

Challenges and solutions in developing legitimate online participation for EU biodiversity and ecosystem services policies

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Abstract

To support legitimate European Union (EU) biodiversity policy development, there is a growing momentum to engage society in these policy processes and build meaningful and inclusive dialogue between science, policy, and society in policy deliberation. So far, engagement efforts have been made to encourage citizen participation in knowledge production via, for example, citizen science. At EU level means to encourage public participation have included a variety of online mechanisms for spreading information and promoting public deliberation. Despite these developments, the involvement of the general public in policy-making at the EU level has been rather inconsistent to date. In this article, we evaluate online science cafés as potential means to encourage dialogue between science, policy, and society; we ask what elements in their design and implementation are essential for inclusive dialogue between science, policy, and society. Our findings emphasise iterative dialogue when approaching multi-scalar challenges. This has important implications for developing legitimate participation across Europe.

Key words: societal engagement; online participation; science café; EU biodiversity and ecosystem services policy; science–policy–society interface; transnational dialogue

1. Introduction

The idea of stronger public participation and societal engagement in policy development in the European Union is far from novel and has been widely studied in the recent years (Heidbreder 2012; Hüller and Kohler-Koch 2008; Kies and Nanz 2013). Additionally, public participation in the environmental management and deliberation has received attention in the European policy arenas (Bell 2004; Renn 2006). The general public and individual citizens can play a role in the environmental policy development and science in various ways: from contributions to research via citizen science, participation in studies that bring topical issues forth or support policy framing to deliberating the raised issues and their various perspectives at different arenas. EU multi-level policy-making, however, challenges our ideas of effective participation and the democratic qualities of EU governance (Newig and Fritsch 2009; Nousiainen and Mäkinen 2015).

In the literature about interfaces for policy-making, the contributions of science and policy are often highlighted, whereas society is presented as users of the interface or implicitly or indirectly integrated into the interface by the actions of science or policy (Gregory and Wellman 2001; Oubenal et al. 2017). Society is invited into the interface with the conditions laid out by science and policy, often

needing to earn its place by showing a stakeholder type of role and relevance (Wynne 2007; Young et al. 2013). While gaps remain in the dialogue between science and policy and the ways it could be arranged and designed in environmental governance at the EU level (Turnhout et al. 2008; van den Hove 2007), the creeping of the third element, society, into the interface, both conceptually and practically, can be observed and its presence argued as relevant (Nesshöver et al. 2016). The inclusion of citizens has been highlighted due to its benefits for both participants and policy, including wider acceptance and legitimacy of decision-making, improved implementation of policies, raising awareness and mutual learning (Renn 2006; Vadrot et al. 2018; Young et al. 2013).

Science–policy–society interfaces (SPSIs) are social spaces that may vary in their formality from being highly institutionalised to rather informal more dialogue-centred interfaces (Sarkki et al. 2014). Science and society may have a more direct dialogue (Bell et al. 2012), whereas society and policy in representative Western democracies tend to interact indirectly. However, more international spaces encouraging science, policy, and society (both civil and business) to come together around European policy issues have arisen in recent decades (Kohler-Koch and Finke 2007) exemplified by the formation of prestigious panels in the environmental sector such as

the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Despite this trend of assembling diverse actors and knowledge-holders (Raymond et al. 2010), the problematic of societal engagement and the integration of diverse knowledge forms remains since it is often via representative organisations that society, or to be exact civil society, is brought to the interfaces. This approach leaves the lay person and unorganised general public to the margins of the dialogues and decisions that concern their everyday lives and solicit action from them (Bell 2005).

In this article, we explore participation of citizens at the science, policy, society interface related to EU biodiversity and ecosystem service policy. We focus on live online engagement as an opportunity to increase legitimate participation in SPSIs on the European scale. We ask how and whether such engagement efforts can promote inclusiveness to develop integrative science, policy, and society interfaces to support dialogue between diverse knowledge-holders. To answer these questions, we analyse a series of science cafés organised in the Eclipse project funded by EU's Horizon 2020 program. Key points of reflection include inclusiveness in the online space from agenda setting and content to openness and participation of diverse actors.

The following part of the article is an in-depth look at the conceptual elements and challenges linked to integrative SPSIs and online engagement. Then, a series of science cafés is presented to better understand the challenges of online dialogue and evaluate science cafés' potential to citizen inclusion on diverse scales. In the discussion section, we share reflections on inclusiveness in the online space and offer insights on how to develop elements of online engagement to ensure more meaningful SPSI dialogue.

2. Science, policy, and society interfaces in virtual public spheres

2.1 Extending the science–policy interface to an integrative public sphere

As noted, we generally tend to speak of only science–policy interfaces (SPIs) with society being neglected from these spaces, despite the arguments for strengthening SPIs often being that a diversity of knowledge-holders improves decision-making, especially in global policies that are to be implemented on local scales (Turnhout et al. 2016; Vadrot et al. 2018). Credibility, relevance and legitimacy are attributes that have been expressed as increasing the effectiveness and influence of science–policy interfaces. Legitimacy refers to the idea that the framings and outputs of the SPI respect the values and beliefs of diverse stakeholders and that the topics of the interface have been dealt with in balanced and inclusive ways, and therefore, outcomes are expected to be more acceptable for wide audiences (Cash et al. 2003). However, achieving balance is difficult (Ouben et al. 2017) and outcomes are often influenced by underlying power structures dictating what topics are placed on the agenda and how they are to be discussed and what roles science or societal actors can have in these discussion (Görg et al. 2016; Turnhout et al. 2016; Wynne 2007). The idea of legitimacy thus implies imbalances in power relations and the existence of authority and subordination (Paloniemi et al. 2015). These imbalances highlight the importance of iterative practices, openness and transparency at the interfaces as legitimacy becomes strengthened by deliberation between diverse actors, which further fosters the democratisation of SPIs (Berg and Lidskog 2018; Dilling and Lemos 2011). For this, exploring how

society could be dynamically mobilised at the interfaces where science and policy have established positions is important, particularly in multi-scalar decision-making where the potential of values and views clashing is high and dialogue is needed for acceptance and effective and appropriate implementation of policies (Vadrot et al. 2018).

For democratic effectiveness and legitimacy, even the most institutionalised EU policy processes must be open to reasoned and relevant communication from different types of publics (Kohler-Koch and Finke 2007). The EU is striving for this as reflected also in its calls for more socially desirable research emphasising collaboration 'with' rather than merely 'for' society as visible on its agendas and funding mechanisms highlighting responsible research and innovation (von Schomberg 2013). The current EU research funding structures implicitly seem to encourage more topics and time-limited organic interfaces aiming to upscale best practices of local and national participation to the EU level rather than fostering the development of institutionalised processes for science, policy, and society to interact. The remaining inconsistency in what the role of society or general public participation should be at the science–policy interface thus still leaves a gap to evaluate and develop how society can be positioned in the policy development processes that aim to build credible, relevant and legitimate knowledge (Nesshöver et al. 2016; Sarkki et al. 2014, 2015).

This deficit of a consistent role for the public in complex governance settings such as the EU (Fung 2006) could be partially overcome by thinking of a democratic SPSI as a type of continuous integrative public sphere in Europe. Science, policy, and society operate and come together in the public sphere, a space for communication and deliberation of public societal matters (Castells 2008). We consider interface as an umbrella for the diversity of public spheres where necessary participatory endeavours can happen both organically and in a consciously planned and institutionalised way. Thus, the notion of SPSI goes beyond the methods of participation and incorporates a mental shift towards acknowledging the need for collaboration between science, policy, and society, and integration into policy processes from agenda setting to outcomes. In our globalised world public spheres, like SPIs are various and diverse, especially when they extend beyond the nation state (Eriksen 2005; Lezaun and Soneryd 2007) as in environmental issues. This heterogeneity also mirrors the context-dependent and value-laden nature of knowledge (co-)creation processes which have to cope with conflicting viewpoints, values, and interests as well as different ways of knowing (Toomey et al. 2017; Vadrot et al. 2018).

The analogue of SPSIs as public spheres helps us to understand some of the abovementioned dilemmas on underlying power structures and imbalances in roles for participation and integrating diverse actors and spheres (Eriksen 2005; Habermas 2015). 'Policy' can be considered the 'strong' public sphere with will formation power and holds the decision-making agency exercised by a group of elected administrators (Table 1). Common interests and an orientation around a certain issue or a shared epistemic community create the legitimacy for a 'segmented' public that resembles that of 'science' at the SPSI. The aim of problem-solving and the restriction of participation to experts in this sphere can still be defined as central in scientific work, although efforts for breaking silos and opening this sphere to a diversity of knowledge-holders are emerging (Vadrot et al. 2018). Lastly, society may be considered the open category of a general public deriving its legitimacy from an sovereign demos which holds the task of forming opinions on issues relevant and meaningful to it. The function of opinion formation should not,

Table 1. Typology of public spheres with analogue to SPSIs (adapted from Eriksen 2005).

Type of public	Participation	Legitimacy basis	Function	SPSI element
General	Open	A sovereign demos	Opinion formation	Society
Segmented	Restricted	Common interests	Problem-solving	Science (-Policy)
Strong	Specialised	Delegated authority	Will-formation	Policy (-Science)
Virtual	Open	Common interests	Opinion formation and problem-solving	Science -Policy-Society?

however, be seen as preventing society from having an input in will formation or problem-solving but rather as adding to the rationality of common decision-making by supporting free rational debate (Eriksen 2005). We see that breaking certain barriers between these functions and spheres is necessary for an integrative SPSI.

Merely encouraging dialogue does not automatically lead to increased participation, as people also need to perceive the issues at the interface as relevant to them. This perception is achieved in part by the agendas of science and policy crossing and integrating the public deliberation agendas (Reed 2008) rather than presenting pre-ordained agendas formulated solely by policy or confining certain topics as solvable only by certain domains (Lezaun and Soneryd 2007; Wynne 2007). Openness does also not necessarily mean people will be aware of their participation opportunities, and thus, efforts to promote participation and also acknowledge the value and enable the emergence of meaningful participation from bottom-up are central (Varumo et al. 2020). Costs of participation and how different audience may feel comfortable to participate should also be considered (Lezaun and Soneryd 2007). Also, there have been doubts about whether the multi-level systems of EU decision-making can truly facilitate heeding of individual citizen voices (Hüller and Kohler-Koch 2008). Is the European scale too abstract for people to engage in dialogue about it? How could the barriers to participation be lowered and what could the role of online spaces be in this effort?

2.2 Online technologies to serve SPSIs

Online methods for getting input from and informing the wider public of the EU have existed for some time, and their use and impacts have been studied from different angles, including access and technical usability (Coleman and Götze 2001), quality, and content of discussions (Welp et al. 2009), evaluating who participates in deliberations or consultations (Heidbreder 2012; Kube et al. 2015; Persson 2007; Quittkat 2011), transparency, legitimacy, democracy, and inclusiveness (Eriksen 2005; Tomkova 2009; Wright 2007) and the potential for educating and raising awareness (Talpin and Wojcik 2010) of the online tools. How and why people contribute to online forums and dialogue depends on various factors such as time, website usability, confidence and fear, the quality of the discussion and other contributions, and feelings of belonging to the online community (Aristeidou et al. 2017). Affordability and costs of upholding online participation mechanisms is also central for policy-makers. Despite issues of accessibility and needs to improve digital literacy of citizens (Kohler-Koch and Finke 2007), it can be argued that the barriers to participation of the wider public in transnational discussions have lowered and the arenas are becoming more open to people outside scientific or political elites due to online tools (Bohman 2004; Talpin and Wojcik 2010).

However, online spaces, denominated often as virtual public spheres (Papacharissi 2002; Woo-Young 2005), create both challenges and opportunities for improving inclusiveness at the SPSIs. Expanding Eriksen's (2005) typology to the virtual world (Table 1),

we can consider online spaces as an opportunity to become a stronger public sphere and to bridge the communicative gaps between actors around Europe. In online participation, legitimacy is derived from transparency and trust in the eyes of society (Carver et al. 2001). A sense of having an equal opportunity to speak, no one exerting control or power over others, exchanging rational opinions, and respecting differing opinions are some of the criteria set for meaningful dialogue (Bohman 2004; Min 2007), which should also apply to the SPSIs. The potential of technology for good online dialogue and deliberation is regarded as high. It may create exposure to opposing views and discussions and allow voicing of disagreements, reconsider initial points, and ideally create understanding of differing views (Price 2009). Online forum discussions can be valuable and good quality and create a sense of being heard even if they do not translate into policy outcomes, and an institutional context (such as EU discussion forum) can create and assume serious level of debate (Price 2009; Wright 2007).

Science and policy have many ways to encourage activeness and integration using online tools while being sensitive to diverse barriers of participation. For example, partially due to the rapid information increase in online spaces, science is encouraged nowadays to take a more active role in communicating its findings in understandable ways in the public online spaces where citizens acquire information (Nisbet and Scheufele 2009). Importantly, different scientific disciplines already have strong traditions of societal inclusion and regularly use diverse outreach methods to integrate society in and with research. The problematic might not be so much in the creation of science–society or policy–society relations as in linking these interfaces.

In policy and governance, the digital age has brought the concept of digital society and citizens, which spurs the spreading of forms of e-democracy and e-deliberation (Macintosh 2004; Mandarano et al. 2010). The policy–society relations are seen as benefitting from increased citizen participation that gives novel inputs to policy processes (Rask and Worthington 2015). Political discussions are also arising in spaces that are not designed or facilitated by government (Warren et al. 2014), but dominated by society and the general public, such as social media, blogs, and vlogs, commentary sections of newspapers. The rapid increase in online spaces for political communication has also been argued to have a destabilising and disengaging impact on democracy and societal participation as the abundance of sources makes it challenging to evaluate credibility the legitimacy of ongoing discussions (Dahlgren 2005). Seemingly scientific communications in the online sphere might also debilitate the credibility of science as such, when people lack the capacity to distinguish scientific research from seemingly factual statements that appeal to what people want to believe in the era of post-truths (Bouma 2018). Hence, even though the digital divide or technology gap in Europe in terms of access to Internet has narrowed, the new divide is in the capabilities of different users to both participate and evaluate content online (Brandtzæg et al. 2011). This also links to

the aforementioned limits of regular citizens being able to grasp abstract issues at the global scale.

The problem of rapidness of participation and information can be partially tackled by allowing diverse online formats. Both asynchronous modes such as discussion forums or the European Commission's (EC) public consultations, and synchronous modes such as the EC's citizen dialogues, have been developed for different purposes and benefits. Asynchronous online discussions tend to be more information rich and based on researched arguments (Talpin and Wojcik 2010) as people have more time to think before reacting and thus make better quality arguments and learn to defend their viewpoints (Price 2009). Synchronous discussions have the possible benefit of motivating participation and building feelings of community and collective action as they resemble face-to-face discussions (Hrastinski 2008). However, to foster deliberation and dialogue, design of the user interfaces is crucial (Manosevitch 2010; Wright and Street 2007) both for synchronous and asynchronous processes. Design elements for online dialogue may include the pre-determination of the topic, providing diverse tools for expressing and forming opinions (such as polls) and using software that is compatible for diverse operating systems allowing easy access and participation (Davies et al. 2009; Zoumenou et al. 2015).

The new modes of online communication have technically made it easier to scale up local issues and to deliberate on European and global themes by decreasing the barriers of time, access, and location (Davies et al. 2009; Manosevitch 2010). Channels for participation are diversifying from traditional and less indirect ways of voicing perspectives to more proactive and interactive and direct modes of taking part (Allen et al. 2013). Policy and science are both taking advantage of the opportunities for inclusion of society provided by the Internet. Despite this growing number of participation channels and options, it is not yet clear how these evolving modes of online communication are able to support inclusiveness, interaction between science, policy and society, and co-production of knowledge. Little research has been dedicated to especially live video-based dialogue and its capacity to foster inclusion of diverse knowledge-holders, with most studies focusing on education situations (Zoumenou et al. 2015). We hope to especially evaluate these aspects in our study.

3. Material and methods: Eclipse science cafés as dialogue spaces for the SPSI

To examine the ways in which society could be integrated in dialogue at the SPSI, we organised a series of science cafés, both traditional face-to-face ones and one online EU scale café.

The science cafés were organised as part of the H2020 Eclipse project developing a science-policy-society mechanism for the EC (Watt et al. 2019). The Eclipse mechanism allows decision-makers to formulate research requests around various themes relevant for biodiversity and ecosystem services policies, which are—after selection and scoping—studied by expert working groups and answered via an evidence synthesis process, including a dialogue between science, policy, and society. In this article, we focus on the Eclipse science cafés that aimed to encourage societal engagement on the pre-determined topic of *diverse values of nature and the challenges of integrating them into decision-making in the EU*. A request to elaborate the topic of diverse values of nature was submitted to Eclipse by Client Earth, an environmental non-governmental organisation

(NGO), and was further refined and developed by researchers in cooperation with the NGO.

Science cafés were chosen to present an example of a synchronous participation method and a cost-effective tool for promoting dialogue between science, policy, and society. The aim was to invite citizens and create an atmosphere which is familiar and inviting for them, and science cafés are considered highly suitable for open dialogue with non-experts. Traditionally, science cafés are designed to bring together science and society to demystify science and empower societal actors to assess and contribute to research topics that have a policy and/or social impact. Science cafés can be organised by anyone, and the setting is generally an informal comfortable space where the topic may be presented and prefaced by scientists, but the discussion develops along lines determined by questions and comments of participants (Bagnoli and Pacini 2011; Grand 2014). Science cafés can also improve audience knowledge and scientific literacy of the topic under discussion (Ahmed et al. 2014). Thus, we expected science cafés to both enable active dialogue and raise public awareness.

We organised a series of three science cafés on the same topic of diverse values of nature, but with different compositions. The first café was held as a local event in early September 2017, in Budapest, Hungary, and followed the traditional design of science cafés. The second café, organised at the end of September 2017, was partially online and partially face-to-face, with one researcher participating virtually from Serbia. While both events were held in Hungarian, the locations differed: the first café was organised in a coffee shop, and the second one was held in a conference room to meet the technical requirements of the online setting.

For the third, Europe-wide event, we took the concept of science cafés to a virtual environment to find out if the ideals of a comfortable and balanced discussion could be created online as well. For the project, emphasising European scale and relevance, it was important to test a light and affordable engagement method that would allow participation from different countries to discuss an internationally relevant topic simultaneously. The online café was organised in November 2017 and used English as the working language. This final event was mainly online with three different hubs in Helsinki, Budapest, and Montenegro where the panellists were located, but audience attended via a video conference tool except for the few people that were present at the hub locations. In addition to the science cafés, we also tested an asynchronous method, a text-based forum thread titled 'Valuing nature' on the Eclipse project's online forum, as a potential means to support synchronous online engagement. The main reason to combine science cafés with the online forum was to allow people to ask questions and share ideas, and this way form the agenda, before the series of cafés, since text-based message boards are generally well-suited for expressing opinions and setting the scene (Davies et al. 2009).

In the design of the cafés, the participation of science, policy, and societal actors was to be ensured by inviting representatives of all the classes to introduce the discussion. Participation by questions and comments was open to everyone. All three cafés were mainly attended by different sets of participants, and no knowledge of the previous round was required in order to participate in the next event. The cafés were promoted via email lists, Internet sites, social media (Facebook, Twitter and LinkedIn) and personal contacts, and anyone could join without any formal registration. The first café has approximately 25 participants, the second 6 and the third 35. Exact numbers are impossible to provide as people were able to come and go from the events.

Table 2. Flexibility, dialogue and participation in the science cafés.

Science cafés	Flexibility of the topic	Dialogue	Participants (legitimacy of the SPSP)
Budapest local face-to-face café	Pre-determined	Two-way dialogue	Researchers and the general public
Budapest local semi-online café	Pre-determined	Two-way dialogue mainly among panellists	Researchers and NGO
EU scale	Flexible	One way	Researcher, policymakers, NGOs and the general public
Online forum	Flexible	One way	Mainly researchers

The focus of this article is on the online engagement; therefore, our analysis focuses mainly on the last event with some comparisons to the two previous face-to-face science cafés. The material analysed included the full recording and transcript of the last (online) science café event, the detailed notes of the participant observation carried out for all three events, the video shots prepared for all three events, and the results of the online evaluation questionnaire filled by some participants of the last event. The transcript and the observation notes were analysed with thematic content analysis (Vaismoradi et al. 2013), where the two major deductive categories of the analysis were the content of the dialogue and the forms and dynamics of participation. Within these two major themes, we did not use predefined codes but searched for emerging topics and their interrelations during the analysis. This mixed deductive-inductive approach allowed us to realise a third key theme, namely how and by whom the agenda was set, and helped us conceptualise the impacts of agenda setting on the content and the process of the dialogue. After we drafted the first results of the thematic content analysis, we had a reflexive discussion within the author team to check intercoder reliability. To corroborate the results, we used the video shots from all three science cafés and assessed the ambience and the perceptions of comfort and vibrancy during the events. Additionally, we used descriptive statistics to analyse the results of the online questionnaire, which inquired about the technical capabilities of the online video conference tool and asked how participants felt about the discussion and their abilities to participate in it. The questionnaire received 15 responses and is used here to complement our direct observations. The following chapter presents our findings from both the synchronous and the asynchronous, online and face-to-face events along the three major themes emerged from our analysis.

4. Results and discussion

In this chapter, we introduce three key elements that we discovered together shaped the results of our online engagement effort. By focusing on the agenda setting, topic and content, and participation of the science cafés we present different possible stages of failure and successes and lessons learnt and reflect on the theoretical concepts related to challenges in integrative SPSP construction and online participation.

4.1 Setting the agenda

The agenda of the science café series ranged from the diverse values of nature (first science café) through the challenges of bringing diverse values to policy-making (second science café) to the various views and opportunities on integrating diverse values into decisions at multiple scales (Third science café). As the overall topic was received as a request within the Eklipse project, we followed the general Eklipse procedures for the scoping, which puts a strong emphasis on the dialogue between the requester and the scientific

community but does not necessarily engage the wider public in the refinement of the research question. The agenda therefore was mainly created on the basis of the initial question and the accompanying material provided by the environmental NGO, which partially built on existing research of the topic. To allow the participation of the wider public in the agenda setting for the science cafés, an online forum was initiated at the Eklipse web page. Here, people could share their ideas, experiences, and questions on diverse values related to biodiversity and ecosystem services and their incorporation and communication in policy- and decision-making. These questions and comments could then be used to inspire conversation in the cafés and the forum itself.

A few days after launching the forum thread scientists posted references to their research articles on the topic. However, they did not express the content of the articles in a more popularised manner, and thus, it was difficult to begin a reciprocal conversation on the topic. As an attempt to redirect the forum to a more dialogue-like mode, another thread was opened. However, it did not gather any responses though it was viewed over 600 times. Thus, even though the content of the forum was information rich, it remained dialogue poor (Table 2). Despite the forum, our main asynchronous participation channel, being promoted as an open space for anybody to participate, it failed to serve as an interface for science, policy, and society where all could help in agenda development for the online science café. We recognised that the agenda was consequently set mainly by researchers, making the dialogue vulnerable to becoming a gathering of like-minded researchers or elites (Price 2009). This outcome is not so surprising knowing that the majority of registered users of the Eklipse online forum have a background in science; it rather shows the closely-knit nature of the scientific community and the somewhat naïve presumption that opening up a science-dominated platform for public dialogue would immediately result in participation.

The Facebook event for the EU online café attracted some attention having 26 participants and 39 interested people. No comments or conversation happened on the social media platforms, and they were practically used only as information channels to promote the event and present the speakers. There may be many reasons for difficulties in encouraging dialogue on the asynchronous platforms. Our interpretation is that they never succeeded to produce an open sphere and rather became another institutionalised EU arena enabling scientists to converse in a language and manner comfortable to them thus possibly excluding others and reinforcing the way certain types of knowledge-holders frame discussion and set conditions for participation of other actors (Vadrot et al. 2018; Wynne 2007). In future studies, it is worth exploring how to overcome this democratic challenge of online engagement since the inequality in digital literacy sets challenges of balanced and open participation, as not all citizens have the capacity to access their communicative rights (Kohler-Koch and Finke 2007).

The forum was the first attempt to make the science cafés' values discussion a more general open public sphere allowing for deliberative and informed inputs. However, the legitimacy basis of an open sphere derives from sovereign demos, which would have been possible only by ensuring participation of a public that represented society more diversely. Both science cafés and online forums are based on voluntary participation and the presumption that people share an interest in the topic (Dijkstra and Critchley 2016; Wojcieszak 2009). Although this can be perceived as strength for the quality of dialogue, in our case, it created a space dominated by a type of segmented public sphere (Table 1). The inability of not all groups being able to influence the agenda was the first stage of failure as it shapes how legitimate for diverse knowledge-holders the SPSI becomes (Fung 2006). The EU funding structures and the requester-based Eclipse mechanism make it challenging to design truly bottom-up agenda processes as the agenda must, to certain degree, reflect the priorities and preferences of the funder and requester. Thus, balancing relevance, credibility, and legitimacy was challenging from the beginning.

4.2 Content and the topic

All the science cafés focused on the plural values of nature with different emphasis on the topic modified to fit the scale and context of the café. The first café focused on the incommensurability of different values of nature and ecosystem services, the second café centred on real-life applications and how the diversity of values is apparent in our lives and the EU café focused on how these values are reflected and integrated into EU policy-making. The panellists were invited according to their expertise on these different perspectives to the topic.

The invited speakers of the face-to-face science cafés brought in personal stories and examples which resonated with the everyday life of the local people in the local language. In the online EU science café, the linkages between the European scale environmental topics to the individual scale were not as concrete and visible. Despite the designed outline for the EU café, the scope of the dialogue became rather abstract, whereas the local cafés stayed more on topic through the connections to daily life. The flexibility in the EU café allowed space for the panellists to direct the conversation towards their individual expertise. Hence, the café provided multiple interesting and important perspectives on integrating values into EU policy, but the conversation spread and did not touch upon personal lessons learnt or opportunities for action. Our science cafés reflect the notion that environmental issues are tied to places which are most naturally perceived by people as their imminent local environment (Heaton and Dias da Silva 2017). The challenge of translating local biodiversity issues and policy into international or global policy and vice versa is commonly recognised (Paloniemi et al. 2015; Turnhout et al. 2016). The challenge is partially due to failure to acknowledge the versatility of local conditions and values, that force local and global actors to evaluate trade-offs and preferences when contributing to solving multi-scalar issues (Oubenal et al. 2017; Vadrot et al. 2018). A lack of a shared European identity has also been recognised (Eriksen 2005; Wright 2007), which may hinder the building of shared concern and ownership for environmental issues affecting people beyond local boundaries.

These notions are relevant, especially because democracy and dialogue can only happen when the level of discussion is appropriate for the participants (Price 2009) and because in the circumstances where issues are too complex, being available for discussion does

not transform into participation (Heidbreder 2012). In future dialogues, we see that the complexity of topics can be at least partially overcome by framing discussion in more relatable ways and being more flexible regarding the framings (Fischer and Young 2007). Such framing would make conversation more understandable while remaining credible, and accordingly feed into the legitimacy and trust building during the dialogue.

Online engagement may bridge the communicative gaps between the scales, but this opportunity relies on the capacity of online (and offline) spaces to provide regular iterative pathways for diverse linkages to real-world experiences and inputs into policy-making (Bohman 2004; Wright 2007). This did not occur sufficiently in our online café since despite our design we did not manage to facilitate the dialogue towards concreteness. This failure is not solely ours since controlling the conduct of participants is challenging and attempts to do so may be seen as trying to pre-choreograph participation to meet the objectives of a limited few (Lezaun and Soneryd 2007; Strandberg 2015). Additionally, expecting meaningful participation from the general public to EU scale topics might be excessive and thus, it is essential to ensure that individuals and networks involved in SPSIs of different scales work together to enable iterative dialogue on a relatable level across these different scales (Fig. 1). In Eclipse, we have since the online science café tested methods of engaging citizens face-to-face locally in different locations on the same topic and then synthesising these discussions to create an overall picture of the topic and the connections between local and global scales. The dialogue in these events has been more appropriate and insightful as people have been able to discuss in a more relatable manner and comfortable setting (Varumo et al. 2020).

4.3 Participation

The backgrounds of the panellists introducing the topic in the three cafés varied. In the first café, it was only researchers, but from different disciplines, in the second café, there were researchers and an NGO representative, and the EU online café panellists included two researchers, a ministry and an NGO representative. We hoped to

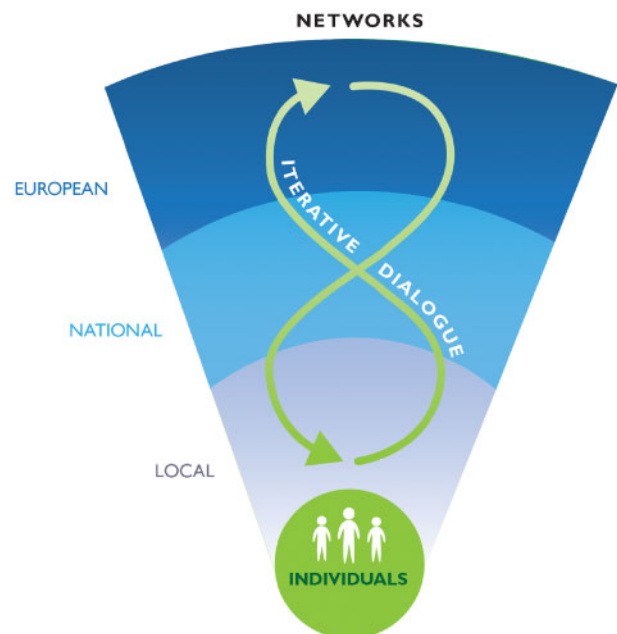


Figure 1. Iterative dialogue in the science-policy-society interfaces.

integrate the general public as much as possible to achieve a discussion reflecting various perspectives. The first face-to-face science cafés managed to include a wide range of participants and the dialogue was casual and inspiring as people were able to connect the topic of diverse values to their daily lives. The audience of the second café was mainly researchers with virtually no general public participation, and the EU online café attracted some interest from the general public, but the majority of participants were researchers (Table 2). The first café was thus the most balanced from the science–policy–society perspective, whereas the two latter cafés were science dominated hampering the legitimacy of the interface.

The post-café questionnaire also noted that for future discussions other stakeholders, especially practitioners, such as landowners, business, and financial institutions would ideally be more engaged. However, despite efforts to promote the café through different channels trying to reach audiences outside our bubbles we did not manage to gather a diverse group of people. Possibly, offering something to people for their participation could have increased the number of participants (Zoumenou et al. 2015), but this may have influenced the quality of the discussion. Instead clarifying the objective may have helped, but eventually the things we could have done may be limited as the costs and benefits of participation are experienced personally by attendees. The agenda and content obviously had consequences on who eventually participated in the café; thus, choices done in various stages of the design process eventually lead to certain failures. The promotion of the science café as an open place for science, society, and policy to come together as an integrated SPSI with the back-up of the EU Commission funding was an attempt to build a stronger public and create prestige and spur interest. However, in practice we did not achieve true will-formation power, having direct linkages to current policy-making processes (Table 1). This was partly natural because the science cafés promoted dialogue for the sake of inspiring dialogue, cautious about promising too much, since failure to fulfil promises discourages further participation (Rask and Worthington 2015; Reed 2008). Thus, the online science café as a science-driven interface created a virtual public sphere where science took the lead from design to dialogue and outcomes and the policy and society elements were weaker, thus not constructing a balanced integrative SPSI.

Despite the low number of participants, those who participated did so actively, answering the polls and sending questions through the chat box of the online tool. The polls were perceived as a good way of inclusion in the online science café. Yet, more reactive dialogue and a post-café discussion on the forum were called for. Although an opportunity to realise this was once again offered by the forum, no discussion happened after the online science café. Language may also have been a barrier as the EU scale café was in English. The combination of a complex and abstract topic in a language that was not native to many participants might have raised the standards for participation too high. Also, despite online solutions being advocated as removing physical constraints of time (Davies et al. 2009; Manosevitch 2010; Strandberg 2015), this issue remained relevant for the synchronous science café as we struggled to find an hour that would suit different European time zones.

From a technical perspective, the online tool also created some challenges for participation in the EU wide café. The online participants were not able to contribute face-to-face using video but could only do so by typing comments in the chat window. This also meant that they could not respond to panellist comments on their questions, denying the opportunity for two-way dialogue. The same issue was partially present in the semi-online café, where one of the

panellists participated via Zoom from Serbia to Hungary and the screen where he appeared was the backdrop of the other panellists limiting natural face-to-face dialogue (see video). In these cafés, the roles of some panellists and audience were thus undermined because of the technical solutions and setting. The two locations and setting caused the panellists at times to appear distant and separate from a shared dialogue. The structure turned out to be more of a panel discussion complemented with audience questions, which was a consequence of organisation and limitations in time and the online tool rather than the format of science cafés as such. In the worst case, this could lead to the audience just being there to tick a box of participatory effort and only being invited to discuss when more dominant participants deemed it relevant (Fung 2006; Wynne 2007). Democracy and will-formation of a strong public are constructed by the person or group that has the strongest and the most convincing arguments and the most effective methods to voice them (Hüller and Kohler-Koch 2008); thus, imbalances in participation influence the power settings of science–policy–society interfaces. It also raises questions as to what extent an online dialogue tool can underpin strong democracy. However, allowing for unlimited video participation might have risked not only the quality of the streaming but also set requirements for more intensive facilitation and time. Thus, there are apparent trade-offs in using technology to simulate real-life discussions and invite balanced participation that needs to be considered in the design of the processes.

Reflecting on our research questions, we have recognised inter-linked elements fostering and hindering legitimate dialogue. By paying further attention to these lessons learnt, we believe that online engagement can produce legitimate dialogue when designed and promoted well. To ensure inclusiveness and legitimacy, it is necessary to pay special attention to a more synthesising and iterative dialogue from local to EU level SPSIs especially when going beyond local scales and with abstract issues. Discovering ways to facilitate deliberation between these spheres is challenging, yet an active public engaged in dialogue is important for building usable knowledge that mobilises action necessary for achieving sustainability and finding solutions to environmental challenges (Cash et al. 2003; Dilling and Lemos 2011; Nesshöver et al. 2016). Therefore, further attempts to renew engagement practices and to increase capacities and interest to get involved are needed in the future.

5. Conclusions

By the example of the Eklipse science cafés, we evaluated the opportunities to increase the legitimacy and meaningfulness of decision-making in biodiversity and ecosystem services policy in Europe by developing integrative SPSIs online. Based on our results, we can state that neither the synchronous nor the asynchronous online participation methods completely succeeded in fostering legitimacy in the sense of creating a balanced representation of diverse views; to the extent that there were diverse views, they did not receive equal weight. We have ascribed this failure to the limited ability of all to partake in agenda setting, an inability to facilitate the content and framing of the topic more concretely, and participation in the events being skewed towards researchers. These shortcomings combined with the underlying structures produced by the nature and priorities of short-term, international projects created an imbalance in roles and power. Increasing legitimacy and democracy of SPSI outcomes would require acknowledging the different sources of legitimacy (Table 1), from scientific expertise to integrating societal values,

something that the Eklipse project continues to work on by testing ways to integrate diverse knowledge-holders through varieties of processes.

Online tools are certainly not all-fixing solutions, and it was clear in our example that meaningful dialogue was compromised by the design of our online process and inability to attract a more diverse audience. The major weakness of online tools in engaging a wider public is that many people still feel uncomfortable using them for expressing knowledge and opinion or raise questions, and therefore, designing both the tools and the dialogue events in a fashion that would promote inclusive dialogue is of key importance. For online tools using breakout rooms for discussions that are summarised by a facilitator and then discussed in plenary could be a partial solution. Another possible solution could be to change the roles of science and public and let non-scientist participants be the experts by asking their opinion on value-led, moral, ethical dimensions of research, related to specific space and time (the so-called reversed science cafés were designed to this end). Legitimacy is rarely achieved by one-time events rather a more systematic approach to iterative inclusion of society to the SPSI is required. For this, also the added value of traditional face-to-face formats cannot be forgotten and rather we need to discover how we can synthesise online and offline discussions and bring together these more local level and different layer conversations to feed into the wider EU discussions. Seeing how local SPSIs transformative potential on higher scales have can foster motivation of local citizens to participate more actively, which in turn can lead to improved EU policy-making.

For integrative SPSIs, we need to acknowledge that openness does not automatically translate into inclusiveness and legitimacy, but rather diversifying participation can be a key solution. Recognising that a great deal of citizen discussion related to policy matters happens outside of institutionalised EU forums in channels managed by different groups ranging from individual citizens to NGOs, businesses, researchers, or other groups that have formed around topics that jointly interest them is important as the channels provided by science or policy might be unfamiliar to wider publics. If people are not aware of how or where to use their rights of communication, then they become excluded from political participation (Hüller and Kohler-Koch 2008; Rask and Worthington 2015). Tapping into the ongoing discussions in these various platforms and data mining, the web to see what is discussed outside the formal channels can be valuable for policy-makers and science. Civic trust in institutions can also be fostered by transparent coexistence and dialogue in shared online spaces (Warren et al. 2014). Again, synthesising this knowledge from diverse sources, also ones that are not moderated or owned by governments or the EU helps to construct an integrative and possibly iterative democratic interface where the public has a role in taking initiative. Through gathering the layers of general, segmented and strong public spheres, the virtual public sphere could provide the transformative potential of deliberation at cross-national scales for EU policy-making and help take ownership and see common ground in environmental issues relevant to all.

Funding

This work was supported by the EKLIPSE project funded from the European Union Horizon 2020 programme [Grant agreement no. 690474] and by the János Bolyai Scholarship of the Hungarian Academy of Sciences was provided to (E.K.).

Conflict of interest statement. The authors declare that there are no conflicts of interest.

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