

The general public lacks the knowledge and time to contribute to debates about new technologies.

Introduction

The essay aims to discuss whether the general public should be involved in debates about new technologies or not. It takes this statement, which implies that the 'public' is a self-contained group and 'knowledge' (or 'non-knowledge') is adverse to other self-contained groups and knowledge as a starting point. The claim is challenged on discussing different aspects of public participation in risk issues, namely the significance of trust, culture and social identities as well as of hazard construction. This widening of the debate will help to enlighten why the essay title itself does not allow to draw the right conclusion: It is not the question whether the public has the knowledge and time to participate in the debate about new technologies, the question is far more what public participation means and what results are produced.

The essay starts therefore on debating the meaning of the terms 'public', 'knowledge' and 'new technology' with the help of definitions given by Bauchspies *et al.* (2006), Berger and Luckmann (1967), Habermas (1991), Marshall (1998), Mateus (2011), Mc Carthy (1996), Rawlins and Bowen (2005) and Wilkinson (1983). Based on their definitions, the theoretical background is grouped along aspects relevant to public participation such as trust, cultural and social identities and hazard construction. Relevant discourses in this regard can be found at Beck (1992, 1998), Durant (1998), Hohenemser *et al.* (2000), Irwin *et al.* (1996), McKechnie (1996), Michaels (1996), Slovic (2000), Wilkins (1991) and Wynne (1996a, 1996b). Furthermore the practical implications of this debate and institutional methods of public participation are discussed on using the work of Arnstein (1969), Coote (1998), Fiorino (1990), Funtowicz and Ravetz (1996), Gilbert *et al.* (2003), Hood (1996), Irwin (1995), Kasperson and Kasperson (2005), Lane (2005), Pidgeon (1996), von Winterfeldt (1992).

The importance of the introduced theories is illustrated in the analytical section on using case studies that investigate public engagement in the field of biotechnology (Hansen, 2010) and in

the field of nuclear power technology (Bond, 2004). The findings are concluded in the already mentioned argument of a necessary change in the discussion about public participation and how this discussion could be continued.

Theoretical framework

Having outlined the general direction and structure of the essay, the main terms shall be analysed and the related theories debated in details. The definition of the terms is fundamental for the following debate as it already uncovers inconsistencies that nourish the actual debate. The term 'public' or 'general public' is described by Rawlins and Bowen (2005: 718) in relation to communication science as the totality of 'publics', which is described as groups of individuals. This definition is essentially different to the explanation given by Habermas (1991: 1, 52) who offers a difference between the term 'public' on defining it as events and occasions open to all and the 'public sphere' as the society engaged in critical public debate. Mateus (2011: 275) finally notes that 'public' is the result of social activities of individuals that share e.g. emotions and symbols in publicness. While the first definition only implies that the public is not a homogenous group but consists of different heterogeneous groups, the other two definitions disclose already what seems to be a bias of social sciences in this regard: The public is expected to share something or to be active in some way. This is notably interesting if compared with the definition of 'knowledge' given by sociologists. Bauchspies et al. (2006: 68), Berger and Luckmann (1967: 15) as well as Mc Carthy (1996: 12-23) agree that knowledge is socially constructed and related to the reality one is living in. Bauchspies (2006: 54) furthermore explains that knowledge cannot be separated from its application. This implies that, as an example, a farmers knowledge about nuclear power differs from a scientist's knowledge not because one is more educated than the other but because both have different experiences with it. Bauchspies (2006: 99) and Mc Carthy (1996: 120) discuss in this regard the concept of 'situated knowledge' that can be seen as knowledge that is embedded in a specific culture. This can be the culture representing the values and beliefs of a local village as well as the culture of a specific branch of scientists – both knowledge is equal but has to be seen within its social context. These definitions of knowledge consider what is inadequately respected on considering the term public: There is no one public as there is no one knowledge either. There

are different groups of individuals with different cultures that share (or share not) different socially related knowledge. Considering the term 'new technologies' Marshall (1998) offers a straightforward definition on stating that new technology is “any set of productive techniques which offers a significant improvement (…) over the established technology (…) ”. Wilkinson (1983), on analysing four case studies, illustrates that this process of improvement, hence the implementation of new technology cannot be separated from attitudes and interests of affected individuals and groups. This finding once more reveals what already was shown on discussing the terms 'public' and 'knowledge': Even an obviously technical term such as 'new technology' cannot be separated from differing cultures and realities. Considering the essay title again that states that the public does not have the knowledge and time to contribute in debates about new technologies, it is clear that a discussion starting from this point does not respect what was illustrated with the definitions given above: That nothing can be said about the public, knowledge and new technology without putting it in a social framework. To get a better understanding of the social framework in which public participation must be embedded, the aspects of trust, social and cultural identities as well as the concept of hazard construction are taken as domains in which public participation can be discussed.

Considering trust as a relevant aspect for public participation in risk issues, Wynne (1996a: 50-51) criticises that trust in many discourses is taken for granted and a factor that can be influenced by means of risk communication and institutional methods of public participation. He notes that this assumption is simplifying a more complicated mechanism in which lay people constantly determine and re-determine their relation to expert institutions. This relation is ambivalent and the judgement of trustworthiness depends on agency, identity and dependency in regard to the experts. Wynne further remarks that public risk perception is based on trustworthiness and not on evaluated risk. This means that risk itself is relational (1996a: 57). This finding is acknowledged e.g. by Hohenemser *et al.* (2000: 177) who investigates the classification of technological hazard and asserts that public risk perception shows only a minor correlation with mortality, one of the most significant hazard classification factors used by experts. Slovic (2000: 184) amends that the public risk judgement (and with that the trustworthiness of experts institution) are shaped by memorability of past events and the imaginability of future events. One important point must be added: Trustworthiness is generally discussed as a feature to be achieved by experts. Wynne (1996b: 24-27) gives a good

example of this unilateral understanding of trust on reflecting the experts contradicting advices given to the Cumbrian hills farmers after the Chernobyl incident. The experts strictly tried to convey certainty and control even if their advise turned out to be wrong several times. Not at any point the experts considered the local farmers as trustworthy, even if they would historically have the ability to adapt according changing circumstances and would not seek for certainty and control by all means.

On discussing the aspect trust two major points were raised: First, trust is an issue between groups with different characteristics. Secondly trust is not mutual and exclusively expected from the group that is not seen as expert panel. These findings are reflected in another main area of debate regarding public participation in risk issues: The influence and importance of social and cultural identities. Durant (1998: 71) approaches the debate on giving a brief historical overview of the changing identity of science. He notes that only recently (after the Second World War) science became a noticeable social and cultural identity that represents clear values, beliefs and promises. This identity is troubled today by a fundamental change of the world we are living in which is named by Beck (1992, 1998) as risk society: A world where no clear distinctions and boundaries can be drawn anymore between nature and culture as well as between roles and responsibilities. The title of this essay perfectly mirrors this struggle of identities: New technology is complex and interdependent, affecting and enabling everyone in one or another sense. But still there is the idea of pre-set responsibilities and abilities, of experts that know and control and the public, lay people, which do not know and have to be 'served' by experts judgements. This struggle and change of identity and roles is well analysed by McKechnie (1996), Michaels (1996) and Irwin *et al.* (1996) who observe that scientific knowledge is only one knowledge which must be completed with other situated knowledge (Bauchspies, 2006; Mc Carthy, 1996). The premise for that is the recognition and respect of and the trust in other social and cultural identities. Only on doing so, the complexity and linkage of new technology can be debated adequately.

Within this debate, the third relevant aspect for public participation in risk issues, the hazard construction, is the key point. Hazard construction actually represents the process of identifying what a complex situation is about and how it fits in a bigger picture (Institute of Lifelong Learning (20011/2012), Module 5, Unit 5: 5-3). While every individual and every group that

shares social and cultural identity is constantly and mostly unconsciously busy with hazard construction, it must be debated officially if public participation shall be applied. The public, itself unifying different social and cultural identities, will participate in risk debates with differing hazard constructions, which must at least be known. Additionally the process is influenced by 'Schema Theory' what Wilkins (1991) describes as the simplification of reality based on past experiences. In other words: People see what they defined earlier. This implies two relevant problems for the debate e.g. about new technologies: New hazards cannot be recognised and complex situations are likely not to be considered in their full extent – whether by the public nor by experts.

So far it was shown that the public is no entity, that there is not one knowledge but different situated knowledge and that new technology cannot be discussed without considering its specific application. In short: the public as well as knowledge and new technologies are socially related. It was furthermore explained that trust, social and cultural identities as well as the hazard construction are relevant aspects of public participation in risk issues. It was highlighted that the knowledge of differing social and cultural identities must be recognised and trusted. Nevertheless it was stressed that hazard construction restricts every knowledge and sets limitations not only regarding public participation in risk debates but also in regard to experts assessments.

Before two case studies are used to illustrate the theoretical framework, the practical implication of the debated issues must be considered. Arnstein (1969) presents a latter of citizen participation in planning processes with increasing participation levels in the decision-making process. Arnstein (1969: 240) as well as Lane (2005: 296) make the important note that public participation is of no use if the decision-making process does not reflect that. But nevertheless Gilbert *et al.* (2003: 17) is stressing one of the limitations of public participation. While hazard construction was mentioned as a conceptual limitation to every decision-making process, 'NIMBYism' (Not In My Back Yard) is mentioned as specific concern if the public is participating in risk decisions. It means on one hand that mainly directly affected people are participating in the discussion and on the other hand that this people naturally try to get the utmost benefit themselves. Fiorino (1990), Funtowitz and Ravetz (1996), Hood (1996), Kasperson and Kasperson (2005), Pidgeon (1996), von Winterfeldt (1992) and other authors

debate practical implications and argue on the advantages and challenges of broad or narrow public participation (Pidgeon, 1996: 164-171). Still one insight most of them seem to share in common, even if they do not name it: There is no discussion that the public has to participate, but the question is how and which models are successful (which also raises the question what successful is). While the different authors offer more or less detailed ideas, Irwin (1995: 73) summarises the requirements for promising public participation in what he calls a pragmatic approach that is flexible, open and allows indefinite levels of participation and instruments. An interesting approach that can be traced back to Beck's (1992, 1998) concept of the risk society and is well explained by Coote (1998: 127) sees the politicians in the role of the honest brokers, which function as agents and translators between the two cultures of experts and lay people.

To summarise the findings of the theoretical framework not much words are needed: Public participation in risk debates and management is a major concern of academic discourse and clearly socially related. With the following case, the relevance of trust, the social and cultural identity and hazard construction as well as the relevance of situated knowledge shall be analysed.

Examples of public participation in new technology debates

Hansen (2010), on discussing public engagement processes in biotechnology in Europe, offers three different case studies, which help to illustrate the debated areas of concern. While the case study situated in the UK discloses a fundamental discussion about public engagement itself, the case of Denmark illustrates the challenges of specific instruments chosen to have the public on board. Yet a different approach can be discussed on analysing public participation in biotechnology in Germany: Not the lay people are involved but different organisations that claim to represent the diversity of the society.

Different preconditions can be found on discussing the public participation in nuclear power plant decommissioning projects. A new technology already established in a specific environment becomes an issue of debate again because the risk level is changing and calls for action. Bond (2004) offers detailed insight in three still very different nuclear power plant

decommissioning projects in Trawsfynydd (UK), Greifswald (Germany) and Vandellós (Spain). Trawsfynydd (officially working from 1965 until 1991) was shut down for maintenance and never restarted again because of the high costs of safety improvements required. The nuclear power plant of Greifswald (in use between 1979 and 1990) on the other hand never reached its full capacity and was shut down with regard to the changing energy policy in Germany. The operation permission of Vandellós (producing electricity from 1972 until 1989) finally was suspended after a turbine fire, which set the starting point for decommissioning.

Public participation – a socially shaped debate

With the briefly introduced case studies it shall be illustrated how the discussion about public participation is socially shaped – a fact that was discussed earlier on criticising the essay title. The debate about public participation in scientific topics has a long history in the UK but not before the BSE shock in 1995 it became a less biased discourse. While scientific knowledge was seen as a precondition for any serious debate, the BSE scandal disclosed the fallibility of science and the importance of trust and non-scientific interests for the acceptance of technology (Hansen, 2010: 112-113). These findings changed the willingness of the political system and science to rethink their position regarding the public and new technology debates. But on tracing the debate about genetically modified (GM) crops it becomes obvious that the willingness to accept public participation was actually aimed to get broader acceptance of the opinion held by the government, the industry and the scientific elite and it was expected to ease the decision-making process (Hansen, 2010: 146). But the opposite was happening: The debate not only uncovered the different ideas of the benefits and risks of biotechnology it also disclosed a different understanding of how the decision-making process should work. Hansen (2010: 147) notes, that the political system changed its view of the issue from seeing " (…) the public not being ready for GM technology to the technology not being mature enough for the needs and preferences of the British public." This is a remarkable shift taking in account this essay's debate. The changing view of the government not only shows the existence of different social and cultural identities and an initial lack of trust in other identities, it also shows that decision-making processes are fundamentally changing if real public participation is wanted and applied. The decision-making process is not anymore straightforward, it needs what Irwin

(1995: 73) calls a pragmatic approach: A flexible and open step-by-step process towards an answer on how to go on with a specific subject.

The debate about public participation in biotechnology in Denmark shows a different pre-setting. While the GM debate was for a long time not a significant point on any agenda, the political culture in Denmark can be described as consensual where the inclusion of different stakeholders and the public has tradition (Hansen, 2010: 78-80). When GM technology became part of the official agenda, the public was automatically involved in what is called a Consensus Conference (CC) by the Danish Board of Technology. Additionally the Danish government launched an expert committee, which was especially concerned with the ethical dimension of GM technology and was used to disseminate information and stimulate the debate (Hansen, 2010: 79). While the public was participating in real terms in the CC by a selection of lay people, the expert committee treated the public as its object of observation and concern and tried to form consensus by establishing transparency. This committee can be seen as what was proposed by Coote (1998: 127) as honest brokers which function as agents and translators between the two cultures of experts and lay people. The interesting point in the case of Denmark is that public participation is applied as standard procedure but actually no direct adherence to articulated concerns can be identified in decisions taken (Hansen, 2010; 109). Nevertheless all parties including the public seem to agree with final decisions. This implies that the recognition and acceptance of differing social identities and situated knowledge is actually judged as to be more important than the consideration of it in the decision-making process. Trustworthiness for the experts and the government (shaped by memorability of a long tradition of participation as mentioned by Slovic, 2000: 184) can in this case be seen as limiting the value of public participation: The public only functions as a mass that has to be considered if already taken decisions shall be accepted.

The third analysed case of public participation in biotechnology concerns Germany. The experience of the Second World War shaped Germanys political system which is influenced by different very active interest organisations. While biotechnology was firstly an exclusive debate of the German Research Society, it was later part of the political agenda of the Green Party. This led to the establishment of the so-called 'discourse on green biotechnology', which was initiated by the Ministry for Consumer Protection, Nutrition and Agriculture. 30 organisations

and institutions from different areas of the German society participated with the aim of finding a consensus to be used for official policy making. This case is different from the other cases in that sense that the debate at no point considered to include the public in a broader way. The institutions chosen for the discourse see themselves as competent partners for this discussion. This is remarkable and seems to mirror the essay title: The political system and the chosen institutions are assuming that their expertise is representative for and substituting the general public. Yet another aspect must be discussed. On aiming to find a consensus in a rather heterogeneous board with predefined pro and contra positions and differing hazard constructions, the members must agree on the least common denominator. This is likely to produce a simplified reality not considering the real extent of the debate (Wilkins, 1991).

The case study of Trawsfynydd, together with the other cases of nuclear power plant decommissioning projects has to be discussed on considering the different precondition. As it was mentioned earlier, the debate in these cases is concerned with a change in the existing policy of specific power plants. This means for public participation that the issue is well known to the local lay people, their interest in the debate is naturally high but therefore biased by a specific hazard construction (Gilbert *et al.*, 2003; Slovic, 2000; Wilkins, 1991). In Trawsfynydd public participation was applied equated – who was most concerned (the employees, followed by the local population and the local and wider authority) could participate first in the discussion about how the decommissioning process should be applied. As 85% of the population in a 30-km radius around the power plant were employees, the further local employment was the major concern of the involved public, followed by the concern about the future visual impact of the site and the radiation doses workers will be exposed to during dismantling (Bond *et al.,* 2004: 625). In a second step, regulatory bodies and different more or less concerned organisations were asked to participate. Their major concerns were articulated over possible radioactive leaks, the fairness to future generations and the insufficient analysis of alternatives. All the mentioned concerns of the different stakeholders were considered and feedback given on how the concerns will be addressed in the decision-making process.
In Greifswald the chosen method of public participation represents a light edition of the system used in the national biotechnology debate. A board called 'Nuclear Engineering Group' consisting of 13 organisations and groups considered to represent the public, were invited to participate in the discussion and articulate their concern about the decommissioning process.

Nevertheless it must be mentioned, that the local concern regarding further employment already led to the decision to dismantle the plant and the Nuclear Engineering Group had to take this decision as given. Additional participation of the public was allowed through a Visitor Centre, web pages and other methods, albeit this dialogue did not in any sense influence the further decision-making process.

In Vandellós the public participation was based on an initiative coming out of the public. While the major local concern was as well restricted to further employment, the Mayor of the nearest local town formed a heterogeneous commission that organised and coordinated interaction with the developers of the decommissioning project. The Mayor was also president of two important national associations for municipalities affected by nuclear power plants, which hence had also an influence on the discussions. This initiative is seen as to have facilitated a smooth and transparent decommissioning process.

While it can be said that public participation in all three cases of nuclear power plant decommissioning projects was applied and differing social identities were considered in some way, the most interesting point is the obvious limitation of public engagement. The influence of Schema Theory (Wilkins, 1991) on hazard construction is notable: The people define a set of problems regarding what they know from experience. In this cases the public knew that the power plant gave the employment, hence their major concern was to loose this. This reflects also the dependency of the power plant, which is influencing the trustworthiness of the institution. Together with 'NIMBYism' – the interest of people that is mainly focused on what concerns their own back yard – the findings of Wilkinson (1983) disclose their significance: The implementation of new technology cannot be separated from attitudes and interests of affected individuals and groups. New technology, knowledge, hazard construction and trust are all socially related.

Conclusion

The essay considered the different aspects relevant to public participation. The importance of trust, situated knowledge, differing social and cultural identities, hazard construction and the limitations of public participation was discussed. It was furthermore criticised that the essay

title is a wrong starting point for discussion and it better should be asked what public participation is and what results are produced.

With the different case studies it was shown that the understanding of public participation is a very different one and that there is a remarkable difference between the willingness of letting the public articulate their concerns and integrating these concerns in the decision-making process. On the other hand it was illustrated that the concerns raised by the public are biased and socially related. But this is a fact true for the participation of expert and political groups as well. The case studies nevertheless offered two promising findings for further discussion: The approach of the UK regarding the public debate of biotechnology and the way of public participation chosen in Spain regarding the decommissioning of the nuclear power plant in Vandellós. While the former shows the willingness to engage in a steady discourse with the public without having a fixed agenda to be fulfilled, the latter example shows how the public by better organising itself can add value to and build up trust in their participation.

This essay does by no means draw final conclusions about what public participation ought to be and what results are produced. But it gives way to a debate that better respects the complexity of the issue: The discussion about new technology as well as all participating bodies and the agreed results must be accepted as socially related. Public participation therefore is only one aspect in the process of finding the most promising way how to deal with new technologies.

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