Policy Paper

Technical versus Participatory Environmental Decision Making: A Critical Analysis

Abstract

Environmental decisions are highly contested with a large number of individuals affecting or being impacted by the outcome of policy. There is always a range of moral, legal and political claims on what constitutes socially acceptable use of the environment, and policy inevitably has to make a trade-off between these viewpoints. Since the 1960s, environmental politics has been institutionalised in developed countries, and has been shaped by scientists, interest groups, the media and public protests. Cost-benefit analysis, environmental impact assessment and risk assessments have been traditionally used to justify decisions in the technocratic process under the idealised framework of the 'linear rational model', commonly referred to in discourse as 'evidence based policy'. Social scientists have been critical voices against the linear rational model over several decades, claiming that in practice the model is simplistic and open to political abuse.

Since the 1990s agencies have begun to experience increased pressure from the public and regulatory bodies to integrate public participation into the process of environmental decision making. This has added a layer of lateral discussion into the traditional hierarchical decision structure, where the agency is now just one of many actors or stakeholders. This transition was internationally reinforced in 1992 during the United Nations Conference on Environment and Development, the Rio Declaration stating that "at the national level, each individual shall have appropriate access to information concerning the environment… and the opportunity to participate in decision-making processes" (para. 10). This paper will consider the extent to which participatory processes are a superior alternative to technical rationality, by examining the failings of technical decision making and how participation addresses these, then discussing the appropriate balance of the two methods and the practical considerations.

Key Words: environmental politics, participatory governance, public participation, policy-making, decision making

Introduction

Environmental decisions are highly contested with a large number of individuals affecting or being impacted by the outcome of policy. There is always a range of moral, legal and political claims on what constitutes socially acceptable use of the environment, and policy inevitably has to make a trade-off between these viewpoints (Vira, 2001). Since the 1960s, environmental politics has been institutionalised in developed countries, and has been shaped by scientists, interest groups, the media and public protests. However, until the 1990s policy was "characterised by consensual arrangements between the state and industry, informed by… science", with the other stakeholders (particularly tribal and marginalised groups) left out of the official policy-making process (Bulkeley and Mol, 2003, 144). In addition to direct protest, the public could also influence policy-makers indirectly through voting allegiances during democratic elections (Tilleman, 1995). Cost-benefit analysis, environmental impact assessment and risk assessments have been traditionally used to justify decisions in the technocratic process (Baxi, 1997; Petts, 2004) under the idealised framework of the 'linear rational model', commonly referred to in discourse as 'evidence based policy'. It is defined by two stages; knowledge from experts becomes the raw material from which politicians base their policy (Owens, 2005). The professional experts are those with "mastery over a body of knowledge and its relevant techniques", and in theory are separate from the policy process and therefore present unbiased scientific evidence (Fischer, 2000, 29). This is in contrast to lay-people who are traditionally seen as having a distorted view of risks shaped by ignorance (Brown and Damery, 2003). Even in the last decade, the concern to transfer knowledge into policy decisions "has become almost ubiquitous". For example, the UK Cabinet Office released documents to prioritise this "arguably to an unprecedented level", and similar refocus has occurred in the USA, EU (Owens et al., 2006, 635) and also Asia.

Social scientists have been critical voices against the linear rational model over several decades, claiming that in practice the model is simplistic and open to political

abuse. Conversely, there has also been disappointment from politicians who view scientists as insensitive to their requirement for focused and politically acceptable material (Owens et al., 2006). In addition, the role of the environmental manager to exercise professional judgement in pursuit of the public good has been challenged increasingly by law suits or administrative appeals from public interest groups. These legal actions delay or halt land management plans and timber sales leaving managers facing a "crisis of control" (Selin and Chavez, 1989, 189). The public trust in environmental policy has declined in part due to disagreements with experts over the acceptability of technological risks, and the inability of science to incorporate moral values. There has also been an issue of one-way communication from the expert community to the lay-public. This implicitly assumes the public are deficient in understanding (Petts, 2004) and at worst the process is not concerned with the degree of understanding in policy choices (Daniels and Walker, 1996).

Since the 1990s agencies have begun to experience increased pressure from the public and regulatory bodies to integrate public participation into the process of environmental decision making. This has added a layer of lateral discussion into the traditional hierarchical decision structure, where the agency is now just one of many actors or stakeholders (Selin, 1989). This transition was internationally reinforced in 1992 during the United Nations Conference on Environment and Development, the Rio Declaration stating that "at the national level, each individual shall have appropriate access to information concerning the environment… and the opportunity to participate in decision-making processes" (para. 10). In the UK, the Royal Commission on Environmental Pollution in 1998, argued that the public should specifically contribute knowledge and understanding to the planning process (Petts, 2004). This paper will consider the extent to which participatory processes are a superior alternative to technical rationality, by examining the failings of technical decision making and how participation addresses these, then discussing the appropriate balance of the two methods and the practical considerations.

Failings of technical decision making

The failings of technical decision making fall into three broad areas; limitations of scientific method, political power, and public acceptability. Environmental policy

options entail a complex interaction between ecosystems and humans that can never be fully understood by scientific method. Land management systems are not easily subjected to controlled experiments as results are rarely unequivocal (Daniels and Walker, 1996). However despite these inherent data deficiencies, scientific method has been criticised for rarely performing uncertainty analysis, instead presenting the results as deterministic rather than probabilistic (Petts, 2004). Where the subject is risk assessment itself, such as flood risk, the scientific method examines only "the quantifiable probability that the event will occur". This overlooks the areas of risk not quantifiable by scientific process; 'strict uncertainty', ignorance and indeterminacy (Brown and Damery, 2002, 423). Over-stating the accuracy of the results has lead to accusations of experts 'black-boxing' to prevent discussion and under-mining of their status. For example, health risks from a small incremental exposure to emissions from incinerators are poorly understood, but nevertheless the methods of risk calculation remain opaque to the public. The public may also be concerned with institutional and moral issues that fall outside the scope of scientific examination. There may be questions about the level and enforcement of regulatory control for private industry, the visual impact of industry, or the existence value of environments (Petts, 2004). The final limitation of scientific method is in the difficulty linking into the political process. The complexity of ecosystems and the need to often smooth data over seasonal variation means the duration of data-gathering will often exceed the window of opportunity to incorporate new information in the policy process. However, knowledge that is not available to decision makers at critical points in the policy process will not be used. In addition, the use of technical jargon and inappropriate scientific scale or focus compared to the political question, will limit the ability of the decision makers to use the work (Owens et al., 2006).

In practice the technical rational model is far from unbiased evidence based policy – "rationality is penetrated by power" (Flyvbjerg, 1998, 227). The knowledge and evidence is selected and structured by political actors to achieve strategic goals. The greater the political power, the less scientific evidence is required to justify a policy choice; "the very powerful can afford not to learn, to dispense even with rationalisation" (Owens, 2005, 289). The powerful are able to define and create realities, with communication of rationality characterised more by "non-rational rhetoric and maintenance of interests, than by freedom from domination and

consensus speaking" (Flyvbjerg, 1998, 227). It is by presenting rationalisation as rationality that the powerful communicate and exercise their power (Flyvbjerg, 1998). The selectivity of scientific method has often been to the detriment of the social and natural disciplines, focusing on technical potential of environmental actions. National and local policies may also be restricted from above, for example, by strong European regulations regarding waste disposal, which may require governments or councils to ignore local scientifically-demonstrated needs. In addition to goal-driven evidence selection, politics can directly affect the manner in which science is undertaken, forcing scientists to frame their question according to the political situation (Owens et al., 2006). There is a danger that engaging academics in policy "risks blunting the critical edge of academic enquiry", making it harder to address the broader concerns (Owens, 2005, 291). An example of the political use of science on the international stage comes from the World Resources Institute (WRI) calculation of national contributions to global greenhouse gas emissions. The WRI did not incorporate the impact of greenhouse gas sinks and examined deforestation rates during perhaps unrepresentative short periods. The result was interpreted to favour western nations and imply the need to reform the global south (Eden, 1996).

The third broad aspect in which technical rationality fails is its inability to get acceptance from the public. Acceptance and understanding from the public is core to generating a sense of ownership over the environment (Treby and Clark, 2004). The technocratic approach is founded on the positivist principal which separates facts and values, conducting empirical research without reference to concepts or implications. This fails to take into account the public's meaning and purpose that shape the way they interact with the environment (Fischer, 2000). There is also a misperception by the public of what is possible in policy. The public is sometimes just passively 'educated' by the expert, who may not be even particularly concerned about the success to which knowledge is imparted. This is based on an 'information-deficit' model, where the public is assumed to absorb the new knowledge, but people rarely react to information in the manner experts expect. The addition of information to the public sphere is often wrongly assumed to instigate the 'linear model of behavioural change' where the message gains comprehension, thus changing intention and resulting behaviour (Daniels and Walker, 1996). For example, in coastal decision making, passive public education has failed to change viewpoints or behaviours

towards sustainable levels of flooding and erosion (Treby and Clark, 2004). The transfer of knowledge is again further complicated by expert use of technical language. For example, in flood assessment, rhetoric such as 'return period' is rarely understood by the public (Brown and Damery, 2003). These effects have lead to a "widespread public disaffection with science and technologies" implemented in environmental policy (Petts, 2004, 116).

Benefits of participation

Participation provides additional information to that available through scientific method alone. The distinction between public and experts is blurred in the case of local environmental issues (Brown and Damery, 1996) where the public may possess considerable contextual information based on local knowledge, direct perception and familiarity (Eden, 1996). This additional information may be in areas that the experts are lacking (Tilleman, 1995). Where both the experts and public have overlapping areas of knowledge, it can be used to validate or reveal deficiencies in technical assessments. Upon further empirical testing any differences between the views can be categorised as either a misconception by the public therefore prompting the need for further education, or an error in expert information resulting in an updated plan (Yearley, 2006). This public scrutiny encourages experts to reveal the assumptions that underlie models and therefore sources of uncertainty. For example, a public discussion group in the UK yielded additional local information for a traffic impact assessment on a proposed energy-for-waste incineration site. The assessment had failed to include bicycles, despite the site being main cycle route to a nearby school (Petts, 2004). In the case of flood risk assessment, inclusion of local information into the environmental policy can utilise local information sharing networks and past experience of local signs of change. During the flooding of Todmorden in 2000, some residents telephoned the Environment Agency to warn them of rising water levels. However, because the public were not included as part of the risk assessment policy the information went unheeded (Brown and Damery, 1996).

Public engagement has the capability to challenge political power by "bridging knowledge and policy" (Yearley, 2006, 701). This is consistent with 'individual participatory democracy', where decision-making power is controlled by individuals

most effected in order to meet public needs (Tilleman, 1995). Participatory democracy encourages 'civil discovery' as communities are able to debate their own future and agree on better planning decisions (Daniels and Walker, 1996). When engaging with the public at the start of the process, participation can suggest appropriate issues or redefine the scope of the policy by identifying questions to be answered, data to be collected and the responsibility for these tasks (Petts, 2004). Once information has been collected, the expert's knowledge can be tested by the public to highlight trade-offs and validate the policy decision. This removes 'black-boxing' because it requires experts to use analogies and stories to convey meaning, rather than technical language incomprehensible to the public (Tilleman, 1995). In the example of air pollution modelling in Sheffield, the public acted as "extended peer reviewers" for the experts by identifying areas of inaccuracy both in input assumptions and methodology. The model inputted factory discharge capped at the regulation limits, but the public believed these to be regularly violated. The model methodology was also criticised for averaging out certain phenomena; vehicle emissions were averaged over the full route which missed the impact of specific locations where buses often remained idling, and car performance was assumed to be the same over the whole city whereas the public suggested a positive correlation between vehicle emissions and regions of poverty (Yearley, 2006, 702).

Participation can help the public understand other stakeholder views and promotes learning about environmental issues, which can foster acceptance from the public and credibility for the whole policy process. The process of participation identifies common ground between the stakeholders, but for minority groups where common ground is lacking the process acts as a form of therapy and gains enhanced respect for irreconcilable views (Tilleman, 1995). This includes greater understanding of budget constraints and the role and responsibility of the various state agencies involved (Daniels and Walker, 1996). The use of the "extended expertise" of the public encourages the discussion of 'existence values' and moral arguments which are not represented in the technical rationality of science (Eden, 1996, 194). The process of participation can also deliver benefits beyond just the policy outcome, by educating the public and generating behaviour change (Treby and Clark, 2004). It is more effective than the 'linear model of behavioural change' because the public are active in the dialogue, having to engage in structured argument to make their opinions heard,

rather than being passively addressed in speeches and hearings (Daniels and Walker, 1996). By these means the process gains credibility and this may reduce the need for the public to bring the state to account using the traditional mechanisms of court cases to overturn decisions, or if not possible, then using their vote to remove the government representatives from office (Telleman, 1995).

Balancing technical and participative decision making

The literature has broad agreement on the usefulness of participation for addressing some of the failings of technical rationality, but there are virtues of the scientific approach that cannot be replaced by the public. While there may be times where local people cumulatively possess much of the information regarding an environmental issue, there is still a need for experts to interpret results and draw insights from existing academic literature (Owens, 2005). Often the public "welcome" or "demand advice" from experts (Petts, 2004, 127). An example of this is the scientific discovery of ozone depletion due to chlorofluorocarbons (CFCs) by specialist atmospheric chemists, such as the British Antarctic Survey. The identification of this environmental issue fell outside the experience and ability of the general public to perceive and so required a technical approach (Eden, 1996). As noted above, political power can be used to distort science, but it is rarely enough to override it entirely – so expertise remains essential to legitimise policy (Petts, 2004). Technical studies, if unsuited to the political climate of the time, may become influential by reframing problems over longer periods through a process known as 'knowledge creep'. This is where "research gradually infiltrates policy… involving slow changes in vocabulary and mindsets" (Owens et al., 2006, 640).

In theory, it is clear that a combination of technical experts and public involvement yields the best results (Petts, 2004). However, by encouraging debate between all the stakeholders, the strength of participation can also be a weakness. By including more groups, there is a danger information will be lost in stories are used to simplify ideas (Owens et al., 2006), and the negotiation becomes so complex that it may be difficult to reach consensus across the many questions the process can entail (Treby and Clark, 2004). The wide range of areas to debate can include "technical, legal and financial issues"; "procedural issues"; "concerns and values of other participants"; "one's own

goals"; "personalities… and communication styles"; and "sets of options… and their benefits". Without appropriate frameworks, negotiation can "produce utter bewilderment". However, social learning cannot happen without conflict in these areas (Daniels and Walker, 1996, 79-80). These complexities lead to delays in approval of projects and increase the cost of the process. As the scale of the environmental issue increases in importance or geographical impact there are more potential stakeholders and the costs are also higher. However, given large projects will likely be more risky and harder to halt or reverse, the additional cost can be offset against a greater benefit (Tilleman, 1995).

Given the need for participation, but its inevitable complexity and costs, it is important to set the correct public involvement for each specific environmental decision. The success of participation is dependent on interlocking factors including the framework, individual stakes and culture (Treby and Clark, 2004). The stakes and culture are highly dependent on location and policy, but the principles behind a framework can be generally applicable. However, the detail of the framework will still require a range of questions, including the number, location and identity of participants; and the degree, type and timing of participation (Tilleman, 1995). In the field of coastal decision making, Treby and Clark (2004) suggest a five step framework for participation acknowledging that while "the expert-led process might well serve to constrain the role of the participants", they "actively seeks to fuse the two roles wherever reasonable" (page 370), and therefore their model does not assume the highest degree of participation in every situation. Step one is education from and between all parties to change the overarching legislative system within which the specific management case lies. The next step is for the public to articulate their opinions on the specific environmental issue before any bias from expert opinion. Step 3 is for all possible options and technical implications to be identified by the experts. Step 4 is the extensive participation stage where all stakeholders discuss priorities and issues are clarified. In most cases, following further rationalisation, this will lead to the final stage where the public is informed of the agreed outcome. This framework reflects the 'stages of change' model which centres on generating action and behaviour change from participants, by making them aware of issues and then empowering them. Frameworks also need to be flexible to be able to react to the strength of public interest in an environmental issue. During the

restoration of a stretch of the Brent river, the council was committed to involving local people in the planning, but consultation meetings were poorly attended and it wasn't until nearly 2 years following launch that a Community Steering Group was set up (Eden and Tunstell, 2006).

Conclusion

Despite the virtues of participation being appreciated in the literature for the last 2 decades and the availability of proposed frameworks, there are limited examples where full participation is currently being implemented, with public engagement specifically in technical assessments limited to research activities. There are concerns that where new methods of public involvement are introduced, the intention is still to legitimise politically driven policy-making (Petts, 2004). The public are generally consulted, but the process is directed by experts rather than stakeholder participants (Treby and Clark, 2004). The experts transfer information passively, in accordance with the ineffective classic linear model of behaviour change (Eden, 2006). In the UK, some local authorities have tested new systems such as citizens' juries, community advisory groups and consensus panels in waste management policy, but these are mostly consultation rather than participation. When it comes to health risks it is rare that any issue is discussed in a participatory manner (Petts, 2004). Where participation has been included, it has generally been reaching out to NGOs instead of the public (Eden, 1995).

The limited extent of participation is partly due to the practical difficulties of instigation. The theoretical frameworks are difficult to imbed within existing institutional structures. In Britain the regulatory requirements can be multiple and fragmented, with compliance necessary at local, national and international level, as is the case with waste disposal. There may also be a lack of resources to fund the additional cost of participation, especially if there is no formal regulatory requirement to engage in the procedure. Technically rationality has been the preferred choice historically because it can be used to further the interests of experts and reinforce political power structures. There may still be a reluctance to change from the status quo which relinquishes some control over politically strategic decisions. Expert

culture has been reinforced over time and some experts are also unwilling to accept scrutiny of their scientific processes (Petts, 2004).

In theory, participatory processes are capable of solving the three failings of technical rationality. Firstly, participation allows the public to contribute more local, contextual information than is available by scientific method alone. Secondly, public scrutiny of expert data and methodology poses a constraint on the capability of policy-makers to produce a selective, strategically-driven policy choice. Thirdly, participation grants credibility to the process and nurtures public education through active discussion and inclusion of moral arguments. However, technical scientific pursuit and expert opinion should not be abandoned, but exist in a framework alongside participatory processes. The two techniques are complimentary to each other with both contributing valuable information and viewpoints.

Given the costs associated with participation, in theory the level should be tailored to each individual environmental decision, especially since the extent to which participation can contribute information will also be highly dependent upon the example. The public are likely to have significant knowledge about local issues, but will have limited information relevant to complex large scale problems. However, even in the case of large-scale projects, the public still have a crucial role in examining expert opinion and curtailing political abuse. It is exactly these traditional power bases that may well be preventing participation from being adopted, both through political under funding and non-adoption into frameworks, and the expert culture of academic authority. Although full participation may not always be necessary to achieve good results, it may be a prudent choice to always aim for it, given that it is likely to be undermined to some extent by politicians and experts.

References

Baxi, U. 1997. Notes on constitutional and legal aspects of rehabilitation and displacement', in Fernandes, W. (ed.), Rehabilitation Policy and law in India: a right to livelihood. New Delhi: Indian Social Institute.

Brown, J. D. & Damery, S. L., 2002. Managing flood risk in the UK: towards an integration of social and technical perspectives. *Transactions of the Institute of British Geographers,* 27 (4): 412-426.

Bulkeley, H. & Mol, A. P. J., 2003. Participation and environmental governance: Consensus, ambivalence and debate. *Environmental Values,* 12 (2): 143-154.
Daniels, E. & Walker, B., 1995. Collaborative learning: Improving public deliberation in ecosystem-based management. *Environmental Impact Assessment Review,* 16: 71-102.
Eden, S., 1996. Public participation in environmental policy: considering scientific, counter-scientific and non-scientific contributions. *Public Understanding of Science,* 5: 183-204.
Eden, S. & Tunstall, S., 2006. Ecological versus social restoration? How urban river restoration challenges but also fails to challenge the science-policy nexus in the United Kingdom. *Environment and Planning C-Government and Policy,* 24 (5): 661-680.
Fischer, F., 2000. *Citizens, experts, and the environment : the politics of local knowledge,* Durham, NC, Duke University Press.
Flyvbjerg, B., 1998. *Rationality and power : democracy in practice,* Chicago, University of Chicago Press.
Owens, S., 2005. Making a difference? Some perspectives on environmental research and policy. *Transactions of the Institute of British Geographers,* 30: 287-292.
Owens, S., Petts, J. & Bulkeley, H., 2006. Boundary work: knowledge, policy, and the urban environment. *Environment and Planning C-Government and Policy,* 24 (5): 633-643.
Petts, J., 2004. Barriers to participation and deliberation in risk decisions: evidence from waste management. *Journal of Risk Research,* 7 (2): 115-133.
Selin, S. & Chavez, D., 1989. Developing a Collaborative Model for Environmental Planning and Management. *Environmental Management,* 19 (2): 189-195.
Tillemann, W., 1995. Public Participation in the Environmental Impact Assessment Process: A Comparative Study of Impact Assessment in Canada, the United States and the European Community. *Columbia Journal of Transnational law,* 33: 337-439.
Treby, E. J. & Clark, M. J., 2004. Refining a practical approach to participatory decision making: An example from coastal zone management. *Coastal Management,* 32 (4): 353-372.
UNEP, 1992. *Rio Declaration on Environment and Development*. [Online] Available at: http://www.unep.org/Documents.Multilingual/Default.asp?documentID=78&articleID=1163 [Accessed 24 February 2009].
Vira, B., 2001. Claiming legitimacy: analysing conflict in the environmental policy process. *Environment and Planning C-Government and Policy,* 19 (5): 637-650.
Yearley, S., 2006. Bridging the science - policy divide in urban air-quality management: evaluating ways to make models more robust through public engagement. *Environment and Planning C-Government and Policy,* 24 (5): 701-714.