Title: When Anthropocene shocks contest conventional mentalities: A case study from Cape Town

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Abstract

Under conditions of protracted reduction in supply and heightened uncertainty, one of the notable responses to the Cape Town drought (2016-2018), was the proliferation of ‘water resilience’ in public and private discourses. Resilience was employed as an explanatory concept and governing tool, signalling a professed transition in the municipality’s understandings to an altered climate episteme – or what they have called, a ‘New Normal’. This article focuses on how public framings of resilience were used by the City of Cape Town to signal divorce from conventional approaches to climate and water. It contrasts conventional framings of a Holocene world, with those of a posited ‘mentality of the Anthropocene’ in order to elaborate this ostensible shift in mentality. Although this case study illustrates how public governors are finding utility in resilience as a term to facilitate explanation of their operating context, decisions and responses, contested and transitional mentalities elaborate why the municipality initially failed to anticipate, perceive and respond the drought. This article thereby highlights the cognitive tensions and practical challenges of transition for professionals patterned by conventional techno-managerial approaches, to a way of thinking more in line with reflexive and adaptive approaches anticipated to be necessary in an Anthropocene world.

Keywords: Resilience; Anthropocene; Water resilience; Cape Town drought; mentalities.

1 Introduction

An anticipated feature of the damaged earth that the ‘Anthropocene’ recognises is climate uncertainties, perceived as unprecedented variation and change (Poff and Matthews 2013). Such developments have, and are, presenting challenges at institutional and individual levels (Bennett et al. 2016), with scholars such as Bierman (2016, 10) asserting, “the ‘new earth’ is here, and a return to the Holocene is no option”. These changes have presented novel challenges that have promoted and required reframing of our understanding of earth systems. However, adoption of the ‘Anthropocene’ is yet to be accepted as a geological epoch by the International Commission on Stratigraphy (Harrington and Shearing 2017), and has not yet permeated general constructions of the world, nor the many established institutional, practice and individual ways of doing things (Biermann 2012). This article uses the recent drought in the Western Cape as a case study, with a particular focus on Cape Town, to explore these responses of contested framings as shocks attributed to the Anthropocene, articulated as a ‘New Normal’ (Neilson 2017a), challenge conventional approaches.

Considerable research and thinking have emerged globally as scholars and practitioners have sought to understand and learn from attempts to shape the flow of such events, both as they have unfolded and to prepare for future events (for example, Rockström et al. 2014). There is increasing interest in understanding how institutions and individuals are recognising, responding to or anticipating events which are outside scientific or historical precedent (Biermann 2016). Whitmee et al. (2015) suggest that such an understanding would be beneficial in charting potential pathways that might secure against harms anticipated by Anthropocene shifts. This article therefore investigates one important aspect of how actors are responding to events outside their conventional frame of reference of the world. It explores how a mentality, shaped by the relatively benign and quasi-predictable patterning of the Holocene (Crutzen and Stoermer 2000), perceives, understands and responds to disruptions that are outside its frame of reference of the Earth. It explores claims that such events hold potential to contest, reshape, reframe or disrupt a mentality groomed by Holocene precedents.

As ‘water resilience’ has been employed in the Cape Town drought as a way of understanding and responding to unprecedented water scarcity under uncharted climatic conditions (De Lille 2017d), as an entry point to socially constructed framings of the world, the article considers how and why water resilience has been constructed, understood and employed to shape what

has been presented as a novel response to the drought, as well as potentially transform and transition Cape Town to a more ‘resilient’ and ‘water sensitive city’ (De Lille 2017d, 2).

2 Framings and their epistemic foundation

The planet has come to be understood as no longer the benevolent and abundant store house of resources it was considered to be during Holocene period (Heidegger 1977). Conventional scientific understanding and governance models which have developed over millennia may have little effect in dealing with the anticipated harms of a human-altered earth attributed to the Anthropocene (Biermann 2016), such as greater variability, frequency and magnitudes of droughts, hurricanes and floods. Consequently, resilience has received increasing attention as a means of understanding and responding to unanticipated and unforeseen disruptions of novel earth system dynamics (for example, Rockström et al. 2014). Although a contested term (Davoudi et al. 2012), at a minimum, resilience is understood to be the ability to absorb disturbance and maintain function (Walker and Salt 2012). It follows therefore that the legibility of unfolding shock and the associated conceptualization of what is needed to buffer, transform or outmanoeuvre its negative consequences, requires a framing of the world commensurate with the scale and type of disruption, even if its drivers are not fully understood. This potentially makes resilience in the Anthropocene very challenging for those locked into conventional ways of thinking and operating.

In light of the anticipated novel pathways required to navigate the potential harms an altered or unusual earth is anticipated to generate (Biermann 2016), and the role that mentalities play in the selection of such response pathways (Geels 2010), it is potentially useful to be able to identify and distinguish between kinds of mentalities as well as establish which mentalities are relevant to ascendant environmental determinants of necessary transition arrangements. For example, observations of social innovations for urban water resilience in Barcelona through the installation of subsidised rainwater harvesting systems have remained locked within a Holocene framing with drought considered as an ‘unexpected and unwelcomed’ event with little regard for the scale or frequency of Anthropocene variabilities and vulnerabilities (Domènech and Saurí 2011, 607). In contrast, recognition of the role of climate change in affecting the ‘Millennium Drought’ in southeast Australia (2001-2009), although not general, is pervasive in the literature and citizen perceptions, despite ‘inconclusive’ modelling results

in attempts to link the drought to Anthropogenic sources (Van Dijk et al. 2013, 1040). Although these mentality caricatures are not dichotomous nor mutually exclusive of each other, for the purpose of providing a structuring case observation schema, an outline of a mentality honed in the Holocene is contrast here with one that is characterised by the anticipated resilience demands indicated in Anthropocene literatures. These caricatures are used to explore how the CoCT outlines its 'New Normal' approach to water (Neilson 2017a) and probe awareness, contestation and moments of transition in mentalities.

Reflecting centuries of advances in our scientific understanding and management of environmental resources, a mentality shaped by the Holocene typically sees disruptions in water supply as temporal climatic perturbations within a state of dynamic equilibrium which will, in time, return to 'normal' parameters (Crutzen and Stoermer 2000). However, problematic path dependencies established in the late Holocene point to the need for mentalities capable of anticipating ecological state shifts and transforming themselves accordingly (Dryzek 2016). Reflexivity, the ability to change oneself in response to reflection on performance, is the opposite of path dependency in the sense that it provides the opportunity to iteratively learn and explore emergent phenomena, while being cognisant of the limitations of existing knowledge and its associated practices and cognitive patterns. But reflexivity, as generally conceptualized, 'does not recognize the active influence of the Earth system itself' (Dryzek 2016, 938), and can therefore remain locked within a mentality of the Holocene. This does not mean that a mentality of the Holocene is not proactive nor unintelligent. A mentality of the Holocene can be reflexive and reflective yet follow conventional pathways of thinking and framing of the world. It includes a reflective view of the world which prepares and provides for shocks yet, is resistant to conceptualizing a world which is outside expected or established thresholds of shock type, frequency or magnitude. A mentality of the Holocene includes a conventional, even 'progressive', way of viewing natural resources which determines our way of relating to resources and governing their use. Further, with skill, it expects to be able to manage and govern change within established and experienced management approaches. It therefore does not anticipate the effect emergent properties might have on risk and operating threshold ranges (Folke et al. 2010). Cognitive routines have been observed to blind engineers to developments outside their focus, frame regulations and standards (Unruh 2000). Evolutionary economists argue that when cognitive routines (such as search heuristics, exemplars, guiding principles) become shared within a community, they orient perceptions and actions of actors in local practices (Geels and Raven 2006). It therefore drives and places

confidence in scientific modelling, technocratic solutions and statistical approaches to inform decisions and actions. Although some mentalities of the Holocene may claim resilience or even recognition of climate uncertainties in their discourse and rhetoric, the mentality is betrayed by actions and responses in the face of unpredictable shocks, responding within conventional framings and entrenched lock-ins. It is through observation of this demonstrable link between mental frames and the practicable actions afforded by certain technologies which outline the types of mentalities in focus here.

In contrast, a ‘mentality of the Anthropocene’ can be hypothesised to be one that exhibits resilience characteristics commensurate with requirements of an altered earth. It does not assume operating conditions to return to historically predictable conditions after disruption (McGreavy 2016). It recognises that models and the corresponding calibration of management tolerance and buffering capacities need iterative and ongoing revision (Yazdani, Otoo, and Jeffrey 2011). Adopting a precautionary approach, it is watchful for emergent properties in systems which may be outside conventional signalling and legibility (Biesbroek et al. 2013). With a high value on communication and information, this mentality operates within highly connected social arrangements while relating to resources and earth systems from an imperative of safe-to-fail for high reliability functions such as water supply (Ahern 2011). A mentality of the Anthropocene considers the governance of people’s lives as intricately involved with the larger earth system feedbacks and acknowledges the agency humans have in contributing towards as well as protecting against damaged earth system harms (Holley and Shearing 2018). It is watchful, always learning, reflective and anticipatory of mitigation and adaptation responses to change (Yu et al. 2016).

We anticipate that it is through times of great stress and disruption that resilience characteristics of mentalities are best observed as responses which typify their episteme (awareness and pathways) are put to test (Petersen, Shearing, and Nel 2015). This paper explores the potential for such moments to revise or inform actors’ framings of their world and anticipation of such future events. Although it may seem intuitive that significantly disruptive events might reshape people’s understandings, cognitive dissonance theory (Festinger 1962), suggests people seek to avoid the internal discomfort that arises when their beliefs, attitudes or behaviour come into conflict with each other or with new information. Although a dichotomy of mentalities is presented here for the sake of schematic clarity, it is likely that fragments of mentalities can coexist at particular junctures, when old and new mentalities cannot mutually exclude each

other because older ways of sense making remain entrenched while newer approaches are put to test, adopted by epistemic pragmatists, and in time are either rejected or develop emerging framing norms (Evans 2007; Geels and Raven 2006). Rather than distinct shifts between mentalities, which would reflect a drastic change from one mentality to another, it is likely that changes can happen in stages and partially, leading to contests and compromises between competing framings.

3 Data collection and methodology

This research conducted a qualitative discourse analysis of academic and grey literatures together with the City of Cape Town's media releases between January 2009 and June 2018. All public domain documentation from the City of Cape Town pertaining to this period was explored, coded and analysed using the NVivo® discourse analysis software. This included policies and plans, such as the City of Cape Town's Spatial Development Framework, Climate Change Policy, Environmental Strategy, Water Strategy, Energy and Climate Action Plan, Disaster Risk Management Plan, Critical Water Shortages Disaster Plan, Preliminary Resilience Assessment and gazetted water restrictions. It also considered the 136 media releases by the City of Cape Town which included reference to the drought or resilience. In addition to documentation from the City of Cape Town, the study also explored and chronologically recorded how the media, social media and academic literatures followed the evolution of the drought. Analysis of these documents explored how the institution explained its change in understanding of, and approach to, the drought through gradual recognition of an unprecedented drought event which they came to characterise as a slow onset event within an altered climatic regime, called the 'New Normal' (De Lille 2017e, 3). Borrowing from Foucauldian approach (Davoudi 2016; Foucault 1984), the article explores how the use of 'things' like resilience and how they are framed illuminates governing mentalities that drive the conduct of governors (practices of policies) which, in turn conduct the actions of populations (facilitate, control, reward, discipline, threaten or coerce). Drawing upon the salient mentalities framing the resilience responses in the Cape Town case, this article advances our understanding of how actors rationalise their perception, response to and recovery from Anthropocene shocks.

4 Contested mentalities and responses to Cape Town's unanticipated drought

The CoCT acknowledged the potential threats of climate change and climate variability in their 'Action Plan for Energy and Climate Change' (CoCT, 2011). It had grappled with implementation and facilitation of climate change adaptation measures with a focus on increased awareness and capacity (Mukheibir and Ziervogel 2007). However, the threat of the abstract and distant risks, which included water security, framed such shocks as perturbations and disruptions framed according to normal environmental conditions. Prior to 2017, climatic changes were anticipated to become a reality in the near future, yet policies, strategies and political discourse did not explicitly assert nor acknowledge an Anthropocene ontology.¹

In May 2017, the Mayor of Cape Town, Patricia De Lille, established a 'Resilience Unit' within her Directorate which, in turn, frequently and strategically used the concept of 'water resilience' in official drought media releases (for example, De Lille 2017a). Introducing the 'Water Resilience Programme' in May 2017 under the newly formed 'Resilience Unit', De Lille signalled a shift in the use of resilience indicating a change in the CoCT's governance approach,

Climate change, most notably, adds significant uncertainty. The models are in flux. We nevertheless understand the impacts of climate change, some of which are devastating. Feedback loops add complexity... We cannot be sure whether it will rain this winter... the point is we do not know. The confidence in weather prediction is low.

...The New Normal is an opportunity for us to significantly change our approach to water. It is about building resilience, which is the capacity of individuals, communities, institutions, businesses and systems to survive, adapt and grow no matter what kind of stresses and acute shocks they experience.

...We need to rethink our over-reliance on surface water and increasingly embrace more non-surface water options such as water reuse and desalination... we need an improved public understanding of water (De Lille 2017e, 1–5).

De Lille's May 2017 statement, and others which followed, indicate that the Mayor and the CoCT began using water resilience as a key governance concept in response to the 'unpredictability' of the drought. Media release documents from May 2017 onwards align with and develop the 'New Normal' awareness within and across all CoCT departments involved in

¹ A detailed chronology of the use of drought framing policies and media releases of the City of Cape Town (2010 – 2018), identifying shifts to a 'New Normal' (Anthropocene) episteme is provided in this supplementary data set: <https://doi.org/10.25375/uct.7143581.v1>.

aspects of water resilience implementation (for some examples, City of Cape Town 2017a; De Lille 2017c, 2018; Limberg 2017; Neilson 2017b, 2018), including the newly formulated Integrated Development Plan (2017-2022) (City of Cape Town 2017b). The consistent messaging across these governing bodies framed the new approach to water as ‘building resilience’ (De Lille 2017e, 1–5).

De Lille (2017a, 1–3) explicitly acknowledged a fundamental shift in the city’s evolving approach to water in August 2017. It grew out of recognition of fundamental changes in the climatological conditions and Earth systems,

We accept that the impacts of climate change add significant uncertainty to existing models. Climate feedback loops add further complexity. That means that some decisions need to be made in the context of unpredictability. That does not imply making poor decisions. It means making decisions that factor in a greater understanding of risk. It means making decisions that mitigate against shocks, that in the context of our city affect the most vulnerable parts of our population most acutely. That is why we believe we are within a scenario called The New Normal – a scenario in which we do not bank on the drought ending but rather actively plan as if it will continue indefinitely.

It is clear from the above that the Mayor found it necessary to be explicit how and why the CoCT made the transition away from conventional approaches to a new awareness of altered and novel climatic conditions, which they call the ‘New Normal’. Together with this new framing, ‘water resilience’ became ‘the number one priority of the City administration’ (2017a, 1–3) with the Mayor’s appeal “to all residents ... to please change their mind-sets and water behaviour. Things simply cannot go on as normal as drought will become the New Normal and we have to adapt” (De Lille 2017b, 2).

Resilience has been constructed, used, deployed and portrayed by the CoCT as a way to respond to and endure the drought. Its use as both a descriptive and a normative concept indicates the utility contemporary actors see in the term as a means of understanding and enduring the disruption brought about by unprecedented events such as water scarcity. It has been portrayed as a new *modus operandi* for the municipality and a means to achieving a new norm of heightened awareness of water scarcity and variability as the city transitions towards a ‘water sensitive city’ (Neilson 2017a). The framing of resilience, in alignment with Anthropocene descriptors by the CoCT’s ‘New Normal’, may also be signalling the emergence of or transition towards an Anthropocene-aware mentality in some governors. This does not however imply a homogeneous understanding or use of the term. At a minimum, it signals an

emerging appreciation of both resilience and Anthropocene related terminologies as convenient and effective governing concepts when responding to unprecedented climatic events.

The prevailing mentality in Cape Town leading up to the drought viewed water supply as largely dependent on two things: rain and dams. This characteristically Holocene and rainfall-dependent view implicitly indicates a mentality that trusts that it will rain again at some stage and that dams are needed because drought is both normal and temporary. It instrumentally values river catchments and their ecological integrity as a means to water supply recharge (CoCT 2016; WWF 2018; Yeld 2018). In this approach, the solution to water scarcity is more (Muller 2007), appropriately sized, situated and managed supply dams (Ziervogel, Shale, and Du 2010). Conventional thinking assumes that when rainfall variations occur, the size of the dam and number of supply dams need to be able to deliver water security and therefore their capacity should be commensurate with statistical modelling of a one in 'x' years variation - however determined - for that climatic region (CoCT 2018b; Wolski, Hewitson, and Jack 2017). The South African Department of Water Affairs plans at a 1 in 50 year level of assurance. Cape Town's drought by the start of 2017 was already outside these parameters, being the lowest on record (Wolski 2017). The protracted length of the drought, together with its progressive severity, provided the opportunity for contestation of assumptions inherent in such planning parameters. As debates raged, new framings and revised positions gained strength as legitimate alternatives to understanding the drought phenomenon. The lag-time in decision making, construction and completion of more climate independent sources however indicates the difficulties for a municipality to adjust to and operate in alternate water resilience response mentality at a utility scale.

De Lille (2017a, 1–3) acknowledged the framing shift involved a degree of internal contest and calculation, both from CoCT officials and politicians. De Lille explained that for the CoCT administration and for officials working in water and sanitation, the 'old way of doing things' still dominated and the city only altered their approach in May 2017 (Perlman 2018a). De Lille claims there was a resistance to making this shift among the administration which is why these augmentation efforts began in earnest only half way through the second year of drought. Up till then, the city still had a false assurance and hope that it was going to rain (Perlman 2018b). De Lille suggests that it was a process of learning from these internal miscalculations that led them to revise their position and decide 'to take the most pessimistic view of the drought' and 'accept ... the impacts of climate change' as a reality (Perlman 2018b). Confessing the failure

of what had worked in the past, she detailed the shortcomings of their reflective and technocratic modelling approach of an expected post-disruption return to normalcy and conventional reliance on winter rainfall.

From a municipal government perspective, acknowledgement of a shift in approach, for example, “The New Normal is an opportunity for us to significantly change our approach to water” (De Lille 2017e, 1–5) with enhanced redundancies such as, “we do not bank on the drought ending but rather actively plan as if it will continue indefinitely” (De Lille 2017a, 1–3), demonstrates a belief in the value of acknowledging the shortcomings of previous approaches which were lacking water resilience. Incorporating the rhetoric of new climatic awareness, allowed the CoCT to identify and apologise for how and why contests with conventional mentalities contributed towards slow responsiveness towards water management and ostensibly ‘accept ... the impacts of climate change’ (Perlman 2018b). This suggests the contest was at the level of cognitive rules and shifting awareness. Whether it signals a shift in awareness of the use of altered climate rhetoric or a substantive and shared shift in the mentalities of governors is however not yet possible to validate. However, infrastructural lock-ins present challenges to alternative pathways, even if mental framings have shifted. The mix of water sources proposed in the Long Term Water Plan suggest that climate-independent supply responses that give expression to a ‘New Normal’, such as permanent desalination may, in time, provide an increasing percentage of the city’s targeted 500 million litres per day (CoCT 2018a) and validate this shift through infrastructural and budgetary commitments. As of March 2019, the Water Strategy sets out ambitions, “will develop new diverse supplies of water – which could include groundwater, water re-use and desalinated water... The City is committed to increasing available supply by approximately 300 million litres per day over the next 10 years, and in suitable increments thereafter, in a way that is robust and adaptable to changes in circumstances” (CoCT 2019).

By February 2019, almost a year after the drought, the South African World Wide Fund for Nature’s fresh water programme observed residents of Cape Town did not rebound to previous consumption rates, suggesting adoption of, “what we call the ‘new normal’ and it’s good to see that citizens have made a fundamental shift in the way they use water” (Colvin 2019, 1). Although it is perhaps too soon to validate the adoption of a shift in mentalities across broader sections of society, this suggest that the professed shift by politicians and officials of the City of Cape Town, together with a suite of other demand management means (Schreiber 2019),

has also had a broader effect on consumption by residents indicating the potential of a New Normal framing to mobilise, discipline and govern water consumption behaviour.

5 Conclusion

Public framing of the Cape Town drought has demonstrated conventional mentalities are deeply entrenched in approaches to water supply, distribution and consumption. Despite the opportunity to learn and change in the face of disruption, limitations to reframing of conventional mentalities is displayed in certain responses to water scarcity in the municipality's response, highlighting the patterning and pathological resilience of conventional framings which resist change. In turn, this observation highlights the imperative for reflective and iterative learning to take cognisance of shifts, in this case a slow-onset and landscape-scale environmental shocks (Simpson 2018). The case study demonstrates how conventional mentalities assimilate aspects of the term of resilience which align with a technocentric view of the Holocene world and, in turn, hold to a conceptualisation of the term according to their untransformed worldview. Through resistance to change, a conventional mentality thereby limits any potentially transformative meaning or practice of the term curtailing potential awareness, motivation or pathways for adaptation.

In contrast to dominant drought and urban discourses which focus, *inter alia*, on planning, rationing, augmentation and financing (for some examples, Butler et al. 2014; Ziervogel, Shale, and Du 2010), this approach to the Cape Town case highlights that crises can be compounded by the challenge to respond to shocks in the type of mentality necessitated by the resilience characteristics of the Anthropocene episteme. The case demonstrates how difficult it is for a mentality to accommodate understandings, responses and pathways that are outside its frame of reference (Festinger 1962). Characteristics of mentalities shaped in the Holocene were observable prior to the drought and remain legible in various contested forms. It therefore presents an *ex ante* cue to types of response and therefore resilience. If understanding existing mentalities is an important determinant of resilience, it is important to develop appropriate schema to make such mentalities legible. Future research can advance these findings through developing broader and more nuanced schema for understanding mentality transitions which determine the preconditions for conversions and explore how mentalities of the Holocene or the Anthropocene can be better understood before, during and after disruption events and then

integrated with such frameworks. Further, such research needs to be grounded in notions of awareness, motivation and pathways which might overcome cognitive challenges and provide an appropriate degree of readiness and reflexivity demanded by the Anthropocene.

Focussing on and interrogating the state and readiness of existing mentalities and the shifts in such mentalities may indicate a slow pace of change, as demonstrated in the CoCT's response to climate independent sources (CoCT 2018a), but this is not necessarily as problematic as it may appear. Although people seek to avoid the internal discomfort that arises when their beliefs, attitudes or behaviour come into conflict with each other or with new information (Festinger 1962), evolutionary resilience theorists such as Davoudi et al. (2012) suggest incremental and iterative adjustments can provide the necessary first steps towards accommodations necessitated by a new regime. When it does become problematic is when pathological resilience of a certain mentality drives the conservation and perseverance of institutional and bureaucratic structures which should have failed (de Bruijne and van Eeten 2007), making responses inflexible, non-malleable and unnecessarily partial to existing lock-ins.

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