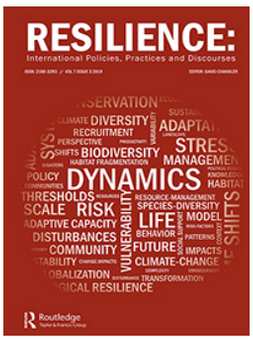

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Resilience and the end(s) of the politics of adaptation

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ABSTRACT

This closing article focuses on the problematic of the politics of adaptation and suggests that resilience appears to be increasingly exhausted as a governmental or analytical framing. The article is in three sections. The first provides an overview of the problems facing adaptation today, especially where 'top-down' or 'engineering' approaches to resilience are considered to be artificial or 'coercive'. The second section analyses alternative approaches to adaptation, from the bottom-up, often relying on the engagement of local communities, aided by the rolling out of ubiquitous computational technologies, like the Internet of Things. In closing, I suggest that resilience as a policy framework of adaptation appears to be drawing to a close as it lacks an adequate agential or transformative aspect: it is always too oriented to adapting to feedbacks and modulating around sustaining what exists.

KEYWORDS

Resilience; adaptation; politics; global warming; anthropocene

Introduction

This collection in the final issue of the *Resilience* journal has nicely drawn out some of the varieties of perspectives on the politics of resilience. Thinking the politics of resilience often depends very much, as the editors argue, on the specific area of focus as much as the normative predilections of the author. Perhaps, one thing that comes through clearly is that while definitions of resilience have their limitations, the development of resilience and its rapid spread throughout the policy world over the last two decades, importantly highlights a desire to use systems theories and process understandings to develop a range of adaptive approaches. Thinking through policy-making and analysis on the basis of system-interactions and adaptation rather than instrumentality and linear causality implies a certain 'politics' but one that seems to be increasingly problematic when we consider the extent of the policy challenges posed by catastrophic global warming in our contemporary age, increasingly understood as that of the Anthropocene.

This conclusion focuses on the problematic of the politics of adaptation and suggests that resilience appears to be increasingly exhausted as a governmental or analytical framing. It firstly provides an overview of the problems facing adaptation today, especially where 'top-down' or 'engineering' approaches to resilience are considered to be artificial or 'coercive'. Then there follows a consideration of alternative approaches to adaptation, from the bottom-up, often relying on the engagement of local communities

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aided by the rolling out of ubiquitous computational technologies, like the Internet of Things. I end with the provocation that resilience as a policy framework of adaptation appears to be drawing to a close as it lacks an adequate agential or transformative aspect: it is always too oriented to adapting to feedbacks and modulating around sustaining what exists. When what exists is the problem itself, in terms of anthropogenic global warming and climate change, then it is clear that critical thought and policy practice need to go beyond imaginaries of resilience.

Rethinking the politics of adaptation

Resilience approaches discursively frame policy problems, and their resolution, through the focus on enabling and capacity-building communities and systems – held to be 'vulnerable', 'at risk' or 'failing' – through an imaginary that somehow natural, innate or inherent resources and productive capacities can be enhanced and developed. These potential imaginaries of resilience – as a policy-making 'magic bullet' for problems as diverse as underdevelopment, conflict and environmental crises – have come under challenge today. The argument of this conclusion is that approaches attuned to the centrality of the Anthropocene provide a critique of the politics of adaptation which is much more powerful than that levelled by critical societal and political theorists who have, over the last decade, condemned resilience discourses for their imbrications within neoliberal paradigms (Chandler, 2014; Evans & Reid, 2014; Joseph, 2013; Walker & Cooper, 2011). In fact, the problematic of global warming and climate change appears to directly challenge the assumptions about resilience, neoliberalism and complexity developed by Jeremy Walker and Melinda Cooper (2011) in their article that initiated the mainstreaming of critical thinking in this area. Walker and Cooper argued that resilience-thinking was immune to critique, 'reabsorbing' or 'metabolizing critique into its internal dynamic' as 'the complex adaptive system remains self-referential even when it encounters the most violent of shocks' (2011, p. 157). As long as policy-makers and academic theorists presumed a modernist 'one world world' external to us and amenable to governing and policy interventions, resilience thinking could 'reabsorb' or 'metabolize' shocks and 'bounce-back' through learning from disasters – even reimagining catastrophes as 'emancipatory' (Beck, 2015) – or as facilitating new forms of self-growth and improved systems of self-management, 'bouncing-forward' with what the President of the Rockefeller Foundation, Judith Rodin, describes as the 'resilience dividend' (Rodin, 2015).

The problem is, as Anthropocene thinkers argue, that it is increasingly realised that climate change is not just another problem or crisis to be 'solved' or 'bounced-back' from' or 'recouped' but rather a sign that modernity itself held out a false promise of salvation, one that has brought us to the brink of destruction (Latour, 2013; Stengers, 2015; Tsing, 2015). While resilience-thinking has recently achieved nearly universal success in the policy-making world – suggesting new sensitivities to problems and rejecting 'high-modernist' technocratic approaches, which depended upon universal 'one-size-fits-all' solutions from on high – resilience is still a 'modern' construction which assumes that problems are 'external' and that we need to develop 'internal' policy solutions to maintain and to enable our existing modes of being in the face of shocks and perturbations. 'We' need to be more responsive and adaptable. 'We' need to be sensitive to minor changes and to 'tipping points' (Stockholm Resilience Centre,

2014). In short, that 'we' are not the problem, but that 'we' need to develop new approaches to preserve our modernist imaginaries of development and progress.

While resilience-thinking could 'reabsorb' or 'metabolize' critiques framed through modernist assumptions of overcoming and problem-solving, it is unable to 'adapt' to the new and increasingly prevalent subjectivities, sensitivities and imaginaries generated by catastrophic climate change. The problems, which the Anthropocene posits for resilience advocacy, have been little recognised in contemporary academic discussions in the humanities and social sciences. Resilience can appear to be still alive and well – if not actually thriving – in policy debates centred upon global warming and climate change. In fact, for the Stockholm Resilience Alliance – in the view of many commentators, the leading research and advisory body for resilience-thinking – the conceptualisations of resilience and of the Anthropocene are closely interconnected. Particularly in the language of systems ecology, both concepts appear to share understandings of complex adaptive systems, 'tipping points' and 'phase transitions' and to be sensitive to the limits of 'top-down' or 'linear' approaches to problem-solving. A glance at the Resilience Alliance webpages[1] reveals the clear interconnections between leading natural and social scientists, whose shared work in systems theory and adaptive systems has shaped thinking in both these areas: including Will Steffen, Paul Crutzen, Frank Biermann, Carl Folke, Johan Rockström and Jan Zalasiewicz among others (see also Biermann et al., 2012; Steffen et al., 2011).

Yet, even at the 'heart of the beast' all is not well. One example of the limits of resilience-thinking comes from a group of Swedish ecology scientists linked with the Resilience Alliance (Stockholm Resilience Centre, 2014) and published in *Ecosphere*, the journal of the Ecological Society of America (Rist et al., 2014). These scientists argue that resilience-thinking has been slow to think through the implications of climate change and the hidden costs of 'anthropogenic impacts on the environment'. The problem of ignoring these hidden costs is highlighted in their conceptualisation of 'coerced resilience', which they define as:

Resilience that is created as a result of anthropogenic inputs such as labour, energy and technology, rather than supplied by the ecological system itself. In the context of production systems, coercion of resilience enables the maintenance of high levels of production. (Rist et al., 2014, p. 3)

Rist *et al* define 'anthropogenic inputs' as the external 'replacement of specific ecosystem processes by inputs of labor and manufactured capital (e.g., fossil fuel, technology, nutrients, pesticides and antibiotics)' (2014, p. 73). Thus sustaining or maintaining growth depends upon the taking of resources, technologies and materials from elsewhere, merely intensifying and redistributing or spreading the problems. This is firstly, because the process is held to weaken and undermine 'natural processes' of resilience and, secondly, because importing resources weakens other, external, ecosystems.

Anthropogenic inputs make the problem worse by weakening rather than strengthening natural ecosystem sources of resilience. For Rist *et al*, this can be clearly seen in the shift to anthropogenic dependencies: with the development of intensive agriculture techniques over a thousand years ago; in forestry, which has moved to the industrial scale over the last few hundred years; and in fisheries, which became industrial after the Second World War (2014, p. 4). In modernity, the problem was understood to be the ability to sustain these vulnerable systems, particularly with concerns of falling

productivity. But in Anthropocene-thinking resilience itself becomes the enemy of resilience as the addition of anthropogenic inputs begins to shift the system regime state, moving further and further away from reliance on the natural ecological processes – and, in fact, causing permanent damage to them – until a new regime state is reached without the possibility of any return to 'nature' (Rist et al., 2014, p. 5). Thus vulnerabilities are cascaded through the larger system.

Rist *et al* argue that one of the key problems with coerced resilience is that it 'masks' or hides the real costs of production through the import of external capital, namely in the form of technology and fossil fuel based energy (2014, p. 3). Thus the problem of modernist resilience policy interventions to enable sustainable development and human progress is thereby their 'artifice' or falsity (see also Schmidt, 2013). For some authors, this is akin to rearranging the deckchairs on a sinking ship as this merely takes materials from other ecosystems and contributes to spreading the problem rather than resolving it. In fact, coercive resilience is a kind of globalisation in reverse, where the ability to import goods from around the globe no longer adds to productivity but rather spreads the sickness of undermining natural processes by over extraction in unsustainable ways. Thus increasing resilience through 'coercion' merely enables tipping points to be reached sooner. The addition of anthropogenic inputs 'masks' the growing loss of natural ecological system resilience, maintaining systems in 'artificial' states, entirely dependent upon more and more external inputs:

This raises an apparent paradox, whereby highly modified production systems can, through anthropogenic efforts rather than ecological processes, mimic the response of resilient natural systems to a specified disturbance, in their capacity to return to pre-disturbance system states. (Rist et al., 2014, p. 6)

This is a dangerous situation as artificial or 'coerced' resilience hides the capacities of these systems to draw upon natural ecological processes (highlighted in discussions of recent declines of wild and domestic pollinators and the plants and other species which rely upon them) (Rist et al., 2014, p. 6). A striking example of the limits of forced or coerced resilience is provided by Michael Taussig in his recent work *Palma Africana*, on the mass production of palm oil in Colombia (2018). One of the unintended and ironic consequences of increasing reliance on anthropogenic inputs, for example, the development of mono-crops, such as the 'Hope of America' palm, is that although artificially designed to prevent the spread of insect predation it needs additional anthropogenic interventions to artificially inseminate it. Thus production becomes increasingly artificial, requiring more and more inputs, despite being sold as a wonderful technical solution for raising productivity:

I see these women inseminators hard at it in the lustrous photographs provided by the Colombian Palm Growers Association. One woman is kneeling by an adult palm with a plastic tube in her mouth blowing sperm into the tiny flowers. In another photo a dark-skinned young woman wearing bright pink jeans and a coal black jacket and cap guides the inseminating tool in her right hand while with her left she pushes back the palm branches studded with fierce thorns. With a look of equally fierce concentration she guides her instrument into its target all because 'Hope of America' can't get it up. One would hope for more from 'Hope of America'. (Taussing, 2018, p. 74)

In language, which very much follows the lines of Rist *et al*, Taussig writes that:

> Once triggered, assemblages tend to proliferate and somersault, one leading to the next… Another assemblage concerns the larger framework of relevant political cliché and self-awareness as to such – namely, third world women of color ministering to the sexual requirements of an impotent masculine 'Hope of America' designed to stall the plagues brought by the very act of mono-cropping. We could continue. Thus does the assemblage principle provoke movement, speed, and metamorphosis. This is the way of things as much as a way of thinking with things. (Taussing, 2018, p. 75)

Thus resilience, in traditional policy approaches, rather than halting or slowing down the process of environmental destruction and exhaustion, can in fact be seen as the very vector of its becoming. What is then to stop resilience from being retrospectively read into precisely the history of modernist developmentalism that it set out to produce an alternative to?

In the Anthropocene, it appears that any attempts to start from resilience 'problem-solving' assumptions merely make the initial problem worse. This transformation or 'transvaluation' of solutions, which were previously seen as part and parcel of 'sustainable development' and 'progress', is due to the closing off of the development of anthropogenic forms of 'cheating' nature. Thus resilience reaches its closure at a global scale, making coercive resilience not just the last gasp of modernity but actually the driver for its demise: 'because continued inputs are largely dependent upon, and ultimately limited by globally finite resources, such as fossil-fuel energy and phosphorous' (Rist et al., 2014, p. 7). The Anthropocene thereby spells the death knell for 'coerced' resilience precisely through revealing the problem of 'masking' the environmental implications, which the distances of time and space had previously concealed. High levels of production and the speed of 'bounce-back' through resilience approaches were not enabling adaptation to new conditions but quite the opposite: merely working to 'mask or camouflage the ecological signals of resilience losses and thus the true underlying constraints to production' (Rist et al., 2014, p. 8).

Resilience, understood in modernist ways, is thereby part of the problem not part of the solution. You don't have to be a scientist of system ecology (the original home of resilience-thinking) to realise that the whole discourse of resilience is potentially put at risk. Criticisms of resilience for its artifice and lack of attention to the 'true underlying constraints' of modernity are now 'cascading' across the academic disciplines. Resilience-thinking rather than being constructed as a challenge to modernist aspirations of 'command-and-control' is more likely to be seen as the last redoubt of eco-modernisers and of modernist dreams of technological and technocratic approaches which attempt to short-cut problems rather than to tackle them at source (for example, Schmidt, 2013; Tierney, 2015; Yarina, 2018).

But what would non-coerced or non-anthropogenic approaches to resilience look like? The scientists linked to the Resilience Alliance do not make a very convincing case of what it would mean to 'attempt to use natural processes to enhance system resilience' and argue themselves that often 'techno-fixes' may be required in the short-term as part of the process of using and manipulating 'natural processes' (Rist et al., 2014, p. 8):

> In such cases where coerced resilience is desired, the impacts on supporting and recipient system resilience must be considered. We argue that the *ultimate goal* is to retain or enhance the provision of *global production system resilience* through *bolstering*

natural supporting processes rather than an increased reliance on anthropogenic inputs. (Rist et al., 2014, p. 9; emphasis added)

The game is rather given away here. The problems vitiating this approach are clear in the quote above. Firstly, there is a clearly instrumental approach to 'natural processes', which are to be harnessed to support the existing status quo, thus 'the ultimate goal' is to support 'global production system resilience'. This has come to the fore particularly in experiments in 'rewilding' and new forms of environmental conservation, seeking to enhance and expand 'ecosystem services', geo- and bio-engineering nature to be more efficient (see, for example, Lorimer, 2015). As Anna Tsing notes, these resilience imaginaries are all part of an 'ecomodernist' fantasy of the 'good Anthropocene' (Tsing, 2017, p. 16). Even if this could be achieved, 'natural processes' would be further modified by anthropogenic manipulation: the mere need to intervene to 'bolster' these allegedly 'natural processes' would inevitably produce other unintended stresses and strains according to the logic of the authors' own arguments.

'Bottom-up' technological resilience

One alternative to 'top-down' approaches to resilience focuses upon how new technological advances in algorithmic computation and distributive sensory capacities can enable local communities to be more self-sustaining. The use of technology, not as a 'techno-fix' that artificially hides feedback effects but rather as one that enables them to be seen and responded to, is now central to many internationally financed resilience imaginaries in the battle against the effects of climate change. The rolling out of Big Data and the Internet of Things approaches to local communities promises a level of responsiveness and sensitivity to environmental changes that was previously unimaginable. For its boosters, in the international development agencies and corporations, these approaches will transform small-scale agricultural production. Even palm oil production receives a critical makeover. Rather than environmentally destructive industrial monocropping, small plot alternatives can be made economically viable if farmers sign up to digitally enhanced 'cloud-based' management systems, where farmers enable large scale data collection and sensory monitoring systems to be installed and so can monitor and minimise the use of chemicals and other anthropogenic resources as well as rapidly respond to drought, pests and disease – detecting problems even down to the level of specific trees and plots. Just as with Google and Amazon, sensitivities to feedbacks increases the more data is shared and drawn upon. As the founder of one agri-tech start-up states:

'We specifically use… cloud storage (to store raw and processed imagery), cloud compute (to process huge amounts of data and extract insights), database storage and to serve our applications… to help farmers grow healthier crops is a perfect example of the way in which technology transforms traditional industries, leading to better livelihood conditions. Africa can be a harsh environment for farming. Crops are constantly under threat from problems such as disease, pests, and drought. Using the… cloud, we are bringing computation, data analytics, and other advanced technologies to help farmers grow healthier crops, despite the harsh conditions.' (Cline, 2018)

The promise is that, with high levels of data generation and developments in computational analysis, the world (coded through datafication) can begin to speak for

itself, moving beyond the limits of fallible instrumental reason (Anderson, 2008; McKenna, 2016; Steadman, 2013). According to the Rockefeller Foundation research group: 'Large data collection and analysis may support communities by providing them with timely feedback loops on their immediate environment.' (Crawford et al., 2013, p. 1) The aspiration of many community-based approaches is that multiple data sources can now enable individuals, households and societies to practice responsive and reflexive self-management in ways which were considered impossible before (for example, Marres, 2012; Halpern, 2014, pp. 242–3). In fields such as disaster risk reduction and disaster management the shift is already clear (de Coning, 2016; Ramalingam, 2013). These community-based or 'bottom-up' approaches are alleged to help empower precisely those that are most marginal and vulnerable at the moments of highest risk. Open information flows are thus held to contribute to the building of resilience by making communities aware of the risks and hazards they may encounter so that they can mobilize to protect themselves (Ahrens & Rudolph, 2006, p. 217). This process is captured well by Patrick Meier (2013):

> Thanks to [Information and Communication Technologies] ICTs, social media and Big Data… we can better measure our own resilience. Think of it as the Quantified Self movement applied to an entirely different scale, that of societies and cities. The point is that Big Data can provide us with more real-time feedback loops than ever before. And as scholars of complex systems know, feedback loops are critical for adaptation and change.

On this basis, international agencies, such as the World Bank, argue that it is possible for technological aids to enable us to be more attentive to feedback effects and for resilience to have more of a positive impact for the UN's Sustainable Development Goals (Chandler, 2016; World Bank, 2018). One thing is clear, however, in this increasingly dominant perspective for dealing with risk, the world becomes much less amenable to transformative practices and experimentation. This limitation of possible alternatives is highlighted in Giorgio Agamben's (2014) critique of the cybernetic 'governance of effects'. He argues that whilst the governing of causes is the essence of politics, the governance of effects reverses the political process:

We should not neglect the philosophical implications of this reversal. It means an epoch-making transformation in the very idea of government, which overturns the traditional hierarchical relation between causes and effects. Since governing the causes is difficult and expensive, it is more safe and useful to try to govern the effects. (Agamben, 2014)

The more responses are automatic, the more the detection of signs and signals are all that is required; no knowledge is necessary any more than a thermostat needs to know why temperature changes occur. The correlation between the sign or signal and the emergent problem is all that is necessary. The learning and adjustment of these correlations is the 'bouncing forward' aspect of society understood as a complex adaptive system; progress thus becomes reinterpreted as a process of managing stability better in the wake of additional potential risks and threats (for example, Rodin, 2015). Here, information is adaptive or cybernetic: it is free of universal content or meaning. Maurizio Lazzarato has usefully highlighted that governance through signs displaces modernist views of subjectivity founded on universal linguistic, communicational and cognitive models: he understands this as 'non-cognitive' capitalism:

Instead of a rational subject who controls information and his choices, *homo economicus* is a mere terminal of asignifying, symbolic, and signifying semiotics and of non-linguistic constituents which for the most part escape his awareness. We are not only well beyond the individualism and rationality of *homo economicus*, we have moved beyond 'cognitive capitalism'. (Lazzarato, 2014, pp. 99–100)

The problem for 'bottom-up' forms of resilience is that the promise of ubiquitous technology makes humans dependent on machines and the companies that manufacture and distribute these technologies. More importantly, the cybernetic impulse behind 'bottom-up' approaches, as prevalent in disaster risk management as in IBM's 'smart city' infrastructure experiments (Townsend, 2013, p. 65–9), is problematic in that 'non-cognitive' forms of responsivity to changes seek merely to modulate around the imaginary of a stable equilibrium. Machinic models of adaptation, even at high speeds or imagined as 'real time' forms of responsivity, make sense in the modernist world of stability where problems are the exception to the norm. If this is no longer the case and problems and threats are generated by the very processes that are being stabilised then the politics of adaptation can no longer be sustainable. Resilience would appear to be exhausted as a mode of political thinking if, in seeking to maintain the world in its unsustainable state, it can perversely only speed up the process of catastrophic collapse.

Conclusion

Resilience, as the politics of adaptation, has been heavily problematized in today's context of global warming and climate change. While modernist and cybernetic approaches to resilience pay attention to systemic interaction, feedback effects and to tipping points they are inevitably productionist, consumptionist and extractivist. They are always focused upon saving or on prolonging or making more efficient what already exists. In the Anthropocene, these approaches stand accused of refusing to see that these contemporary forms of governing life are exactly the problem themselves. It is certainly true that resilience discourses of adaptation are losing purchase because they are too interested in conservation and sustainability rather than transformation, however whether more agential or futural alternatives can emerge or can hold out any opportunities for a different politics is an open one.

Note

1. https://www.resalliance.org.

Disclosure statement

No potential conflict of interest was reported by the author.

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Mapping, Sensing and Hacking (Routledge, 2018); and *Resilience: The Governance of Complexity* (Routledge, 2014).

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