Bielefeld University

Institute for Science and Technology Studies (IWT)
Faculty for Sociology

POLICIES FOR RESEARCH AND INNOVATION IN THE MOVE TOWARDS THE EUROPEAN RESEARCH AREA

Public participation, stakeholders and expertise:

Multi-actor spaces in the governance of biotechnology

State-of-the-art report

by

Gabriele Abels

and

Alfons Bora

Institute for Science and Technology Studies (IWT)

Faculty for Sociology, Bielefeld University

P.O. BOX 100131, D- 33501 Bielefeld, Germany

e-mail: abels@iwt.uni-bielefeld.de / bora@iwt.uni-bielefeld.de

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1. Introduction and scientific background

Science the 1990s, the issue of participation has become prominent in social studies on science, technology and innovation (ST&I) as well as in science policy-making. Participation refers here to different forms of involvement of citizens in general and stakeholders in particular in social processes concerned with conflicts over technologies. Participation – essentially a means of political inclusion – may serve very different functions such as, for example, integration of different social perspectives or interests, legitimisation of outcomes, legal protection of persons affected, or rationalization of policy-making.

Science and technology policy was indeed among the first policy fields where participatory demands were raised with the beginning of the 'participatory revolution'[1] in the 1960s (cf. Nelkin 1984). However, it took some years until concepts for such new forms of citizen participation were (a) developed and (b) practically employed. Especially in the field of technology assessment (TA) concepts for new procedures – so called participatory TA (pTA) – have been developed and put to an empirical test. Prominent examples of such procedures are the Danish-style consensus conferences, citizen's foresights and juries, scenario workshops or stakeholder dialogues (for an overview cf. Abels and Bora 2004).

Today, many organisations are active in the field of pTA. This neither means that pTA is already well established nor that it is currently the most widespread TA instrument, yet, the issue itself is today at the very heart of TA activities (cf. Joss and Bellucci 2002: 5f.). As opposed to other forms so-called instrumental or expertocratic TA, pTA has mainly a democratic function (cf. Bechman 1993). While the former two involves experts and policy-makers and aims at policy-advice, the latter involves a variety of social actors and policy-makers are no longer the only addressee of TA. Participatory TA is considered a feasible and promising way for direct interaction between members of the general public, interest groups, professional experts and policy makers in multi-actor spaces. Advocates of pTA have great hopes in the potential benefits of citizen participation: these procedures should help to motivate citizens to participate, to broaden the cognitive and normative basis, to initiate social learning, to show opportunities for avoiding of overcoming social conflicts, to foster public interests, and to increase the acceptance and legitimacy of political decisions. It is evident that this discourse over pTA is closely linked to the topic of democracy and its empirical shortcomings: the overall objective of pTA is to democratize the governance of ST&I. Enhanced social inclusiveness is equated with democracy, and the degree of citizen participation is considered the key indicator for the democratic quality of a political system. In this way, pTA can be read as an instrument for 'democratic technology assessment' (Abels and Bora 2004).

[1] With the so-called 'participatory revolution' many forms of unconventional political participation have been developed such as sit-ins or house squatting, and conventional forms such as political demonstrations or collections of signatures have become widespread.

While pTA procedures have been applied to a number of technological innovations in many European countries (as well as elsewhere in the world), there is one field that sticks out: Biotechnology (as well as genomics) is a particularly lively field for developing and employing pTA (for an overview cf. Joss 2003). The main reasons for the prominence of biotechnology is that it is perceived as a risk technology affected, on the one hand, by contested scientific expertise and epistemological uncertainty. Both pertain to specific and unspecific 'non-knowledge' (Nichtwissen)[2] that is characteristic for risk technologies (Japp 1997). 'Specific non-knowledge' means that one is aware of what one does not (yet) know; the consequential strategy aims at improving the knowledge base. This is the 'normal case' of disputes over scientific knowledge that can be solved by science involving experts and counter-experts. In contrast, 'unspecific non-knowledge' refers to an area of principally non-available non-knowledge. Protest movements refer to epistemic uncertainty in their critique of risk technologies. Especially with regard to biotechnology, on the other hand a second issue comes into play: biotechnology is considered to involve new or escalate already existing ethical dilemmas. This is transformed into the basic question over who should decide over biotechnology (actors), how (procedure) and based on what grounds and knowledge (expertise). Therefore, both dimensions or topics make biotechnology prone to pTA, because they relate to questions over risk regulation and moral goods. In this sense, governance over biotechnology is linked to fundamental issues of democratic legitimacy.

Given the lively political and academic debate, it is amazing that systematic and theoretically informed studies lack behind. This holds true for empirical, especially comparative studies on the practical relevance of participatory science governance, even though a number of research projects (mainly case studies) have been conducted in the last years that are highly informative and most relevant. The lack is even more urgent regarding theoretical reflection. What is needed is pTA studies that link ongoing developments to broader social and political changes and their conceptualisation in social theories. This is not to say that pTA is without any theoretical or rather conceptual foundation, yet the question is what level of theory is necessary. Many of the attempts to theorise pTA can be described as either merely normative – i.e. without any force to deliver relevant social scientific descriptions, not to speak about explanations – or as 'tool box theories' meaning that they are themselves built as sort of a tool box: syncretistic mixtures of incompatible fragments.

In this report, we aim to present the state of the art with regard to the relation between public participation, stakeholders and the role of expertise in social space of science governance. Our particular focus is on the field of biotechnology.

Against the background of the sketched out desiderata, a state-of-the-art evaluation is an indispensable first step to identify future research needs. Furthermore, a methodological evaluation of the research conducted so far is an important for the development of future research designs. In

[2] The English term 'ignorance' does not really capture the meaning of 'Nicht-Wissen', since it assumes personal intention rather than structural problems.

addition to a review of the relevant pTA literature, which is already documented and discussed in detail in Abels and Bora (2004), this report draws heavily on the results of an international expert workshop under the auspices of PRIME.[3] The workshop 'Public participation, stakeholders and expertise: An assessment of ST&I studies on multi-actor spaces in the governance of biotechnology' was organised by the authors of this report; it took place from 2-4 December 2004 at Bielefeld University, Germany. We are most thankful for the input to the workshop from all participants (list of workshop participants cf. Annex 1). All remaining errors in this report are ours.

In the following, we firstly introduce the objectives and the outline/background of the expert workshop (section 2). We then discuss some general theoretical/conceptual topic that are relevant in the literature and which were also important in the workshop (section 3). After that, we present the results as to the five central questions of the workshop (section 4) and conclude by summarizing some results for future research (section 5).

2. Objectives and outline of the PRIME expert workshop

The expert workshop was organized under the PRIME programme line 'Multi-actor space and the governance of research and innovation in Europe' and was funded by PRIME. The objective of this programme line is to understand the emergence and stabilisation of new multi-actor spaces and their governance arrangements as well as to study the role of key selected actors linked to new multi-actor spaces. Biotechnology is conceived to be an area most promising for the study of multi-actors spaces, their development and dynamics since this area of technology development is highly controversial.

Against the background of the above-mentioned empirical as well as theoretical desiderata, the overall objective of the PRIME expert workshop was an *integration of research activities*. In addition, the specific objective were threefold:

(1) to *explore the state-of-the-art* regarding new modes of governance ST&I policy making (especially in the field of biotechnology), especially on the subject of involvement of civil society actors – above all, stakeholders – and the role of expertise;

(2) to *discuss future research needs*, to identify the relevant theoretical and methodological issues (above all comparability); and

(3) to *identify shared interests* and research agendas as well as discuss feasibility for jointly executed research projects of PRIME contractors.

[3] PRIME stands for 'Policies for for Research and Innovation in the Move towards the European Research Area'. It is a Network of Excellence (NoE) involving 42 member institutes from about 20 countries and is funded by the European Commission under the 6th Framework Programme for research and development. For more information see: http://www.prime-noe.org/

In the last few years, a number of research projects and thematic networks have investigated pTA procedures or new modes in ST&I governance in a more general sense. They were identified as central to respond to these objectives. These studies – often funded by the EU – usually take on a comparative approach. They differ with regard to their theoretical and conceptual premises, their methodology, their research design and the case studies scrutinized. However, they have something in common, i.e. an empirical interest in the role of civil society, e.g. of citizens and interest groups (stakeholders), and the interaction with experts in concrete space of pTA or ST&I governance with a strong focus on the field of biotechnology and genomics. Representatives of the following projects and thematic networks were invited to participate in the workshop (for details cf. Annex 2): **EuropTA, ADAPTA, PABE, PARADYS, PubAcc, STAGE, TAMI**.

These projects and thematic networks make most valuable contributions to the empirical and theoretical investigation of multi-actor spaces in ST&I governance and particularly PTA. An in-depth evaluation of these projects and networks allows inter-case comparison because the research projects/networks focus (whether exclusively or not) on applications of biotechnology (esp. genetically modified food, deliberate release, plant biotechnology) or genomics (table 1).

Table 1: Overview of biotech/genomics case studies included in thematic projects[4]

	EuropTA	**ADAPTA**	**PABE**	**PARADYS**	**PubAcc**	**STAGE**
agricultural biotechnology						
deliberate release of GMOs				X	X	
plant biotechnology			X	X	X	X
GM food	X	X	X			X
genomics/biomedicine						
human genetics						X
genetic testing		X				

Furthermore, an in-depth evaluation of the projects and thematic networks allows for promising inter-country comparisons. The projects and networks cover all EU-15 member states (except for Luxembourg) as well as some of the accession countries that recently joined the EU, and, finally, Switzerland and Norway as non-EU countries (table 2). The countries included in the empirical research are an excellent starting point for further comparative analysis, because they represent a variety of political systems with heterogeneous political cultures, different systems of interest representation and mediation as well as diverse historical traditions of civil society involvement in policy-making. We assume that this heterogeneous political context is reflected in the concrete participatory processes and multi-actors spaces. In sum, these projects and networks represent an

[4] The TAMI project is not included in table 1 since it does not take such a thematic approach. However, it is of great added-value because it evaluates ongoing TA procedures with a focus on their impacts on policy-making.

extraordinary rich body of empirical data as well as theoretical and methodological approaches. A comparative and in-depth analysis allows for fruitful findings as to the role of citizens and especially interest groups as well as the role of expertise.

In order to link these empirical findings to the more general theoretical debate about governance and participation in policy-making, some additional experts were invited. We consider these explicit linkages of the specific debate about pTA to broader social and political transformations and their scholarly reflection in social theories (in a broad sense) of paramount importance for future pTA studies. In fact, several scholars of pTA have begun to make such linkages (e.g. Joss, Saretzki, Bora), yet they need to be further elaborated.

Table 2: Overview of countries included in projects and networks

	EuropTA	**ADAPTA**	**PABE**	**PARADYS**	**PubAcc**	**STAGE**	**TAMI**
EU member states							
Austria	X						
Belgium							
Denmark	X	X			X	X	X
Finland						X	
France		X	X		X		
Germany	X	X	X	X	X		X
Greece						X	
Ireland				X			
Italy			X	X			
Netherlands	X	X		X		X	
Portugal		X			X	X	
Spain			X				
Sweden				X		X	
UK	X	X	X	X	X	X	X
EU level							X
accession countries (until 2004)							
Czech Republic					X		X
Hungary				X			
Latvia					X		
Poland							X
non-EU country							
Norway						X	
Switzerland	X						X

3. General theoretical/conceptual pTA debate

Some theoretical/conceptual themes (and their methodological implications) have become central in the relevant pTA literature and were consequently prominent in the workshop. Firstly, since its inception in the last decade, we can observe a shift in pTA procedures; while they were initially mainly oriented towards the political system, today they are increasingly directed towards the public sphere (Joss 2002). If pTA procedures are effective in the sense of having an '*impact'* on the political and/or public sphere and in which way, is a key question, yet still not sufficiently answered. From the very beginning, the evaluation of pTA was considered a necessity and not a luxury (Joss 1995). So far, there is a severe lack of studies that systematically measure impact; the EuropTA project (Joss and Bellucci 2002) as well as the TAMI network (Decker and Ladikas 2004) go furthest in that direction. However, the conceptualisation of impact is highly problematic and does require a theoretical framework about the functioning of policy-making and what is considered 'the public' in liberal democracies; here social sciences provide a number of different models. Therefore, impact measurement is not to be left to TA practitioners (only) as part of the evaluation of their work, but requires explicit linkages to theoretical frameworks and debates in the social sciences. Based on such theoretical design, impact evaluation is then a second empirical step as a means to an end rather than a means in itself. Furthermore, given the claim that pTA allows for social learning due to its deliberative nature, learning could be a central focus of evaluation studies, again, requiring a theory of social learning. Yet, there are so far no studies analysing *social learning*.[5] How can we conceptualise institutional learning? Some empirical studies (e.g. on consensus conferences) refer to learning effects, however, until now without systematic reference to an extensive social science literature about learning theory. So when used, the term learning is completely empty in theoretical and methodological respect. Looking at pTA from a 'learning perspective' it might be possible to develop instruments for the evaluation of learning processes.

Secondly, the shift from the narrow political to the broader public sphere in pTA is reflected in a different framing of the debate about science, technology and society. Today, this debate is framed in more general terms *governance*. The use of the governance concept (in fact, there are many different concepts in the social sciences) allows relating this highly specific debate to more general social and political developments and to theoretical concepts of democracy. Governance has become a catchword in the social sciences in recent years meaning different things. The dominant understanding in political science and sociology is that it refers to a different mode of societal interaction. Rather than hierarchical and state-centred top-down steering, governance implies a process in which state and social actors interact and are interdependent. While governance as such is inevitable in modern society, the question is how to make it participatory and what are the actual advantages and shortcomings of 'participatory governance'. The major advantage is seen, above all,

[5] Some evaluations focus on changes in opinions among the participation of pTA procedures, yet this is not to be confused with learning.

in enhanced legitimation. Based on Robert Dahl's discussion of the democratic dilemma in liberal democracies between system effectiveness on the one hand and citizen participation on the other hand (Dahl 1994), the question is how to balance these different modes of legitimation in different political-social contexts. In general, deliberative designs may serve both purposes and are not restricted to the participation aspect; especially stakeholder involvement in deliberative designs serves instrumental, effectiveness reasons. Different strand in democratic theory give different answers to this dilemma. Participatory governance is rooted in the tradition of deliberative democracy. This tradition is also prominent in pTA and debates about science governance. Several recent studies embed single pTA procedures in theories of deliberative democracy (cf. Einsiedel 2000; Smith/Wales 2000; Braun et al. 2002; Foltz 1999).[6] However, the actual development of diverse pTA procedures refers to the need for a more differentiated theoretical debate and embedding of pTA. Deliberative theories are not the only point of reference for pTA, but other theories such as pluralism make important contributions (cf. Laird 1993; Baron 1995). A starting point for a more in-depth analysis is a typology of pTA procedures that links the actual forms of different procedures to their assumed and real functions. In the literature, we find some first attempts for such typologies such as Joss (2003) or Braun et al. (2002); the most advanced typology is presented by Abels and Bora (2004). It differentiates forms of pTA according to the criteria of heterogeneity of actors involved; it distinguishes between seven different models and assesses the function of these models with regard to theories of democracy.[7]

Thirdly, *science governance* involves a broad concept that claims to go beyond the old deficit model of 'public understanding of science' (cf. Irwin and Wynne 1996) by assuming that there is per se no hierarchical relationship between the actors involved. The deficit model is based, in short, on the idea that scientists informing the public can solve conflicts over technologies; knowledge is considered the key problem; this could be phrased as 'educational governance.' This is still one of several possible modes of science governance, which hints to the need for a more thorough clarification of the term itself rather than taking it as given. As the STAGE project (Healey et al. 2004) illustrates, other possible modes are *discretionary* (government (and science) acting in the public interest), *corporatist* (stakeholders producing workable compromises), *market* (establishing the institutional conditions for economic success), *agonistic* (making policy under conditions of confrontation) and, finally, *deliberative* governance (improving the quality of decisions through lay

[6] For example, Smith and Wales (2000) argue in an article entitled 'Citizens' juries and deliberative democracy' that citizen's juries fulfil key conditions of deliberative democracy such as the inclusion of affected groups, an open and reasoned discourse, and a more active civil society. Braun et al. (2002) interpret in their evaluation for the German Science Policy Programme the deliberative model as a republican model that allows – and this is important – *unorganised* citizens to deliberate freely on their own interests.

[7] These models are (1) dialogue model involving stakeholders/interest groups only; (2) an expert-stakeholder model of pTA; (3) a decision-oriented model as part of the administrative procedure involving affected persons; (4) the consensus conference model as the most prominent layperson-expert procedure; (5) an extended consensus conference model involving also interest groups; (6) voting conference model involving laypersons, experts, interest groups as well as policy-makers and introducing a voting element; and finally (7) the scenario workshop model involving again all four social groups, especially affected persons at the local level. Model 6 and 7 are considered 'balanced' insofar as they include a wide variety of possible social actors.

engagement). Participatory TA is often confused with just the latter mode of science governance, ignoring that de facto different modes co-exist and often even overlap. This requires analysing the interaction of different modes. This clearly brings in the issue of power and how to explain the development of participatory/deliberative science governance as a means of solving policy problems in one field but not in another.

Fourth, so far a major focus of the pTA debate is on studying the relationship between social actors and policy-making. Most empirical studies (e.g. EuropTA, PubAcc) focus on this kind of social interaction. The term 'science governance' indicates, however, that the social regulation of science and technology comprises more dimensions than regulatory policies and even more than policy-making. Science governance is also related to other forms of de facto pTA such as entrepreneurial and administrative decision-making procedures as well as decisions in single cases, or the every-day dimension of regulating and shaping research (cf. PARADYS).

Fifth, the governance concept is linked to the idea of *citizenship*. Yet, citizenship is a historic and dynamic concept that consequently needs to be conceptualised in specific contexts. Citizenship has traditionally been conceived as state-centred referring to the relationship between the state and 'its' citizens. This narrow concept needs to be extended to the societal sphere of governance. One example of such extension is Philippe C. Schmitter's concept of holder that addresses the question of 'who should participate.' According to Schmitter, holders are persons who participate because of they possess either some quality or resource (e.g. expertise) that entitles them to participate. With regard to multi-actor spaces of ST&I two holder positions are most important: knowledge holders and stake-holders. In methodological terms, this implies to reconstruct citizenship from 'local', specific context rather than assume them as given, and to ask why they evolve in some contexts but not in other. At the same time, the relationship between a 'new' citizenship status and the existing and constitutionally protected ones has to be clarified and determined. New governance modes can and should be compared to old modes in order to see if and what is actually so new about them. This also involves to link these new modes of participatory governance to existing ones and to clarify how they relate to given institutions of representative democracy, and to analyse the pitfalls and advantages of different modes, including the participatory, deliberative one. The PARADYS project is an exception in the way that it does link the analysis of pTA to a theory of 'communicated citizenship' evolving in administrative contexts. Citizenship is regarded as empirically constituted within the interactions between administrators and different groups of citizens; in the interaction, it becomes a membership category and contested concept (cf. Bora and Hausendorf, 2004; Bora and Hausendorf 2005; Hausendorf and Bora 2005)

4. Results and discussion of key questions

To insure a comparative perspective on the empirical research studies and networks presented at the workshop, we asked the participants to address in their presentations the following five key questions:

1. What exactly is the new *governance mode* scrutinized in your project?
2. What is the *role/position of stakeholders* in the governance mode?
3. How does holding a stake relate to *expertise* contributed to the issues at stake? And how do stakeholders relate (a) to science and (b) to unorganised citizens?
4. Are there any specific features or effects that relate to the field of *biotechnology governance*?
5. What *methodological and methodical approaches* are fruitful for studying these questions?

4.1. What exactly is the new governance mode scrutinized in your project?

There is currently a shift from science policy-making to *science governance* not only at national level, but also at European level and especially with regard to biotechnology (e.g. EuropTA, STAGE, PARADYS, cf. also Abels 2002; Jasanoff 2005). At national level, it is not only established democracies that encounter citizen's claims for changing governance in order to enhance democracy, but also new EU member states (accession countries). Notwithstanding, political institutions and cultures shape the manifold ways such claims are addressed and the form in which they are realized. Most participatory modes scrutinized in the various projects can be labelled as *new* modes of governance in ST&I governance. New refers to the integration of actors into the pTA procedure that are usually excluded in science policy-making such as lay-persons. A key feature is the involvement of laypersons and stakeholders. Yet, some procedures are not so new, for instance, public hearing in legal-administrative procedures, planning processes or also negotiated rule making. The latter, nevertheless, can now be studied as an aspect of governance, rather than as a mere bureaucratic exercise. It is important to see that governance has very distinct forms, varying from context to context. Therefore, a general assessment is not only impossible, but essentially an erroneous assumption.

While most participatory procedures emphasize the role of citizens, new models such as scenario workshops or voting conferences do not consider 'citizens' a homogenous group. Instead, they take into account 'organised citizens' such as representatives of interest groups (stakeholders); the focus is on the dialogue between these groups of laypersons and unorganised citizens. Scientific experts (and sometimes policy-makers) are part of these procedures and sometimes they help to mediate the communication between stakeholders and laypersons. Theses 'balanced models' (Abels and Bora 2004) seem promising, because they respond to the fact of a pluralist society in which interest groups have a privileged position. Yet, while they represent particular interests, in their communication with unorganised citizens they have to argue their case in a deliberative style

aiming for the construction of the common good. Yet, while many of the new forms of pTA are deliberative, some are more deliberative than others. In fact, some procedures are more oriented or at least do have a bargaining element involving exchange of resources rather than discourse over good arguments. How specific procedures work in real policy contexts relates also to the features of the procedures (form aspect). This means that contexts of application are becoming increasingly important.

In this sense, 'Europe represents a distinctive social and institutional laboratory' (Healey et al. 2004: 11) for science governance, even though there is no singly paradigm. As for the deliberative mode, the measurement of policy impact is problematic. Even the participatory modes are exclusive in the way participants are selected and engagement does not lead to consensus, but in fact increases social conflict. If their function is real or just legitimising is not yet clear. For future research, two aspects are important: In what kind of field does participation take place? There is a tendency to polarise 'science' and 'the public'; the latter is engaged in ethical debates, but not in scientific debates themselves.

The workshop very clearly showed that the results of the particular projects are not yet sufficiently integrated. A systematic comparison in this respect is still missing.

4.2. What is the role/position of stakeholders in the governance mode?

The definition of the term 'stake-holder' is not very clear in the different contexts; sometimes it relates more to interest groups, sometimes even government bodies are enclosed. A key question is what is considered a legitimate stake as prerequisite for participation. Depending on the definition, the access of stakeholders to and their position in the specific governance mode varies. Involving stakeholders in deliberative designs does bring along serious pitfalls or even quagmires: While deliberative designs in general may serve both purposes of system effectiveness and citizen participation, especially stakeholder involvement in deliberative designs serves instrumental, effectiveness reasons. At the same time, stakeholders make instrumental use of deliberative designs (cf. Hendriks 2002): they participate when the process offers some direct value to them (e.g. PR exercise, science communication event, collect customer or citizen feedback, or platform for advocacy). For interest-based groups the deliberative condition is a major challenge because it differs from the bargaining mode. It is empirically and theoretically interesting to analyse what kind of stakeholders actually participate, how, why and to which effects – and who does not. For example, in the ADAPTA project, stakeholders are present in various public arenas, in the PARADYS project holding a stake is part of a more complex social position. In general, participatory procedures face the risk of *stakeholder capture*. Consequently, future research has to, firstly, clarify the rationale to set up pTA exercises, secondly, elucidate the social figures of stakeholders, citizens, concerned publics etc. from a sociological perspective, and, thirdly, to ask the question who actually gains from pTA exercises.

Studies on participatory TA essentially assume deliberative designs to be successful and exclude the distressing possibility of *governance failure*. Yet, studies on failed procedures can shed light on the complex social conditions in multi-actors spaces that have to be fulfilled for a procedure to be successful. In addition, new statuses (in the sense of social positions in a decision-making process) develop incrementally and 'locally', they are usually not designed and given a priori (for instance by the state). The relationship between a new status and the existing and constitutionally protected ones has to be clarified and determined; for example, it is important to look for contradictions and tensions. As regards the normative foundation for stakeholder involvement, there is not just one model of citizenship in the theory of democracy which can serve as a normative foundation. It does not seem advisable to construct new rights and positions.

4.3. How does holding a stake relate to expertise contributed to the issues at stake?

Expertise is becoming a major topic in ST&I studies (Collins and Evans 2002). It is obvious that stakeholders bring in specific expertise; in this sense, they are also knowledge-holders (to use Schmitter's distinction). Expertise is their major resource and one of the main reasons for involving them in participatory procedures. They often represent a certain aspect of expertise *in persona*. At least, they are regularly accompanied by interest-bound expertise (stakeholder-experts). In this sense, there may be a major overlapping between expertise and strategic intelligence. As regards stakeholder expertise, there are certain quality assessment criteria for scientific expertise that can also be applied to stakeholder expertise. Future research could engage in quality assessments of different forms of expertise contributed to a pTA.

The core insight is that if persons act as stakeholders, their relation to other participants is primarily instrumental: they engage in a participatory procedure whenever it best suits their interests. Their *relation to science* very much depends on their social position respectively on the public arena in which they are active. *Citizens* may be stakeholders, too; the distinction is not clear-cut. Stakeholders may be counterpart to citizens; so sometimes the involvement of lay citizens is a major challenge for stakeholders, especially when they stick to a pluralist model. Yet, at other times stakeholder may serve as sources of information for citizens. The strength and weakness of stakeholders and their involvement in policy-making and in single case decision-making is just one indicator for their attitude towards citizen engagement in ST&I governance.

In general, in the relevant literature as well in actual pTA procedures, there are different images and concepts of citizens and 'the public' depending on the governance mode. For example, 'discretionary' or 'educational' governance is rather based on the deficit model of the public (cf. STAGE final report), while for a 'corporatist' mode citizens are only recognized as organized citizens representing interests.

4.4. Are there any specific features or effects that relate to the field of biotechnology governance?

As the relevant literature shows, the issue of risks is a prominent topic in participatory procedures related to biotechnology in particular and ST&I policies in general. Risk is closely related to a specific kind of knowledge, i.e. scientific and technical knowledge. Consequently, scientific expertise (and 'the scientist' as a social position) holds a prominent place also in deliberative designs involving laypeople. At the same time, the *risk discourse* is linked to the fundamental issue of epistemological uncertainty and contested knowledge invoking counter-expertise. In the biosciences, we also see the construction of 'scientific citizens' (Irwin 2001) and along with that the call for pTA.

While expertise and counter-expertise can – principally – be debated in scientific terms, and conflicts can be solved by general means and instruments provided by science as a social system, the *risk discourse* tends to cover up chief issues in the public discourse such as *social needs and benefits*. Technology often serves as a trigger or marker for broader social issues over, for example, property rights or social needs. These are essentially normative questions. Moral issues are a second prominent topic (cf. Eurobarometer data such as Gaskell and Bauer 2001; Bauer and Gaskell 2002). It is this *ethics* dimensions that makes biotechnology prone to participatory procedure; some authors argue that ethics has taken centre-stage also in policy-making over biotechnology (Lindsey et al. 2001). The question is what kind of knowledge is contributed and integrated into the pTA by whom, how and to what effects; and does participation take place with regard to the normative discourse or also the risk discourse. The empirical studies illustrate that citizens are most often engaged in the ethics discourse over ST&I, less so in the scientific debate. There is a strong tendency to polarise 'science' and 'the public' which builds on the still prevalent notion of 'sound science' that has to be kept away from 'public engagement.' Yet, the question is: What is the proper knowledge in ST&I policymaking?

4.5 What methodological and methodical approaches are fruitful for studying these questions?

Current research is dominated by a qualitative, inductive, and comparative case study methodology. This methodology – whether on closed or running cases – has its severe pitfalls and strengths. Most case studies enclose a number of research methods such as participant observation, interviews, document analysis etc. Recent research draws on linguistic and hermeneutic methods originally from conversation analysis (PARADYS). Future research needs to broaden the methodological and methodical repertoire: As regards the key questions of impact and social learning, long-term studies are required; this requires more profound theories about impacts and learning, but also methodologies to measure and evaluate these complicated social processes. In addition, the European perspective has to be broadened and experiences from other parts of the world should be integrated to scrutinize the cultural and political background of participatory procedures. New development in pTA integrating stakeholders and citizens require further attention as does research into

the capacities and willingness of stakeholder in public engagement (including the intra-organizational preconditions and rationalities). Open questions are for example:

- How can we evaluate the quality or value-added of participatory debate?
- How can we demonstrate first-, second- and third-order learning in a particular participatory procedure?
- How can we deal with (quantitative) research findings in (qualitative) judgment and deliberation processes?
- How can we theoretically construct 'the public'? As population, human beings, consumers, users, stakeholders, subjects, citizens, target groups, pupils?
- How can we construct what are the 'stakes' and who are the 'holders' in wicked, messy, unstructured problems?
- How can we deal with stakeholders if the 'stakes' are short-term, but the issue demands require a long-term perspective?

5. Conclusions for future research

Since the 1990s we can observe a widespread and undifferentiated 'participation euphoria' in the scientific and political discussion on national as well as on European level. This general and unspecific support for stakeholder involvement and public participation has to be confronted with questions about the empirical relevance of participation on the one hand and its normative reasons on the other hand. A strong differentiation in the field of ST&I governance requires for very subtle analysis of the possible functions of any forms of participatory decision-making. Theory and methodology have to be further developed in order to cope with these difficulties.

On a *methodological level*, the following research strategies seem promising:

- collection of a set of 'raw' case studies as research infrastructure
- cross-country comparison beyond European countries, especially in order to study the influence of institutions and political culture
- cross-sectoral comparison over different technologies
- install some sort of reflection group on pTA
- comparative research that extends the framework, e.g. comparing pTA with other modes of governance
- focus on stakeholder capacity and willingness to engage in multi-actor spaces depending on policy context

On a *theoretical level*, the most general conclusion is that there is an urgent need for more theoretically informed research on pTA meaning that is on based on and linked to social theories in a broad sense. Overall, TA research is not yet very closely linked to basic theoretical concepts in

the social sciences; this missing link is one of the weaknesses of the TA community. In many cases it prevents scientific analysis from thoroughly scrutinising the structural and functional achievements, the different forms of pTA are able to deliver.

Finally yet importantly, the debate about participatory TA is so far strongly linked to Dahl's second democratic transformation, i.e. the rise of representative democracy in the nation state. We may be able to perfectly integrate participatory and representative institutional designs at the *national* level, however, this does not address the still-ongoing third transformation of democracy Dahl describes: the influence of *internationalisation* or globalisation on societies, economies but also on national polities. There is an active debate about possibilities and designs for transnational democracy, especially for the European Union. What this may imply for participatory TA is another open, yet urgent question that has to be addressed.

The following points shortlist some of the desiderata that pTA researchers have to attend to when developing into an innovative and productive scientific community that can contribute not only to science and technology studies, but to more general questions of political and social transformation:

1. Differences

"Participation" has many faces. It is crucial to be aware of the differences in policy issues, application contexts, procedures, national frameworks etc., when talking about participation. There might be very different functions for participation, when we take a closer look at these distinct circumstances. In our view, science policy not always is aware of these differences. From this point of view, it might be necessary to rethink the very general normative consequences and recommendations in some of the central EU policy papers (White paper on governance, Science, Society and the Citizen in Europe, e.g.). The normative function of participation, therefore, should be clarified with respect to every particular procedure and with respect to the constitutional and legal framework in every given case. The function of participation should be made explicit in legal texts and policy documents, a task for research (first), but then of course, for research policy. A procedural differentiation between participation in legal-administrative (every-day) procedures on the one hand, and "alternative" forms of citizen participation with a more policy-oriented function on the other, should be made. Any implementation of "alternative" forms of stakeholder participation should be prepared and accompanied by a precise scientific analysis of the function and structure of participation in the particular model.

2. Procedures

One focus in the debate is on procedures; this is an interdisciplinary subject. Our observation is that the links between science and technology studies and procedural research – for instance the procedural justice research that has been carried out all over the world since about thirty years –are still very weak or even non-existing. In this respect, further integration activities would be of major value. This is a task for research and for integration actions, e.g. in the PRIME context.

3. Theory

Three points are of particular interest with respect to general social theory in this field:

a) Evaluation, self-observation: A meta-conceptual point should be emphasized here: The existing empirical studies are highly informative and relevant. Nevertheless, they do not yet treat all basic questions of theoretical and methodological kind. The well-known general issues of evaluation, methods, criteria, definitions, and concepts etc. are still rather under-developed in the area of pTA. How do we observe and evaluate our own exercise? A strong effort in conceptualisation and systematisation is still needed.

b) Basic concepts: The workshop clearly illustrated a strong impact of theoretical concepts while at the same time there is insufficient/weak reflection about this theoretical basis. Take, for instance, the idea of pTA as a tool box that can be used in order to reach certain goals. Based on this instrumental concept, one will probably come to a completely different understanding of our subject, to a different research design, and to completely different policy recommendations than one would from a slightly modified theoretical starting point, such as the idea of pTA as a way of co-production of social interpretations, or from pTA as a competing and irritating way of observing the world of technology. Interestingly, these theoretical differences do not play a major role in the pTA debate until today.

c) Scientific advice: The same holds true for the description of the role of pTA itself in the policy-making process. It often seems as if the relation between pTA and policy-makers is conceived according to the deficit-model that we ourselves criticise so heavily. How do we understand our pTA expertise in relation to politics? Do we have theoretical models to talk about "impact" at this point?

4. World society

Has the debate about research policy arrived at the current state of the art, when we look at sociology and political science? When thinking of the global dimension of research and research policy, how can we speak about our topic? What are "stakes" in this respect and who are stakeholders? What are the conditions, limitations, and possibilities of pTA under these circumstances? Do we need a comparative or rather a world society perspective? These issues require a scientific debate, if the TA community wants to keep pace with the dramatic and far reaching political and social changes we are contemporarily facing.

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Annex 1: List of workshop participants (alphabetical order)

Dr. Gabriele **Abels**, Institute for Science and Technology Studies (IWT), Bielefeld University, Germany

Prof. Alfons **Bora**, Institute for Science and Technology Studies (IWT), Bielefeld University, Germany

Dr. Michael **Decker,**, Institute for Technology Assessment and Systems Analysis (ITAS), Forschungszentrum Karlsruhe, Germany

Prof. Hubert **Heinelt**, Centre for the Interdisciplinary Study of Technology, Technical University of Darmstadt, Germany

Dr. Carolyn **Hendriks**, Australian National University, Research School of Social Sciences, Australia

Prof. Robert **Hoppe**, Faculty of Business, Public Administration and Technology, University of Twente, Netherlands

Prof. Alan **Irwin**, Social and Environmental Studies, The University of Liverpool, UK

Prof. Birgit **Jæger**, Roskilde University, Denmark

Dr. Pierre-Benoit **Joly**, Institut National de la Recherche Agronomique – Unité TSV, Ivry-Sur-Seine Cedex, France

Dr. Teresa **Kulawik**, Dept. of Gender Studies, University College of South Stockholm, Sweden

Dr. Justus **Lentsch**, Institute for Science and Technology Studies (IWT), Bielefeld University, Germany

Dr. Patrick **O'Mahony**, Department of Sociology, University College Cork, Ireland

Prof. Thomas **Saretzki**, Department of Environmental Studies, University of Lüneburg, Germany

Malte **Schophaus**, Institute for Science and Technology Studies (IWT), Bielefeld University, Germany

Dr. Helge **Torgersen**, Institute of Technology Assessment of the Austrian Academy of Sciences (OEAW), Vienna, Austria

Dr. Barend **van der Meulen**, University of Twente

Prof. Peter **Weingart**, Institute for Science and Technology Studies (IWT), Bielefeld University, Germany

Annex 2: List of participating projects and thematic networks

ADAPTA: Assessing Debate And Participation in Technology Assessment in Europe (1998-2000)

- Research project: comprehensive analysis of the interactions between pTA vents and wider public debate in various institutional and political contexts; analysis of the interactions between these various forms of formal and informal public participation process in the area of biotechnology in six European countries (Denmark, France, Germany, Portugal, The Netherlands, and the United Kingdom)
- Objectives: providing a better understanding of the role of structured participatory processes (such as pTA)
- Final report: Joly and Assouline 2001

EuropTA: European Participatory Technology Assessment (1998-2000)

- Research project: comparative analysis of participatory procedures in six European countries (United Kingdom, Austria, Germany, Netherlands, Denmark, Switzerland)
- Objectives: advancing the understanding of the role of PTA by systematically including the societal and institutional context. Furthermore, it strived to help furthering the development in PTA practice, and to give guidance for the implementation of participatory methods as a support function for public discourse and decision-making.
- Final report: Joss and Bellucci 2002

PABE: Public Perceptions of Agricultural Biotechnologies in Europe (1998-2000)

- Research project: focuses on the factors shaping the diversity of viewpoints of citizens and stakeholders about agricultural biotechnologies and related food-products in five European countries (United Kingdom, France, Germany, Italy and Spain)
- Objectives: providing policy makers with insights into the conditions necessary for improving levels of public trust in agricultural biotechnology policies
- Results: http://www.inra.fr/Internet/Directions/SED/science-gouvernance/PABE/PABE-Final-Report.pdf

PARADYS: Participation and the Dynamics of Social Positioning (2001-2004)

- Research project: concerned with the interaction between citizens and administrators in licensing procedures for the deliberate release of living modified organisms in seven European countries (Germany, United Kingdom, Ireland, Netherlands, Sweden, Italy, Hungary)
- Objectives: contribution to the analysis and comparative evaluation of European governance practices and is directed towards a theory of communicated citizenship
- Final report: http://www.uni-bielefeld.de/iwt/paradys/English_start.html; Bora and Hausendorf 2004; Bora and Hausendorf 2005; Hausendorf and Bora 2005

PubAcc: Analysing Public Accountability Procedures in Europe (2001-2004)

- Research project: relevance of public accountability procedures for achieving publicly legitimate and sustainable governance of socially complex issues, at the transnational level as well as at the national level in seven European countries (United Kingdom, Czech Republic, Denmark, France, Germany, Latvia, and Portugal).
- Objective: assess the functional role of public accountability, and particularly the relationship between public accountability procedures, on the one hand, and the legitimacy and effectiveness of policy- and decision-making on the other
- Results: http://www.cts.cuni.cz/~pa/index_e.html

STAGE: Science, Technology and Governance in Europe – A European Network (2001-2004)

- Thematic network: The findings are based on 26 case studies, some of which focus on biotechnology, take from eight European countries (Denmark, Finland, Greece, the Netherlands, Norway, Portugal, Sweden and the United Kingdom); its great strength is the dissemination strategy that tries to bring results to stakeholders in the process including policymakers in industry, government and academia across Europe, as well as NGOs and grassroots movements operating at a national or European level
- Objectives: developing a conceptual framework of how European countries confront common issues of science and technology governance, including those arising from major EU initiatives and European regulation with a special emphasis on stakeholder involvement
- Final report: http://www.stage-research.net/STAGE/documents/STAGE_Final_Report_final.pdf

TAMI: Technology Assessment in Europe: between Method and Impact (2002-2003)

- Thematic network: analysis of the implementation of TA methods; focus is on their premises, their capacity for problem-solving, and their applicability; TAMI partners are from major European TA institutions in six countries (Germany, United Kingdom, Denmark, Switzerland, Czech Republic and Poland) and from the EU (STOA).
- Objectives: create and promote a structured dialogue within the TA community as well as between TA experts and policy makers in order to improve the impact of TA in ST&I policy-making; identify the impact of various TA methods and to suggest "best practices" for the implementation
- Final report: Decker and Ladikas 2004; http://www.ta-swiss.ch/www-remain/ reports_archive/ publications/2004/ 040224_TAMI_finalreport.pdf