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Beyond Experiments

Innovation in Climate Governance

BRUNO TURNHEIM, PAULA KIVIMAA AND FRANS BERKHOUT

1.1 Experiments in Climate Governance

In this edited volume, we are interested in understanding how experiments in climate governance can lead to broader changes in rules, practices, norms and other wider outcomes of efforts to respond to the challenges of climate change. We start with three observations about experiments in climate governance as entry points for some more general reflections about how change in governance comes about *from below*, rather than as a result of coordinated policymaking from above.

First, climate governance experimentation has become a legitimate object of research and is a practice attracting interest among policymakers and citizens. There is, therefore, an opportunity to analyse the motivations, direct outputs and broader outcomes of these initiatives. We want to ask what do these experiments add up to, and whether they influence deeper change in the legitimacy and effectiveness of climate governance. This is the broader policy context on this volume.

Second, climate governance experimentation is linked to the search for new ways of dealing with the causes and consequences of climate change, often at the margins of formal and established governance regimes, and in ways that are often temporary and local. We seek to understand what happens beyond this initial experimental setting. How do the ideas, networks and capabilities that emerge and are partially stabilised in experimental settings come to have a broader impact across policy and political systems? This provides a general problem and intellectual challenge for this volume.

Third, climate governance experimentation is a multifaceted object of study that compels a view from different perspectives. With this volume we seek to draw on the richness of a variety of conceptual and methodological traditions to further our understanding of governance experimentation in the context of climate change. In particular, we have sought to bring scholars of governance and of innovation together to reflect on climate policy experiments and their broader impacts beyond

the original experimental setting. We do so by encouraging and setting the terms of a constructive dialogue between these quite distinct approaches. This provides an interdisciplinary orientation to this volume.

1.1.1 The Growing Attention to Climate Governance Experiments

In common with other areas of policy studies (Greenberg, Linksz and Mandell, 2003; Tassey, 2014), there has been a growing academic and policy interest in experimentation in governing the causes and consequences of climate change over recent years. This is evident across different scales, from local communities and cities (cf. Blok and Tschötschel, 2016) to policy communities (McFadgen and Huitema, 2017) and international organisations.

There appear to be a number of reasons for this revived interest (Sabel and Zeitlin, 2012). First, experimentation is seen as a mode of response well suited to the challenges of mitigating climate change and adapting to climate risks. It is argued that experiments are better attuned to the complex, situated and uncertain character of the climate change problem than more traditional modes of governing through national and international policy (e.g. Broto and Bulkeley, 2013; Bulkeley, Broto and Edwards, 2014; McFadgen and Huitema, 2016). In particular, governance experiments appear to be fitting when responding to uncertainties and incentive problems confronted by local climate action. The literatures on risk governance (Renn, Klinke and van Asselt, 2011), polycentric governance (Ostrom, 2010; Jordan et al., 2015) and urban experimentation (Bulkeley et al., 2014) recognise the limited capacity of national and international policy regimes to address global climate change effectively. This failure accounts for the 'groundswell of actions on climate change mitigation and adaptation from cities, regions, businesses, and civil society organizations' (Chan et al., 2015:476). According to some commentators, the failure of the 15th session of the Conference of the Parties (COP 15) in Copenhagen (2009) strengthened a mandate for decentralised, bottom-up climate interventions – a shift in climate governance internationally that was confirmed at COP21 in Paris (2016) that placed greater emphasis on voluntarism at the national level ('pledge and review') and a greater role for non-state action and subnational actors (van Asselt, Huitema and Jordan, Chapter 2). The 'experimental turn' in climate governance can be viewed as a rejection of the perceived failures of coordinated and global approaches to climate action, whether that coordination was achieved through governments or markets. Experimentalism has been presented as an entrepreneurial approach, stressing agency over coordination, with coordination itself viewed as emergent and *organic*, drawing on the norms, incentives and relationships of actors at a more granular level.

Second, experimentalism is being embraced as a principle for action in an area that is fraught with uncertainty, complexity, diffuse authority and agency, justified by the need to design provisional goals and to fine-tune through comparative learning (Sabel and Zeitlin, 2010; De Búrca, Keohane and Sabel, 2014). In this view, experimentation is more than a means to an end. The function of experimentation is not merely to encourage learning or to build up actor coalitions that can propel change. Instead, experimentalism is seen as a new approach to climate governance itself; that is, it is a transformation in governance in its own right. This debate on experimentalist governance extends well beyond the issue of climate change (Sabel and Zeitlin, 2012), but it points to a deeper set of problems in complex, polycentric and multilevel governance systems.

In either case, experimentation represents a challenge to climate governance as conventionally conceived and practiced. Often, experiments are inscribed in processual narratives linking demonstrations, pilots and field trials with the promise of a deeper link to motivations and incentives of actors, and generalisable and replicable approaches. However, the true value of governance experiments in serving as microcosms that can be disseminated and reproduced is in question. For example, it is not clear how experimentation can generate outcomes beyond learning by those directly engaged in them, and the body of evidence documenting successful replication remains thin (Kivimaa et al., 2017).

Current enthusiasm for experimentation in climate governance explains the proliferation of initiatives and schemes. It also creates increased scope for reflection about the goals and consequences of experimentation: what experiments may lead to, beyond their particular and bounded contexts, and whether they can influence changes in norms, incentives, rules, behaviours and relationships more generally. This volume seeks to explore the question of what lies after and *beyond* experiments. In doing so, we aim to contribute to a critical analysis of climate governance experimentation. If experiments are largely uncoordinated and entrepreneurial initiatives by new coalitions of actors, what direct outputs do the experiments produce and how do they come to have broader influence? What notions of diffusion, reproduction and embedding can best describe the process by which the multiple possible outputs of experiments come to generate broader outcomes? These are deep conceptual challenges which each of the contributions in this collection grapple with and which we return to in Chapter 12.

1.1.2 Framing the Problem: Embedding Climate Governance Experiments

A good starting point for a volume about climate governance experimentation is to understand how experimentation became a promising approach for addressing global climate change. Climate change has been labelled a ‘wicked problem *par*

excellence' (Dryzek, 1987; Jordan et al., 2010; Levin et al., 2012; Jordan and Huitema, 2014c). This is because of the inherent messiness, uncertainty and intractability of climate change, and the complexities of incentives and resistance to possible responses, whether through the mitigation of climate-forcing emissions or adaptation to the impacts of climate change. There is no simple 'climate fix'. Instead a range of activities have been taken, for example, in the domains of renewable energy (Baker and Sovacool, 2017), low carbon mobility (Hopkins and Highham, 2006) and building energy demand reduction (Kivimaa and Martisikainen, 2017) with the hope of partly alleviating the problems of climate change. Awareness and knowledge of climate change is partial and contested, and incentives for action may be weak and perverse. The nature of climate change and the difficulties it poses for collective decision-making and coordination (with a global commons, blurred and differentiated responsibilities, asymmetries in costs and benefits of action, and so on) have precipitated a general search for novel forms of governance that are more exploratory, flexible and multivalent (Biermann et al., 2012; Burch et al., 2014; Hale and Roger, 2014; Jordan and Huitema, 2014a; Chan et al., 2015). Global state-led climate governance has been characterised by, for some, a disappointing record and a history of political impasses (e.g. Levin et al., 2012; Kanie et al., 2012). This record has played a role in energising the search for new ways of handling the causes and implications of climate change.

The search for and analysis of innovative forms of climate governance has been a feature of academic commentary over the past decade (Jordan and Huitema, 2014a, 2014b, 2014c; Upham et al., 2014). This includes the crafting of new governance arrangements, as well as analysis of how new modes and instruments of governance are implemented and evaluated (Huitema et al., 2011). Jordan and Huitema (2014a, 2014b) describe policy and governance innovation as significant novelty linked to the emergence of a new policy, its diffusion and effects. Part of this debate has concerned the role of experiments in generating innovations in governance, including a variety of attempts at defining climate governance experiments. Kivimaa et al. (2017:2) argue that governance experiments 'can either constitute (deliberate) interventions that aim at solving problems or developing new practices (as in pilots or demonstration projects), or they are conducted in order to learn about the effects of (limited) interventions for future (more large-scale) interventions'. Experiments can embody governance innovation but present the additional 'opportunity to tinker with new approaches, practices or institutions on a small scale and/or temporarily' (Kivimaa et al., 2017:2). It has also been argued that experimentation is less directed than innovation – often associated with the adoption of an idea in a market – and is therefore more open-ended and oriented towards exploration (e.g. Schot, Kanger and Verbong, 2016). This approach is also used in the definition of an urban sustainability experiment

developed by Sengers et al. (2016:21): 'An inclusive, practice-based and challenge-led initiative designed to promote system innovation through social learning under conditions of deep uncertainty and ambiguity.'

The literature on climate governance (Hoffmann, 2011) has been interested in exploring novel forms of action 'beyond, below and outside the state-dominated climate regime' (Jordan and Huitema, 2014c). However, the analyses are often narrowly focussed on the realm of policy itself, with little consideration for the social, institutional and material aspects of governance (Bulkeley et al., 2014). Conversely, the literature on socio-technical experiments in the context of sustainability transitions (Kemp, Rip and Schot, 2001; Berkhout et al., 2010; Smith and Raven, 2012; Späth and Rohracher, 2012) has been less concerned with specific applications in policy and governance (Kivimaa et al., 2017). This gap represents a serious constraint on the broader outcomes potentially generated by experiments in governance for sustainability. Experimental initiatives tend to be situated in time and place, operate in relative isolation, and may require further refinement and consolidation to become impactful more widely. Beyond the talk of the need to *scale up*, there is little insight into how the direct outputs of experiments can be reproduced and embedded to achieve significant impact on climate change problems.

We believe that a useful next step is to define ways to harness learning from experiments with new instruments, modes and approaches to climate governance, and at the same time consider critically the shortcomings of experimentation as a solution to the wicked problem of climate change. This may be done by studying the careers of individual climate experiments and experimental practices, examining the variety of climate action on the ground, and theorising and tracking their broader outcomes on the way climate governance is done and what effects this may have at different scales of analysis.

Taking the notion of climate governance experimentation seriously, this volume focuses on the career, relevance and adequateness of climate governance experiments beyond their experimental nature, and beyond their own institutional contexts. It explores the expansion, reproduction and embedding of climate governance experiments as they turn into more than experiments.

1.1.3 Approach: Interdisciplinarity and Empirical Variety

With this volume, we have sought to capture a wide range of perspectives on climate governance experiments, reflecting the diversity of approaches proposed in the literature and in practice. It brings together contributions from a range of approaches to climate governance experiments – governance understood in the broadest sense as forms of coordination of state and society toward collective

interest (Pierre and Peters, 2005) – and to experimentation and sustainability innovation more generally. Rather than advocating for a particular view, we seek to provide a broad picture of existing concepts, representing a variety of approaches, the different challenges they identify and the main strategies they offer for governing climate change. We also seek to reflect critically on current interest in experimentation, which is far from a benign and neutral term. We find it particularly useful to mobilise rich empirical cases to support this critical line of enquiry.

We have sought to stimulate a constructive dialogue between the different approaches critically engaging with experimentation for climate governance. We have convened contributions by climate governance and innovation scholars, understood widely as studying the introduction of novelty to sociotechnical systems and the institutional and material reconfigurations that may ensue. When doing so, it became evident that other related fields are also relevant in approaching the central questions posed by 'beyond experiments', and this volume therefore also builds from selected approaches in science and technology studies, geography, and policy studies. This has resulted in contributions that together span a wide variety of concepts and analytical frames, providing different lenses through which to appreciate the challenges and lasting impacts of climate governance experimentation. We hope to have contributed to mapping out the contours of this intellectual space and the multiple opportunities it offers.

Rather than providing an overarching framework, our aim has been to make sense of rich and varied new directions for research, guiding contributions into a coherent direction, so as to explore the scope for cross-fertilisation. This has led us to offer a general problem framing (climate governance, experiments, embedding), a set of concepts to the problem at hand and what we see as underlying master processes (articulation and alignment at the level of systems) that each contribution deals with in specific ways. This allows us to explore a variety of current analytical contributions, unpack their significance and identify their potential complementarities. We also explore how these different conceptual frames may be 'bridged' (Turnheim et al., 2015).

Climate governance experimentation is rapidly evolving, presenting challenges to practitioners and researchers. For this reason, we thought it relevant to seek out a variety of interesting and novel empirical cases, focussing on their richness and diversity (see further Section 1.3). Contributions to this volume critically engage with real-world cases of climate governance experimentation, further supporting our collective exploration with empirical context and contributing to our broader conceptual ambitions. Besides obvious benefits in terms of generating inductive insights on the conduct of climate governance experiments in practice, this allows contributions to produce greater clarity about the phenomena at hand: experimentation and embedding.

1.2 Conceptual Starting Points

In this section, we start mapping out the main analytical challenges of this volume in greater detail and apply a variety of concepts to make sense of the emergent significance of experimentation in the climate governance. We recognise an inherent problem with providing strict definitions, mainly because conceptual flexibility is valuable when engaging with an emerging problem area characterised empirically by a multiplicity of entry points and because our background aim is to bring together contributions from a range of perspectives, themselves often invoking varying and incompatible conceptual tools. After more than a year of convening and mediating interdisciplinary conversations on the topic, we see our task as clarifying the range of perspectives and where they may be bridged. This implies mapping, unpacking and exposing the variety of useful perspectives, rather than reaching conceptual closure. We do so around a clear intellectual programme, which concerns understandings of experimentations, their emergence and consolidation into new 'orders' and the different ways in which they become embedded in practices, institutions and regimes of governance.

1.2.1 Experimentation and Experiments

Whereas in natural and engineering science, as well as some fields of social science like psychology and economics, the experiment is a methodological framework for testing knowledge claims against well-established criteria of significance, the notion of experimentation which we use here is significantly different. In the context of governance, experimentation is associated with more open-ended initiatives usually designed to test the feasibility or effectiveness of a novel governance practice in which emergent or unexpected outcomes may be the anticipated product. Although there is likely to be an evaluation framework for governance experiments, the process and criteria for evaluation are expected to be flexible to some extent, needing to take account of the unfolding and emergent nature of the impacts which may be observed. Typically, experiments will be expected to lead to changes, whether these relate to the pursuit of new knowledge, new practices, new solutions, or the enrolment of new actors (see Karvonen, Chapter 11; Pallett, Chapter 5). As in natural science experiments, scepticism is important to the success of governance experiments since, in practice, experiments may be mobilised to make up for the lack of more systemic action (Howlett, 2014), which can also lead to 'reframed policy innovations' (Upham et al., 2014). As background for the contributions to this collection, we outline a number of ways in which experimentation has been framed in existing literature, highlighting also what we see as the main focus of innovation studies and governance studies.

1.2.2 Why Experiment? An Overview of Metaphors

One aim of this collection is to explore the different ways in which climate governance experiments are conceived in social science. It is these 'creation myths' associated with experiments which will serve as the template for ideas about the broader outcomes of experiments on policy and governance. Here, we review briefly some of the main metaphors which have been employed in talking about experiments in governance and innovation studies.

Experimentation as Method: Testing Hypotheses

The term 'experimentation' originates from scientific method and experimental practice in laboratory contexts (see Pallett, Chapter 5). In this original form, experimentation is often inscribed within a positivist understanding of knowledge production through a primarily deductive logic, and a general understanding that a hypothesis can be formulated and then 'tested'. In that context, experiments are seen as allowing for the testing of hypotheses through repeatable observations and the introduction of variations in a controlled setting (the laboratory). Strict controlled environments do not exist in the social realm and, hence, call for methodological adjustments in the context of climate governance (e.g. 'uncontrolled experiments', 'field experiments'). An experimental approach carries with it the illusion of control over an environment, the social world and its complexity. The notion of laboratory has been transposed into the social world, in settings such as living labs (Veeckman et al., 2013), where strategic experimentation is taking place, requiring the creation of contained and to some degree 'controlled' spaces (Evans, 2011). Spatial and temporal bounding become central concerns (e.g. Karvonen, Chapter 11).

Experimentation as Testing: Selecting Designs that Work

Related to the preceding discussion, and against the background of classical understandings of innovation, experimentation is often seen as the initial step (e.g. 'from theory to practice', 'from design to implementation' or 'from idea to market'). Here experimentation is seen as a means for selecting promising designs and specifying challenges on which to focus for further development. A novel idea is trialled so as to establish its feasibility, identify potential problems and guide further adjustments. This view is tied to an understanding of experimentation as a source of strategic learning to be exploited.

Experimentation is here seen as the more or less systematic testing of ideas. Within business innovation, these can be referred to as 'trial-and-error problem-solving processes and strategies for experimentation used in the development of new products and services' (Thomke, von Hippel and Franke, 1998:315). This

form of experimentation typically involves a simplified version of an innovative product or service and may go through a series of stages. Pilots seek to test for feasibility and acceptability, while demonstration projects aim to refine further the performance potential of an innovation (Hoogma, 2000). For highly regulated products, like pharmaceuticals, safety and efficacy testing is part of the demonstration phase. Experimenting as testing informs the notion of policy piloting, where learning can occur in a specific setting before wider deployment (see Nair and Howlett, Chapter 9; van Buuren et al., Chapter 8), or to more symbolically display leadership on a particular issue.

Experimentation as Transformational Strategy: Learning by Doing

Beyond the limits of scientific method and hypothesis testing, experiments are generally associated with the acquisition of new skills and knowledge. In such an understanding, experimentation may refer to trial-and-error learning. Learning by doing is also explicit in most definitions of experiments (Smith, 2006; Berkhout et al., 2010). Experimentation produces specific kinds of interventions, observations and inferences that may be strategically mobilised for governance purposes (Pahl-Wostl, 2009). The key aspect of experimentation becomes a process of recursive learning, which is seen as enabling improvement through iterative cycles of designing, making and adjusting (see Farrelly and Bos, Chapter 6; Karvonen, Chapter 11). Experimentation can, in this view, also be seen as a specific disposition of individuals or organisations, to be resilient under turbulent environments and is linked to notions of improvisation and organisational adaptation (Tushman and Romanelli, 1985; Weick, 1998). Therefore, learning happens both during and after experiments, on the basis of individual projects and at a more aggregate level. From our perspective of 'beyond experiments', learning after an experiment also appears important. In this category, higher order learning has been described as a measure of success (Brown and Vergragt, 2008) that manifests itself through, for example, changed discourses and practices, as well as policy and institutional change resulting from experimentation (Kivimaa et al., 2017).

Experimentation as Radical Novelty Creation: Opening Up Alternatives

A related metaphor understands experimentation as a source of novelty. On the one hand, such novelty can consist in relatively small variations from existing processes, offering scope for incremental improvement. On the other, radical innovation can be seen as novelty creation well beyond the boundaries of existing frameworks (of knowing, of doing, of thinking, etc.). Such a view is closely associated with an understanding that radical change tends to come from outside the prevailing ways of doing things and involves breaking conventions by experimentalists. Experimentation can then be seen as thinking beyond existing

paradigms to solve previously intractable problems, or to chart new possibilities. In a policy and governance context, this may involve seeing problems under, above and between existing jurisdictions (Jordan and Huitema, 2014c).

Experimentation as Nurturing: Fostering Alternatives in Protected Spaces

Linked to the innovation metaphor is an emphasis on the fragility and lack of 'fitness' of any form of novelty. Mokyr (1990) referred to path-breaking innovations as 'hopeful monsters' that have yet to fulfil their potential and may carry a number of intrinsic problems. From this comes the idea that experiments are organised for nurturing and protecting early and vulnerable seeds of change. Experiments are seen as small-scale initiatives in the earliest stages of innovation processes that do not yet conform to existing socio-technical contexts (Schot, Hoogma and Elzen, 1994; Berkhout et al., 2010). Due to their inherent fragility, new socio-technical configurations can be strategically nurtured in 'niches' (cf. Kemp et al., 2001), understood as 'protected spaces' where external selection pressures cannot exert their full influence (Smith and Raven, 2012). Within this evolutionary understanding of change, experimentation is seen as an activity enabling a variety of options and solutions to be generated and their relevance explored. This view sees a role for experimentation in an understanding of transformative change that originates from and grows in innovation niches, and eventually may break through to challenge (and overtake) an established regime.

Experimentation as Politics: Performing Reality

Experimentation is not a value-free proposition. On the contrary, engaging with the world through experimentation is reminiscent of the generalisation of a scientific method to all realms of society – in our case climate governance. However open or narrow the transposition of the laboratory metaphor to the social realm, experimentation has a performative dimension with deep implications. Experimentation implies the appreciation and acceptance of a worldview and a set of tools, mobilised to produce collective realities (see Castán Broto and Bulkeley, Chapter 4). In short, experimentation can be seen as a process of ordering the socio-material world. The experimental process and its concrete outputs, by articulating and establishing a certain kind of reality, define what is important and worth observing, make predictions about broader outcomes and seek to validate these through actions. An experimental attitude contributes to 'governing' the perceptions and actions of individual actors and decision-makers by, for instance, favouring certain approaches over others, legitimising certain forms of epistemic authority and permitting and preventing access of certain actors. In this sense, experimentation can be seen as 'politics by other means'. This becomes