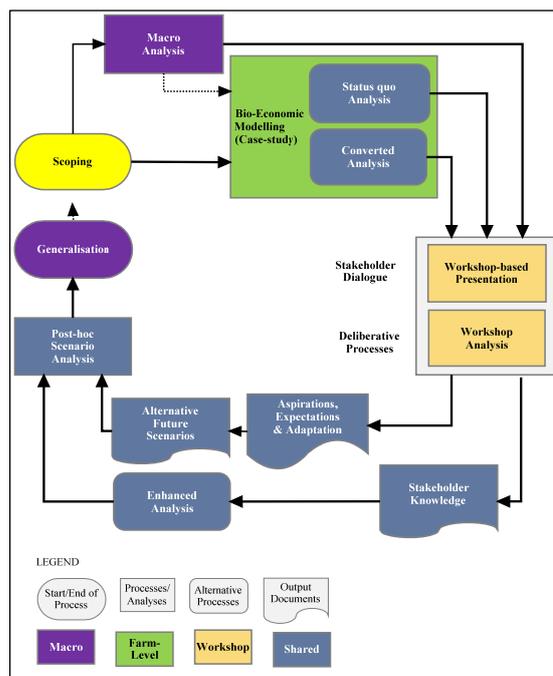


Figure 1 – A multi-scale integrated assessment process

farm-scale analysis needed to be able to assess not just the financial bottom line, but to break this down in terms of the balance between fixed and variable costs, capital requirements (machinery, labour and infrastructure), the range of on farm activities in terms of the skills mix required and the balance of material flows as an indication of the ecological footprint of the farm enterprises.

The workshop based activities present the results of the first phases of research to a multi-perspective stakeholder audience with the intention of engaging with them in a dialogue on the wider issues and a deliberation on merits of specific alternative strategies or policies. The workshop also provides and opportunity for a formal evaluation of the utility of the tools/outputs and the process. The outputs of the workshop are typically a series of documents. These can usefully be classified as stakeholder specialist knowledge and as aspirations (what stakeholders want to happen), expectations (what they think will happen) and adaptations (what they will actually do themselves). The former is typically information confirming or amending the data, assumptions or outcomes of modelling. Previous experience of using model outputs with stakeholders has shown that eliciting stakeholder knowledge is extremely valuable. This knowledge serves to make the modelling results more salient (e.g. since they prioritise the outputs of greatest relevance to decision making). The modelling gains legitimacy, since it allows the stakeholders the direct opportunity to question the operation of the model and to influence (though not control) the research through the research team’s commitment to reconsider and review the analysis in the light of their comments. Finally the results have greater credibility since for the *status quo* analysis they match with the experienced reality. This in turn enhances the credibility of the alternative scenarios (in this case the organic conversion analysis) since they share either many of the same underlying assumptions or the new assumptions have been deliberated on and agreed. The importance of stakeholders as *actors* or *agents* within the system with their own goals to achieve also needs to be recognised within any analysis. They are not automata passively receiving policy measures but dynamically seek to alter the implementation of policy either positively or indeed to circumvent their intended purpose. When multiple perspectives are present within the workshop it is possible to identify where there may be conflicts between the expectations of policy makers, the aspirations of land managers and the likely adaptations (or lack of them) that may result. A synthesis of these views and adaptation strategies can be undertaken to derive a series of alternative future scenarios, which may influence wider debate or be combined with the enhanced farm-level analysis to inform a wider range of cases through a process of generalisation.

### 3.3. Stakeholder Participation

The workshop was arranged in partnership with the Scottish Government’s Rural and Environment Research and Analysis Directorate. They hosted and participated in the meeting and acted as stakeholder champion for the meeting. This latter role was essential in ensuring that key stakeholders were present for the meeting. Participants included Scottish Government staff concerned with implementing payment calculations with respect to organic farming, SG staff with a wider interest in payment calculations, stakeholders representing organic producers, the Soil Association (who certify organic production) and farming interests more widely (e.g. the farmers union). An England and Wales perspective was provided by a delegate from one of the agencies tasked with developing agri-environmental measures. There were 10 participants in total and these provided a good breadth of perspectives and significant practical expertise in the issues of designing and administering differentiated payments and the practical consequences.

The outputs of the integrated assessment process, including the workshop are reported elsewhere but the evaluation of the outputs and process are presented in the next section.

### 3.4. Stakeholder Evaluation

Formal evaluation of the utility of tools, outputs and processes has been shown in other activities undertaken by the authors to be of significant benefit both to interpreting the outputs from workshop activities and improving communication of information to a

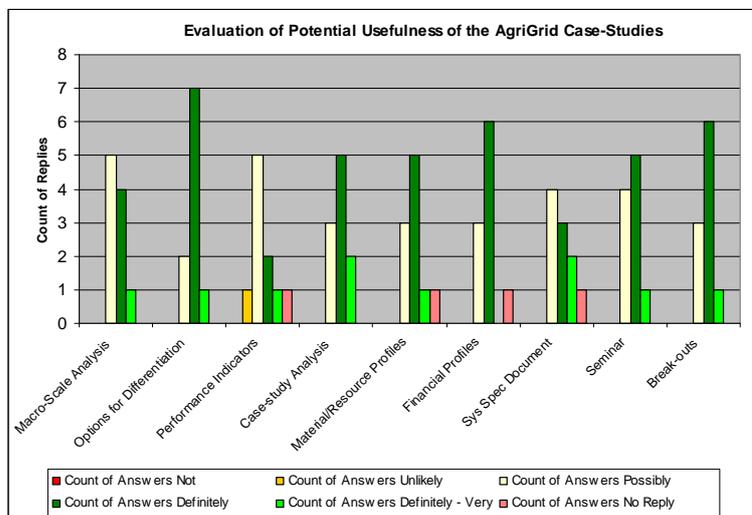


Figure 2 – AgriGrid evaluation form responses.

wider stakeholder audience and in refining the analyses undertaken (Matthews *et al.*, 2008). It elicits information that can be difficult or uncomfortable for stakeholders to provide in a face-to-face exchange and is an extremely useful cross check for workshop organisers. For the AgriGRID workshop the evaluation was carried out using a simple check box form (supplemented by a free text comments sheet). This was filled in by all participants on the day. The sheet had two parts. The first part captured information on the utility of the elements of the analysis and the workshop process using a five point qualitative categorisation.

Figure 2 summarises part of the evaluation sheets. The overall responses from the workshop participants were very positive, with definitely and definitely-very useful responses out weighing possibly and unlikely responses for all but one of the items. The wording for the top two categories was deliberately challenging to make certain that positive responses could be clearly differentiated from the more neutral possibly category. Indeed there was only one instance of unlikely and no not useful responses in the whole survey – despite it being filled in and returned anonymously.

Particularly strong positive responses (the difference between definitely and possibly) were seen for the options for differentiation. This may reflect a strong desire for stakeholders to be part of the process of assessing concrete options rather than lobbying for general principles. The case-study analysis and its components were also well received perhaps indicating the utility of tools that allow a more in-depth exploration (including non-financial factors) of the circumstances within which differentiated payments would be applied. It is also perhaps worth noting that the breakout groups were seen as more useful than the seminar elements reflecting that stakeholders want to be actively engaged in debate on the issue event when there is no formal decision making component to the workshop.

#### 4. THE OUTCOME GAP

The research and development activity followed the principles set out in Section 2 and drew on many years of interdisciplinary and software development experience in the various research teams. The elements of the research and software development were well integrated with a coherent approach to stakeholder participation. There was a genuine partnership with frequent meetings with staff from the member state agencies and governments. There was dialogue both on the specific functionality of the tool and on the wider issues that needed to be considered. For the software this led to considerable scope creep compared with the original specification with the grid now supporting two contrasting approaches to payment justification - limiting standardisation but making it more relevant to existing practices and available data. The macro-analysis was effective in illustrating the costs and benefits of differentiation schemes and putting a bound on the efficiency gains that could be made and the likely additional administration costs. The case-study was effective in encouraging engagement in the debate on the likely uptake and effectiveness. Yet as apparently successful as the conduct and evaluation of the integrated assessment was (and we would certainly repeat the approach for other issues) the outcome gap remains. The research has, to date had no influence on the actions of any of the stakeholder partners and the associated software tool has not been used in anger.

The key reason for this outcome failure lay in the timing of the project. Originally intended to support the process of evaluating EU rural development plan (RDP) proposals from member states, the commissioning of this project was delayed by a year. Thus by the time the project was delivering it was a year behind the original schedule and the process of agreeing payments had been completed eliminating the potential to have immediate positive outcomes. It was not possible to compress the project into a shorter time since the research organisations did not have the capacity due to other commitments. The need for research commissioning agencies to anticipate requirements is apparent as is the need for contingency planning.

The AgriGRID project has, however, delivered outputs, particularly the research-policy partnerships and the software that have the potential to be highly relevant to the next round of RDP payment evaluations. Indeed it would be possible to argue that the time and effort needed to embed a software tool in the processes of the various agencies means that there is only just enough time to complete the task before the next round of proposals in 2011. There is likely to be little appetite for such activities with operational staff in government, however, given the immediate demands on their time. Furthermore the short-term contract for the research has ended, and there is only the vague hope that each of the partners will some how find the funds to continue the application of the grid in their own country. The research partners are now all committed to other projects and there is no budget to support the software, provide updates, train users or provide consultancy. This is a classic example where the capacity to support policy is developed but not retained or maintained within the research or policy organisations. In effect if there are no immediate outcomes then there are likely to be no outcomes at all leaving a widening gap between rhetoric and reality.

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