DELIBERATION AS A CATALYST FOR REFLEXIVE ENVIRONMENTAL GOVERNANCE

John S. Dryzek
Jonathan Pickering

UNIVERSITY OF CANBERRA

INSTITUTE FOR GOVERNANCE & POLICY ANALYSIS

CENTRE FOR DELIBERATIVE DEMOCRACY AND GLOBAL GOVERNANCE

ABOUT THE SERIES

The Centre for Deliberative Democracy & Global Governance working paper series makes preliminary findings of research on deliberative democracy publicly available in advance of publication in journals and books. The series aims to present new research that makes original, high-quality contributions to the theory and practice of deliberative democracy informed by recent literature in the field. For further information see: http://www.governanceinstitute.edu.au/centres/deliberative-democracy-and-global-governance/working-paper-series.

Views expressed in working papers are those of the author(s) and do not necessarily reflect those of the Centre's members.

Deliberation as a Catalyst for Reflexive Environmental Governance

John S. Dryzek (john.dryzek@canberra.edu.au) and Jonathan Pickering (jonathan.pickering@canberra.edu.au)

Centre for Deliberative Democracy and Global Governance, Institute for Governance and Policy Analysis, University of Canberra

Working Paper Series No. 2/2016

ABSTRACT

Reflexivity has long been accepted as a central virtue in environmental governance. Ecological or ecosystemic reflexivity involves the capacity of social-ecological systems to reconfigure themselves in response to reflection on their performance. In this paper we argue that deliberation is central to reflexive governance, mainly because it can reconcile many if not most of the sometimes contradictory claims that are made in the literature about its drivers. We take four key dimensions along which reflexivity may be sought, each of which features a binary that puts two plausible drivers of reflexivity in tension with one another: (i) sources of knowledge (public participation versus expertise); (ii) composition of public discourse (diversity versus consensus); (iii) institutional architecture (polycentricity versus centralization); (iv) institutional dynamics (flexibility versus stability). In each case, we demonstrate that deliberative ideas can manage the tension between the two plausible drivers of reflexivity.

Keywords

Acknowledgments

1. INTRODUCTION

Reflexivity has long been accepted as a central virtue in environmental governance (Beck 1992; Beck et al. 2014; Hendriks and Grin 2007; Meadowcroft and Steurer 2013; Voß, Bauknecht, et al. 2006). In the context of governance generally, reflexivity is the ability of a structure, process, or set of ideas to reconfigure itself in response to reflection on its performance. In environmental governance we can speak of ecological or ecosystemic reflexivity whose concern is with social-ecological systems rather than just human systems; while reflection requires human agency, the ability to listen and interpret signals from the non-human world is central. Given that our context in this paper is environmental, we shall refer to reflexivity for short while we mean ecosystemic reflexivity throughout.

The increasingly prominent conceptualization of environmental affairs in terms of an emerging epoch of the Anthropocene confirms the importance of reflexivity and adds urgency to its pursuit. The Anthropocene emerges as human influences become decisive in affecting the parameters of the Earth system. While its starting point is debatable, the Anthropocene makes itself felt in the "Great Acceleration" in material production, global trade, and environmental degradation starting in the mid-twentieth century (Steffen et al. 2011). The departure from the relatively stable conditions of the preceding Holocene epoch increases the risk of catastrophic tipping points or state shifts in ecosystems, including the Earth system in its entirety. Possibilities include rapid sea level rise as polar ice melts, and local or regional collapse of ecosystems such as the Amazon rainforest. Many if not all of the dominant human institutions that developed in the late Holocene have trouble recognizing their environmental preconditions and impacts, and as such are insensitive to the possibility of catastrophe and indeed have contributed to ecosystem degradation. In other words, the key problem with dominant political and economic institutions such as states, corporations and markets is that they are not reflexive. The problem is exacerbated inasmuch as those institutions feature path dependency generating feedback that seems to confirm their own necessity, but in a way that avoids responding to signals from the non-human world (which, in an epoch of pervasive human influence in ecosystems, is less non-human than before).

Reflexivity is, then, a key virtue for environmental governance. But what exactly enables reflexivity, and what inhibits it? The literature on reflexive governance (and associated areas) makes a variety of claims about the sources of reflexivity and obstacles to it. This literature does not however speak with one voice. So, for example, views are divided as to whether addressing complex global problems such as climate change requires an approach that is highly decentralized (given diverse individual and social drivers of environmental impacts and the ways in which climate change affects communities) or highly centralized (given the globally aggregated nature of the causes of climate change). Here we will not try to put to rest questions about the drivers of reflexivity, but we will make the case for regarding deliberation as necessarily central to reflexive governance, mainly because it can hold a series of governance binaries in productive tension, thus yielding reflexivity. Our concern is with drivers that can be the object of collective choice, which rules out (for example) uncontrollable disasters and crises.

There is a large literature on deliberative democracy and the environment (see among many others Gundersen 1995; Baber and Bartlett 2005; Smith 2003), most of which points to the positive environmental consequences of deliberation (but see Humphrey 2007 for a discordant note). While the occasional reference to reflexivity can be found in this literature (see for example Hendriks 2009), as yet there is no sustained treatment of the sort we develop in this paper.

Our strategy is to take four key dimensions along which reflexivity may be sought, each of which features a binary that puts two plausible drivers of reflexivity (both of which have their advocates) in tension with one another. The dimensions and their associated binaries are:

(i)   Sources of knowledge: public participation versus expertise;
(ii)   Composition of public discourse: diversity versus consensus;
(iii)   Institutional architecture: polycentricity versus centralization;
(iv)   Institutional dynamics: flexibility versus stability.

In each case, we will demonstrate that deliberative ideas can manage the tension between the two plausible drivers of reflexivity.

While at its core our argument is an attempt to pin down what enables reflexivity in practice, it can also be read as confirmation that deliberation in environmental governance remains important under a diverse range of assumptions about institutional arrangements.

Though our argument is mostly normative, it is informed by empirical evidence on environmental governance at global and national levels, albeit not (in the space of a short paper) by systematic empirical analysis. The binaries we set out may provide foundations for further empirical study of drivers of reflexivity and the associated role of deliberation.

2. DISTINGUISHING SOURCES OF REFLEXIVITY FROM ITS CONSTITUTIVE FEATURES

By analyzing reflexivity and deliberation in tandem we seek to address a limitation of existing literature that often fails to distinguish clearly between what reflexivity is (its constitutive features) and what enables it (its drivers). Clarifying this distinction is a prerequisite for well-grounded empirical analysis aiming to explain the conditions under which institutions become reflexive.

Maintaining this distinction is particularly important—though challenging—when it comes to the relationship between deliberation and reflexivity. We define deliberation as "debate and discussion aimed at producing reasonable, well-informed opinions in which participants are willing to revise preferences in light of discussion, new information, and claims made by fellow participants" (Chambers 2003:309). Like reflexivity, deliberation describes a process of reflection and revision. Nevertheless, it does not follow that reflexivity is necessarily deliberative. If Hayek (1979) is right about the way markets work, poor performance can lead to their reorganization, using numerous bits of incomplete and fleeting knowledge, with no collective contemplation of reasons for failure. Lindblom's (1965) "intelligence of democracy" works through "partisan mutual adjustment" or a series of reciprocal adaptations without conscious collective attention to success or failure. Non-deliberative (or weakly deliberative) reflexivity might also involve response to social movement protest or civil disobedience; or the spread of technological or institutional innovations through market-driven competition (see generally Finnemore and Sikkink 1998; Stevenson and Dryzek 2014:214-216; Westley et al. 2013).

This variety of sources is grist for an ongoing debate about the drivers of reflexivity. We will try to show that, whatever one thinks about these non-deliberative sources, deliberation needs to be central to thinking about reflexivity, and that the theory of deliberative democracy can show what is required.

3. SOURCES OF KNOWLEDGE: PUBLIC PARTICIPATION VERSUS EXPERTISE

3.1 Reflexive tensions

Meadowcroft and Steurer argue that "because policy-relevant knowledge is increasingly dispersed among different societal actors, [...] the quest for reflexivity is closely related to the principle of participation" (Meadowcroft and Steurer 2013:7). This argument is particularly relevant for ecosystemic reflexivity given the widespread dispersion of both causes and impacts of environmental change. Such a view can draw on epistemic arguments for democracy, for which cognitive diversity is much more important than narrow expertise in solving collective problems (Landemore 2013). In Ulrich Beck's (1992) classic account of reflexive modernization, it is publics (not experts) who, recognizing the harmful side-effects of economic development, begin to call into question taken-for-granted assumptions about the priority of economic growth and the composition of its trajectory.

Beck's (1992) argument for the most part treats scientists as risk apologists (which is certainly no longer the case when it comes to major environmental issues), and assumes it is possible for ordinary citizens to trace the causes and effects of environmental risks and damages. But especially when it comes to complex and global hazards, it is only experts who are capable of identifying the problem in question, where it came from, and what biophysical mechanisms should be targeted in order to ameliorate it (Reid et al. 2010). Without science, the ozone layer could not have been recognized, nor the impacts of chlorofluorocarbon emissions upon it traced, nor the damage caused by increased exposure to ultraviolet radiation that results from this damage located. Without science, climate change could not have been conceptualized as an encompassing phenomenon, nor its causes in greenhouse gas emissions established. Climate change too illustrates the disastrous consequences for public debate when those without any relevant expertise regard themselves as competent judges on its (non-)existence. Thus McCright and Dunlap (2010:105) characterize the US conservative movement, which has vigorously attacked climate science, as "a highly potent force of anti-reflexivity".

In short, the complexity, aggregative nature and global scale of some alterations to global ecosystems—including the impact of human activity on the Earth's atmosphere—mean that knowledge about changes at the global level is difficult to accumulate in the absence of some degree of coordination of expert inquiry (ICSU 2010:12). In this light, reflexive governance must include relevant expertise at its center.

Yet reliance on expertise also poses hazards for reflexivity. Meadowcroft and Steurer observe that state-sponsored environmental assessments may rely excessively on elite sources of knowledge that often take for granted existing institutional arrangements, thus limiting the potential of such assessments to explore alternative configurations (Meadowcroft and Steurer 2013:16). Silke Beck et al (2014) argue that the reflexivity of global environmental assessments would benefit from greater openness to different kinds of knowledge.

Still deeper suspicion of the political implications of expert knowledge organized in such assessments can also be found. Luke (2011) sees scientific expertise as generated by (for example) the Intergovernmental Panel on Climate Change (IPCC) as helping constitute a power-knowledge complex involving corporations and governments as well as scientists whose main function is to

perpetuate economic growth and convince ordinary people that (say) changes in their consumption patterns will actually make a difference in limiting climate change, when in reality they will not. While Luke does not use the term "reflexivity", he is effectively describing the shutting down of reflexivity in a process in which experts are complicit.

The scientists who gather in the IPCC and anyone who has observed their frustrations would not recognize this interpretation of their activity. Earth scientists in general who have tried to involve themselves in more comprehensive reorientations of governance have found themselves frustrated by global politics. In 2012 Earth scientists made a concerted push in connection with the United Nations Conference on Sustainable Development (Rio+20), for official adoption of the key idea of "planetary boundaries". Nine such boundaries define a space in which human life can flourish, and each has a value attached to it. So for example the boundary for carbon dioxide concentration in the atmosphere is set at 350 parts per million; that for land system change at converting 15% of the Earth's land area to cropland (Rockström et al. 2009). The push failed: the planetary boundaries concept proved too controversial to make it into the final declaration of the summit, largely because some countries (including the US and China) interpreted the concept as placing quantitative limits on economic growth (Galaz 2014:8). To these scientists, the idea that they are participants in an oppressive global power-knowledge complex would be laughable, given they are frustrated by the fact that those in positions of power do not take seriously enough what scientists are saying. Many of them are dismayed when the science is either ignored or its implications mangled in international and domestic politics. Still, the fact that the ambition to assert the authority of science remains might worry those who believe reflexivity requires more participatory processes.

Participation too has its reflexivity hazards. The heuristics and biases identified by behavioral decision theory can affect the way people react to risks. Non-experts are likely to give more weight to immediate personal experience as opposed to statistical probabilities (the availability heuristic) and to react to the same risk very differently depending on how it is framed (for example, whether damage to an ecosystem is framed as a loss from the status quo, or as preserving most of the good in the status quo) (Kahneman 2011:140, 370).

3.2 Deliberative reconciliation

The dual importance of participatory and expert deliberation raises difficult questions about how to foster exchange of knowledge between scientists and the public, how to weigh competing claims between these communities, and whether and how to construct a suitable division of epistemic labor (Cornell et al. 2013). We believe deliberative thinking is well placed to handle the tension between participation and expertise, in the following ways.

To begin, expertise itself can be more or less reflexive. It may not be reflexive when experts assert that their disciplinary training gives them unique insight and authority when it comes to an environmental problem. It is more reflexive when assessment processes involve competing methods and perspectives, such that they may generate a degree of reflexivity in combination despite the limitations of each kind of knowledge in isolation (Meadowcroft and Steurer 2013:19). But so much depends here on the way combination and synthesis occurs. We suggest that the more deliberative the process, the more reflexive can science become. In his retrospective on the Millennium Ecosystem Assessment (MA; involving 2000 natural and social scientists), Norgaard (2008)

concludes that particular disciplinary knowledges cannot simply be aggregated to yield an adequate understanding of complex ecological systems. But what the MA showed was that people from different disciplinary backgrounds could deliberate and so "form a collective analytical ability that was more than the sum of their individual contributions" (Norgaard 2008:863). Crucially, "personal or experiential knowledge played an important bridging role in the deliberative learning process" (Norgaard 2008:863) – which suggests an opening to bridging the expert/lay divide (though only experts were involved in the MA). Thus incompatible disciplinary frameworks could be reconciled at the level of dealing with practical issues. This does not mean we have anything approaching deliberative *democracy* in the MA, which would require broader lay participation.

There are two lessons here. The first is that more deliberative scientific assessments are likely to be more reflexive, in terms of a collective ability to question presuppositions and associated limitations in particular discipline-based knowledges. The second, drawn by Norgaard (2007:381) himself, is that "the lines between scientific ways of knowing and democratic ways of choosing continue to blur." Many of the judgments exercised by participants in the MA are not that dissimilar to those that lay citizens could contribute to (for example) deliberating the directions that research and technology should take, or how particular sorts of risks should be interpreted and evaluated.

Here it is possible to think more deeply about how to involve experts and citizens in productive deliberative relationships. Now, in some cases citizens can participate in the generation of what looks like expert knowledge. An example would be the kind of "popular epidemiology" celebrated by Fischer (1993:178-181). Frustrated citizens undertook their own epidemiological analysis of health problems in the vicinity of a toxic waste site in Massachusetts, eventually involving university-based experts in the generation of data that stood up in court in forcing a chemical company to recognize a leukemia cluster, joining experts and lay citizens in a deliberative relationship.

In deliberative settings, ordinary citizens can grapple effectively with expert knowledge, while at the same time not leaving behind their own ordinary knowledge and varied lay perspectives. The evidence here comes from designed citizen forums on issues such as genetically modified organisms in agriculture, human biotechnology, nanotechnology, and climate change (Grönlund et al. 2014). One common task (in for example consensus conferences and citizens juries) is that the citizen-participants write a report recommending and justifying policy action. The report can reflect moral as well as technical judgments. Citizens are given access to information and receive expert presentations. They can also receive presentations from advocates on different sides of an issue. Among hundreds of such cases in many different countries, it is very hard to find a single instance of citizens failing to comprehend scientific knowledge presented to them. Moreover, there is evidence to suggest that citizen deliberation can help overcome the biases and cognitive shortcuts that otherwise affect judgments about risk. In Kahneman's (2011) language, deliberation involves "slow" rather than "fast" thinking. Niemeyer (2014:184) shows how deliberation can bring preferences into line with inner values and beliefs, as deliberators can see through the symbolic claims that often populate partisan politics.

One empirical finding from an analysis of citizen forums on genetically modified foods is that wherever these forums are conducted, they almost invariably reach a more precautionary approach to the issue than that adopted by policy-making elites, who are

more committed to putting the technology to use in the interests of economic development (Dryzek et al 2008). Here it is not risk aversion per se that indicates reflexivity, but rather risk recognition, which policy making elites tend to repress in the interests of economic imperatives. This is a perfect illustration of deliberating citizens with access to scientists and expertise proving to be more reflexive in their willingness to question society's basic normative commitments than standard policy-making processes.

It is possible to think further about the role of deliberation in productively reconciling expertise and public participation through reference to attempts to communicate climate change to the public. The traditional approach to communication assumed that the public simply needed to be educated in the findings of climate science. This one-way model has reached its limits, as members of the public who do care about the issue one way or the other process information through ideological filters. Surveying success and failure in communication on climate change and other issues, Moser and Dilling (2011) believe that the solution to failure in one-way campaigns lies in better engagement and deliberation involving scientists, advocates, and ordinary citizens. Citizens would play a more active role in helping to pose questions for science to study, prioritizing problems for inquiry, making sense of what scientific findings imply, reconciling lay concerns with the findings of science, and reasoning through the implications for policy. The hope is that this kind of engaged dialogue would enable participants to get beyond ideological filters and engage in more reflexive scrutiny of established practices (Cornell et al. 2013).

The kind of process advocated by Moser and Dilling involves direct, face-to-face dialogue. An alternative way of thinking about expertise and participation would be to see each as moments in the life of a deliberative system (Mansbridge et al. 2012; Dryzek and Stevenson 2011). In this light, there would be no strict need for experts and citizens to deliberate together all the time. Such a deliberative system might involve an expert assessment such as the IPCC or the recently formed Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) along with familiar sorts of citizen forums. Each kind of forum could be internally deliberative, and it may make sense for (say) scientists to spend time just with other experts, and citizens with other lay citizens. What then becomes crucial is the nature of the connections between the two sorts of forums (and with intergovernmental negotiations). Communication from science to existing lay citizen forums is well established—though the scientists who do it are usually there as individual experts, rather than representatives of an expert assessment panel. Communication in the opposite direction, from citizen forum to expert panel, is currently for the most part non-existent.

One very clear institutional design implication is that bodies such as the IPCC and IPBES should foster ways of enhancing citizens' input into future assessments. This need not mean delegating to citizen forums the task of passing judgment on technical aspects of atmospheric chemistry. Rather, these bodies could engage with citizens' perspectives in several ways: (i) assessing the current state of scholarly knowledge about public perceptions relevant to specific assessments (e.g. perceptions of risk, and the values that people assign to goods such as nature and a safe climate); (ii) enabling representatives of groups of citizens and discourses to inform the work of the bodies; and (iii) drawing insights from citizen forums either convened by each body or by other institutions. The IPBES has progressed considerably further than the IPCC in engaging stakeholders (Beck et al. 2014:85). Nevertheless both institutions need to do more to take account of the knowledge held by citizens, including those such as indigenous peoples who may be particularly vulnerable to—and aware of—the impacts of climate change and biodiversity loss.

4. COMPOSITION OF PUBLIC DISCOURSE: DIVERSITY VERSUS CONSENSUS

4.1 Reflexive tensions

Andy Stirling and others refer to the dilemma of "opening up" versus "closing down" that arises in governing complex problems (Stirling 2008; Voß, Kemp, et al. 2006:429). On the one hand, reflexivity requires that governance be opened to multiple perspectives and sources of information (see also Cornell et al. 2013). There is clear resonance here with the epistemic argument for democracy discussed in the previous section, with the accent on the diversity of perspectives that a pluralist democracy in particular enables. A substantial body of thinking points to the importance of a vibrant and diverse public sphere in critically scrutinizing existing governance practices, values and discourses, and in generating new ideas and discourses (see for example Habermas 1996). These characteristics may be particularly important sources of reflexivity in recognizing problems and rethinking the ends of collective decision. Healthy skepticism about widely accepted claims may also be important in challenging orthodox views that marginalize environmental concerns (Söderbaum 2013:224). But on the other hand, a collective response may also require a degree of closing down in the sense of bracketing unresolved uncertainties and establishing a degree of discursive common ground in order to determine a specific course of action (Voß, Kemp, et al. 2006:431; Walker et al. 2006:8).

4.2 Deliberative reconciliation

On some misconceptions, deliberation is all about "closing down" in these terms, involving a search for consensus. While that might have been true of some theoretical statements (associated with Habermas in particular) several decades ago, a more sophisticated orientation toward navigating the tension between diversity and commonality, opening up and closing down, now characterizes deliberative thinking. This orientation can be put to good use in thinking about reflexivity.

Here, the concept of meta-consensus is key. Instead of striving for simple consensus, deliberative processes should look for a more productive relationship across diverse values, judgments, preferences, and discourses. Meta-consensus refers to agreement on the legitimacy of disputed values, the credibility of disputed beliefs, the nature of disputed choices (including the range of acceptable options), and the acceptable range of contested discourses (Dryzek and Niemeyer 2006). Meta-consensus cannot be achieved without a degree of scrutiny by participants of their own positions as well as the positions held by others. This does not necessarily mean that individuals have to let go of the positions with which they began (though that is a possibility). But it does mean that these positions may have to be re-formulated in a way that renders them acceptable to others who do not share the position, who must themselves be equally willing to engage in such self-scrutiny. Here, the deliberative pursuit of meta-consensus comes close to the essence of reflexivity at the intersubjective level. The achievement of meta-consensus may require hard work, especially when it comes to the need to construct discursive bridges across conflicting positions.

Meta-consensus is not just a theoretical abstraction; its generation is observable in response to all kinds of real-world conflicts. In communicative approaches to dispute resolution, getting each side to recognize the legitimacy of the interests held by other sides is a key step on the way to a substantive agreement. The agreement itself is sometimes referred to as "consensus" (Susskind et al. 1999), but it is not consensus in the sense that the outcome is now the first preference of all participants. Rather, it is a workable agreement that the different sides can accept in comparison to the alternative of no agreement (Lo 2013:92). Often this requires a measure of creativity to craft options that meet the interests of different sides – though those interests can themselves be reconstructed in deliberation.

We can see something like meta-consensus emerging in global climate change negotiations, in (say) the path to agreement at the UN climate summit in Paris in 2015, in which the traditional division between developed and developing states was transformed into a more productive recognition that all countries had parts to play in reducing emissions. Attempts to quantify the part that each country should play (in terms of shares of the global mitigation effort) foundered on a collective inability to agree on a single metric or formula for apportioning national efforts (Pickering 2015). Yet, in the absence of substantive consensus on a metric for effort-sharing, countries moved to what might be seen as an implicit meta-consensus that, while countries retain discretion to choose the metric on which they base their national pledges, they must publicly justify why their pledges are fair and ambitious (UNFCCC 2015, paragraph 27). Nevertheless, the overall process was at best only weakly deliberative, for deliberation did not reach as far as any questioning of dominant neoliberal growth-centric models of development (Stevenson 2016).

Both the content of a meta-consensus and the process through which it is generated can be more or less defensible in deliberative terms. A negative example here involving sustained attempts to engineer an epistemic meta-consensus (on judgments) that undermines simple consensus can be found in the efforts of those Oreskes and Conway (2011) call "merchants of doubt." These merchants are publicists and a small group of scientists who have tried to obtain public acceptance for the credibility (though not necessarily the truth) of claims challenging the view that smoking causes cancer and that climate change is occurring as a result of human activity. Policy inaction can then be justified on the grounds that there is legitimate disagreement on the underlying science. What these examples illustrate is that meta-consensus only contributes to reflexivity if it is generated through free and reasoned deliberative means, and if it is accompanied by reflection on one's own position, as opposed to manipulation of the terms of public discourse. The more deliberative the process, the less likely it is to reflect false claims and symbolic invocations (Niemeyer 2014).

5. INSTITUTIONAL ARCHITECTURE: POLYCENTRICITY VERSUS CENTRALIZATION

5.1 Reflexive tensions

The literature on resilience and adaptive governance frequently emphasizes the importance of decentralized or polycentric configurations of institutions for addressing environmental or social concerns. A common argument is that reflexivity may arise through the ability of individuals and groups to organize into "niches" for innovation or experimentation that are partly insulated from external pressures to conform or compete (Olsson et al. 2014:5; Westley et al. 2011:767). One example is the emergence of the Danish wind farm industry, which originated in the Alternative Technology social movement but later expanded with support from the Danish government (Smith 2006). Of course much depends on what goes on in particular niches. It is entirely possible that a particular niche may be dominated by a narrow set of actors (Chaffin et al. 2014:1; Hendriks 2009:359) or by economic interests committed to development at all costs (Baber and Bartlett 2005:129-130), and not interested in reflexive questioning of that imperative. Still, the more niches, the greater the possibility that something positive may be found, somewhere. Niches or settings comprising smaller groups of actors may also help to build trust necessary to secure large-scale or multilateral agreements (Cole 2015).

Even if a niche does feature effective experimentation, innovation has to be taken up more widely if reflexivity is to have much meaning. There is risk that a high degree of decentralization may limit possibilities for the kind of collective action necessary to apply niche ideas more broadly (Folke et al. 2005:450; Hendriks 2009:357) and may pose difficulties for monitoring—and thus reflecting meaningfully on—aggregate performance (Jordan et al. 2015). Even those who argue for a polycentric approach to environmental governance frequently qualify their claims by noting that the degree of decentralization required may depend on the type of environmental problem at issue (Young 2002), and that an effective polycentric approach still requires linkages or "modes of coordination" involving civil society and governments to enable the spread of innovations (Olsson et al. 2014:5). Learning across cases may be limited where ties within decentralized networks are stronger than the ties between them (McNutt and Rayner 2014). At the same time, however, too tight an integration between non-governmental organizations and government may limit institutional flexibility and the capacity of civil society to hold government to account—this can happen when environmental groups are brought into corporatist arrangements.

In a skeptical light, decentralization means mainly the fragmentation of governance, limited to partial and ineffective solutions. The implication of this kind of position is that there is no necessary reflexivity at the level of the system as a whole. So if we look for example at the numerous decentralized initiatives in climate governance celebrated by Hoffmann (2011), there is no systematic learning mechanism that transcends individual cases; still less any contemplation within the pattern of governance they constitute about how adequate they are in sum when it comes to addressing climate change. Hoffmann (2011:159) himself recognizes that participants are not able to discern the system they are part of in the way he describes it.

With the danger of uncoordinated and unsatisfactory fragmentation in mind, Biermann (2014, ch. 4) recommends more strongly multilateral environmental governance, as this would enable more effective collective action on global problems. Biermann calls for

a "constitutional moment" in global affairs (a bit like the burst of institutional innovation that followed World War II). Biermann's idea would involve a well-defined set of institutions (such as a World Environment Organization) and arrangements rather than more open-ended reflexive scrutiny of the foundations of global environmental governance. As Christoff and Eckersley (2013) note in their critique of Biermann's proposal, more multilateral action alone may achieve little unless individual states, which are the dominant actors in shaping the multilateral system, opt first for less ecologically damaging strategies for economic development. Few multilateral environmental regimes have performed particularly well (with the notable exception of the ozone regime), so a degree of faith is required in advocating a more centralized approach. There is no guarantee that centralized governance will be reflexive, even if it is effective in other ways (e.g. in achieving compliance on the part of states). Scott (1998) warns that centralized "seeing like a state" in a complex world means hubris and disaster.

5.2 Deliberative reconciliation

Polycentricity and centralization both have plausible arguments that can be made for and against their capacity to generate reflexivity. Can deliberation help navigate the tension between them?

To begin, the difficulty that decentralized approaches have in enabling more systemic reflexivity could be overcome by a deliberative learning mechanism that sorts lessons from particular cases and communicates them in persuasive and comprehensible terms to those in a position to advance initiatives in other locations. The best existing intimation of such a mechanism may perhaps be found in networks that link local governments concerned with issues such as climate change. The International Council for Local Environmental Initiatives (ICLEI) cities network is an information-sharing, advocacy and capacity-building institution through which lessons from successful (and unsuccessful) local practices can be disseminated. Multilateral processes may also facilitate deliberation about the role and impact of decentralized processes, thereby increasing the prospects of diffusing successful initiatives. At the Paris climate summit, for example, members of the United Nations Framework Convention on Climate Change (UNFCCC) agreed to establish a "platform for the exchange of experiences and sharing of best practices on mitigation and adaptation in a holistic and integrated manner" among Indigenous peoples and local communities (UNFCCC 2015, paragraph 135).

Reflexive governance requires not just deliberation, but also meta-deliberation: that is, contemplation of the deliberative qualities of the system on the part of those engaged in it (Landwehr 2015). While meta-deliberation could extend to any of the four tensions we discuss, we illustrate its potential by reference to the tension between polycentricity and centralization. Thus a meta-deliberative capacity could help evaluate the deliberative qualities of both centralized and decentralized initiatives, with a view to encouraging a productive relationship between them. Meta-deliberation about institutional architecture must inevitably be context-specific, as there are almost certainly no right answers that apply across all issues, times, and places (despite what some enthusiasts on each side believe).

Meta-deliberation could address the reflexivity deficits that can accompany centralization, for example by exploring alternative modes of decision-making that could avoid the stasis and levelling-down that have plagued the UNFCCC's consensus-based processes, while also ensuring that those affected by decisions are not excluded (see among others Eckersley's (2012) proposal for

"inclusive minilateralism" within the UNFCCC). Parties have sporadically raised the adoption of majority voting as an alternative to consensus-based decisions but to date there remains little appetite for change among more influential countries (Kemp 2015).

In multilateral climate governance we can see other hints of meta-deliberation, such as movement toward recognition that a more decentralized approach to setting targets may be necessary, along with acknowledgment (as discussed above) that such an approach should be accompanied by measures to hold countries accountable for doing their fair share of the required global effort. The recent formation of a Standing Committee on Finance in the UNFCCC reflects awareness that institutional arrangements for funding responses to climate change in developing countries had become highly fragmented, to the detriment of effectiveness and accountability (Schalatek 2012), and that a forum was necessary to improve the coherence and coordination of funding arrangements.

Meta-deliberation could also address the reflexivity deficits that can accompany decentralization: how to promote learning that transcends individual cases, how to facilitate the broader recognition and take-up of successful niche ideas, how to coordinate partial actions into more consequential wholes, and how to incorporate expertise into fragmentary governance arrangements. Of course meta-deliberation is not the only way to address such questions, which could also be contemplated by some hierarchical authority, or even by multilateral negotiation. But meta-deliberation is the only way to perform these tasks while preserving the advantages that decentralization offers for reflexivity.

A measure of meta-deliberation can be found in proliferating decentralized experimental governance initiatives. So for example the founders of the C40 Cities Climate Leadership Group designed it with the limitations of ICLEI's older Cities for Climate Protection in mind (Hoffmann 2011: 92). But generally missing on such occasions is contemplation of how partial actions contribute to consequential wholes and systemic effectiveness. Where then might we seek meta-deliberation about the pattern of polycentric governance as a whole in a particular area?

The most promising avenue here would involve transcending the centralization/polycentricity binary. In this light, the finding of a survey of sixty transnational climate governance initiatives that their emergence "has taken place in the 'shadow' of the international [climate] regime and is firmly embedded within existing patterns of political economy" (Bulkeley et al. 2012:603) can be drawn on to locate meta-deliberative possibilities at the intersection of polycentric and multilateral processes. Here, it is noteworthy that sub-national climate actors have recently secured greater recognition in multilateral governance. Thus, for the first time in a legally binding multilateral climate pact, the Paris Agreement recognizes "the importance of the engagements of all levels of government and various actors [...] in addressing climate change", albeit with a caveat that such engagement should occur "in accordance with respective national legislations of Parties" (UNFCCC 2015, Preamble). The Agreement and its accompanying COP decision explicitly acknowledge subnational actors in several operative provisions. While this kind of recognition is a long way from instigating full-fledged meta-deliberation, it does open the door to meta-deliberation that would join polycentric actors with the multilateral process in a way that could mobilize the advantages of experimental governance with a multilateral concern for the adequacy of the pattern of governance in its entirety.

6. INSTITUTIONAL DYNAMICS: FLEXIBILITY VERSUS STABILITY

6.1 Reflexive tensions

Almost by definition, reflexivity requires flexibility. Institutions with greater flexibility may be better able than rigid institutions to adjust their operations in light of feedback from ecosystems (Wilson et al. 2013). Conversely, institutional path dependence—where choices about institutional design are constrained by existing institutional configurations and ingrained routines—inhibits possibilities for reflexive change (Voß and Kemp 2006:13). Yet on closer inspection, the equation of reflexivity with flexibility can sometimes be called into question.

To see why, consider what happens if flexibility and reflexivity are pursed to an extreme. A fully flexible and fully reflexive institution would be in permanent contemplation of its own structure, to the exclusion of just about anything else, including the production of valuable substantive outcomes. Reflexivity all the way down means that it may be hard to speak of an institution at all, for an institution by definition requires some degree of continuity around which routines can be developed and expectations converge, a stable context for action (Goodin 1996:22). This recognition may actually be the best argument there is against the very idea of reflexivity: that it is possible to have too much of a good thing.

The antidote to too much of a good thing would be some degree of institutional stability. Institutional stability can contribute further to reflexivity in the following ways.

First, entrenching stable legal entitlements or rights for the interests of ecosystems or future generations may help in recognizing these interests in decision-making on emerging environmental problems (Lawrence 2014; Hayward 2005), thus helping render any reflexivity that does exist more truly ecosystemic. So for example the Endangered Species Act in the United States forces consideration of at least some species in some decisions; and the National Environmental Policy Act mandates at least limited deliberation by mandating public comment on environmental impact statements.

Second, relatively stable environments for climate policy in particular may help to give renewable energy industries sufficient certainty to invest in long-term projects that compete with entrenched fossil fuel industries, thus enabling questioning of the established order in the political economy of energy.

Yet such routines clearly have their attendant dangers for reflexivity. Entrenched rights may mean that what eventually turn out to be very partial concerns get privileged and protected: for example, particular species over ecosystems, as in the US Endangered Species Act. Stable investment environments might involve privileging a technology that in the long run turns out not to be the best ecological bet; for example, centralized solar, if decentralized solar turns out to be more efficient (or vice versa).

6.2 Deliberative reconciliation

The solution here may be found in incorporating periodic review of the way that institutions function. Milewicz and Goodin (Forthcoming) see periodic review as a way to strengthen the deliberative capacity of international organizations to address a variety of issues, including environmental protection. Mandating periodic review of (for example) sustainable development strategies can itself be seen as a way to "embed reflexivity in governance routines" (Meadowcroft 2007:161). Now, review itself may not be especially deliberative in practice, especially if conducted in narrow legalistic fashion, with rigid advance specification of the terms of review. Reflexivity requires scrutiny of normative commitments and core values – not just of practices and results. Required here is a kind of deliberation that enables such critical questioning, which in turn ought to involve participants with substantially different normative commitments (which might include say biocentric as well as anthropocentric worldviews). We noted in our earlier discussion of diversity versus consensus that the deliberative pursuit of meta-consensus can help navigate the tensions that relatively deep diversity of commitments can generate.

Such review could also apply to routine practices that are intrinsically non-reflexive but may promote substantive environmental values. Consider for example the idea that international environmental agreements should establish a long-term framework under which countries have considerable flexibility to ratchet up their commitments in the light of further environmental degradation but limited flexibility to water them down (van Asselt 2014; Byrnes and Lawrence 2015).

7. CONCLUSION

In this paper we have made the case for attending to the deliberative dimension of the drivers of reflexivity. Rather than treating deliberation as an isolated driver, our argument rests on the interaction of deliberation with other possible drivers – and the tensions between them. To summarize, deliberation can contribute to reflexivity by managing in productive fashion tensions between:

- *Participation and expertise*, by joining expert and lay deliberation, whether face-to-face or by linking these two sites of deliberation within a broader deliberative system;
- *Diversity and consensus*, through the free and reasoned generation of meta-consensus that can validate multiple perspectives while at the same time enabling workable agreements across them;
- *Polycentricity and centralization*, by enabling deliberative learning across institutional niches, and through meta-deliberation that can preserve the reflexivity advantages of polycentricity while coordinating actions into consequential wholes; and
- *Flexibility and stability*, by requiring periodic deliberative scrutiny of any stable arrangements.

Reflexivity does not mean favoring one side in each of these tensions over the other. It is not necessary to see each tension as an either/or question; instead, the tension can be reconciled in a productive fashion that retains the positive qualities of both of the drivers in question.

None of this proves that deliberation is the key to reflexivity, but it does show that deliberation should play a central role in the search for reflexivity. The challenge for those who remain skeptical concerning our argument would be to identify some process that can do better when it comes to navigating all the binaries we have identified. The real advantage of a deliberative approach is that it shows how to navigate all four tensions in ways that are mutually reinforcing.

REFERENCES

Baber, Walter F, and Robert V Bartlett. 2005. *Deliberative Environmental Politics*. Cambridge, MA: MIT Press.

Beck, Silke, Maud Borie, Jason Chilvers, Alejandro Esguerra, Katja Heubach, Mike Hulme, Rolf Lidskog, Eva Lövbrand, Elisabeth Marquard, Clark Miller, Tahani Nadim, Carsten Neßhöver, Josef Settele, Esther Turnhout, Eleftheria Vasileiadou, and Christoph Görg. 2014. Towards a Reflexive Turn in the Governance of Global Environmental Expertise. The Cases of the IPCC and the IPBES. *GAIA - Ecological Perspectives for Science and Society* 23 (2): 80-87.

Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. London: Sage.

Biermann, Frank. 2014. *Earth System Governance: World Politics in the Anthropocene*. Cambridge, MA: MIT Press.

Bulkeley, Harriet, Liliana Andonova, Karin Bäckstrand, Michele Betsill, Daniel Compagnon, Rosaleen Duffy, Ans Kolk, Matthew Hoffmann, David Levy, Peter Newell, Tori Milledge, Matthew Paterson, Philipp Pattberg, and Stacy VanDeveer. 2012. Governing Climate Change Transnationally: Assessing the Evidence from a Database of Sixty Initiatives. *Environment and Planning C: Government and Policy* 30 (4): 591-612.

Byrnes, RC, and PM Lawrence. 2015. Can 'Soft Law' Solve 'Hard Problems'? Justice, Legal Form and the Durban-Mandated Climate Negotiations. *University of Tasmania Law Review* 34 (1): 34-67.

Chaffin, Brian C., Hannah Gosnell, and Barbara A. Cosens. 2014. A Decade of Adaptive Governance Scholarship: Synthesis and Future Directions. *Ecology and Society* 19 (3).

Chambers, Simone. 2003. Deliberative Democratic Theory. *Annual Review of Political Science* 6 (1): 307-326.

Christoff, Peter, and Robyn Eckersley. 2013. *Globalization and the Environment*. Lanham, MD: Rowman & Littlefield.

Cole, Daniel H. 2015. Advantages of a Polycentric Approach to Climate Change Policy. *Nature Clim. Change* 5 (2): 114-118.

Cornell, Sarah, Frans Berkhout, Willemijn Tuinstra, J. David Tàbara, Jill Jäger, Ilan Chabay, Bert de Wit, Richard Langlais, David Mills, Peter Moll, Ilona M. Otto, Arthur Petersen, Christian Pohl, and Lorrae van Kerkhoff. 2013. Opening up Knowledge Systems for Better Responses to Global Environmental Change. *Environmental Science & Policy* 28: 60-70.

Dryzek, John S., and Simon Niemeyer. 2006. Reconciling Pluralism and Consensus as Political Ideals. *American Journal of Political Science* 50 (3): 634-649.

Dryzek, John S., and Hayley Stevenson. 2011. Global Democracy and Earth System Governance. *Ecological Economics* 70 (11): 1865-1874.

Eckersley, Robyn. 2012. Moving Forward in Climate Negotiations: Multilateralism or Minilateralism? *Global Environmental Politics* 12 (2): 24-42.

Finnemore, Martha, and Kathryn Sikkink. 1998. International Norm Dynamics and Political Change. *International Organization* 52 (4): 887-917.

Fischer, Frank. 1993. Citizen Participation and the Democratization of Policy Expertise: From Theoretical Inquiry to Practical Cases. *Policy sciences* 26 (3): 165-187.

Folke, Carl, Thomas Hahn, Per Olsson, and Jon Norberg. 2005. Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources* 30 (1): 441-473.

Galaz, Victor. 2014. *Global Environmental Governance, Technology and Politics: The Anthropocene Gap. Cheltenham*, UK: Edward Elgar.

Goodin, Robert E. 1996. Institutions and Their Design. In *The Theory of Institutional Design,* edited by R. E. Goodin. Cambridge: Cambridge University Press. 1-53.

Grönlund, Kimmo, André Bächtiger, and Maija Setälä, eds. 2014. *Deliberative Mini-Publics: Involving Citizens in the Democratic Process.* Colchester: ECPR Press.

Gundersen, Adolf G. 1995. *The Environmental Promise of Democratic Deliberation*. Madison: University of Wisconsin Press.

Habermas, Jürgen. 1996. *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy. Cambridge,* MA: MIT Press.

Hayek, Friedrich A. von. 1979. *Law, Legislation, and Liberty: The Political Order of a Free People. Chicago*: University of Chicago Press.

Hayward, Tim. 2005. *Constitutional Environmental Rights.* Oxford: Oxford University Press.

Hendriks, Carolyn M., and John Grin. 2007. Contextualizing Reflexive Governance: The Politics of Dutch Transitions to Sustainability. *Journal of Environmental Policy & Planning* 9 (3-4): 333-350.

Hendriks, Carolyn M. 2009. Policy Design without Democracy? Making Democratic Sense of Transition Management. *Policy Sciences* 42 (4): 341-368.

Hoffmann, Matthew J. 2011. *Climate Governance at the Crossroads: Experimenting with a Global Response after Kyoto*. New York: Oxford University Press.

Humphrey, Mathew. 2007. *Ecological Politics and Democratic Theory: The Challenge to the Deliberative Ideal*. Abingdon: Routledge.

ICSU. 2010. Earth System Science for Global Sustainability: The Grand Challenges. Paris: International Council for Science (ICSU). Available at: http://www.icsu.org/publications/reports-and-reviews/grand-challenges/GrandChallenges_Oct2010.pdf.

Jordan, Andrew J., Dave Huitema, Mikael Hilden, Harro van Asselt, Tim J. Rayner, Jonas J. Schoenefeld, Jale Tosun, Johanna Forster, and Elin L. Boasson. 2015. Emergence of Polycentric Climate Governance and Its Future Prospects. *Nature Climate Change* 5 (11): 977-982.

Kahneman, Daniel. 2011. *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux.

Kemp, Luke. 2015. Framework for the Future? Exploring the Possibility of Majority Voting in the Climate Negotiations. *International Environmental Agreements: Politics, Law and Economics*: 1-23.

Landemore, Hélène. 2013. *Democratic Reason: Politics, Collective Intelligence, and the Rule of the Many*. Princeton, N.J: Princeton University Press.

Lawrence, Peter. 2014. *Justice for Future Generations: Climate Change and International Law*. Cheltenham, UK: Edward Elgar.

Lindblom, Charles E. 1965. *The Intelligence of Democracy: Decision Making through Mutual Adjustment*. New York: Free Press.

Lo, Alex Y. 2013. Agreeing to Pay under Value Disagreement: Reconceptualizing Preference Transformation in Terms of Pluralism with Evidence from Small-Group Deliberations on Climate Change. *Ecological Economics* 87: 84-94.

Luke, Timothy W. 2011. Environmentality. In *The Oxford Handbook of Climate Change and Society*, edited by J. S. Dryzek, R. B. Norgaard and D. Schlosberg. Oxford: Oxford University Press. 96-109.

Mansbridge, Jane, James Bohman, Simone Chambers, Thomas Christiano, Archon Fung, John Parkinson, Dennis F Thompson, and Mark E Warren. 2012. A Systemic Approach to Deliberative Democracy. In *Deliberative Systems*, edited by J. Parkinson and J. Mansbridge. Oxford: Oxford University Press. 1-26.

McCright, Aaron M, and Riley E Dunlap. 2010. Anti-Reflexivity: The American Conservative Movement's Success in Undermining Climate Science and Policy. *Theory, Culture & Society* 27 (2-3): 100-133.

McNutt, Kathleen, and Jeremy Rayner. 2014. Is Learning without Teaching Possible? The Productive Tension between Network Governance and Reflexivity. *Journal of Environmental Policy & Planning*: 1-16.

Meadowcroft, James. 2007. National Sustainable Development Strategies: Features, Challenges and Reflexivity. European Environment: The *Journal of European Environmental Policy* (Wiley) 17 (3): 152-163.

Meadowcroft, James, and Reinhard Steurer. 2013. Assessment Practices in the Policy and Politics Cycles: A Contribution to Reflexive Governance for Sustainable Development? *Journal of Environmental Policy & Planning*: 1-23.

Milewicz, Karolina, and Robert E. Goodin. Forthcoming. Deliberative Capacity Building through International Organizations: The Case of the Universal Periodic Review of Human Rights. *British Journal of Political Science*.

Moser, Susanne C., and Lisa Dilling. 2011. Communicating Climate Change: Closing the Science-Action Gap. In *The Oxford Handbook of Climate Change and Society,* edited by J. S. Dryzek, R. B. Norgaard and D. Schlosberg. Oxford: Oxford University Press. 161-174.

Niemeyer, Simon. 2014. Scaling up Deliberation to Mass Publics: Harnessing Mini-Publics in a Deliberative System. In *Deliberative Mini-Publics: Involving Citizens in the Democratic Process*, edited by K. Grönlund, A. Bächtiger and M. Setälä. Colchester: ECPR Press. 177-202.

Norgaard, Richard B. 2007. Deliberative Economics. *Ecological Economics* 63 (2–3): 375-382.

———. 2008. Finding Hope in the Millennium Ecosystem Assessment. *Conservation Biology* 22 (4): 862-869.

Olsson, Per, Victor Galaz, and Wiebren J. Boonstra. 2014. Sustainability Transformations: A Resilience Perspective. *Ecology and Society* 19 (4).

Oreskes, Naomi, and Erik M Conway. 2011. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York: Bloomsbury.

Pickering, Jonathan. 2015. Top-Down Proposals for Sharing the Global Climate Policy Effort Fairly: Lost in Translation in a Bottom-up World? In *Ethical Values and the Integrity of the Climate Change Regime*, edited by H. Breakey, V. Popovski and R. Maguire. Aldershot, UK: Ashgate. 89-104.

Reid, Walt V, D Chen, L Goldfarb, Heide Hackmann, YT Lee, K Mokhele, Elinor Ostrom, Kari Raivio, Johan Rockström, and Hans Joachim Schellnhuber. 2010. Earth System Science for Global Sustainability: Grand Challenges. *Science* 330 (6006): 916-917.

Rockström, Johan, Will Steffen, Kevin Noone, Asa Persson, F. Stuart Chapin, Eric F. Lambin, Timothy M. Lenton, Marten Scheffer, Carl Folke, Hans Joachim Schellnhuber, Bjorn Nykvist, Cynthia A. de Wit, Terry Hughes, Sander van der Leeuw, Henning Rodhe, Sverker Sorlin, Peter K. Snyder, Robert Costanza, Uno Svedin, Malin Falkenmark, Louise Karlberg, Robert W. Corell, Victoria J. Fabry, James Hansen, Brian Walker, Diana Liverman, Katherine Richardson, Paul Crutzen, and Jonathan A. Foley. 2009. A Safe Operating Space for Humanity. *Nature* 461 (7263): 472-475.

Schalatek, Liane. 2012. Democratizing Climate Finance Governance and the Public Funding of Climate Action. *Democratization* 19 (5): 951-973.

Scott, James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.

Smith, Adrian. 2006. Niche-Based Approaches to Sustainable Development: Radical Activists Versus Strategic Managers. In *Reflexive Governance for Sustainable Development*, edited by J.-P. Voß, D. Bauknecht and R. Kemp. Cheltenham, UK: Edward Elgar. 313-336.

Smith, Graham. 2003. *Deliberative Democracy and the Environment*. London: Routledge.

Söderbaum, Peter. 2013. Ecological Economics in Relation to Democracy, Ideology and Politics. *Ecological Economics* 95: 221-225.

Steffen, Will, Jacques Grinevald, Paul Crutzen, and John McNeill. 2011. The Anthropocene: Conceptual and Historical Perspectives. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences* 369 (1938): 842-867.

Stevenson, Hayley, and John S. Dryzek. 2014. *Democratizing Global Climate Governance*. Cambridge, UK: Cambridge University Press.

Stirling, Andy. 2008. "Opening up" and "Closing Down" Power, Participation, and Pluralism in the Social Appraisal of Technology. *Science, technology & human values* 33 (2): 262-294.

Susskind, Lawrence, Sarah McKearnan, and Jennifer Thomas-Larmer, eds. 1999. *The Consensus-Building Handbook: A Comprehensive Guide to Reaching Agreement*. Thousand Oaks: Sage.

UNFCCC. 2015. Adoption of the Paris Agreement. FCCC/CP/2015/L.9/Rev.1 (12 December 2015). Available at: http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf.

van Asselt, Harro. 2014. Between the Devil and the Deep Blue Sea: Enhancing Flexibility in International Climate Change Law. *Netherlands Yearbook of International Law* 45: 255-286.

Voß, Jan-Peter, Dierk Bauknecht, and René Kemp, eds. 2006. *Reflexive Governance for Sustainable Development*. Cheltenham, UK: Edward Elgar.

Voß, Jan-Peter, and René Kemp. 2006. Sustainability and Reflexive Governance: Introduction. In *Reflexive Governance for Sustainable Development*, edited by J.-P. Voß, D. Bauknecht and R. Kemp. Cheltenham, UK: Edward Elgar. 3-28.

Voß, Jan-Peter, René Kemp, and Dierk Bauknecht. 2006. Reflexive Governance: A View on an Emerging Path. In *Reflexive Governance for Sustainable Development*, edited by J.-P. Voß, D. Bauknecht and R. Kemp. Cheltenham, UK: Edward Elgar. 419-437.

Walker, Brian, Lance Gunderson, Ann Kinzig, Carl Folke, Steve Carpenter, and Lisen Schultz. 2006. A Handful of Heuristics and Some Propositions for Understanding Resilience in Social-Ecological Systems. *Ecology and society* 11 (1): 13.

Westley, Frances, Per Olsson, Carl Folke, Thomas Homer-Dixon, Harrie Vredenburg, Derk Loorbach, John Thompson, Måns Nilsson, Eric Lambin, Jan Sendzimir, Banny Banerjee, Victor Galaz, and Sander van der Leeuw. 2011. Tipping toward Sustainability: Emerging Pathways of Transformation. *Ambio* 40 (7): 762-780.

Westley, Frances R., Ola Tjornbo, Lisen Schultz, Per Olsson, Carl Folke, Beatrice Crona, and Örjan Bodin. 2013. A Theory of Transformative Agency in Linked Social-Ecological Systems. *Ecology and Society* 18 (3).

Wilson, Samuel, Leonie J Pearson, Yoshihisa Kashima, Dean Lusher, and Craig Pearson. 2013. Separating Adaptive Maintenance (Resilience) and Transformative Capacity of Social-Ecological Systems. *Ecology and Society* 18 (1): 22.

Young, Oran R. 2002. *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale*. Cambridge, MA: MIT Press.

UNIVERSITY OF
CANBERRA

INSTITUTE FOR
GOVERNANCE
& POLICY ANALYSIS