EUROPEAN SCIENCE FOUNDATION

SETTING SCIENCE AGENDAS FOR EUROPE

cost

Communication on Environmental Research at the Science Policy Interface (CSPI)

Brussels, 28-29 November 2006

www.esf.org

The strategic workshop 'Communicating Interests, Attitudes and Expectations at the Science/Policy Interface (CSPI): *Setting Environmental Research Agendas to Support Policy'* was held in Brussels on 28th-29th November 2006 and sponsored and organised by

The European Science Foundation (ESF)

The ESF was established in 1974 to create a common European platform for cross-border cooperation in all aspects of scientific research. With its emphasis on a multidisciplinary and pan-European approach, the Foundation provides the leadership necessary to open new frontiers in European science. Its activities include providing science policy advice (Science Strategy); stimulating co-operation between researchers and organisations to explore new directions (Science Synergy); and the administration of externally funded programmes (Science Management) in all research areas.

Headquartered in Strasbourg with offices in Brussels, the ESF's membership comprises 75 national funding agencies, research performing organisations and academies from 30 European countries. The Foundation's independence allows the ESF to objectively represent the priorities of all these members.

This project involves two ESF Standing Committees: Life, Earth and Environmental Sciences (LESC) and the Social Sciences (SCSS)

European Cooperation in the field of Scientific and Technical Research (COST)

COST is one of the longest-running instruments supporting co-operation among scientists and researchers across Europe. COST now has 35 member countries and enables scientists to collaborate in a wide spectrum of activities in research and technology.

COST is an intergovernmental network which is scientifically completely self-sufficient with nine scientific COST Domain Committees formed by some of the most outstanding scientists of the European scientific community.

This project involves two Domain Committees: Earth System Science and Environmental Management (ESSEM) and Individuals, Societies, Cultures and Health (ISCH)

Report written by:
Dr. Alister Scott
The Knowledge Bridge Ltd, UK
alister@theknowledgebridge.com

Contents

Background

The background to the workshop stemmed from questioning the often-stated assumption that environmental research findings would be of value to policy formulation. How do researchers know that this would be the case?

Developed in the desire to enhance the chances that 'the best science and understanding'[1] would influence environmental policy-making, the workshop questioned how environmental research agendas are set, IF the research purports to be in support of policy formulation. It was thought that joint agenda setting, in which researchers interact with policy-makers and other stakeholders in setting the questions for research, would trigger research that would be 'more likely to be of interest and value to the policy process'.

In the past, problems at the science-policy interface have been mainly thought of as communication problems. While, as testified at the meeting, communication problems of various kinds are significant, they are rarely the whole picture. Another approach to enhancing the research-policy interface is to generate mutual awareness through joint 'ownership' of research processes and findings. Thus, another useful strategy is the joint setting of research agendas, helping to generate a style of research that some have called the 'co-production of knowledge'.

Joint agenda setting involves researchers in interacting with others to identify research topics and questions of interest. This also alerts them to perspectives, resources, knowledge, networks, methods, commitments and preferences that can help or need to be taken into account during the research process. To an extent, the close relationship between questions around agenda setting and research communication meant that during the meeting, it was hard to maintain a focus purely on agenda setting; the discussion inevitably spilled over into being about the communication of research, as did the background paper[2].

Crucially, as the meeting emphasised, agenda setting does not take place in a vacuum – either of ideas or of interaction between the players. With respect to ideas, just as researchers often approach research challenges with their own conceptual and disciplinary frameworks, methods, and histories, it is also the case that policymakers and other potential research 'users' often have strong commitments to particular ways of doing and thinking about things. For example, within many government departments around the world, policy makers favour economic analyses over other approaches.

With respect to interaction, it is now well recognised and attested by the experiences of those at the meeting and also from studies of the history and sociology of science that science does not take place in a social vacuum. Science can never be completely 'objective', unaffected by various influences from the wider society within which it is conducted. Scientists are influenced by a range of factors including: the priorities and procedures of funding agencies; policy perspectives, interests, priorities and 'framings' of problems; social norms, culture and histories; and a range of disciplinary factors including the relative power of different disciplinary 'framings' of research problems and priorities and the developmental stage of a discipline or a sub-discipline.

Both of these – interactions and ideas – mean that the process of setting agendas for research does not happen on a 'clean slate'. While it is often the case that researchers and decision-makers are functionally separated, creating apparent 'gaps' at the science-policy interface, they can nevertheless often influence each other in ways that are variously subtle or obvious, deliberate or accidental, explicit or concealed.

---

1. Quotations here are from the two-page note circulated prior to the meeting (p. 17).
2. Elizabeth Shove's background paper is appended at the end of this report (p. 19).

Keynote Talk[3]

The meeting started with an introductory paper – entitled 'Framing of research questions: interactive agenda setting at the science-policy interface' – presented by Elizabeth Shove. This paper, and the related talk, challenged the validity of any simple categories of science and policy, scientist and policy-maker, and scientific agenda vs. policy agenda. The thrust of the paper was that these categories are much more porous than they are often made out to be. Indeed, these simple categories did not survive the course of the meeting; many of those who presented case studies spoke to the complexity of both the institutional contexts and the processes involved.

Some commentators – see the special issue of science and public policy[4] – claim that interactive research is: 'A style of activity where researchers, funding agencies and user groups interact throughout the entire research process, including definition of research agenda, project selection, project execution, and the application of research insights'. The *benefits* of such an approach include its ability to enhance the effectiveness and legitimacy of the research, since interactive research provides explicit opportunities to address questions of power, equity and access.

Against this, others argue there are various hazards, including concerns among researchers that interactions with decision-makers will:
- **reduce the 'purity' of the research**
- **undermine its theoretical content or its ability to contribute to the development of theory**
- **result in colleagues thinking that they are undertaking 'applied' research, which is seen by some as second rate**
- **reduce the ability of quality-control processes to work in the traditional manner.**

Elizabeth proposed that the question of where research agendas came from, and related questions about the character of knowledge, legitimacy and authority, were 'foggy' in that they have not been addressed with anything like as much attention as have questions about non-academic involvement in the research process itself.

There are different ways of thinking about where research questions come from. One is to consider the way in which disciplines develop; new sub-disciplines occasionally emerge from mainstream academic disciplines, sometimes taking the researchers involved closer to the methods, perspectives and interests of other disciplines and sub-disciplines, but all the time being influenced by institutional factors involving jobs and resources, the shape of departments and external pressures[5].

These disciplinary environments change for different reasons, e.g. through generational changes within the research community, with disciplines differing from each other in terms of their stage of development and their relations with the outside world. Often, theoretical concerns endure while topics come and go.

Next, Elizabeth considered the views of those who argue that disciplines go through cyclical processes of development, and that at different moments in this cycle, disciplines are variously permeable or open to external influence on research agenda setting processes[6]:
- **exploratory, where research questions are informed but not influenced by outside concerns**
- **paradigmatic, where research questions are theoretically driven and relatively closed to outside influences, and**
- **post-paradigmatic, where research questions are problem driven and open to outside influences.**

These different types of research setting interact with the type of institutional context within which the research is taking place; for example, agenda-setting within research centres can be a very different experience to that within national research programmes that commission research in a variety of institutions. Managing research agendas within research centres can involve:

---

3. Elizabeth Shove's background paper is appended at the end of this report (p. 17).
4. Chris Caswill and Elizabeth Shove (2000). "Introducing interactive social science (introduction to a special issue on interactive social science)." Science and Public Policy 27.

5. All. University of Chicago Press.
6. See Elizabeth's web site on interactive agenda setting: www.lancs.ac.uk/fss/sociology/research/projects/iass

- Winnowing and sifting – deciding which topics offer opportunities
- Juggling – trying to take forward various different topics at the same time
- Knitting – research has to make a claim to do something new, and one way to achieve this is to offer to knit together threads from different disciplines
- Lining up the stars – picking topics that connect
- Funnelling – squashing issues into a manageable core.

In addition, in some fields, the community of researchers is quite close, while in others, interests are more scattered. Research Centres tend to have a strong path dependence, building up an identity and a reputation and also the ability to set their specific research agendas within an overall research strategy. Here, there are challenges around the need to generate feedback on the relevance and legitimacy of their research, and the need for renewal so that research portfolios and perspectives do not become stale.

By contrast, within Research Programmes, while there may be an initial research agenda, the ability of the central programme administrators to craft a balanced, relevant portfolio of projects depends strongly on the responses received from the research community in the form of research proposals. This community is diverse in its interests, disciplines, and approaches, and not all aspects of the original research agenda may be picked up. Thus a research programme may end up with clusters of projects around particular topics, but also gaps.

The development of policy research priorities

The other aspect of agenda setting is around the question of where policy research priorities come from. All policy topics themselves have a 'career', with some analysts talking about an 'issue attention cycle'. The cycle can often be initiated by research; problems such as ozone depletion and climate change were first noticed by scientists during their own research or monitoring.

While this can lead to new concentrations of policy effort and measures such as investments in research, 'old' topics can also hang on as a result of the accretion of institutional habits, affiliations, and investments. This can explain why it sometimes takes time for governmental department research portfolios to react to new priorities.

At the same time, Elizabeth noted that there is a widely held view that complex 'real-world' problems and priorities do not match on to disciplines, so interdisciplinary research is required to address such problems. Some universities such as York and Sussex were set up to promote interdisciplinarity in a variety of forms, for instance, through their organisational structure, physical form and official statutes. So, for example, Elizabeth cited the development plan of the University of York as stating that 'The university must be a meeting place…each specialisation must be enriched by the greatest possible contact with others'.

Yet a series of workshops on interactive research run by Elizabeth had shown that 'meeting' is not enough. This is because paradigms vary hugely between disciplines, with each discipline having its own assumptions about what is at stake. Within the social sciences, for example, disciplines like economics and sociology have widely different ideas about human nature at their core. So when disciplines are invited to join together to 'solve' a seemingly neutral 'real-world problem', they are in fact invited to enter into an existing but usually invisible or tacit paradigmatic frame. This brings us back to the early observation that the policy world is full of paradigms and problem definitions.

For example, the UK Environment Agency invited bids for a 3-year research project on the 'social science of encouraging water efficiency'. Here, the focus was on the behaviour, understanding, and choices of individual consumers, and solutions such as social marketing. This approach was assumed to be the 'natural' one to take. Academics and research institutions that respond to this brief in ways that are in keeping with this particular framing of 'the problem' will be seen to, provide 'policy friendly' outcomes and outputs. However, the essentially individualistic paradigm that underpins this brief fails to take account of other social scientific theories and arguments about the more systemic nature of social and technical change. Such approaches would, for instance, highlight the significance of infrastructures, institutions, and the cultural norms of the day (such as expectations around cleanliness).

A response that builds on a more systemic view of social practice would be 'policy hostile', since it takes issue with the implicit framing of the research question. This is the case even if, from the perspective of the researchers involved, they are providing such a challenge because they believe that such an approach will ultimately be more useful for the development of policy on water efficiency. In short, there exists a conceptual gulf between the two contrasting approaches, but also a gulf between which approach is assumed to be policy friendly.

On the basis of this analysis, Elizabeth reached several conclusions.

First, the meaning of the 'policy relevance' of research shifts over time, and is relative at any particular

moment to the situation in hand, shaped by the factors discussed above, including factors such as policy commitments, paradigms and 'framings' of problems, and issue-attention cycles. Research agendas cannot simply be made to fit policy agendas; where policy and research paradigms are shared, they 'fit' anyway. The co-production of knowledge supposes shared problem definitions and theoretical framings. This raises the larger question of 'what lies behind the seemingly neutral ambition of achieving a 'better fit between science agendas and policy formulations'?'

A second conclusion was that to achieve joint agenda setting, it will be necessary to develop new ways of organising academic and policy work, and new hybrid forms of problem definition. In particular, it will be necessary to promote active academic engagement in multiple communities of practice. Here, several influences come into play:

- **the history of disciplines, centres, careers and programmes**
- **networks: how people, resources and ideas circulate, and what this means for shared practice and for difference**
- **the 'ecology' of the entire system.**

During discussion around Elizabeth's presentation, it became clear that the challenges around setting agendas for research are much the same within the research and policy communities, in that each has their own habits, paradigms, assumptions and commitments.

Summary of Discussions

This section of the report gives a summary of some of the key topics that emerged during the workshop. This is necessarily selective and clusters the discussion around four main headings.

1. Institutional and Cultural Factors

A range of institutional and cultural factors help to set up the conditions that affect agenda setting at the science-policy interface.

1.1 Cultures and Motivations

Even within Europe and other western countries, which were the focus of the discussions at the meeting, there are significant differences between countries as to the style and intensity of interactions at the science-policy interface. Smaller countries such as the Nordic countries are thought to be characterised by close links between scientists and policy-makers, while larger countries have more diffuse and varied relationships, largely as a reflection of the larger scale of the research and policy systems involved.

Several people spoke of the high levels of personal motivation that are required on the science-policy interface. It can require courage to attempt to tackle complex questions, where scientists may feel safer dealing with more conventional, safer questions. The compensation is that the challenge of dealing with complex real-world questions is rarely dull!

One working group pointed to the need for scientists to be motivated to work at the science-policy interface. Factors here included:

- If, after helping to develop policy, decisions are not based on evidence provided, this will have the effect of undermining scientists' motivation to become involved in future. How transparent is decision making and how much feedback is given so that scientists know why a decision was taken and how their advice was used? Many scientists have an expectation that if they give advice, it must be acted upon. However, there may be other considerations such as cost that policy-makers will want to take into account. Some attempt is being made to bring together such multiple criteria, for example the UK's regulatory impact assessment.
- Do policymakers understand the range of evidence that they need, and are they open to contributions from different sources?
- Is the policy maker open minded or have they got the answer in their head before the research is there?
- The present incentives and reward systems for academics do not provide strong motivations to take part at the science-policy interface.

Indeed, this group reported that there was often a dislocation between scientists and real-life problems; scientists need to develop an understanding of the 'logic' of policy. In Finland, Universities are required to add a 'Science in Society' dimension to their teaching and research. Is it coincidental that scientists are held in high regard in Finland?

1.2 Resources and Skills available

Joint agenda setting is often an intensive process that requires resources, especially staff time. For example, Irja Vounakis at the Environment Directorate General (DG) of the European Commission stated that their attempts to make sure that scientific research informed the development of the Commission's thematic strategy on air quality involved over 100 meetings with scientists. While officials want to be actively involved in research, time does not always allow it. One of the answers to this that was identified at the meeting was the value of people working in both research and policy contexts; this provides a chance for networks to develop.

However, institutions on the science-policy interface like the IPCC[7] are not always heavily resourced. For example, many contributing authors on the IPCC donate their time, for reasons of prestige but also because they want their work to have an impact on policy.

Scientists also sometimes feel that they lack the skills required on the science-policy interface. There is therefore a role for training in various aspects of working with the media and policy-makers. Several participants referred to a 'scientist's survival kit' produced by the European Commission. The SKEP ERA Net is also working on this (SKEP – scientific knowledge for environmental policy, a network project of environmental agencies in different European countries, which is funded under the European Research Area scheme).

Another resource factor is that of research funding. As Peter Rombout pointed out, long-term research programmes are not fashionable in some countries, especially if joint agenda setting means that some funds will be taken from 'bottom-up' or 'responsive mode' funding to give to directed mode programmes.

Inter-disciplinarity was another skill that is often assumed to be needed in addressing real-world problems. One working group concluded that even being multi-disciplinary does not fulfil the purpose, which is to produce relevant knowledge.

1.3 Variability across Cases

One finding that became apparent during the course of the meeting was the variability of experience across different cases at the science-policy interface. For

_____
7. Inter-Governmental Panel on Climate Change

example, Jan Willem Erisman contrasted the experiences with acidification from air pollution with the problem of ammonia. The first he proposed was an example of a success at the science-policy interface, while the second – ammonia - was more intractable. Acidification involved a few readily identifiable point sources (coal-fired power stations), while ammonia involves many diffuse sources. As Sif Johansson pointed out, this more diffuse feature of the problem means that more people's interests will be affected if action is taken.

Part of this variability can be explained in terms of the wide variety of different forms and sources of both research and policy. As Henk Stronkhorst pointed out, this means that there is often no simple divide between two worlds at the science-policy interface. Intermediaries are useful as bridges.

2. Boundary Spanning

Several topics could be clustered under the title of boundary spanning or knowledge bridging:

2.1 Communication

A number of different issues were raised that are pertinent to the issue of communication.

From the point of view of researchers: Communication is germane to agenda setting, as effective communication by researchers is often vital to get policy-makers on board with the topic in hand, therefore driving policy research agendas in the direction needed to gather the resources to be able to conduct the necessary research. Jan Willem Erisman suggested using 'big name' scientists and high-profile journals such as Nature and Science; these can acts as 'intermediaries' (see related section). While big-name scientists could bring dangers in that they may want to impose their own personal agendas, they can also often be useful in drawing attention to a new issue. With respect to journals, reports in respected journals will often get picked up in the mainstream media and by policy-makers; both of these groups benefit from the 'authority' these journals bring.

One example of an attempt to enhance communication is a series of publications that has started to be produced by DG Environment at the European Commission: 'Science for environmental policy'. Here, DGE uses a contractor to scan peer-reviewed output from the European Commission's research and 'translate' it into something that is suitable for the non-specialist. This service is free of charge and the results are made available on a web site. This is a sort of 'data mining' role, intended to make the most of existing investments in research and obviate the re-inventing of wheels.

In the case of the Florida Everglades, more than a hundred years of human intrusions on the natural ecosystem – including the creation of dikes, elimination of rivers, draining of wetlands, and introduction of cultivated agriculture – have resulted in scientific assessments that suggest that the critical natural functions of the ecosystem are effectively being dismantled. In this story, the dialogue between decision-makers and scientists throughout the 1990s was essentially broken: government agencies did not seek advice that would cause them political pain with powerful constituencies, and scientists found it a waste of time to pursue a dialogue. Instead, scientists appealed directly to the public and to environmental constituencies, which in 2000 forced through federal legislation that included a Comprehensive Everglades Restoration Plan. This Plan provided for mandatory independent scientific oversight of progress with restoring the natural system. This oversight task was given to the National Academy of Sciences, and eminent scientists were finally engaged in addressing the challenge.

Alex Bielak presented the case study of Canada's National Water Research Institute, which has undertaken a range of efforts at 'knowledge brokering' on the science-policy interface. For example, they ran a series of workshops to 'link water science to policy'. These were envisaged as opportunities for two-way exchange, not simply the one-way communication of research findings. The overwhelming majority of respondents to an evaluation of these workshops indicated that on-going dialogue was important to help link science and policy; most felt that it would be useful to have a combination of electronic and face-to-face interaction.

2.2 Story Telling

One participant stated that if scientists or others who want action on a particular environmental problem have a simple story to tell, with a clear victim, a clear offender, and a simple solution, it is easier to talk to politicians and other policy-makers. However, there may be competing versions of the story.

By contrast, if you want nothing to happen, just make things insecure and uncertain – this has been one of the key tactics employed by the tobacco industry in trying to challenge the findings about the effects of smoking on health. This sort of approach can undermine the power of story telling to be an ally on the science-policy interface.

2.3 Timing

The timing of research and policy cycles often fails to overlap. Even if policy-makers and scientists are well-connected at the agenda-setting stage, policy-makers may need research quickly that researchers are unable to deliver within that timescale, and policy-makers will

often not have a clear idea of what research they will need in two or three years' time. There may be good reasons why policy-makers are driven by short-term needs, but participants also thought it useful where they can develop longer-term perspectives, so that there will be more chances for science to inform policy. Nevertheless, researchers need to be aware of windows of opportunity, as these may open and close relatively quickly, so researchers need to be ready to make the most of them. On-going interactions with policy-makers will be likely to alert researchers as to when such opportunities are opening up. This relates to the need for regular dialogue in the development of research and policy.

2.4 Regular Dialogue, and Distance

Several participants were clear that effective interactions at the science-policy interface would not come about if they entailed meetings once in three or five years. Trust between players takes time to build up. For example, Sif Johansson described several cases from fisheries, such as the debate about cod fishery in the Baltic Sea. To keep all parties on board, it was necessary to meet frequently and move forward, sometimes in small steps.

Such frequent interactions can help to break down the actual or perceived 'distance' between the parties, either in terms of values or actual physical distance. For example, fishermen often perceive that scientists are part of a distant policy system that takes decisions that affect their livelihoods in a major way.

John Robinson felt that it was often more fruitful to employ interactive research processes at the local level; national and regional governments were often too distant, slow and problematic in various ways to be worth seeing as the primary players, even if they appear at first to have more power.

One suggestion to emerge from the discussions was about the value of creating 'neutral spaces' with the time to create dialogue, where no one player is on their 'home turf', and therefore in an inherently stronger position to set the agenda.

This dialogue perspective tends to break down the use of a 'pipe' metaphor, with scientists at one end and policy-makers at the other, and replace it with a circle metaphor, in which the process is never finished, albeit that particular events such as legislative outcomes or the implementation of new standards may mean that different moments in the issue-attention cycle will require different levels of interaction. Even here, some participants felt that such mental models were too simple to describe the complex reality – but nevertheless useful to help think about what is at stake.

On-going dialogue places considerable demands on both scientists and policy-makers. As generalists, the latter tend to change jobs often, while scientists are increasingly contract-driven, and therefore often unable to sustain attention on one topic for the many years that it often takes to see a policy topic go from 'early signal' to maturity.

Dialogue need not be constant, however. Sometimes, regularity is enough. For example, the IPCC happens every 4-5 years, while a similar exercise on trans-boundary air pollution also takes place in the UK. Here, a large group of scientists collect together with policy-makers to discuss latest findings and also on-going research needs.

2.5 Role of Individuals and Institutions

Various participants' experiences led them to believe that it is often individuals who influence policy agendas. These are people who do research, run the research institutions, or sometimes move between the worlds of research and policy. Chance plays a key role in many policy processes, bringing together groups of like-minded people with common interests at a time when policy change is politically possible. There is rarely a linear continuous process. More frequently, policy emerges through complex interactions between people and events.

By contrast to this emphasis on the role of individuals, Alexandre Quintanilha spoke for the value of credible scientific institutions. He argued that such institutions can provide the 'buffer' between policy-maker and society, whereby it is the institution that puts together the group of different analysts to provide inter-disciplinary assessments of problems and policy options. These institutions take decades to build, and in some countries there are few or none of such institutions – how many are there in Europe? An example of a set of institutions that have taken decades to build recognized credibility among policy-makers and the public are 'national statistical institutes', which have been developed since the mid-19th century. Of course, scientists are sometimes still critical of current statistical systems, but in general these are trusted institutions.

With time, however, such institutions can develop a form of credibility that the public and policy-makers recognise. In cases where these institutions do not exist, policy-makers can choose the analysts to get the answers they want. While they will always be able to do this, the presence of trusted institutions could provide some ballast to stabilise arguments on the science-policy interface.

One option would be to enhance the role of the National Academies in providing policy advice, while others were looking to institutions like the ESF[8]. Both of these have the merit of not being connected directly

_____
8. European Science Foundation

to Ministries or funding agencies and decisions (so, paradoxically, it is argued that it is precisely the disconnection here that provides value).

2.6 Role of Interpreters and Intermediaries

Interpreters and intermediaries are boundary spanners – people or institutions who can be useful by complementing the narrow specialist expertise of scientists by looking broadly at a topic and bridging the worlds of research and policy. Such people and institutions occupy specific 'niches' in the science-policy ecosystem; some at the meeting felt that there should be more support and opportunities for people to pursue such careers, as these are not currently felt to be mainstream. There is increasing interest in this area among some research institutions, such as Caroline Fenwick's role as science-into-policy facilitator at NERC in the UK.

There were several mentions at the meeting for the role of intermediaries and also 'interpreters' of various kinds. Interpreters were thought useful in processes of communication, where specialist knowledge needed to be put in accessible forms; policy-makers are more likely to engage with science if it is presented in brief, summarised form and in clear language.

Intermediaries can provide these functions, but can also undertake other more substantive tasks such as synthesising knowledge in an area[9]. These groups (e.g. scientific networks, the media, think tanks) can provide a useful link across the science-policy interface, as it can be their specific niche to have awareness both of the research and of the needs and imperatives (such as timing) of the policy-makers. Here, quality control is an important consideration, as the process of synthesis itself is substantive, involving as it does decisions about priorities, quality of the 'base' information, comparability of research and so on.

3. Values and Influence

A range of factors emerged that might be clustered under the heading 'values and influence':

3.1 Scientific 'Objectivity'

The idea that science is neutral or objective was strongly challenged at the meeting. There are conflicting influences on science, but also competing interests and results in most issues; these are not easy for policy-makers to handle. In another facet of this question, policy-makers often use scientific evidence selectively to justify their policies.

John Robinson maintained that much independent science is 'policy hostile', challenging the assumption that science is necessarily policy friendly. This also challenges the implication in a lot of standard discussions that assume that research will feed uncontroversially into a policy process that leads to a desired outcome. Instead, experience suggest that because independent research often challenges the basis on which much policy is developed, it creates an immediate stand-off between the research community and the policy community. He went on to promote a 'doughnut' model where an interactive outer ring protects the curiosity-driven core. This is nothing to do with 'purity', but instead to do with the origin of the problems. So while the inner core is curiosity driven, the outer ring is driven by problems coming from outside. This can produce two different kinds of inter-disciplinarity.

But university-based science is not the only show in town, so a related question is whether those involved in science within government can provide what Alex Bielak called 'fearless advice' to government. Do those who are charged with providing scientific advice within government have the ability to challenge policy framings of problems?

3.2 Paradigms and Framings

As already discussed, a vital question on the science-policy interface relates to how policy-makers and researchers frame the questions that need to be addressed in any given situation. One participant stated something to the effect that 'If you don't get this right you won't get the answers you need'. Several examples help to illustrate this topic.

The first was presented by Richard Bissell, and arose as a result of the destruction of New Orleans by Hurricane Katrina. Here, the initial reaction of deci-

---

9. One example that was discussed in one working group was the '100 top Questions in ecology': this was a one-off initiative rather, indicating that such exercises do not always need an established on-going organisation.

sion-makers was to restore the status quo ante in all aspects. The questions put to the National Academies for advice were primarily of an engineering nature – why did the levees and other shore protection systems fail, and how can they be rebuilt to withstand future natural shocks?

Many scientists said that this was fundamentally the wrong question – experts felt that there were longer-term systemic approaches that might offer a more valuable basis for policy. Yet government at various levels (Department of Homeland Security and Department of the Army) maintained that they *would* re-build the dykes. The US National Academy of Science gathered together a range of experts who gave advice on the questions that were being asked by these branches of government, and they also offered advice from the wider systemic perspective that the latter had not asked for, in a chapter of the report sent to government. At first, government ignored the chapter, but eventually came back to it and convened a round table to look at the options. This was an example of scientists taking an opportunity to provide advice, even though they did not agree with the initial perspective, and in doing so stayed in the conversation, keeping open the possibility of shifting the paradigm.

In another example of an influential paradigm, John Young outlined how the notion of the 'tragedy of the commons' has been influential in policy approaches to, for example, local fishermen or nomadic pastoralists in a range of settings in developing countries. John Young offered the perspective that these people had managed resources together well until others had tried to intervene from outside and manage them. The myth had also been influential in framing research agendas.

A further consideration is the type of knowledge that is used to frame policy questions for research. Which natural science disciplines are regarded most highly and consulted most often? Are social scientists involved from the start in defining the problems, or brought in once the agenda has been set?

3.3 Power

Power emerged as a central consideration in the setting of research agendas. Certain groups may develop the ability to control and shape not only specific research agendas but also the whole trajectory of research initiatives; comments were frequently made during the meeting about the tendency to close down research initiatives such as environmental monitoring initiatives that were challenging or failing to serve the prevailing political or policy perspective.

The policy context often has the power to determine the research agenda, for example through the scale of military research budgets, or declared policy objectives such as the 'war on cancer'.

One example offered by John Robinson was that of 'safe injection sites' for intravenous drug users in Canada. In this example, a new political party came to power at the Federal level, whose view of drug use led them to refuse to extend the funding for this scheme, on the basis that more research was needed to establish whether such policies were effective. Revealingly, though, they also withdrew funding for research at the same time.

If those affected by research are powerful and have the capacity to engage in the setting of research agendas, this may result in a different outcome compared to where research is recommending policy changes that will be affecting widely dispersed, less powerful players. At the same time, the move from 'government' to 'governance' means that power is increasingly being shared and devolved, raising questions about where responsibility lies.

A further aspect of the question of power is the seniority of the people with whom researchers interact. Researchers at the meeting had had experiences of creating good working links with junior policy people who had become usefully involved in the research, only to be re-organised by those higher up, undermining the continuity of relationship. Even if this does not happen, these relatively junior players rarely have the power to act on knowledge from research, although they can feed in policy advice based on such knowledge. They also take their knowledge with them as they move on in their careers.

Should scientists play power politics, and if so when and how? Is it possible to play the role of an 'honest broker'? One answer is for analysts to embed themselves within an international community, as this makes it harder for national policy-makers to 'get rid of you'. This relates to the question of scientific objectivity.

3.4 Research as a Delay Tactic

Research can be used by policy-makers as a method to delay action. Thus although researchers may be happy to take the resources on offer and use them to pursue a variety of research objectives, it may have little to do with informing policy in the short term.

However, this topic is complicated too. As John Young observed in his presentation, policy-makers themselves sometimes adopt an antagonistic attitude towards research, if they feel that research is the opposite of action rather than a response to ignorance.

3.5 Values

The role of values emerged as an influential factor throughout the workshop. Participants felt that what you see in any given situation depends on where you are looking from. If you are an economist, you will have a very different view to an environmentalist. If you are a

government economist, you may see things differently from a university-based economist, even if you share many pre-analytical assumptions. Values shape problem framings and research approaches as well as our interpretation of results and potential policy options.

3.6 Influence of Economic Considerations

Economic considerations were thought to be highly influential on the success or otherwise of interactions at the science-policy interface. For example, if it could be shown that the impact of new environmental measures would be small or even beneficial, for example because setting standards helps to stimulate technological innovation, this helped environment Ministries to make the case with their Treasury colleagues.

For example, Alex Quintanilha asked who it is that determines what health risks are acceptable? Often such decisions are based on cost benefit analyses that produce answers that are apparently rational and neutral. Yet for the people who are bearing the risks, the question of acceptability will often come into sharper focus, highlighting the central place of values in such analyses.

Peter Rombout, in his presentation about policy and research agenda setting around air pollution, suggested that it is often useful to try to see the whole picture, rather than tackling just one aspect, as is so often the case with specialist advice and narrow policy framings. For example, with respect to air pollution you need to be able to show the consequences and benefits in an integrated way. So policies to reduce car use should not just be based on air-pollution considerations – because they are bad for your lungs – but also because cars are noisy and kill people in accidents. Such an integrated yet simple framework can show the overlapping benefits of policy proposals, and also has implications for the type of research that is commissioned to inform policy decisions. Even enlarging the picture by looking at the impact of car use in terms of noise and accidents is still limited. Looking at the question of people's needs for mobility may enlarge the picture still further, taking other means of transport into account.

Similarly, Catherine Boyle from the UK spoke about the experiences with BSE (bovine spongiform encephalopathy, otherwise known as 'mad cow disease'), where government commissioned much science to inform the decision-making, partly as a result of the lack of understanding of the link between BSE and CJD (Creutzfeld Jacob disease, a disease similar in form to BSE that affects humans). Government was spending £100m/year on tough policy measures to eradicate BSE, when the epidemiological science was clearly indicating that the risks were falling fast. The question here was about judgements on proportionality; as a result of the public

concern about BSE/CJD, government felt that it had to be seen to be taking tough action, when the science was indicating that those resources might better be spent elsewhere. How much expenditure is 'no-regret'? This is again an example of the role of values in judgement.

3.7 Flexibility, Adaptability, Evaluation and Policy Learning

Policy agendas and instruments need to be flexible in order to be able to take account of new research findings. This can be achieved by writing revisions clauses into legislation, which require the laws to be revised in the light of the latest scientific information on the topic, via processes of policy evaluation. But as John Holmes said, few countries do much serious policy evaluation, or use it in a 'policy learning cycle'.

While this is easy to say, it can be more difficult to implement in practice, as laws tend to lead to the creation of institutions that develop routines and interests; these can be harder to change than the laws themselves, as they become entrenched. One participant talked about 'train and tracks': once politicians have

decided to go along a particular path, they tend not to be flexible to change, even in the light of compelling evidence that suggests that they may not have chosen the most effective policy option. It is not easy to reverse the train safely, or to change tracks. Some policies require the development of expensive infrastructure, making changes in policy difficult – the infrastructure underpinning mammography is an example. Massive investments in particular types of breast screening machines make introducing other forms of screening difficult.

At the same time, Eva Furman reminded the meeting that any evaluation is itself framed by its purposes and the aims of the organisations that have commissioned it. Evaluation can be conducted on the basis of multiple criteria, each of which will be given different scores and weights by the various stakeholders involved.

4. Designing Joint Agenda Setting

There are six main topics that cluster under our fourth main heading of 'designing joint agenda setting':

4.1 How to start a successful Research-Policy Cycle

Jan Willem Erisman suggested that in trying to start a successful policy cycle, it was useful to be aware that in most cases, there will be 'believers' and 'non-believers' – those who are in favour of pro-environmental change in this particular case, and those who are not. Scientists should look for the co-believers to build up a network of 'friends'. Trying to convert everyone at once will dissipate energy – it is best to get the ball rolling, and then collect more to your cause as it rolls, rather like a snowball. Once the ball is rolling, it is a matter of getting the message across – see communication.

Other participants also challenged us to reflect on the meaning of success and good – good for whom?

4.2 Stages

Jan also suggested that it is valuable to analyse the stage that an environmental topic is at at any given moment. He proposed a four-stage model:
1. **signalling – discovering and communicating the existence of a problem** (often done by scientists)
2. **policy formulation** (policy-makers)
3. **implementation of solutions** (stakeholders) and
4. **monitoring** (government – although see discussion under monitoring).

Looking to current examples, Jan suggested that climate change is at the signalling stage, nitrogen is at the policy formulation stage, acidification is between stages 3 and 4 and protection of the ozone layer is at

stage 4. It is necessary to build bridges between the stages, and the four-stage model should be regarded as a heuristic device rather than as a 'bible'. However, such a model could be useful in setting research agendas, in helping to identify where research can most usefully help on any given topic at any particular moment.

4.3 Monitoring

The need to monitor the environment was discussed at several points during the meeting. While it was acknowledged that monitoring often played a 'signalling function' by making new discoveries about environmental change – such as the discovery of the hole in the ozone layer by researchers in the Antarctic – it was also thought that for many scientists, monitoring is not 'exciting' or seen as a likely source of 'new knowledge' – and hence publication and promotion.

Monitoring often provided the long-term information needed to assess the need for policy change and for the success of existing policy measures. Yet like other research, by providing 'useful' information, monitoring resources can fall victim to those who do not see that information to be in concert with their interests (see section on power).

While some felt that monitoring should be the role of government, others felt that the tendency of governments to 'pick and choose' the science that suited them meant that monitoring should be outsourced to more independent bodies. And as Judith Layzer said, the question of what to monitor and how to monitor it is itself open to debate and uncertainty; 'ask 100 scientists for environmental indicators and you'll get 100 indicators'.

Those involved in monitoring the environment, for example the new system in the US for ecological observation, need to build in time and capacity for interactions with policy-makers and others, so as not to get so wrapped up in the work of observation that the results go nowhere. Again, the research needs to be connected to policy and other decision processes if it is to stay relevant.

4.4 Top-Down or Bottom-Up?

While, as seen elsewhere in this document, some participants were arguing for bottom-up agenda setting in processes that involved many stakeholders, Peter Rombout made a plea for the effectiveness of top-down agenda setting. He and others have used this approach in setting agendas for research on air pollution, and have found that in doing so it is possible to design a schematic framework that encompasses the causality chain from emissions to health and other air-pollution-related risks. Policy-makers and scientists together 'zoom in' on the environmental problems and

the risk management needs of the near future, allowing them to pinpoint those aspects of the causality that are understood least well. This in turn helps to identify research needs, and helps prevent duplication of research in areas that are better understood. This cycle can be repeated whenever necessary.

Such an approach requires leadership and vision, intensive interaction between scientists, policy-makers and stakeholders, resources to carry out the necessary research, and on-going communication of the research findings as they emerge, not only to stakeholders but also to those working on adjacent environmental problems.

4.5 Asking 'good' Questions

For policy to be informed by appropriate research inputs, policy-makers need to be able to ask 'good' questions. For example, Jan Willem Erisman stated in his presentation that in the field of air pollution, we are about to embark on a policy trajectory that is already obsolete as a way of dealing with air pollution in Europe. This is because in both Europe and the US, the policies being developed are aimed at reducing PM10 pollution, whereas for more than 10 years the research community has been convinced that smaller PM2.5 particles should be the focus.

So it is important that scientists are presented with an open, general question by policy-makers, such as 'what can we do about air pollution?'. For example, in trying to deal the health effects of air pollution, governments need to be able to bear in mind changes in society that alter exposure to different forms of air pollution. As society changes, and people spend more time indoors, the significance of indoor air pollution increases, raising the need for policy-makers to ask different questions about the sources of people's air-pollution-related health problems.

4.6 Complexity and Action

Complexity can sometimes be used as an excuse to do nothing. There was even an allusion during the meeting to the fact that because the challenges on the science-policy interface are complex, there might be a danger in falling back on a position where some might argue that we need to 'know more' before acting, for example on the question of interactive agenda setting. Complexity can sometimes be tackled by embracing it in action, learning as one goes along – clarifying parts of the complexity, learning to disregard others, and becoming clearer about those parts that need further analytical attention.

For example, Eeva Furman pointed out that when we are discussing environmental problems, many players are involved in technology policy, not just scientists. So the question of agenda setting is not just a dialogue

between policy-makers and scientists; it is also a 'trialogue' or something even more complex, involving these two parties plus other players from the private sector, the public, civil society groups such as NGOs and think tanks, the media and more.

Policy-led research brings a range of hazards discussed elsewhere in this report, some relating to power and the dominance of research agendas by certain groups. One option for tackling this would be to think not in terms of joint agenda setting between policy-makers and researchers alone, but 'civic' research that involves the community, local people, stakeholders. As one contributor stated, what you really want for research to be really useful is first to undertake research that is 'in the heart of the people'; once it is taken up by the people it will come up through the media to policy-makers.

4.7 Analysing 'best Practice'

The discussions at the meeting suggested a range of 'practical steps' to enhance the effectiveness of relationships at the science-policy interface, particularly around agenda setting. As Judith Layzer suggested, the diversity of experiences means that it would be useful to treat these practical steps as hypotheses to be tested over time and in varying contexts. Such a comparative analysis might help to find out whether it is possible to make generalisable assertions about 'what works'. It would be helpful to filter out from the case studies things that are country-specific and things that can be generalised, and therefore transferred between contexts. At the moment, we are still at the stage of having a range of ideas about what has worked in particular situations, but cannot be sure that these are stable conclusions. John Young felt that in some fields, we already have many case studies; the challenge is to create a common framework of analysis to allow the comparison.

Recommendations and Next Steps

In the final session, the group discussed various possibilities to take forward the challenges that had been highlighted at the meeting.

Next Steps

It was proposed to convene a small follow-up meeting to plan a possible international research project on interactive agenda-setting. Such a project could:
a) deliver a small number of papers based on a number of case studies in different sectors and countries, perhaps to be published as a special issue in an appropriate journal
b) prepare a synthesis of findings from such case studies

This follow-up could be part-funded by residual funds from the COST ESF allocation for the Brussels workshop.

Appendix I – Background Paper I

Communicating Interests, Attitudes and Expectations at the Science/Policy Interface (CSPI): *Setting Environmental Research Agendas to Support Policy*

Tuesday 28 & Wednesday 29 November 2006
COST Office, Brussels

Environmental policy formulation needs to be based on best science and understanding, but how is the science agenda best set, and by whom?

Research related to improved environmental management has to be made in relation to policy formulation and decision-making. This needs a greatly enhanced collaboration between scientists, private sector decision-makers and the policy-making community. This can be developed on the 'co-production of knowledge' approach whereby stakeholders engage with the formulation of the research question before it has been defined in detail, and then work within the research project.

Environmental science research proposals often state that the work will be of value to policy makers. While this will hopefully be the case in many instances, the assumption may often not be valid for a number of reasons. First, the scientist may not be aware of policy priorities at any given time and the perceived importance of the research is in fact low on the policy agenda. Second, policy makers may not be aware of a rising scientific issue, and are not adjusting their priorities in line with latest findings. Third, scientific output is often not 'policy-maker friendly'. In order to establish science agendas that are more likely to be of interest and value to the policy process, it is important to improve communication between the science community and those working in the policy and resource management communities, and other end-users. Key issues revolve around the need to better communicate interests, perceptions and expectations between the respective communities.

A recent UK Scientific Alliance/NERC Seminar noted that only a few people work specifically on communicating the science to policy-makers. While more specialists in this important area would obviously be of benefit, the task itself would be made the easier if better understanding of communication methods were available to help set science agendas, and if both scientists and end-users were aware of latest research in communications techniques.

This Exploratory Workshop will review ongoing European research related to communications at the science-policy interface, and determine how best to further develop this important research agenda. Major issues to consider include key aspects of policy formulation and science agenda setting, designing and conducting stakeholder interviews, use of multi-media techniques and communications theory. To give a focus to the meeting, workshop presentations and discussions will be centred on interests and information needs relating to water and air quality, the subject of much current environmental research. In addition to advancing the research process on science/policy communications in general, workshop output will therefore also contribute to enhanced agenda setting of research related to these two important topics.

Workshop questions

Within the general theme of 'How can the science-policy dialog be enhanced to the mutual benefit of science and policy communities?', specific questions are:

Q1: At the Science/Policy interface, what helps and what hinders the setting of environmental research agendas relevant to policy formulation?

Q2: How far could an improved understanding of social factors (e.g. the communication of attitudes, perceptions, expectations and interests) achieve a better fit between science agendas and policy formulation?

Q3: What practical measures might be devised to enable improved agenda-setting dialogues at the Science/Policy interface, in a variety of contexts?

Proposed outputs

Multi-author paper on theory and different approaches for setting environmental science agendas aimed at informing policy.
- **Workshop Report on ESF web**
  Possible further outputs
- **Proposal to develop a joint COST ESSEM-ISCH Action**
- **Proposal for further joint COST-ESF work in this area**

Participants

The meeting will involve about 30 people including Organising Committee, communications theoreticians and researchers in interactive agenda-building, science communicators, policy-makers and environmental and risk assessment scientists. Some non-European experts will be invited.

Organising Committee

Mr. John Ingram (Chair)
Vice Chair, Domain Committee Earth System Science and Environmental Management, COST

Dr. Eeva Furman
Finnish Environmental Institute (SYKE)

Mr. Chris Godwin
Chair of the Domain Committee Individuals, Society, Culture and Health, COST

Dr. Martina Hartl
Vice- Chair of the Domain Committee Individuals, Society, Culture and Health, COST

Dr. John Holmes
Department of Earth Sciences, University of Oxford, UK

Dr. Pavol Nejedlik
Science Officer, Domain Committee Earth System Science and Environmental Management, COST

Professor Alex Quintanilha
Chair of the Standing Committee for the Life, Earth and Environmental Sciences (LESC), European Science Foundation

Professor Slavko Splichal
University of Ljubljana, Slovenia

Dr. Henk Stronkhorst
Head of Social Sciences Unit, European Science Foundation

Ms. Irja Vounakis
DG Environment, European Commission

Appendix II – Background Paper II

*Prepared by **Dr. Elizabeth Shove***
(Lancaster University, UK) November 2006

Framing Research Questions: Interactive Agenda Setting at the Science-Policy Interface

Introduction

At first sight, the notion that policy should be based on well founded science and understanding is uncontroversial. But as soon as we probe further – either in the direction of policy, or of science – fundamental questions emerge about the framing of problems, the nature of knowledge and the specification of relevant research. This paper explores some of these issues with reference to ideas and insights generated in the course of six workshops on *Interactive Agenda Setting in the Social Sciences*, funded by the UK's Economic and Social Research Council, and to two recent efforts to develop social scientific research on water.

For the most part, debate about the uses and users of social and natural science has focused on the conduct, the promotion and, above all, the exploitation of academic research by business and policy. Questions about how well (or how badly) scientific research results are communicated, and how well (or how badly) they are taken up by individuals or institutions engaged in creating wealth or enhancing the quality of life have been dominant themes for the last decade or more (Chancellor of the Duchy of Lancaster 1993). Despite focusing on use and relevance the research and science policy literature pays hardly any attention to prior questions of agenda setting: to where research questions come from and to whether and how 'users' are involved in defining timely, worthwhile and innovative lines of enquiry.

In what follows I focus on three related themes, all of which have a bearing on the production of policy relevant science. I begin by reflecting on how research priorities are shaped within the different institutional contexts of academic life, for example, within disciplines, research centres, research programmes and within policy settings of one kind or another. The view that complex 'real world' problems require the attention of several disciplines at once is widely held and my next step is to review deliberate efforts to configure academic priorities around areas of immediate policy concern. Having commented on the typically obscure but nonetheless influential bases of policy oriented problem definition, I conclude by considering the conditions and contexts in which research agendas might be more interactively co-produced. In setting this as my own agenda, I go along with the view that academic and policy priorities routinely differ and that this is a problem that should be minimised. As will become clear, framing the discussion this way is in itself a powerful organising device and one that necessarily excludes alternative interpretations of knowledge production and research relevance.

Where do research questions come from?

What is it that leads researchers to define and work on some topics but not others and how does the resulting distribution of scholarly effort shape and reflect trends and traditions in the disciplinary structuring of academia? There is no one way of answering this question: in looking back at the development of different fields, some commentators focus on an unfolding history of ideas (Collins 1998); others pay more attention to institutional contexts and incentives (Whitley 1984; Becher and Trowler 2001); or to the dynamic combination of the two (Abbott 2001). Abbott, for example, identifies generational cycles and associated patterns of 'fractal division' in which 'young turks' carve out new careers by opposing mainstream debates and in which initially marginal priorities and approaches become established over time. The result is an ongoing process in which fields split apart, develop and recombine and in which recognised specialisms come and go. Areas of growth capture resources and draw in new recruits, depleting previously important research topics, changing the landscape of job opportunities and chances of funding and promotion. While Abbott's analysis emphasises the *internal* dynamics at play, 'external' considerations are often important. For example, the explosion of computing power over the last few decades has allowed psychologists to formulate and address research questions that could not have been imagined or conceived of before. Or, to give another example, terrorism and security – until recently of interest to a handful of scholars – are now 'hot topics' in political science. Disciplines vary in how they relate to 'real world' problems. This may reflect their present location in a cycle of intellectual and institutional development (e.g. is the field consolidating or fracturing, is it open or resistant to external influence? Böhme et. al. [1976]), or the way in which theoretical and substantive concerns intersect. Staying with political science, topical priorities relating to the events of the day may have little or no impact on the typically slower development of underlying theories and concepts. On the other hand, contemporary experiences may well sustain mindsets and ways of thinking that favour some but not other styles of interpretation and explanation. Either way, it is misleading to think of academia as a realm entirely cut off from the world in which it exists.

Although disciplines are extremely important in structuring academic energies, they are not the only 'site' in which research agendas develop and unfold. Priorities are shaped and formed in significantly differ-

ent ways in other institutional contexts. For example, centres and programmes routinely justify their existence and their funding by claiming to address clusters of research questions and priorities that lie *beyond the reach* of any one discipline. In formulating agendas of their own, directors of centres and programmes are (unlike disciplines) required to be explicit in identifying and promising to fill 'gaps' in existing knowledge. In this context, generic appeals to non-academic relevance are often crucial, especially in the early stages, but as those involved in the 'interactive agenda setting' workshops confirmed, in real life, research priorities are routinely marked by multiple, often competing pressures and demands. However carefully crafted, research programme agendas (as set out in calls for proposals) develop in uncontrollable ways as programmes are populated with projects and as those projects acquire lives of their own (Shove 2003). Similarly, established centres often struggle to refresh their identity, purpose and reputation and keep up with their own always evolving position in a research landscape that is itself changing all the time. There is more that could be said, but for now it is enough to appreciate the point that academic research priorities are moulded by a combination of disciplinary, 'external' and interdisciplinary dynamics.

Before commenting on what this means for those who seek to engender relevant research – i.e. that which addresses the needs and interests of policy makers – it is appropriate, and only fair, to pause for a moment and think about where non-academic research agendas come from, and how and why they change. Again there are no simple answers. Policy priorities are propelled by different but also dynamic processes – sometimes in synch with trends in academia, sometimes not. There is an extensive social scientific literature on the making and framing of social, natural and environmental problems (Becker 2003), much of which underlines the unavoidably political nature of this enterprise. Put simply, what counts as a problem and what does not is itself a matter of context, history and culture. Different policy issues have their own idiosyncratic careers, sometimes shaped by generic processes of 'fractal' division and generational cycles similar to those that Abbott identifies in the world of academic research. In addition, policy priorities are routinely distilled and framed by layers of institutional ordering; by associated interpretations of responsibility and tractability, and by understandings of the limits and possibilities of different modes of governance. In the environmental field, and in other settings too, the relative 'mattering' of topics relates to the relative and changing influence of different interest groups and to their capacity or failure to mobilise public debate and opinion. Again there is much more that could be said, but again the basic point is clear: policy priorities are not static – they too have a history, a politics and a dynamic of their own.

Academic disciplines and real world problems

Conway is not alone in claiming that ''many of the practical challenges of the future are inherently interdisciplinary'' (1995: 3-4). The view that the "complex problems of the modern world" (Scottish Universities Research Policy Consortium 1997) do not correspond to the problems and priorities of academic disciplines and specialisms underpins efforts to build interdisciplinary teams, to engender new modes of knowledge production (Gibbons 1994) and to involve non-academics in research agenda setting. This makes sense on the grounds that being unconstrained by 'artificial' disciplinary divisions, non-academics will, by definition, have a better, more rounded understanding of the issues at stake. While this sounds plausible enough, the philosophy and sociology of science suggests that such strategies rest upon an oversimplified view of the complex ways in which social and natural scientific problems are formulated.

According to Weingart, 'real world' problems do not simply exist, nor is their definition and specification somehow detached from existing structures of knowledge. In his words "The empirical fact is that the 'real problems' are constituted by existing knowledge and its gatekeepers". In writing about how areas of previously unproblematic practice become 'real world problems' he contends that the deliberate formation of interdisciplinary research programmes, for example, in areas of climate research, "is primarily driven by political goals and needs of legitimation." (Wiengart and Stehr 2005).

Put a little less contentiously, the common sense argument for interdisciplinarity disregards, and in fact obscures, the role of social structure in the process of knowledge creation (Blume 1990). It is obviously the case that boundaries of subject matter and of expertise exist within and between disciplines – but how could it be otherwise? What is the alternative? Without some such structure knowledge production would be impossible. Equally relevant, and as Weingart also argues, "every structure is selective". The key point here is that the difference between a disciplinary structure and an interdisciplinary one, or one from policy, is not that the latter offers a better fit with reality. They may have different blind spots, but blind spots they all have (Shove and Wouters 2005). This is an important observation and one that reminds us that the non-academic world (in all its diversity) also reproduces and is also organised around paradigms, problem framings and specialist structures of knowledge.

When disciplines are invited to join together to 'solve' a seemingly neutral 'real world problem', they are in fact invited to enter into an existing but usually

invisible or tacit paradigmatic frame. This observation is immediately useful in making sense of everyday experiences and frustrations of interdisciplinary research and in thinking about compatible and incommensurable agendas in policy and in academia. Two examples of recent efforts to foster social scientific research in relation to water and water consumption illustrate the 'disciplinary' nature of non-academic policy-based problem definition – and the implications of such framings for the co-production of knowledge.

Producing and co-producing research agendas

In July 2006 the UK Environment Agency issued a call for proposals for a three-year project on the "social science of encouraging water efficiency". In the environmental field, water is generally the province of engineers, economists and modellers, not of social scientists. This call therefore represents an important and innovative development. The term 'social science' encompasses a multitude of theoretical approaches, methodologies and philosophies of knowledge. While some of these are indeed compatible with a behavioural model of action (that is with the view that individual actions, decisions and choices reflect individual beliefs and environmental commitments), most are not.

The Environment Agency's invitation to tender asks contractors to "provide a review of previous and current social scientific work of relevance to water use by people at home". This call is currently on hold, but when and if such a review is undertaken it will undoubtedly reveal extensive and in social scientific terms, significant, traditions of research that investigate, explore, and in various ways demonstrate the theoretically incommensurable point that most consumption is undertaken in the course of accomplishing valued and *shared* social practices; that water use is *not* significantly affected by individual environmental commitment but *is* strongly related to changing cultural conventions of bathing, laundering, gardening etc.; that demand and supply are closely intertwined and that there are important and relevant micro-social (but still not individual) differences in the reproduction of water-consuming practice.

In essence this means that the successful – but in other ways unfortunate! – contractor would have to review but then proceed to ignore all this research (and all these corresponding theories of social action) in order to accomplish the next, already specified, task of testing methods with which to influence *individual* behaviour.

This particular call for proposals, and this particular definition of the problem (i.e. one that frames water consumption as a matter of individual choice; that seeks to influence choice through methods of social marketing; that aims to identify and test the 'factors' that influence the effectiveness of such techniques) runs quite against the grain of much contemporary social science. In effect it is an agenda framed and defined by paradigms of rational choice economics and/or behavioural psychology. Conceptually, it therefore invites and excludes in equal measure – in framing the problem as it does, the call already precludes (or more accurately, renders irrelevant) the possibility of learning from literature that the contractor is obliged to review.

This is not an unusual example, nor one of which we should be critical, especially not if we are social scientists. The Environment Agency is simply doing its job: commissioning research with which to address what it takes to be the very 'real' problem of changing behaviour. If anyone was to respond to this call, – and no doubt some will do so – they will, by definition, produce environmental social scientific research that is of 'use' and value to policy. But what of those social scientists who do not respond? What of those who refuse to contemplate spending time on what (some) existing research suggests is a fundamentally misguided formulation of the problem? If these academics were to engage at all, their response to this call would certainly not be 'policy friendly' – in theoretical terms they would take a thoroughly 'policy hostile' view of such a ridiculously narrow understanding of behaviour and change. In the longer run, is at least possible that theirs would be the more 'relevant' policy response but it is not one that will be heard.

In something like May 2001, the UK Water Industry Research Association contacted the UK's Economic and Social Research Council in search of social scientists with whom to talk. UKWIR had no clear agenda, only a sense that social science might have something to offer, particularly to an industry that had only recently begun to think about its 'consumers' (as opposed to rate payers). One thing led slowly, sometimes very slowly, to another and in 2004 UKWIR commissioned a couple of social scientists to run a series of six workshops in which historians, anthropologists, sociologists and assorted academics mixed with regulators and people from the industry to discuss different topics relating to the everyday use of water and to the changing dynamics of demand.[1] This resulted in a rather more unusual opportunity to frame and reframe and criticize the framing of various problems from different points of view. By most standards, these events represented 'greatly enhanced collaboration between scientists, private sector decision-makers and the policy-making community'. They also served to reveal and perhaps reinforce already existing differences of perspective and approach.

_____

1. www.lancs.ac.uk/depts/lec//////cswm/Traces.php

As the UKWIR workshop series developed it became clear that critical fault lines reflected fundamentally different ways of thinking about the relation between supply and demand. Interestingly, the split was not simply between academic and non-academic, but rather between alternative ways of conceptualising consumption. Academic and non-academic participants who shared broadly similar theoretical frameworks found that they had more in common with each other than with either their fellow academics, or their fellow policy-makers. New hybrid groups began to emerge and to engage in what others have called the 'co-production' of knowledge.

How basic theoretical orientations come to be shared across academic and non-academic divides is another question and one that deserves more attention than can be given here. It is, however, possible that these common orientations reflect or relate to some also common experience or practice-based understanding (Duguid 2005). In the 'interactive agenda setting' discussions referred to earlier, it was, for instance, clear that researchers and policy makers operating in the field of social work and child protection had a vast amount in common socially, intellectually and in terms of shared commitments. In this context, research agendas developed within a relatively homogenous community. By contrast, and despite frequent meeting, communication and interaction, the research priorities of business people and of management academics rarely meshed in quite this way.

These observations have practical implications. If commonality of practice is a precondition for the emergence of genuinely shared agendas, merely bringing people together is not in itself enough. A related conclusion is that interactivity cannot be forced. Having said that, there might yet be ways of intervening in the formation of clusters of attention – or agendas – in which academics and non-academics *both* have a stake. Defined like this, the task of promoting interactive agenda setting is one of cultivating particular fields of practice and influencing the way in which academics and non-academics define and go about their work. This insight is relevant for research policy and in particular for decisions about forms of funding and the kinds of inter-activities that are thereby sustained. Whatever these strategies might be, and whatever their effect, it is important to remember that the business of specifying social, natural and environmental problems and framing them as topics for research is inherently selective and as such, unavoidably political. Becker's (2003) response is to be reflexively aware of the inevitability of this kind of positioning and to engage with as many versions of problem formulation as possible. In making this latter point Becker addresses a second risk of academic-policy interaction which has to do with closure. When

researchers "go native", or become "too close" to policy, they may lose their critical faculties with the result that agendas converge around a limited number of topics that capture resources and monopolise attention in self-sustaining, but in the long run, problematically stultifying ways. This suggests that mechanisms to promote interactivity should be balanced by those that favour fragmentation, fleeting encounters, and shallow rather than deep exchange of ideas.

Communicating interests, attitudes and expectations at the science/policy interface

The agenda for this exploratory workshop itself reflects a particular definition and framing of the science-policy problem. Specifically, it supposes that there is 'insufficient communication between the science community and those working in the policy and resource management communities, and other end-users'. The hope is that more and better communication will permit 'greatly enhanced collaboration' and the 'co-production' of knowledge. At risk of being irrelevant, I have sought to challenge this way of thinking about knowledge and relevance and about the relation between science and policy. Building on what I have said already, I now draw out a handful of equally challenging conclusions.

In thinking about where research questions come from, I hinted at relevant institutional and epistemological dynamics, noticing differences in how these work out with respect to disciplines, research centres, research programmes and areas of policy. This exercise is important in that it reminds us that research questions are not 'free floating' – they are embedded in and to an extent constitutive of the always changing 'worlds' in which they attract interest and resources.

Deliberate efforts to bring disciplines together to 'enhance collaboration' and to address seemingly neutral 'real world problems' tend to overlook two key issues: first that problem definition is never neutral (in effect the world of policy is as divided by paradigms and quasi-disciplines as is academia); and second, that disciplines bring with them, and are organised around, characteristically different knowledge structures. This is an ordinary feature of knowledge production, not a problem that can be overcome through more or better communication.

I illustrated some of these points with reference to recent initiatives to develop a social science of water. The Environment Agency project represented a ready-made framing of a 'problem' which social scientists were then invited to address. While this might result in useful and 'relevant' research such strategies preclude the co-production of knowledge.

The UKWIR workshops suggest that knowledge can be co-produced by cohorts of academics and non-academics providing they define 'the problem' in

broadly similar ways. In the workshop setting, the split between academic and non-academic was less significant than between those who thought demand existed independent of supply, and those who concluded otherwise. More generally, these experiences suggest that interactive agendas are best seen as essentially emerging phenomena, only ever arising from hybrid research communities that are always in a state of flux, always partly open and partly closed, and always seeking to attract attention and draw academic and policy resources away from others and toward themselves.

To finish, it is instructive to revisit the three questions around which the next two days of discussion are organised and to do so with reference to the ideas explored in this background paper.

Question 1: At the science/policy interface, what helps and what hinders the setting of environmental research agendas relevant to policy formulation?
A first step, in addressing this question, is to identify similarities and differences in the paradigms, theories and understandings that lie behind the specification of research problems in policy as in academia. A second is to review the institutional histories, pressures and dynamics that characterise the academic and the policy contexts in which research questions are framed. This would reveal current (and possibly future) areas of disjunction and overlap. Another equally plausible way of addressing the question would be to inquire further into the relative, changing and situated meaning of policy relevance.

Question 2: How far could an improved understanding of social factors (e.g. the communication of attitudes, perceptions, expectations and interests) achieve a better fit between science agendas and policy formulation?
If interactive agendas cannot be forced into existence, understanding the social, institutional and epistemological grounding of divergent research priorities is of limited practical value. Research agendas cannot simply be made to fit and the short answer to this question is therefore 'not at all'. A longer and more elaborate response would require careful analysis of what lies behind the seemingly neutral ambition of achieving a 'better fit between science agendas and policy formulations'.

Question 3: What practical measures might be devised to enable improved agenda-setting dialogues at the Science/Policy interface, in a variety of contexts?
The ESRC and the UKWIR workshops suggest that new forms of interactive agenda setting require and suppose new ways of organising academic and policy work, new institutions and with them new hybrid forms of problem definition. They highlight the significance of theoretical framing and imply that 'dialogue', meeting and interaction is not, in itself, a sufficient basis from which to embark on the co-production of knowledge.

In conclusion, and to rephrase another sentence from the exploratory workshop outline, it seems that the key issues revolve not around "the need to better communicate interests, perceptions and expectations between the respective communities" (academic and policy) but around the need to articulate, explicate and debate different ways of framing natural, social and environmental problems as these circulate across academia and policy.

References

Abbott, A. (2001). *Chaos of Disciplines,* Chicago: University of Chicago Press.

Becher, T. and Trowler, P. R. (2001). *Academic Tribes and Territories Intellectual Enquiry and the Culture of Disciplines* Buckingham, The Society for Research into Higher Education and Open University Press.

Becker, H. S. (2003) 'Making Sociology Relevant to Society' (Paper given at the meeting of The European Sociological Association in Murcia, Spain, 2003) http://home.earthlink.net/~hsbecker/relevant.htm

Blume, S. (1990) 'Interdisciplinarity in the social sciences' SPSG Concept paper No. 10.

Böhme, G. Van den Daele, W. and Krohn, W. (1976), "Finalisation in science", Social Science Information, 15, pp. 307-330.

Chancellor of the Duchy of Lancaster (1993) 'Realising our potential: a strategy for science, engineering and technology, CM2250, HMSO.

Collins, R. (1998), *The Sociology of Philosophies: A global theory of intellectual change*, Cambridge: Belknap Press of Harvard University Press.

Conway, G. (1995) University of Sussex, Address to University Court.

Duguid, P. (2005) "The Art of Knowing: Social and Tacit Dimensions of Knowledge and the Limits of the Community of Practice", *The Information Society*, 21, pp. 109-118.

Environment Agency (2006) 'Project PSR(06)01 Social science of encouraging water efficiency project specification'

Gibbons, M. *et al.* (1994). *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Society*, London: Sage.

Scottish Universities Research Policy Consortium (1997) 'Interdisciplinary Research: process, structures and evaluation, Scottish Higher Education Funding Council.

Shove, E. (2003) 'Principals, Agents, Actors and Research Programmes', Science and Public Policy, special issue on principal agent theory edited by D. Braun, 30(5) 371-381.

Shove, E. and Wouters, P (2005) 'Interactive agenda setting in the social sciences – Interdisciplinarity' (http://www.lancs.ac.uk/fss/sociology/research/projects/iass/isshome.html

Weingart, P. and N. Stehr, eds. (2000) *Practising Interdisciplinarity*., University of Toronto Press: Toronto.

Whitley, R. (1984). *The Intellectual and Social Organization of the Sciences*, Oxford: Clarendon Press.

Appendix III – Participants

Professor Gabriele Bammer
The Australian National University

Dr. Alex Bielak
Environment Canada

Dr. Richard Bissell
The National Academies, Committee on Science, Engineering, and Public Policy, USA

Dr. Catherine Boyle
Department for Environment, Food and Rural Affairs, UK

Ms. Tanja Cegnar
Environmental Agency of the Republic of Slovenia

Dr. Jan Willem Erisman
Energy Research Centre of the Netherlands (ECN)

Dr. Caroline Fenwick
Natural Environment Research Council, UK

Dr. Eeva Furman
Finnish Environmental Institute (SYKE)

Professor Maria Eduarda Gonçalves Barroso
Instituto Superior de Ciências do Trabalho e da Empresa (ISCTE), Portugal

Dr. David Guy
Economic and Social Research Council, UK

Dr. Edward Hackett
National Science Foundation, USA

Dr. Martina Hartl
Vice Chair of the Domain Committee Individuals, Society, Culture and Health, COST

Dr. John Holmes
Department of Earth Sciences, University of Oxford, UK

Mr. John Ingram
Vice Chair, Domain Committee Earth System Science and Environmental Management, COST

Dr. Sif Johansson
The Swedish Environmental Protection Agency

Dr. Judith Layzer
Massachusetts Institute of Technology, USA

Ms. Ula Löw
International Human Dimensions Programme on Global Environmental Change (IHDP), Germany

Dr. John Marks
Director of Science and Strategy, European Science Foundation

Dr. Pavol Nejedlik
Science Officer, Domain Committee Earth System Science and Environmental Management, COST

Professor Alex Quintanilha
Chair of the Standing Committee for the Life, Earth and Environmental Sciences (LESC), European Science Foundation

Professor John Robinson
The University of British Columbia, Canada

Dr. Peter Rombout
National Institute of Public Health and the Environment, Netherlands

Dr. Alister Scott
The Knowledge Bridge Ltd, UK

Dr. Elizabeth Shove
University of Lancaster, UK

Professor Slavko Splichal
University of Ljubljana, Slovenia

Dr. Kristien Stassen
VITO, Technology for Ecology and Economy, Belgium

Dr. Henk Stronkhorst
Head of Social Sciences Unit, European Science Foundation

Ms. Irja Vounakis
DG Environment, European Commission

Dr. Mary Ann Williams
Earth System Science Partnership (ESSP), Sweden

Dr. John Young
The Overseas Development Institute, London, UK

Appendix IV – Workshop Agenda

13:00	Sandwich lunch
13:45	**Welcome and Introductions**
14:00	**Introductory Paper on interactive agenda setting at the Science/Policy interface including theoretical issues** (Elisabeth Shove, UK)
14:45	**Policy Viewpoint on interactive agenda setting** (Irja Vounakis, DG ENV)
15:15	**Environmental Science Viewpoint on interactive agenda setting** (Jan Willem Erisman, Netherlands)
15:45	Break
16:15	**3 WGs on experiences related to Q1** (2 short 'stories' to be presented in each)
	Q1: *At the Science/Policy interface, what helps and what hinders the setting of environmental research agendas relevant to policy formulation?*
18:00	Close, followed by Social Dinner near COST Office (details to be announced at the meeting)

9:00	**Reports from WGs; discussion**
9:30	**Case Studies: Examples of what actually happened in the agenda setting process relating to research on water and air quality:**
	a) How policy identified a need for information from environmental science (Alex Bielak, Canada)
	b) How environmental science set a research agenda to inform policy (Peter Rombout, Netherlands)
10:30	Break
10:45	**3 WGs Q2 and Q3 in relation to Case Studies**
	Q2: *How far could an improved understanding of social factors (e.g. the communication of attitudes, perceptions, expectations and interests) achieve a better fit between science agendas and policy formulation?*
	Q3: *What practical measures might be devised to enable improved agenda-setting dialogues at the Science/Policy interface, in a variety of contexts?*
12:00	Sandwich lunch
12:45	**WG Reports**
13:30	**Summing up and Discussion**
14:30	**What next? Follow-up actions**
15:00	Close

Appendix V – Organising Committee

Mr. John Ingram (Chair)
Vice Chair, Domain Committee Earth System Science and Environmental Management, COST

Dr. Eeva Furman
Finnish Environmental Institute (SYKE)

Mr. Chris Godwin
Chair of the Domain Committee Individuals, Society, Culture and Health, COST

Dr. Martina Hartl
Vice- Chair of the Domain Committee Individuals, Society, Culture and Health, COST

Dr. John Holmes
Department of Earth Sciences, University of Oxford, UK

Dr. Pavol Nejedlik
Science Officer, Domain Committee Earth System Science and Environmental Management, COST

Professor Alex Quintanilha
Chair of the Standing Committee for the Life, Earth and Environmental Sciences (LESC), European Science Foundation

Professor Slavko Splichal
University of Ljubljana, Slovenia

Dr. Henk Stronkhorst
Head of Social Sciences Unit, European Science Foundation

Ms. Irja Vounakis
DG Environment, European Commission

References

Andrew Abbott (2001). *The Chaos of Disciplines*. Chicago, University of Chicago Press.

Chris Caswill and Elizabeth Shove (2000). "Introducing interactive social science (introduction to a special issue on interactive social science)." *Science and Public Policy* 27 (3): All.