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Focus groups

Integrated assessment focus groups: bridging the gap between science and policy?

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In the last decade, integrated assessment (IA) has become an important approach for synthesising multidisciplinary knowledge about complex environmental phenomena with regard to policy decision-making. So far IA has been performed primarily as an expert exercise. This paper argues that a participatory element is needed that integrates lay persons (citizens, stakeholders) into the assessment process. The focus group method is considered as a promising tool to achieve such inclusion. Characteristics, applications, problems, and opportunities for focus groups in policy-oriented IA are discussed. The insights presented are backed by experiences collected in the context of two large research programmes — the European Union project ULYSSES and the Swiss project CLEAR.

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FOR THE LAST TWO DECADES or so, environmental problems such as global climate change have become central issues in the international policy arena. In most environmental policy discourses, scientific evidence plays a crucial role. However, many uncertainties — limitations in our systems understanding or the data, non-linearities in systems behaviour — restrict the potential to predict environmental dynamics. Nevertheless, the assessment of future changes and the communication of uncertainties remains an important ingredient of any prudent environmental policy.

Currently, the dominant scientific assessment methods for complex environmental (and other) issues are multidisciplinary expert panels and computer modelling. Many analysts agree that, especially against the background of uncertainty, there is a need for new scientific advisory tools which combine scientific assessments with citizens' and stakeholders' concerns and judgements of which experts are possibly not aware (compare with Rotmans and van Asselt, 1996). Inclusion of lay people in assessment activities would combine scientific competence with arguments about fairness, equity and other policy-relevant value dimensions (Renn *et al*, 1995; Kasemir *et al*, 1996).

In the last decade, computer-based assessments have developed into the rapidly evolving field of integrated assessment (IA) (see Rotmans and Vrieze, 1996; Weyant *et al*, 1996). IA has been defined by Rotmans *et al* (1997) as an interdisciplinary process of combining, interpreting and communicating knowledge from diverse scientific disciplines in such a way that the whole cause–effect chain of a problem

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can be evaluated from a synoptic perspective. Two characteristics are treated as pivotal: first, IA should have added value compared to single disciplinary assessment; second, IA should provide useful information to decision-makers.

Similarly, Parson (1996) defined IA as an exercise to provide information of use to decision-makers rather than merely advancing understanding for its own sake. It aims to bring together a broader set of disciplines, methods, styles of study, or degrees of confidence than would typically characterise a study of the same issue within a single research discipline.

So far, IA has been performed primarily as a scientific exercise. However, the inclusion of lay people in the assessment of complex environmental problems is legitimate and desirable.

It is legitimate because environmental problems cannot always be described unequivocally and assessed in scientific terms. To make prudent policy decisions, scientific expertise is needed, but it does not suffice, because uncertainties and associated risks will be valued differently by and among lay people, experts and politicians. Such diverging views should not be considered as an obstacle to effective policy but as the very nature and basic ingredient of the democratic tradition of policy-making, especially in the early stages of the policy cycle (Brewer and deLeon, 1983).

The inclusion of citizens and stakeholders in policy formulation is not only legitimate but also, from the point of view of "strong democracy" (Barber, 1984; Dryzek, 1990), highly desirable. Fiorino (1990) has identified three rationales for citizen participation in policy formulation:

> The normative rationale builds on the principle that, in democratic societies, citizens have rights to participate in public decision-making and to be informed about the bases for government decisions.
> The substantive rationale highlights the fact that relevant wisdom is not limited to scientific and other specialists. The public may contribute substantively to risk characterisation (for instance by highlighting aspects that specialists have not taken into consideration so far) and to the design of decision processes that address social, ethical, and political values.
> The instrumental rationale for public participation is that it may help to lower conflict and to increase acceptance of and trust in government and expert decisions (Stern and Fineberg, 1997, page 23ff).

The inclusion of lay people in the assessment of complex environmental problems can be organised as an academic research activity like public opinion surveys and face-to-face interviewing. In such applications, citizens are addressed in their capacity as informants only. The assessment may also be organised as a political activity that is part of an on-going discursive process. Then, people are addressed in their capacity as citizens that contribute to policy.

A promising tool for this purpose is the 'focus group', which is a guided small-group discussion between lay people about a focal topic. In contrast to an ordinary group discussion, purposive information on the issue in question is given as input or stimulus to the group. In the context of IA, focus groups may receive expert information about complex policy problems and associated policy options.

We will use the term 'IA-focus group' for those oriented towards policy issues — often global in scope — that require a broad range of specialised scientific and technical expertise, and that produce policy recommendations, which are informed by scientific and lay people's knowledge and by the participants' ethical and political reasoning. To become a truly participatory methodology, IA-focus groups need to be sure that the people's recommendations enter into the policy-making process. Otherwise, these groups degenerate into an instrumental social engineering exercise.

IA-focus groups fill a gap in the toolbox of participatory policy instruments (for an overview see, for instance, Stern and Fineberg (1996)) as they are, first, oriented towards generic and long-term (sustainability) issues, and, second, operating at the interface between science and policy. Public hearings (Checkoway, 1981), negotiation rule making (Fiorino, 1995), planning cells and citizens' juries (Dienel, 1992; Crosby *et al*, 1986), consensus conferences (Joss and Durant, 1994), citizen advisory committees (Lynn and Busenberg, 1995), and mediation (Folberg and Taylor, 1984) are instruments which predominantly operate in the policy arena itself and when policy conflicts are, or are likely to become, acute in the short term.

This paper gives a possible methodology to cover the problems and prospects of IA-focus groups. The two research programmes (the Swiss project CLEAR and the European Union (EU) project ULYSSES) within which this methodology was developed are

Focus group research is to increase qualitative insights into specific topics and behaviour, especially in little-known fields and/or those with limited social science research insights and/or in which policy formulation is at an early stage

described and preliminary findings reported. The method is evaluated qualitatively and two critical factors for successful IA-focus group applications are discussed.

Focus groups

Focus group research and areas of application

The beginning of focus group research can be traced back to the Second World War (see Merton and Kendall, 1946; Merton, 1987): in a seminal experiment, a war propaganda film was presented as stimulus to an audience that had to react on it by pressing a green button for positive feelings and a red one for negative feelings. Following the presentation, the reactions were discussed by the group with the help of a moderator, to learn about people's attitudes and to increase the film's effectiveness to influence public attitudes.

The focus group method is most popular in marketing research (Cox *et al*, 1976) for eliciting consumer preferences, for tuning products to consumer needs, and for improving promotions and suppliers' profiles (see, for instance, Higginbotham and Cox, 1979). Greenbaum (1993) estimates that the US market research industry performs in the order of 100,000 focus groups per year for such purposes. Focus groups are increasingly used for prelaunch testing of commercials (compare with Morrison and MacGregor, 1995).

Another important field of application is health and family research (Basch, 1987). Kitzinger (1994) investigated the production, content and effect of media messages about AIDS. Folch-Lyon (1981) and Ward *et al* (1991) ran focus groups to investigate motives and reasons for use of contraception and other means of family planning.

In policy, media and communication research (Desvouges and Smith, 1988; Byers and Wilcox, 1991; Conner *et al*, 1991) little academic work exists. However, it is known that important political campaigns rely on focus groups. An example is the Yeltsin campaign that has commandeered "all the best focus-group research, direct mailings, polling data, political consulting and advertising expertise money can buy" (*International Herald Tribune*, 1996). Also decisions or actions with a high symbolic status are often backed by focus groups, for example, President Reagan's visit to Breshnev in 1988 that was, among others, designed by two focus groups (*Los Angeles Times*, 1988).

In recent years, the environmental sciences and technology assessment scientists have made increasing use of focus groups. Liebow *et al* (1993) ran focus groups on the perception of local residents towards a planned waste incinerator. Dahinden and Dürrenberger (1997) used focus groups to investigate national energy policies, and Macnaghten *et al* (1995) applied it to a study of local sustainability policies. The Centre for Technology Assessment in Baden-Württemberg is using it in the context of genetic engineering and energy scenarios (Centre of Technology Assessment, 1998; Lattewitz, 1998).

Purpose of focus groups

The strength of focus group research is to increase qualitative insights into specific topics, attitudes and behaviour, especially in fields about which people are not yet well informed and/or in which only limited social science research insights exist, and/or for which policy formation is in an early stage and could benefit from citizen participation. In such cases, focus groups may meet, following Fiorino (1990), three (interrelated) objectives:

Substantive purpose: To collect lifeworld knowledge on perceptions, behaviour or cultural diversities to increase our understanding about public concerns and visions. Such knowledge may be input into policy (Richter *et al*, 1991) and/or into additional research, for instance, surveys. A precondition for such good design is to give people as much control over the process as possible, and to reduce expert knowledge, jargon and teaching attitudes to a minimum.

Instrumental purpose: To design marketing or policy campaigns. By including the public at an early stage, policies, products and campaigns are more likely to be effective, and potential conflicts and options for conflict resolution may be more easily anticipated. Substantive and instrumental purpose mostly go hand-in-hand, as in the case of adjusting generic programmes to particular (often local) circumstances (Kumar, 1987).

Participatory purpose: This is not a standard purpose in traditional focus group research. However, IA applications are organised with the participatory intention to increase the quality of policy decisions and to strengthen democracy by including citizens in policy-making (compare with: Dienel, 1992; Kumar, 1993; Joss and Durant, 1995).

Structure of focus groups

Despite the relatively long tradition of focus groups, most of the literature is introductory (Krueger, 1988; Stewart and Shamdasani, 1990; Morgan, 1993;

Greenbaum, 1993; Dürrenberger and Behringer, 1998), with the notable exception of Krueger and Morgan (1998). There is still a lack of systematic academic research on the method itself and focus groups are an "under-utilised technique" (Basch, 1987) in social science. It is only recently that the instrument is receiving increasing attention as a means of obtaining qualitative data in discourse, interactive or argumentative contexts (Goss, 1996; Fischer and Forester, 1993).

The following key features characterise a focus group:

Group size: We advocate that groups consist of six to eight participants. This gives sufficient speaking time and allows for small-group dynamics (mutual acquaintance, plurality of opinions, potential for consensus building or disclosing group dissension).

Composition of group: No generic criteria can be given, but two basic choices exist: between real groups (that is, already existing groups such as families, business teams, clubs) and groups of strangers; and between homogeneous and heterogeneous groups with regard to a selected criterion, for instance, gender or risk-preferences (compare with Douglas and Wildavsky, 1982; Schwarz and Thompson, 1990).

Recruitment: Recruitment is generally done by phone. Alternatively advertisements can be taken out in newspapers. Selection may range from random sampling to quota selection, depending on the necessary group characteristics. Recruitment is rather time-consuming. Over-recruitment is advised.

Number of groups: If exploratory research is undertaken, a rule-of-thumb criterion is to consider the marginal value of information obtained by running additional focus groups. Experience shows that about half a dozen may generate enough information to be able to defend insights *vis-à-vis* peer communities. In any case, never rely on the results of a single focus group, no matter how carefully it was designed, conducted and analysed. If systematic qualitative research is undertaken, every independent variable (roughly) doubles the number of groups.

Number of sessions: Most focus groups meet once, for about two hours. However, if complex (policy) issues are the focal topic, several sessions (at least two or three) are needed. If the group is meant to produce a tangible output, an additional meeting is required. Preferably, sessions take place in the evening. Discussions can also be organised in a workshop format, for instance one or one-and-a-half-day gatherings that roughly correspond to four to five evening sessions.

Frequency of sessions: If evening sessions are chosen, the groups should meet on a regular basis. The breaks between the sessions should not be too long. As a rule, a weekly rhythm is recommended. If the workshop format is adopted, a weekend seems to be most convenient.

Location: Focus groups should be organised at neutral places. Offices of the sponsor or of a particular stakeholder in the issue are not very suitable, since trust in the process (which includes the organising institution and people) is essential.

Inputs: Discussions are stimulated by input provided by the organisers. This is aimed at establishing an emotional and a cognitive group focus. Suitable input materials are: videos, pictures, music, written material such as newspaper articles, radio broadcasts, and so on. Inputs have to be pre-tested.

Outputs: Standard output of focus group discussions are video (or audio) tapes, minutes and possibly notes. This is the raw data to be processed and analysed. Additional output may comprise questionnaire data. Although questionnaires are rarely used in focus group research, they may help to provide a quick picture about the diversity of opinions and, if the instrument is distributed before and after a discussion, about changes of individual opinions. The group may be asked to produce tangible output such as a collage or synthesis report. Collages are a valuable technique to stimulate symbolic and emotional capacities that are generally undervalued in discussions. Written output is easier to analyse than symbolic, but the process of writing a document is rather difficult to manage and it is often perceived by participants as an academic exercise. In any case, such output cannot be produced during a single focus group session.

Moderation: The moderator should be a discussion facilitator, in contrast to the expert (who embodies scientific authority) and a participant (who brings in his/her personal preferences). The provision of scientific knowledge should be separated from group moderation and shifted to another person (an expert; in the case of computer model input, a 'model moderator').

Costs: Costs can vary greatly. A full cost budget for organising and conducting a six-person focus group meeting five times (2.5 hour sessions) consists approximate expenses (Swiss labour costs) of: Phone recruitment along quota criteria, including mailings: US$800 Reimbursement: US$1200 Moderation, including preparation: US$1000 Infrastructure (room, equipment, material, snacks): US$500.Total costs without producing input material and transcripts: US$3500. Full transcripts of ten hours of discussion may amount to US$2500. Unit costs for a single 2.5 hour session (six persons) amount to about US$2000, including transcription.

IA-focus groups

IA-focus groups are conceived to: gain insight into people's perceptions, concerns, visions and

judgements on a policy issue (substantive research purpose); improve policy-making by eliciting constraints to, and opportunities for, citizen acceptance (instrumental policy purpose); and, last but not least, include citizens into the process of policy formulation (participatory purpose). To meet these interlinked purposes, the design of an IA-focus group differs from the 'standard'.

A crucial feature of IA-focus groups (for a detailed discussion see Dürrenberger *et al*, 1997) concerns the number of sessions. While standard focus groups deal with topics about which participants feel fully competent to speak, IA-focus group topics are often perceived by lay people as being 'too scientific', too 'far away', or too 'complex' to be discussed adequately by a group of citizens during a single meeting. Thus IA-focus groups have a multiple-stage format, meeting, for instance, for weekly sessions.

Second is the input of specialised scientific knowledge. Discussions on complex problems need to be informed by both scientific evidence and uncertainties. Such expert knowledge can be provided by written, verbal and/or electronic sources. In current IA-focus group research the use of computer models is characteristic of the methodology. Ideally, computer tools are a stimulus for discussions and an information system for conveying scientific insight. However, computer tools, especially those designed for use by experts, may be counterproductive: they are likely to exclude people less familiar with information technology, and prevent participants from expressing their opinions and concerns. It is a challenging task to develop computer tools that fit the needs of IA-focus groups (see Schlumpf *et al*, 1999).

Third is what can be called the 'output stimulus'. In focus groups the initial focus is set by an input provided by the organisers. In IA-focus groups an additional group focus is created via an output task. We can think of different forms of output such as a written document, probably presented to policy representatives, or a video that records the group's policy recommendations. The common goal to produce a tangible output can increase motivation, given that the process is flexible enough to be adapted to the needs of the participants.

A fourth characteristic, related to output, concerns synthesis. IA-focus groups generate policy recommendations that synthesise and integrate a wide variety of scientific information and social, political and ethical considerations. Recommendations may be oriented towards identifying potential for consensus, highlighting possibilities of conflict in future policy debates, and/or pinpointing obstacles in the design and implementation of specific policy measures.

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Critical issues

The focus group is increasingly used as an innovative tool for empirical research by social scientists. An impressive amount of practical experience has been gathered in recent years. However, there is still a lack of methodological depth with regard to evaluation. This is clearly the case with focus group applications in participatory contexts, where the following critical questions spring to mind:

What are standards of good practice for focus group methodologies concerning the selection of participants, moderation, and programme flexibility? For IA-focus groups, what are adequate ways of conveying information to participants? How can it be ensured that the participants' problem framing will not be replaced by the experts' conceptualisations? Does the use of modelling tools contribute to such a shift? What are critical success factors for focus group methodologies? What are sensible evaluation criteria?

First indications about such critical IA-focus group issues are given in this paper. However, much more experience has to be gained. In our view, future projects should address those topics systematically by integrating methodological and evaluation issues into the research designs (Stern and Fineberg, 1996).

Case studies

In the context of two large research programmes, the EU project ULYSSES[1] and the Swiss project CLEAR,[2] the methodological requirements for IA-focus groups were developed and tested. Other research initiatives are going to apply similar focus group designs for IA purposes. The most prominent example is the EU project Visions.[3]

ULYSSES and CLEAR

ULYSSES (urban lifestyles, sustainability and integrated environmental assessment) is a European Commission-sponsored research project comprising ten partners in eight European countries. It ran from April 1996 until early 1999. The transdisciplinary project CLEAR (climate and environment in alpine regions) is a research initiative funded by the Swiss National Science Foundation for the period 1996–2000. It comprises 15 projects ranging from atmospheric sciences to life sciences and social sciences.

Both projects have explored how to use state-of-the-art scientific inputs, such as computer models, to support discussions on climate change and

other sustainability issues. A key challenge of the projects is that they combine a global issue — climate change — with regional issues pertaining to lifestyles and local (and national) policy. Both projects have tried to organise the assessment process as a discourse between scientists and lay people.

Important differences, however, make the two programmes complementary. First, CLEAR is a transdisciplinary research effort that involves natural as well as social scientists, with natural scientists as the predominant group. ULYSSES brought together social scientists, primarily. Second, CLEAR does both disciplinary research and integrated assessment, while ULYSSES focused on integrated assessment. Third, CLEAR has developed new model tools to be used in IA-focus groups particularly. ULYSSES used existing highly integrated models. Fourth, CLEAR looks at the Alpine region, ULYSSES at seven urban regions in Europe.

IA-focus group setting

Preliminary experiences were collected with pilot focus groups within the two projects from 1996 to the beginning of 1997. This involved conducting about 70 IA-focus group sessions in seven European urban regions. In this pilot phase, a variety of group settings and compositions were tested, ranging from standard one-session groups to panels having three sessions, and from real groups (families) to sampled groups differing with regard to age, gender and political orientation. During this phase, the inputs were tested and further developed.

In a second phase, four five-session, weekly panels were conducted. These consisted of citizens differing with respect to age, gender and professional background. A group encompassed six to eight persons and met in the evenings for about two and a half hours. A small reimbursement was given to the participants. The last of these four panels was linked with local (environmental) policy in Zurich.

In the first session, participants were made familiar with the topic. An important goal of the session was to build trust among the participants and with the organisers, the procedure, and the research at large. The second session was devoted to climate change as conceptualised in the sciences. Background knowledge about processes and impacts was conveyed by fact sheets and, in some groups, a small simulation model presented by a model-moderator.

In the third session, a simulation tool (PCC, personal CO_2 calculator) was introduced that allowed a quick and rough estimate to be made of personal CO_2 consumption, and assessed reduction potentials by lifestyle changes (compare with Schlumpf *et al*, 1999). In the fourth session, pros and cons of selected policy measures, documented on fact sheets, were discussed. In the last session, the citizen report was compiled, based on output from the previous sessions. In the panel that was linked to local policy, the citizens' recommendations were presented to a member of the City Council which was in charge of the local Agenda 21.

Practical experiences

The most basic methodological conclusion that can be drawn from our experiences is that great flexibility is needed in participatory IA research. There is no single 'true' IA-focus group approach but a variety of methodologies with respect to sampling, setting, input and output. The basic methodological choices applied in the second phase proved to be feasible.

Recruiting: Recruiting participants for focus groups is rather time consuming. If done by phone, up to an hour per participant is needed (depending on the quota criteria). Recruiting real groups is often less cumbersome, especially if an organisation actively supports the study. It is advised to over-recruit. To be on the safe side, about eight or nine people should be selected to obtain a six-person focus group. There is a tendency for singles and higher- and middle-class people to be over-represented. The time-span between recruitment and group discussion should not exceed more than a month.

Structure of panel and sessions: No single optimal solution exists. However, organisers are advised not to overload the group with input, activities and topics. As a rule of thumb, do not achieve in a session more than one activity in addition to ordinary group conversation. Possible additional activities are introducing and using a computer model, inviting an expert, producing a collage or a written output and so on. Another rule of thumb: do not address in a session's discussion more than half a dozen different aspects on the focal topic. In the case of climate policy, for instance, half a dozen different mitigation measures is the upper limit. More issues are only processed by groups that share a common background of discourse style and topic knowledge. A third rule of thumb: start with the more general issues and continuously shift discussion to the more specific ones.

Information material: Highly sophisticated expert information is not well received by focus groups. In the worst case, such information can close discussions. This risk is especially accentuated when computer models are used, when scientific documents are distributed, or when invited experts use too much jargon and focus too heavily on technicalities and details. In our experience, expert information material should be separated from discussion stimuli. The closer information is, or can be related to, the experience (and skills) of participants, the better it is received. This is especially important for computer tools.

Computer models: When we used our first simulation model to illustrate climate dynamics, participants criticised it as being too abstract, despite its

easy-to-handle interface, the ability to use it interactively, and its simple model structure. Participants wanted to work with a tool that is sensitive to their activities and choices. They wanted to be informed about the 'climate relevance' of their lifestyle.

So, we developed the PCC (see Schlumpf *et al*, 1999). This is currently used by research teams in Germany, the USA, Canada and Spain. It was useful for stimulating discussion on CO_2 emissions in general and on the potential for reductions in particular. In our experience, bottom-up approaches are well suited for lay people as they require participants' data and, consequently, there is a basic understanding and a feeling of ownership of results. Using the PCC helped participants to gain a realistic picture of how much CO_2 emission could be reduced, and it was more than they originally thought.

The main lessons we learned with respect to computer models and their use in focus groups are:

- models should have manifest links to local and/or personal lifestyle issues;
- they should have a high degree of visualisation and interactivity (which requires small-group work with a model-moderator);
- model structures should be simple and transparent, and operating/running time should be short;
- generally, models are not regarded as a substitute for other information carriers, therefore, model information should be supplemented by written information.

Written output: It is possible that a focus group produces a short report that reflects the group's (integrated) assessments, including uncertainties and open questions. Production of the report must be organised as a process that spans the whole panel programme. Assistance from the research team should be limited to writing services and other ancillary tasks. Approval can be made explicit by discussing the final product. A possibility here is to include policy representatives.

Our experience with written output is ambiguous: the process is very time-consuming (at least one session plus preparatory steps in preceding meetings) and writing reports is not daily practice among the population. Furthermore, if the report to be written is pre-structured, for instance in terms of table of contents, the participants' genuine framing of the topic might become substantially deformed. Our experience showed that length and degree of detail increase when the structure of the report can be defined or changed by the group.

Policy link: Perhaps the most important and critical point of the methodology concerns policy relevance. This can be illustrated by the task of writing a report. The motivation to produce a document strongly depends on the potential policy impact the report may have. If the impact–policy link is not conceivable or existent, writing a report becomes an isolated academic exercise. This very critique was expressed in the first panels. As a consequence, we have embedded the methodology into the environmental policy process of Zurich. First experience is rather encouraging. With respect to the report, for example, the participants wished to address it *and* present it to the city's responsible for the local Agenda 21. After presentation and discussion, one participant concluded:

> "What I want to add is: Usually the politicians make the policies and tell the population what to do. And if we now turned that upside down … if what we have done showed any effects, you could, of course, extend the project. Then opinions and changes would originate from the population and the political level would only have to take them up, give them some form. The population, however, would actually support them and then also realise them. Quite the contrary of what we have now."

Conclusions

The purpose of this paper was to introduce the methodology of IA-focus groups, and to review first experiences with this new participatory tool at the interface between science and policy. We argued that, in the case of complex policy problems, the inclusion of lay people in the assessment process is desirable and necessary as it allows academic insights to be combined with citizens perceptions, concerns and judgements. Policy relevance of research is likely to increase because assessments will be backed by both 'technical' expertise and social valuations. Public input is not only instrumental in gaining acceptance, but essential for making sensible decisions.

Focus groups as well as other participatory tools for lay involvement in complex policy problems require careful planning, thoughtful preparation, and flexibility to change procedures on the demand of the affected constituencies (Renn *et al*, 1997). We introduced a series of standards for good practice for IA-focus groups, and reviewed our experiences collected in two on-going projects, which generally confirmed the feasibility of the methodology. Nevertheless, more practice is needed to improve and evaluate the methodology systematically.

Concerning evaluation, we suggest adopting criteria that are generic for participatory tools. A possible set of criteria is, for instance, fairness, competence, legitimacy and efficiency (Renn *et al*, 1995; 1998). Fairness points at the issue of selection and the rules of the process, which all participants should support. Competence concerns topic knowledge (to minimise post-decisional regret). However, there should be no *a priori* superiority of, for instance, scientific knowledge over anecdotal evidence. Legitimacy concerns the policy link, primarily, and efficiency evaluates cost–benefit ratios.

In our experience, the IA-focus group methodology is especially problematic with regard to

competence and legitimacy. The supply of expert knowledge is difficult and challenging for researchers and organisers of the groups. Input that is too sophisticated and 'expert' is generally not well received, or may even demotivate participants. IA-focus groups should be balanced in informing participants and listening to citizens that bring in their local knowledge, life ex- perience and political and cultural valuations.

As IA-focus groups are policy oriented, their legitimacy depends on scientific standards as well as on policy relevance. The latter must be achieved with regard to formal or methodological aspects (are the relevant interest groups or social strata included?) and policy integration (is there a real link to on-going policy processes?). The first aspect is not a restriction for IA-focus groups, but calls for excellence in sampling. The second demands policy and institutional embeddedness. Informal integration into administrative procedures, for instance within local authorities, may be an important first step in this direction. This can help researchers to include in their agenda the relevant (local) policy topics; it can secure that administrators bring in their policy interests; and it may help to establish the necessary link between citizenship (participants) and policy (representatives). An official policy mandate may further deepen policy embeddedness and raise the policy impact of IA-focus groups.

It has been our conviction that IA-focus groups are instrumental in generating useful integrated assessments about complex policy problems. Such assessments by IA-focus groups might contribute to prudent policy-making, as their recommendations will be informed by insights about what is possible and what is not, and by valuations about what is desirable and acceptable.

Notes

1. ULYSSES is co-ordinated at the Technical University of Darmstadt by Professor C Jaeger.
2. CLEAR is jointly co-ordinated by the Swiss Federal Institute of Technology and the Swiss Federal Institute for Environmental Science and Technology by Professor H Davies.
3. VISIONS is co-ordinated at Utrecht University by Professor J Rotmans.

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