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### Conclusions: The Value of an Innovation Framework for International Law

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Conclusions  
The Value of an Innovation Framework for International Law

Neil Craik and Sara L Seck

## Introduction

This volume is animated by the themes of global environmental change and innovation in international law. The relationship between these themes has a number of dimensions, but most fundamentally this volume concerns itself with the recognition that large scale and existential environmental change creates a higher demand for new legal forms in both the traditional sense of new principles and rules to govern state and non-state actor behaviour, and in the more far-reaching sense of new institutions and new approaches to social ordering beyond the state. The Introduction to this volume frames this challenge in terms of the Anthropocene, which identifies not only the severity of environmental change, but also the inextricability between environmental change and human processes and institutions, including legal systems, and the attendant complexity associated with socio-ecological systems.

Legal scholarship, including the contributions in this volume, devotes a lot of attention to tracking these changes descriptively and normatively, but there has been much less focus on the processes of innovation itself. For example, how do we identify and track innovation in law? Are there bio-physical, social and institutional conditions that precipitate innovation? What are the processes and instruments policy-makers turn to in order to effect legal innovation? These issues have been explored extensively in connection with processes of technological and social innovation, but remain underexplored in relation to legal innovation.

In addressing these questions, the contributors to this volume were asked to identify innovations in international law and institutions that addressed themselves to global environmental change and its consequences or legal responses to either regulate or facilitate technological innovations that address environmental change. The purpose of this chapter is to distil these observations and take stock of the state of innovation in international environmental law. Because innovation has not been a central preoccupation of international lawyers we return to the question of the value of an innovation framework for international environmental law in light of the contributions in this volume.

### **I What is legal innovation?**

Innovation, perhaps like obscenity to the United States Supreme Court, is not easily defined, but we know it when we see it.<sup>1</sup> A common thread among the authors was to approach innovation in line with Schumpeter's classic definition as "new combinations" of existing resources.<sup>2</sup> In the case of legal innovations, these resources include instruments, principles, and institutions, but also less tangible resources, such as interpretations. The Paris Agreement (and the Agreement of Trade Facilitation) provides an interesting example, where the innovation is less the substantive norms incorporated into the agreement, than the approach the agreement takes to legal normativity itself. This is described by Nishimura, Lamp, and Panezi as incorporating a much more reflexive form of law – directed towards future cooperation, as opposed to specific state conduct. More than being merely soft law, the Paris Agreement combines commitments to take steps to reduce greenhouse gas emissions in line with international goals with hard procedural obligations to openness and reviewability.

A recurring theme in relation to legal innovation is the centrality of diffusion to the notion of innovation. Matley, for example, in her discussion of new compliance mechanisms in relation to fisheries conservation, draws on the distinction between invention (the creation of new ideas) and innovation (the spread of those ideas in society).<sup>3</sup> The importance of the tractability of novel legal forms is identified by others, (see, for example, Ferreira, Kimura and Brent), which aligns with our understanding that social acceptance is integral to law. In other words, legal innovation is more than newness or change, but rather requires a degree of recognition in the target system. This raises the question of which actors within a target system must grant recognition of a legal innovation, and, within the system of international law, whether the answer is always states, a question of importance to the recognition of the rights, laws, and institutions of Indigenous peoples, for example.<sup>4</sup>

One implication of the need for recognition is that legal innovations may be more susceptible than other forms of innovation to backsliding. Ferreira's discussion of the principle of common but differentiated responsibilities provides an apt example. On one level, the principle seems to enjoy widespread acceptance, and provided a novel basis for the development of treaties that moved away from reciprocity and uniformity as the basis for international agreement. But, as Ferreira points out, the more disruptive interpretation of the principle – that international agreements ought to account for distributive justice – received some initial support (under the Kyoto Protocol), but has since been abandoned by most states in favour of a more instrumental approach.

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<sup>1</sup> *Jacobellis v. Ohio*, 378 U.S. 184 (1964), 197.

<sup>2</sup> Joseph Schumpeter, *The Theory of Economic Development*, (Cambridge, Mass.: Harvard University Press, 1934).

<sup>3</sup> Matley, this volume, citing Westley et al., 'Tipping Toward Sustainability: Emerging Pathways of Transformation' (2011) 40 *Ambio* 762-780, 763.

<sup>4</sup> James (Sa'ke'j) Youngblood Henderson, *Indigenous Diplomacy and the Rights of Peoples: Achieving UN Recognition* (Saskatoon, Saskatchewan: Purich Publishing, 2008); Patrick Macklem, 'Indigenous Recognition in International Law: Theoretical Observations' (2008) 30 *Mich. J. Int'l L.* 177-210; Irene Watson, (ed), *Indigenous Peoples as Subjects of International Law* (Taylor & Francis, 2017).

This example points to another distinct aspect of legal innovation, which is that the degree of change legal innovations entail is more likely to be incremental than radical in nature. This is so because the internal structure of law requires a degree of adherence to past commitments.<sup>5</sup> Legal norms are not free floating, and this rootedness may constrain the degree of novelty that legal systems can incorporate. Legal systems, including international law, privilege stability over disruption. This is not to say that disruptive changes to law cannot occur. Sabel and Simon's work on "destabilization rights" for example, where litigants seek to disrupt entrenched legal structures, provides an important attempt to chart processes of more radical innovation in law.<sup>6</sup> While its analogue in international law may not be evident, an example could be the Inuit Climate Change Petition, brought before the Inter-American Commission of Human Rights in 2005 by the Inuit Circumpolar Conference in an effort to open dialogue on the link between human rights and climate change and its impact on Arctic peoples.<sup>7</sup>

Despite the predisposition of law to incremental change, it may be useful to consider the nature and degree of change an innovation requires. Measuring the degree of novelty in law might best be described as the degree to which the new arrangement departs from existing normative practices. The innovations described by Matley in relation to fisheries oversight can largely be accommodated within the framework of the *Straddling Stocks* Convention (albeit with implementation deficiencies), whereas the innovation discussed by Ferreira, which involves treating the atmosphere as a public good that is subject to equitable distribution arguably requires a fundamental shift away from foundational legal understandings.<sup>8</sup> Of course, to make this assessment assumes that there is agreement as to what these foundational international legal understandings are, an assumption that is challenged when global south perspectives on international environmental law are taken into account.<sup>9</sup> Moreover, if, as noted above, the internal structure of law requires an adherence to past commitments, it is worth considering the extent to which, as argued by Antony Anghie and others, colonialism is embedded within the very structure of the international legal system, as international law and institutions emerged from the colonial

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<sup>5</sup> Ronald Dworkin, *Law's Empire*, (Cambridge, Ma.: Harvard University Press, 1986). The importance of fit or coherence in international law is examined in Thomas Franck, *The Power of Legitimacy Among Nations*, (New York: Oxford University Press, 1990). See also Jutta Brunnée and Stephen Toope, *Legitimacy and Legality in International Law: An Interactional Account* (New York: Cambridge University Press 2010).

<sup>6</sup> Charles Sabel and William Simons, 'Destabilization Rights: How Public Law Litigation Succeeds' (2004) 117 *Harvard L.R.* 1015.

<sup>7</sup> Inuit Circumpolar Council of Canada, 'Inuit Petition Inter-American Commission on Human Rights to Oppose Climate Change Caused by the United States of America', December 7, 2005, online at: <http://www.inuitcircumpolar.com/inuit-petition-inter-american-commission-on-human-rights-to-oppose-climate-change-caused-by-the-united-states-of-america.html>.

<sup>8</sup> Thinking of the degree of innovation as the extent of departure from base principles maps on to Brian Arthur's definition of novel technologies, who distinguishes between mere improvement (using the same engineering processes) and real origination, where a new base principle is exploited. Arthur uses the example of jet engines, which employed a novel base principle to solve problems of air flight. Brian Arthur, *The Nature of Technology: What it is and How it Evolves*. (New York: Free Press, 2009).

<sup>9</sup> See generally Shawkat Alam, Sumudu Atapattu, Carmen G Gonzalez, and Jona Razzaque, (eds), *International Environmental Law and the Global South* (Cambridge: Cambridge University Press, 2015).

encounter.<sup>10</sup> Nevertheless, it follows that more radical changes will likely encounter greater inertia, because they will require shifts away from highly embedded normative commitments and therefore will likely require greater resources to secure. Alternately, more radical changes may encourage or require innovation at different scales, and the emergence of overlapping or polycentric systems of governance.<sup>11</sup>

Assessing the degree of change may also be useful analytically to better understand the dynamics of legal change. Here again reference to the broader field of innovation studies may provide some useful guidance, as theoretical and empirical work has broken down and mapped out distinct elements of innovation systems, with accompanying explanations of how successful innovation unfolds.<sup>12</sup> The point here is not that these same systems will apply to legal innovation, (although law is certainly a part of these systems), but the analytical approach to understanding purposeful change and its diffusion may inform our understanding of legal innovation in complex systems such as international law.

Innovation is typically understood as being normatively neutral. That is, whether something counts as innovation is not dependant upon whether its effects are positive. Innovation is, however, like law, a purposive activity. Innovations are oriented to address some perceived problem. This does not mean that the effects themselves will be uniformly positive. Levine notes that investor state dispute settlement has been a profoundly important development that has negative consequences for environmental protection. There is little question that providing private individuals and firms direct access to remedies under international law was a watershed innovation in investment law, notwithstanding its impact on domestic regulatory authority (which was, of course, the point). Levine refers to the mixed results of this innovation as an example of “asymmetrical innovation”, which points to the distributive consequences of innovation, but also to the role of political power in determining the success of innovations. Asymmetrical innovation can spur counter-innovation, as evident in the emergence of normative instruments designed to balance investor rights with recognition of business responsibilities for human rights.<sup>13</sup>

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<sup>10</sup> Antony Anghie, *Imperialism, Sovereignty and the Making of International Law* (Cambridge: Cambridge University Press, 2005) at 3-4.

<sup>11</sup> Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change* (Policy Research Working Paper, World Bank 2009) 5; Sara L Seck, “[Revisiting Transnational Corporations and Extractive Industries: Climate Justice, Feminism, and State Sovereignty](#)” (2017) 26:2 *Transnational Law & Contemporary Problems* 383-413 (*Symposium: International Environmental Law, Environmental Justice, and the Global South*).

<sup>12</sup> For an overview, see Jan Fagerberg, ‘Innovation: A Guide to the Literature’ in Jan Fagerberg, David Mowery and Richard Nelson (eds.), *The Oxford Handbook of Innovation* (New York: Oxford University Press, 2005), 1.

<sup>13</sup> Report of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie, *Guiding Principles on Business and Human Rights: Implementing the United Nations “Protect, Respect and Remedy”: a Framework for Business and Human Rights* (A/HRC/17/31, OHCHR 2011).

The distributive consequences of legal innovation and the role of political power are themes that Kanetake considers in her assessment of export control law and dual use items. For Kanetake, every decision to grant a license ultimately involves a choice among ‘multiple levels of duality and dichotomy’ that are ‘rooted in wider international legal discourse.’<sup>14</sup> Among these, the choice between security and sustainable development appears to be the most fundamental. Similar themes emerge from Lewis’ consideration of economic development and access to sustainable energy in sub-Saharan Africa, goals which may only be achieved through innovative industrial policies and technical assistance.

## II. Sources of Innovation

The legal innovations in this volume are responses to physical change or its consequences, and is, for the most part, demand driven. The need for innovation in law is both direct and indirect, with many of the contributions identifying legal innovations or requirements for innovation that respond to deficits in the existing legal system, such as the need to respond to new scientific knowledge or a novel problem. Innovation will also arise in response to new political and economic conditions. The demand for a new approach to global climate governance, described by Nishimura, was precipitated in part due to the economic shifts in developing countries such as China and India, which made the binary approach of Annex 1 and non-Annex parties unviable.

The degree of innovation required will be a function of the extent to which the new knowledge can be incorporated into existing legal categories and processes. For example, two of the contributions, by Bell James and Kimura, involve new problems that are poor fits for existing categories. For Bell James, new scientific understandings of the role of coastal ecosystems in carbon sequestration, coastal protection and ecosystem services, creates demand for enhanced conservation, but the prevailing approach which bifurcates these benefits and secures them through different means creates a significant gap that must be overcome. Similarly, climate induced displacement, as explored by Kimura, falls between legal categories of traditional refugees and the bio-physical focus of climate law. On the other hand, Kanetake’s consideration of dual-use items sheds light on the implications that flow when choices must be made between dual legal categories.

One source of demands for innovation is the increasing complexity and scope of the international legal system. Nishimura alludes to this in his consideration of the Paris Agreement, which he notes has incorporated a much wider range of issues beyond greenhouse gas emissions reduction, such as adaptation, loss and damage, as well as human rights concerns. As the climate regime becomes more multi-dimensional, the more formal approach to law making, as captured by the Kyoto Protocol, was insufficient. The demand for innovation here is not simply a function of recognizing more issues, but also arises because it becomes much more difficult to insulate legal regimes from one another. As regimes seek to capture a wider array of issues addressed in multiple fora, there is an increase in opportunity for normative conflicts. Complexity in legal relations, which entails greater uncertainties, is an emerging system characteristic in

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<sup>14</sup> Kanetake, this volume, [pinpoint]

the Anthropocene,<sup>15</sup> which suggests that the demand for legal innovation will increase as existing solution structures struggle to keep pace with accelerating environmental change.

Thus, a recurring source of innovation demands that arises from the studies presented here is the need for new legal responses to regime interactions. For example, innovation demands arise in relation to trade and environment, as internal carbon pricing gives rise to a need for border carbon adjustments that may then run afoul of international trade law rules (Panezi). Patent rights protected under international intellectual property regimes may be seen as creating a barrier to innovation and the diffusion of essential climate technologies, while others view patents as essential for technological innovation. (Israel). The inability for legal regimes to maintain functional autonomy reflects the accelerated pace of globalization, but is also very much a core characteristic of the Anthropocene. Consider the complex linkages between climate, oceans and food security described by Kojima, who describes the linkages between human rights (the right to food security), oceans law and climate change. These linkages are both bio-physical, (climate change impacts oceans productivity which in turn impacts food security), but also normative in that approaches and legal interpretations flows across regimes generating novel legal solutions.

Owens' discussion of climate finance can be understood in a similar light. Climate change gives rise to new finance requirements and mechanisms, which has introduced powerful new actors into transnational relations. This has in turn raised accountability issues, which are political, but also legal in the sense that international law has generated over the past twenty years greater democratic norms, relating to transparency, participation and deliberation.<sup>16</sup> Owens presents this as a form of innovation cascade, in the sense that innovative financial mechanisms give rise to further demands for innovation to address accountability, which in turn increase system complexity.

Others addressed the indirect role of law as part of a wider system of technological and social innovation. In this latter regard, law is understood as a mechanism that can facilitate other forms of innovation, for example, as a means to facilitate new technologies through intellectual property rules (Israel), finance mechanisms (Owens, Lewis) and capacity building. Thus, mapping the role of international law in traditional innovation systems is an important line of inquiry. The role of law in regulating innovation is well developed in domestic systems, but transplanting domestic tools to address transnational issues may itself require the generation of new legal approaches.

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<sup>15</sup> Jonas Ebbeson, 'The rule of law in governance of complex, socio-ecological changes' (2010) 20 *Global Environmental Change* 414-422; see also Jorge Vinales, 'Law and the Anthropocene' (2016) C-EENRG Working Paper 2016-5. Available at SSRN: <https://papers.ssrn.com/abstract=2842546>.

<sup>16</sup> See Thomas Franck, 'The Emerging Right to Democratic Governance' (1992) 86 *AJIL* 46-91; Benedict Kingsbury, Nico Krisch and Richard Stewart, 'The Emergence of Global Administrative Law' (2005) 68 *Law and Contemporary Problems* 15-51.

The obstacles that state consent requires have been the subject of much debate in connection to international environmental law.<sup>17</sup> Viewed through an innovation lens, consent can be seen as a barrier to new legal solutions as consent dramatically raises the costs of diffusion. However, consent can also be viewed as a source of innovation insofar as many new legal forms are generated to address the difficulties of achieving consent. Soft law, the use of treaty bodies and other new institutional forms, such as the Paris Agreement's mix of soft commitments and hard procedural requirements, as well as greater resort to private regulatory authority, can all be seen as significant innovations responding to the difficulties inherent to traditional legal forms.

### III. Instruments of Innovation

Since all legal innovation must take as its starting point the existing legal framework, new solutions must be generated from the available legal resources. There is greater scope for innovation in relation to treaty law, where policymakers have greater discretion to develop legal solutions that do not adhere to past legal decisions. Customary law, which is structurally tied to state practice, appears to offer fewer opportunities for innovation. Brent's analysis of liability rules in connection with solar geoengineering illustrates some of these constraints. Solar geoengineering is a hypothesized technological response to climate change, which could present serious risks if deployed. The legal response is constrained by the existing categories in international law, which would treat solar geoengineering as a form of potential transboundary harm subject to fault (due diligence) requirements to establish liability. Brent argues that this new technological form may be a poor fit for a due diligence standard. She argues in favour of a strict liability standard, but recognizes the difficulty in relying on existing state practice to address a highly novel technological form. Drawing on Brunnee and Toope's, Brent goes on to describe how a new legal response could be generated through a variety of institutional structures such as treaty bodies, the International Law Commission and non-state actor formulations of norms, each of which might be viewed as a norm generating practice.

The opening up of international law to a wider variety of actors, which was identified by Thomas Franck as one of three significant innovations within international law in the twentieth century, is noted by many of the contributors (Levine, Kojima, Kimura, Brent, *inter alia*) as being a significant source of new legal ideas.<sup>18</sup> In this regard, the opening up of international law might best be understood as a form of meta-innovation, in the sense that it has resulted in a broader structural shift that in turn facilitates greater opportunities for legal innovation by broadening the available mechanisms and pathways to effect innovation. Having said this, the extent to which the opening up of international law to

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<sup>17</sup> Geoffrey Palmer, 'New Ways to Make International Environmental Law' (1992) 86 AJIL 259-283; Jutta Brunnee, 'COPing with Consent: Law-Making Under Multilateral Environment Agreement' (2002) 15 *Leiden Journal of International Law* 1-52.

<sup>18</sup> Thomas Franck, 'Three Major Innovations of International Law in the Twentieth Century' (1997) 17 *Queen's Law Review* 139-156.



wider actors is best understood as an innovation moving forward as opposed to a rolling back to an earlier time of overlapping sovereignties may be open to debate.<sup>19</sup>

Other contributors consider the role of novel legal interpretations to generate innovations, often through dispute settlement mechanisms. In the context of climate change, Kojima mentions the *Urgenda* and *Leghari* cases,<sup>20</sup> both of which involved litigants suing governments for their failure to implement international climate change commitments. The use of domestic or international tribunals in order to embed new interpretations and create legal change follows Koh's theory of how international law becomes internalized in domestic legal systems as an explanation of state compliance.<sup>21</sup> The processes of compliance Koh identifies appear to provide a good starting point for understanding processes of legal innovation in that both track the origination and diffusion of norms across multiple scales. Koh draws on Finnemore and Sikkink's work on international norm dynamics, which is more explicitly a theory of norm evolution.<sup>22</sup>

Much of the prevailing discussion on innovation systems focuses on their multi-level character, and the importance of both top-down and bottom-up processes in generating successful innovation. International institutions, such as treaty structures and finance bodies are able to provide some top down direction, but adoption of new rules or processes (such as Matley's description of illegal, unreported and unregulated vessel lists) does not guarantee their implementation. At the other end, small scale experiments, such as domestic climate litigation, may allow for more radical approaches to emerge, but diffusion and scaling remains a challenge. Owens observes that the Green Climate Fund's support for grassroots innovation is essential for meaningful transformation, as micro and small-scale projects can more easily access local knowledge, expertise and capacity, and are equally likely to lead to innovative and systemic change.<sup>23</sup> One response is cross-level interactions, but legal structures, which have system level requirements respecting jurisdiction and recognition of legal standing and capacity, add further complexity. That said, there are some noteworthy examples of experimentation. Brent notes that, while there is little movement towards global regulation of solar geoengineering, treaty bodies such as the *Convention on Biological Diversity* and the *London Protocol*, have attempted to formulate rules in relation to other forms of geoengineering (ocean fertilization) that are more amenable to international regulation.

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<sup>19</sup> Mark D Walters, 'Rights and Remedies within Common Law and Indigenous Legal Traditions: Can the Covenant Chain be Judicially Enforced Today?' in John Borrows & Michael Coyle, (eds), *The Right Relationship: Reimagining the Implementation of Historical Treaties* (Toronto: University of Toronto Press, 2017) p.187, p.195 (describing the legal order of Indigenous peoples of the Great Lakes region as involving 'overlapping and interconnecting jurisdictional spheres'); John G Ruggie, 'Territoriality and Beyond: Problematizing Modernity in International Relations' (1993) 47:1 *International Organization* 139-174.

<sup>20</sup> *Urgenda v. State of the Netherlands*, District Court of the Hague, 24 June 2015, C/09/456689/HA ZA 13-1396; *Leghari v. Federation of Pakistan*, Lahore High Court, WP No 25501/2015.

<sup>21</sup> Harold Koh, 'Bringing International Law Home' (1998) 35 *Houston Law Review* 623.

<sup>22</sup> Martha Finnemore and Katherine Sikkink, "International Norm Dynamics and Political Change" (1998) 52 *Int'l Org.* 887

<sup>23</sup> Owens, this volume, citing Adrian Smith et al. *Grassroots Innovation Movements* (London: Routledge, 2017).

Borrowing or transplanted is identified by several contributors as a significant source of innovation. Borrowing can occur across jurisdictions, (such as Lewis's examination of the adaptation of feed-in-tariffs in Africa), or across regimes. Lamp provides a more generalized model that seeks to distil lawmaking developments through the Paris Agreement and the Agreement on Trade Facilitation. Both agreements mark a distinct break away from interest based bargaining based on direct reciprocity to an approach that is described by Lamp as being rooted in a more principled and less directive approach. Lamp does not suggest that the parallel approaches in each agreement were borrowed from one or the other, but each is responding to a similar negotiating landscape. The framework itself may have broader application in other issue areas that face similar negotiation demands.

#### **IV Innovation and Transformation**

The environmental and social crises that characterize the Anthropocene era require dramatic shifts away from current patterns of development. It is plausible that these shifts will not only require radical changes to resource development and energy production, but will require more wholesale transformations of global economic relations and patterns of social behaviour. If this is the major project of the twenty-first century, then what are the functions and prospects of international law within this transformation?

One aspect of the need for transformation is that the relevant legal arrangements go well beyond laws directed towards environmental externalities. One role that is identified in a number of this volume's chapters is what Bell James refers to as supportive innovation, by which she means the legal change that is necessary to support and facilitate innovations in other areas. As noted many of the contributions would seem to fall into this category, where law follows innovation. As part of a broader process of sustainable transformation, law in this role is a handmaiden to innovation, responding to the demands of scientific, technological and social change, but not directly fomenting transformation. This suggests that there is another, less instrumental role for international law, whereby the new legal arrangement is responsible for generating broad social change. The principle of common but differentiated responsibilities can be seen in this light, as can, perhaps, recent attempts to reframe displacement in light of environmental change. The framing of treaties as commitments to share ethical goals (such as common concern), as opposed to being framed in terms of reciprocating self-interest, as described by Lamp, can be seen as seeking to shift the underlying normative landscape of cooperation.

The problems associated with the Anthropocene are bio-physical, but there are also profound ethical dimensions to the Anthropocene, involving the distribution of material goods and how fundamental rights are maintained (or are re-evaluated) in light of rapidly changing conditions. The extent to which international law can provide a normative basis for transformation may be a centrally important function. Meeting this challenge may involve the development and diffusion of new substantive norms, but as suggested in a number of contributions, this will also involve the creation of new forms of cooperation and accountability. Procedural reform in support of transformation may appear less daunting than substantive legal innovation, but as Owens points out in her discussion of

democratizing climate finance, even the basis of accountability can be highly contested and viewed as a source of domination.<sup>24</sup>

Part of the particular challenge for generating transformative legal innovations is that part of any new law's acceptability is made with reference to existing legal arrangements. There is a necessary path-dependency that is created by the requirement for normative coherence. As legal relations become more complex there are increased requirements for integration across regimes, requiring new legal arrangements to potentially satisfy a wider range of normative requirements that may become harder to reconcile. As noted above, this complexity may give rise to cascading innovation requirements as legal incompatibilities amass. Thomas Homer-Dixon has argued that there may be limits to the ability of innovation to address global environmental change that arise from increasing systems complexity.<sup>25</sup> One hypothesis that warrants further consideration is whether the structure of international legal relations fits this trend. Certainly, there are some indications in this volume that suggest that the pace of legal innovation is already having a hard time keeping up with the demands for new legal solutions. Disruptive or destabilizing legal innovations may face greater challenges owing to the requirements for consent. For example, international dispute settlement bodies are not as well placed as national courts (particular appellate courts) to generate systemic legal change. Normative transformation, particularly among states may require much more sustained and multi-faceted interactions. Of course, to the extent that state consent poses a problem, the emergence of non-state actors as participants if not subjects of international law with the capacity and legitimacy to consent to disruptive innovations may be the pathway forward, or a return to the past.<sup>26</sup>

## Conclusion

In considering whether international lawyers ought to think more systematically about innovation, our answer is a cautious yes. Cautious, because there is a danger that innovation frameworks might be old wine in a new bottle. To some degree, legal scholars have not framed legal change in terms of innovation because we have fairly well defined avenues of legal reform. A large part of legal scholarship is devoted to identifying legal deficiencies and prescribing new legal solutions.

That said, thinking about how law supports innovation and how legal innovations themselves are created draws our attention to some important questions. Certainly, the chapters that focus on the role that law plays in facilitating and impeding technological and social innovation remains an important area of inquiry. As innovation processes relating to the environment are increasingly being coordinated at global scales, understanding how international legal structures shape innovation processes at multiple levels is an area where legal scholars can contribute to innovation scholarship more generally. The systems focus of innovation may aid in better understanding the linkages

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<sup>24</sup> Owens, this volume, citing Bhupinder Chimini, 'Co-option and resistance: Two Faces of Global Administrative Law' (2005) 37 *NYU Journal of International Law and Politics* .799-827.

<sup>25</sup> Thomas Homer Dixon, *The Ingenuity Gap*, (New York: Knopf, 2000).

<sup>26</sup> See above note 19.

between the elements and levels of innovation systems. In the context of global environmental change, the contributions in this volume point to the criticality of linking finance to broader equity concerns, and the need to reconsider intellectual property rules in light of the need to generate essential public goods.

Understanding the demand for legal innovation and the potential constraints on its supply may provide new insights into the way in which law-making processes are structured and operate. The extent to which legal processes are subject to lock-in strikes us as being particularly important as institutional arrangements become more complex. The prospects for legal experimentation and disruption in international law are potentially fruitful areas for research. There is a growing body of literature on climate governance experimentation that considers the role of climate governance activities by cities, regions, private corporations, and networks, which links to international structures,<sup>27</sup> but how experimental approaches can be implemented in international law remains underexplored. Moreover, this exploration could extend to governance activities in relation to other planetary boundaries that receive less attention in this volume. In domestic environmental law, there is increasing interest in adaptive forms of legal arrangements, but these run up against systemic demands for stability and predictability of legal arrangements that are equally if not more present in international law.<sup>28</sup> Finally, innovation is not normatively neutral. Bringing considerations of fairness and equity to bear on processes of transformation is a central challenge to sustainable transitions that speaks directly to legal ordering.

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<sup>27</sup> Michelle Betsill and Harriet Bulkeley, 'Cities and Multilevel Governance of Global Climate Change' (2006) 12 *Global Governance* 141; Matthew Hoffman, *Climate Governance at the Crossroads: Experimenting with a Global Response after Kyoto* (New York: Oxford University Press, 2011); Sara L Seck, 'Business Responsibilities for Human Rights and Climate Change' - A Contribution to the Work of the Study Group on Business and Human Rights of the International Law Association (May 25, 2017), online at SSRN: <https://ssrn.com/abstract=2974768>.

<sup>28</sup> See, for example, J.B. Ruhl, 'Panarchy and the Law' (2012) 17 *Ecology and Society* 31.