



Environmental Communication

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Communication for sustainable policy: connecting science, society and government

Both the cause of environmental problems and possibilities for addressing them depend on human perceptions, attitudes and behaviour, which are linked to values, preferences and beliefs about the world. Communication is key to analysing the relation between all of these aspects. This thematic issue reports on research which provides insights into how we can communicate environmental issues effectively.

Communication plays a central role in shaping our understanding of the natural world and the role of humans therein. Such understandings, in turn, influence the way we act and our support for, or opposition to, specific policies. Communication is also the terrain where diverse points of view are negotiated. Issues of power and access to different arenas are important; some individuals or organisations have a voice, while others are constrained.

There has been a shift in political discourse towards increased public participation and integrating non-scientific forms of knowledge in policy-making. To learn about research in this area, see the article: **“Towards greater public participation in EU biodiversity policy”**.

Communicating specialist knowledge on complex environmental problems, such as climate change, to policy-makers poses diverse challenges. It is important to devise ways to make scientific uncertainty and its implications for policy-making meaningful to all. See: **“Communicating uncertainty at the science-policy interface”**.

Public understanding of risk depends on social and cultural factors, and not just on technical information. As discussed in **“Public perceptions of new technologies: the case of CO₂ storage”**, public acceptance of technological innovations depends on trust in scientists and policy-makers, as well as intuitive, emotional responses.

Will climate change affect us in the near future? Time-scales significantly influence citizens’ evaluations of environmental problems, as pointed out in a study on the use of different climate change scenarios for behavioural change. See: **“Effective scenarios for communicating climate change”**.

While we need continuous public engagement to tackle climate change, an emphasis on fear can lead to paralysis. Icons or images that suggest practical ways of acting on the problem can be more empowering and effective. See: **“Fear is not the answer to communicating climate change”**.

The media is a central arena for amplifying environmental issues and can influence the course of policy. A study on media representations of the relation between climate change and international development illustrates problems associated with prevalent dramatic, alarmist messages. See: **“Media coverage of climate change and international development”**.

This special issue demonstrates that research into environmental communication can help us to better understand and improve connections between the scientific, social and political spheres.

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Towards greater public participation in EU biodiversity policy

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Theme(s): Biodiversity, Environmental information services, Sustainable development and policy analysis

“Scientific experts determined how Natura 2000 sites should be selected and managed in most Member States, implying that changes in policy practices towards increased public participation were not taking place.”

The public are becoming increasingly involved with decision-making processes related to EU biodiversity policy. However, according to a recent study, further improvements could be made to close the gap between desired participation described in biodiversity policy and what is achieved in practice.

Participation by a wide range of stakeholders in decision-making is recognised as key to developing better environmental policies. In this study, the researchers identified major shifts in participation trends, focusing on the implementation of the Birds and Habitat Directives and Natura 2000.

Participation has changed in concept and practice since EU biodiversity policy first began to be developed in the 1970s. Three key shifts in attitudes towards widening participation in the decision-making process were identified by the research:

- from a top-down, state-centred approach to policy-making, to a bottom-up, more flexible approach, which allows greater participation by more local stakeholders and the public
- from basing policy decisions largely on scientific expertise, to including greater participation from diverse communities to provide and assess all types of knowledge
- from narrowly focusing on biodiversity policies as solely a conservation issue, to a broader view which also includes sustainable use of ecosystems

The research, conducted under the EU PATH project¹, showed that the Birds and Habitats Directives were originally established in the EU, based mainly on conservation criteria and using advice from experts in a top-down approach. However, the issues were first put on the agenda by Non-governmental Organisations (NGOs) and public pressure. Other than this, the study found little evidence of a bottom-up or a sustainable use of ecosystems approach, which incorporated the views of the public and other stakeholders in the early stages of development of the Directives.

Individual Member States decided on which sites should be designated as Natura 2000 sites and how to manage them, including the level of public and stakeholder participation in the process. In reality, scientific experts determined the process in most Member States, implying that changes in policy practices towards increased public participation were not taking place. This caused conflicts between landowners, users, conservation administration and NGOs, which delayed the process in many countries. However, this conflict also led to greater participation at the local level.

Specific case studies focused on France and Germany. They found a shift towards a bottom-up, participatory approach in France, although authorities set the participatory rules. In France, increased stakeholder participation has appeared to reduce participation by scientific experts, which may possibly be because stakeholders questioned the scientific evidence. This limited the influence of scientists.

In Germany, there is largely a top-down approach guided by scientific expertise and framed mainly in terms of conservation priorities. However, there is some local participation as well as evidence of NGOs by-passing state levels to directly communicate with the EC.

Source: Rauschmayer, F., van den Hove, S., Koetz, T. (2009). Participation in EU biodiversity governance: how far beyond rhetoric? *Environment and Planning C: Government and Policy*. 27:42-58.

¹ PATH (Participatory Approaches in Science and Technology) was supported by the European Commission under the Sixth Framework Programme. See: www.macauley.ac.uk/socioeconomics/research/path/index.html



Communicating uncertainty at the science-policy interface

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Theme(s): Environmental information services, Risk assessment

“When probabilities were described in words instead of figures, interpretations of the policy’s impacts and effectiveness varied widely, depending on the context.”

Better communication of uncertainty helps decision-makers integrate science into environmental policy, according to a recent study.

Dealing with uncertainty is an integral part of using evidence-based, environmental assessments in policy decisions. Decisions frequently have to be made before conclusive evidence is available. A better understanding of how to communicate uncertain science could mean that uncertainties can be considered more effectively in decision-making.

Although providing information about uncertainty can complicate already complex issues, not to do so would impair the quality of any decisions taken. The possible implications of uncertainty provide policy makers with useful perspectives.

Dutch researchers gathered views on the communication of uncertainty, from researchers, governmental, regional and local policy makers, stakeholders and policy advisors active in the science-policy interface. The participants felt that information on uncertainty was valuable, but it should be concisely presented and policy-relevant.

The participants were interested in different types of uncertainty, including uncertainty about the effects of policy, reaching goals and the severity of environmental problems. In addition, participants wanted more uncertainty information on topical issues, such as air quality, and on problems with insufficient information about uncertainty, such as flooding hazards.

Ways of communicating uncertainties were explored in the study. They found that when probabilities were described in words instead of figures, interpretations of the policy’s impacts and effectiveness varied widely, depending on the context. For example, to say that there is a ‘medium’ likelihood of reaching a target, when there is a 33-66 per cent probability.

Participants considered the reasons for uncertainty to be important, as these can have very different policy implications. For example, uncertainty could relate to limited knowledge of what the future will be like (e.g. will emissions have risen by 5 per cent or 20 per cent in 2020?) or it could relate to inaccurate measurements of the current situation (e.g. are today’s emissions 100 or 120 tonnes?).

In written reports, important uncertainty information should not be left in the appendices. One approach is to progressively disclose information, for example in the summary, conclusions and individual chapter summaries.

Different uncertainties are relevant to different people, situations, and stages of the policy cycle. Communicators should therefore tailor information to the user. Furthermore, policy makers in the study strongly called for information on the implications of uncertainty. This does not mean that communicators should tell policy makers what to do with this information, rather they should provide useful insights to help them make their decisions.

Source: Wardekker, J.A., van der Sluijs, J.P., Janssen, P.H.M. *et al.* (2008). Uncertainty communication in environmental assessments: views from the Dutch science-policy interface. *Environmental Science & Policy*. 11:627-641.



Public perceptions of new technologies: the case of CO₂ storage

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Theme(s): Climate change and energy,
Environmental information services, Risk
assessment

“It appeared that emotions play a more dominant role than analytical thought processes in perceptions of CCS as it became more ‘real’ and closer to everyday life – a typical response for such conditions.”

A Dutch study reveals that public perceptions of carbon storage are more likely to be influenced by intuitive trust than an analysis of costs and benefits if a storage plant is planned near an individual’s home.

Modern technologies can bring benefits to society, but they also bring risks and uncertainties. Public trust in scientists and policy makers who have responsibility for these innovations is important if they are to be accepted by the general public, who will have little knowledge about how these technologies work. Trust is often strongly linked to intuitive, emotional responses, rather than a ‘rational’ analysis of costs and benefits, particularly if the technology becomes highly relevant and local to an individual.

Carbon capture and storage (CCS) is one example of such a new technology. It would see large volumes of carbon stored underground and has been proposed as a means of reducing the level of greenhouse gases (GHGs) in the atmosphere, but it must be developed safely. There are concerns among developers that public perception of its safety could be one of the factors that hamper its implementation.

The study used surveys to analyse the relationship between trust and attitudes towards CCS. The surveys were conducted in 2003 in two Dutch towns located on potential sites for carbon storage. The research investigated attitudes about carbon storage both in terms of it occurring locally and about CCS in general. The survey included brief information on CCS, including details of its potential benefits and explaining that it will only be used if safe. Most participants indicated knowing little to nothing about CCS before the survey, confirming it was judged to be an unknown technology.

The results show that attitudes towards local carbon storage were more negative than towards CCS in general, which was seen as slightly positive. In a local context, trust in carbon storage was strongly influenced by emotions whereas views on CCS in general were more strongly influenced by an evaluation of perceived benefits of the technology. It appeared that emotions play a more dominant role than analytical thought processes in perceptions of CCS as it became more ‘real’ and closer to everyday life – a typical response for such conditions.

Although a relatively small number of residents were surveyed (112) in just two Dutch towns, the results provide an insight into how trust and emotion influence the public acceptance of CCS.

Source: Midden, C.J.H. & Huijts, N.M.A. (2009). The Role of Trust in the Affective Evaluation of Novel Risks: The Case of CO₂ Storage. *Risk Analysis*. 29(5): 743-751.



Effective scenarios for communicating climate change

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Environmental information services

“Socio-economic and climate scenarios provoked discussion and reflection, but did not necessarily motivate a change of attitudes or opinion.”

Researchers have explored what kind of information is effective in influencing the public's perceptions of climate change. They found that individuals may be more likely to relate to climate change if its impacts are presented for the near future, rather than for the longer term.

For most people in Europe, climate change is distant from their daily lives. Climate change action needs to take place at global and local levels and cross-cultural research on public attitudes can be informative. The researchers conducted public surveys and in-depth discussions with members of the public in the UK and Italy to explore attitudes to climate change and the effects of different types of information on attitudes.

The information given to participants consisted of scenarios that combined possible future climate outcomes with socio-economic changes for their local region.

The surveys indicated that views on climate change could be placed into the same four categories for both countries:

- *Denying* – the view that climate change is unimportant and humans do not affect it
- *Doubting* – the view that climate change is important but not caused by humans
- *Uninterested* – the view that climate change is an issue caused by humans but they do not wish to do anything about it
- *Engaged* – the view that climate change is something to face up to and take action on

As all these groups were present in both regions, it may be that similar groups are present throughout Europe. The participants discussed how the future scenarios affected their views on climate change. Socio-economic and climate scenarios provoked discussion and reflection, but did not necessarily motivate a change of attitudes or opinion. The effectiveness of scenarios depended on whether they corresponded with the individual's prior beliefs and their trust in the science.

The research suggested information should be tailored to different public groups according to their beliefs and attitudes. The scenarios were often described as 'otherworldly', and all groups suggested improvements to the scenarios.

Firstly, shorter timescales would be more effective, i.e. 20 years into the future rather than 50. In practice, this may be difficult because differences in 20 years' time are likely to be negligible. Secondly, they called for details on the methods and sources of information used to produce the scenarios to increase their credibility. Thirdly, they suggested that scenarios should be motivational and not based on shock or alarm.

Source: Lorenzoni, I. & Hulme, M. (2009). Believing is seeing: laypeople's views of future socio-economic and climate change in England and in Italy. *Public Understanding of Science*. 18:383-400.



Fear is not the answer to communicating climate change

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Environmental information services

According to recent research, 'frightening' images of climate change may initially attract public attention, but they are also likely to disempower individuals, distancing them from the issue. The research suggests communication strategies should use more 'enabling' images that are relevant to the target audience in combination with these fearful images.

"While fear-provoking images certainly have a place, they must be used selectively, and with caution. If people do not feel climate change is a significant issue, using fear-provoking images is likely to cause denial, apathy and avoidance."

The impacts of climate change will be numerous and varied, ranging from changes in ecosystems to difficulties in insuring against losses caused by climate change. These impacts will affect everyone to some extent. However, engaging the public to take action is proving difficult.

New research investigated the influence of visual and iconic representations of climate change on people's engagement with the subject, in terms of their thinking, feelings and behaviour. The researchers discussed a range of images and icons with participants in surveys, focus groups and interviews.

The results indicated that the public have a large number of images that they strongly, and easily, associate with climate change. These tend to be images of large and extreme impacts such as melting icesheets, visions of rising sea levels and intense heat and droughts.

However, these images also tend to enhance the sense that climate change happens somewhere else, to somebody else. Some individuals react to such images with a fatalistic attitude, feeling they are unable to do anything to help. Others deny climate change, rather than experience the discomfort of its reality.

While the dramatic images were judged to be the most personally important, they were also considered the most disempowering. Enabling imagery, such as an image of a tram, were seen as least personally important, yet made people feel more able to do something about climate change.

Further discussions in focus groups indicated that although dramatic images catch people's interest, they tend to be forgotten after the initial impact. Participants felt other images were needed to communicate local relevance and the possibility of action. However, participants also agreed that global images were still necessary to highlight the importance of climate change.

The researchers conclude that while fear-provoking images certainly have a place, they must be used selectively, and with caution. If people do not feel climate change is a significant issue, using fear-provoking images is likely to cause denial, apathy and avoidance as a way of coping with the unpleasant feelings they bring.

Source: O'Neill, S. & Nicholson-Cole, S. (2009). "Fear Won't Do It": Promoting Positive Engagement with Climate Change through Visual and Iconic Representations. *Science Communication*. 30(3): 355-379.



Media coverage of climate change and international development

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Newspapers in the UK reflect a sense of climate change as an impending catastrophe for the developing world, which requires the help of the West. This view partly reinforces the concept of the poor as victims and could influence the public's response to climate change policies.

“Developing countries and the poor were largely depicted as unfortunate victims of climate change who require urgent help from the rich West.”

The mass media is seen as an important source of information for the public about climate change, influencing public perceptions and understanding of the issues as well as government initiatives. For these reasons, the media can influence public support for policy development.

This study analysed media representations of climate change and international development to help show how views are constructed and reflected, and ultimately how policy actions will be received by the public. 158 articles from four 'quality' British newspapers published between 1997 and 2007 were investigated.

Articles were sorted according to eight different viewpoints: ranging from the view that climate change is beneficial, seeing climate change as an opportunity to help lift people out of poverty, right through to reporting that climate change is a disaster for developing countries.

In approximately one third of articles, climate change was portrayed as a potential catastrophe for development in poor countries. Other viewpoints were less common in the analysis but were present. A range of factors appeared to influence how climate change was reported, including:

- key events, such as the Kyoto summit and the publication of the findings of the IPCC in 2000/2001
- whether the newspapers sought a balanced view (for example, is it a crisis or can opportunities for development be identified?)
- the source of the stories (NGO reports or opinions featured heavily, scientific papers were rarely used as the basis for articles)
- wider political, social and economic factors, such as government actions

Developing countries and the poor were largely depicted as unfortunate victims of climate change who require urgent help from the rich West. Furthermore, differences between countries in the 'developing world' were not explored in the articles, nor the possible actions of the poor themselves to tackle climate change.

The fact that only 158 articles over 10 years focused on climate change and international development demonstrates the low priority given by UK newspapers to the impacts of climate change on developing countries. This has implications for shaping public understanding of the issue, which in turn could affect, to some degree, public policy.

Source: Doulton, H., Brown, K. (2009). Ten years to prevent catastrophe? Discourses of climate change and international development in the UK press. *Global Environmental Change*. 19: 191-202.



A selection of articles on environmental communication from the *Science for Environment Policy News Alert*

Living with nuclear power: public views not as simple as we thought (8/10/09)

A UK study provides the first contemporary investigation of public perceptions of nuclear power among residents living close to existing nuclear plants. It indicates that responses are not simply 'for' or 'against', but a complex 'landscape of beliefs' that will need complex communication from authorities about plans for new plants.

Knowledge brokers could transfer research findings to policy makers (2/7/09)

Environmental policies and regulations are increasingly supported by strong scientific evidence, often the result of research specifically designed to inform policy. A new report examines approaches to managing and communicating environmental research.

Local participation in biodiversity monitoring: how much is best? (30/4/09)

Monitoring species and habitats is essential to sustain biodiversity. A recent Danish study has classified different monitoring schemes based on levels of community participation. The classifications could help conservation leaders identify the most appropriate schemes for different situations.

Smarter climate change communications needed with public (2/4/09)

A new report argues that smarter approaches to engaging the public with climate change issues are needed to bring about social change and reduce carbon emissions. The researchers say emissions targets can only be achieved by combining intelligent policy making with strategies that meaningfully engage members of the public on an individual basis.

Understanding social perceptions of invasive alien species (8/1/09)

Almost all respondents to a stakeholder survey on invasive alien species (IAS) agreed that eradicating species with negative impacts is necessary. However, perceptions of what the main impacts and benefits of IAS are vary according to the stakeholders questioned. Such insights into social perceptions towards wildlife can help inform effective conservation programmes.

Encouraging energy conservation in the home (8/1/09)

Despite high levels of environmental concern in the EU, domestic energy use continues to rise. A recent study has examined the psychology behind energy usage and behaviour change to help inform energy strategies.

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