



The Cape Town Drought: Lessons from the City that Nearly Ran Out of Water – Gina Ziervogel

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The Nokoko journal is committed to a world where people are free from all forms of oppression and exploitation, where respect for individuals' varied differences is maintained, and where everyone can realise their full potentials. NokokoPod is a companion to the journal, covering current African issues. It aims to bring forth new perspectives that broaden, trouble, complicate and enrich current discourses. Edited and annotated versions of the conversations will be made available on the journal website.

This issue of NokokoPod explores the Cape Town drought of 2017 and 2018 and the lessons learned from it. The podcast for this discussion is available on the Nokoko journal website. This conversation took place on March 4th, with Logan Cochrane in Canada and Gina Ziervogel in South Africa. This version of the PDF has been reviewed by Logan Cochrane and Gina Ziervogel. In addition to the conversation, a set of annotations have been added as footnotes so as to strengthen the value of these publications and enable them to act as a resource for listeners and readers who want to

have additional context and/or find additional resources on the topics discussed.

Logan: Welcome **Logan:** Welcome to NokokoPod Issue #3 of 2020. Today we are joined by Associate Professor Gina Ziervogel, at the University of Cape Town in Environmental and Geographical Sciences.¹ Gina has spent the majority of the last couple of decades working on questions related to adaptation and vulnerability in relation to climate, climate change and broader environmental issues. Today, we will be speaking about the drought and water crisis that occurred in Cape Town, which those of us outside of Cape Town heard about in 2017 and 2018.² Around that time, we started to see headlines of a "Day Zero", about a major city potentially running out of water. To get us started, could you tell us some of the history of how Cape Town arrived at having a Day Zero countdown?

Gina: Thank you and it is great to be chatting to you. One of the things to say is that these types of things are complex. Looking back, we can unpack some of it, but they are so many factors that contribute to this type of citywide crisis. One of the questions that people ask is, was it climate change? And, yes, climate definitely contributed to it. The rainfall levels were pretty low and they stayed pretty low for three years in a row. Some attribution studies that have been done suggest that the drought was three times more likely because of climate change.³ We had low dam levels. What is important to note is that 95% of Cape Town's water is from surface water or from dams. We have six large dams around the city, which

1 For more background, see: <http://www.egs.uct.ac.za/egs/staff/academic/ziervogel> and follow Gina on Twitter @GinaZiervogel

2 Some emerging literature on the drought includes: Booysen et al (2019), Cooke (2019), Enqvist and Ziervogel (2019), Maxmen (2018), Simpson et al (2020), Wolski (2018), Ziervogel (2019), amongst others.

3 For more on this, see interview with Mark New in the Cape Town Drought Response Learning Initiative (<https://www.drought-response-learning-initiative.org/>).

have been supplying us our water in the past. These dams were really low, which was very concerning to the city of Cape Town. There were also a number of other issues that contributed to the crisis. There were issues around cross-scalar governance: between the city, the province and the national government. Unfortunately, the national government in South Africa, particularly the water department, was quite weak during the drought and still is. Their ability to respond to requests from Cape Town for putting restrictions in place, for example, was often very slow and insufficient. There was definitely an element of that. Since bulk water is a national competency, the city needed to rely on the national government. Groundwater is also a national competency and the city does not have much control of groundwater. During the drought, groundwater became a very important resource and the city had to work with national government to try and figure out how to use groundwater resources.

As the drought intensified, it became clear that this was a citywide problem. One of the things that I think was interesting is that the water department had been managing this in 2015 and 2016, and disaster management had been involved as well. But in 2017, the mayor at the time, Patricia De Lille,⁴ was really concerned about what was unfolding. She saw this as a citywide crisis. She moved up the importance of responding to the water crisis, to the central policy team within the city. This shift was important because it helped to frame it as a citywide issue, which was not just about water. As the drought unfolded, we started to see all the aspects that it impacted. It was really useful to see how a water crisis contributes to a citywide crisis. Tourism was dramatically impacted. Day Zero became an international headline, and therefore people around the world were worried about coming to Cape Town. They wondered:

⁴ The former mayor (serving 2011-2018), Patricia de Lille, is now the Minister of Public Works and Infrastructure.

would there be enough water? Would the taps be turned off? In late 2017, there was a big concern that people were not saving enough water, and all the work that the city was doing to try and bring new water on board was really tricky to do in a short time span. This kind of stuff takes years and years of planning. If you are thinking about infrastructure projects where you are trying to either get groundwater on-line or have desalination, et cetera, you need time. There was incredible effort put into bringing new water on board. There were some temporary desalination plants that came on board in a very short amount of time. However, it was clear that this was insufficient. Towards the end of 2017, the city shifted its strategy and started focusing a lot on consumption and water demand management. That was when a big campaign was launched about Day Zero, late in 2017. That was accompanied by a disaster plan on what would happen if the dams got to 13.5%, because the city wanted to ensure that critical services were not interrupted. Due to our old pipes in Cape Town, they did not want to have to shut off the water supply for a day or two at a time because they were worried that doing so might lead to increased burst pipes and loss of water. They really wanted to try and turn off the taps at a point when they could then still keep going with the water in the dams for critical services such as hospitals, schools, and the central business district.

When the disaster plan was launched, and the Day Zero campaign was really ramped up, citizens started to change their behavior. Their change in behavior was phenomenal. When we look back at the data, we can see that the citizens of Cape Town and the businesses cut their water use by half in just over two years.⁵ This is a world record because halving water use is an extremely difficult

⁵ For some reporting on this, see: <https://www.cnn.com/2018/02/01/africa/cape-town-water-crisis-intl/index.html> and <https://www.businessinsider.co.za/how-cape-town-cut-its-water-usage-by-50-in-3-years-it-took-melbourne-12-years-to-do-the-same-2018-3>

thing to achieve. One of the reasons why we were able to pull through this and not have a Day Zero when the taps would have been turned off is because of how people changed their behavior and reduced their water consumption. Of course, there were things that accompanied this, that are very important, both technical and behavioral. For example, pressure management devices were put in place so that the pressure was reduced in some areas, meaning that water lost from leaks were reduced and people were not using as much water when they turned on their taps. There were also restrictions put in place and tariff increases that contributed to bringing down water use.⁶ In early 2018, when we were at the height of wondering if Day Zero was going to happen or not, there were a few tense months where we were waiting to see if the winter rainy season would bring rain or not. There were some other things that happened then as well: one of the large agricultural dams released water into the system, and, importantly, the agricultural restrictions were followed through on. In previous years, although there had been agricultural restrictions in place, the National Department had not followed through, and agriculture had used more than their allocated share. The city was worried that this might happen again. Because of the severity of the crisis at that point, the restrictions were implemented. That helped to reduce the amount of water that was being used. Day Zero was called off, and luckily, the 2018 rains were a normal year, so along with the reduced consumption, it was enough to start filling up the dams.

Logan: I was in Cape Town in February and March in 2018, and what I found quite amazing was the extent to which behavior change occurred. For example, I was staying with a family and they

⁶ Some reporting on this, includes: <https://www.weforum.org/agenda/2019/08/cape-town-was-90-days-away-from-running-out-of-water-heres-how-it-averted-the-crisis/> also research by Taing et al (2019).

shifted practices to re-using wastewater from their clothes washing for toilet flushing and reducing all sorts of consumption patterns in a really quick period of time. That is an example of how that reduction took place in my experience. At a higher level, you being a member of the Section 80 Water Resilience Advisory Committee,⁷ could you speak to the policy and planning level? What was happening in order to enable all of those system changes?

Gina: It is quite hard to pull out what exactly enabled those changes. As you rightly said, we started to see extreme behavior change. I would say that for many people, many of their habits have stuck and they have continued using a lot less water than they did pre-drought. Some people have gone back to their old habits and some have kept some habits and not others. I have certainly kept some of the habits that I developed during the drought to use less water. I think there was a very real felt sense of what it meant to have less water in the city. What is interesting to me is that there was this citywide behavior campaign to really try and get across the message of "use less water", which was important. However, there was also something around the threat of "Day Zero" and this large-scale crisis looming where individuals were going to have to queue, in line, for a daily water allowance. That made people wake up. I was really glad that we were able to have that opportunity where people could have that felt sense that this is going to affect me. As somebody who works in the field of climate change adaptation, it has always been quite challenging in cities to think about how to get residents to understand the severity of the challenge, because as individuals, we have been able to turn on taps and the city government has been the one who has had to think about adaptation and ensures that there be enough water available so that residents can turn on the tap and

⁷ For additional information, see: <https://www.100resilientcities.org/ten-new-ideas-water-resilient-cape-town/>

have water. Now, suddenly people were faced with asking where the water comes from and how the system works. One of the aspects that was really important and improved during the drought was the general population's understanding of water and how the water system works. Even for myself, I did not know before the drought exactly where the six dams were and that 95% of our water came from surface water. However, during the drought there was so much education and sharing of knowledge about the water system that people's understanding of the complexity of it really increased. That was very important. Policy wise, I think it is a tricky one because the city was faced with a lot of challenges. Yes, they wanted to bring new water online quickly, but they realized that that came at a cost. They also needed to look at things like water reuse, which they did manage to increase, and re-use and ground-water is currently being scaled up. Building standards were reconsidered and in some buildings grey water systems were put in place.

Across the city, a number of things have shifted and changed. One of the biggest things coming out of the drought is the City's new water strategy that was launched in 2020.⁸ It is a significant shift from where we were five years ago - where water was really seen as being part of a technical infrastructure system. Post-drought, there is a lot more understanding that water is part of a complex system that needs to explicitly include an understanding of people and behavior change, economics, as well as the ecology and the importance of sustainable urban drainage and how you use your stormwater. Cape Town is a city with high levels of inequality, and many people in the city are living with very poor access to water, and have been for decades. During the crisis, many people said that some have been living

⁸ Available at: <https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Cape%20Town%20Water%20Strategy.pdf>

with poor water access for ages and nobody has been up in arms. Now, suddenly, when the well-off might not have good water access people are very concerned. I think that has shifted mindsets and the need to focus more on the urban poor and think about how to improve their sanitation and water access. That is captured in the new strategy as well. The new strategy tries to lay out what it would mean for Cape Town to become a water sensitive city and all the aspects that go into that, which I think is very encouraging.

Logan: One of the new practices that emerged, at least in 2017 and 2018, was interdepartmental collaboration within government and outside of government. First, could you tell us a bit about that? And second, has that been something that has been retained or was that a process driven around a crisis and then stopped?

Gina: Intergovernmental collaboration has been one of the goals of the city of Cape Town for a while. They tried to implement something called transversal management to try and get different departments to collaborate more and for there to be a central policy group that cuts across different departments. In practice, I think this was very slow in development. During the crisis, there was more interdepartmental interaction because it was clear that departments had to work together. The water department was central to this, but they had to work with finance, they had to work with housing, they had to work with informal settlements. As a result, relationships really were strengthened during the crisis. One of the things that I saw from being on the inside through the Section 80 Committee was that people got to know others in different departments that they hadn't known before. The director of the water department did not really know some of the people in the policy and planning department before the crisis. However, as the crisis unfolded, they worked together so closely that they got to know each other well and built relationships of trust and understanding, which going forward I

think are so important. I think that post-crisis collaboration is no longer in place to the same extent that it was during the crisis, but it definitely has shifted things in some ways.

Logan: Elsewhere, you have spoken about the challenges of the financial aspects of incentives and disincentives within the water system. Could you tell us a bit about what that is?

Gina: This is tricky for the city of Cape Town and other cities in South Africa, and I am sure in other countries as well. In South Africa, the city government is responsible for charging for water because the city needs to pay for all the pipes, networks and treatment works to get water from the dams to our houses. As a result, they need to charge for water use. But, in the long term, we want people to use less water. That is a bit of a challenge for the city because in some ways they do not want to encourage people to use less water because then they get less revenue and they do not have a good way of then financing the water system. It really is a challenging issue to deal with. The city of Cape Town had to look closely at this. It has looked into alternative ways of funding water. It has looked at international financing. We have also seen a shift in how water is charged for. We used to pay for the amount of water we used. During the drought, what happened is that they broke our water bill down so that there is a fixed charge, which means we pay just for having a pipe to our house and the availability of that water. It is a pretty low cost of 50 Rand, which is the price of two cups of coffee. Then you pay for the amount of water you use on top of that. It was felt that this was a more equitable system than just charging for water use because houses with direct access would then pay for that access. It was also important for houses to recognize that even if they use no water, they need to be paying for the service of having access to that water.

Logan: Would this potentially have implications for other public good type things. For example, electricity, water and access to other services, with regard to the kind of financial incentives that exist. We want to move to decreasing consumption, but many of these services are provided on a model that would encourage consumption or that would grow profitability or even financial sustainability of those entities. Might that require us to rethink how those institutions and systems are designed?

Gina: Absolutely. I think this is a huge area of work and is really challenging. One of the things that Cape Town had as an advantage is that it had faced an electricity crisis in preceding years.⁹ It had dealt with the challenges around wanting people to use less electricity, but needing to pay for the electricity services. Unfortunately, what we have seen is that electricity has become very expensive. Yet, we still have load-shedding and power plants that are not functioning well. We are seriously hoping, those of us who are pro-renewable energy, that more attention can be paid to renewable energy because coal fired electricity is not the answer. However, South Africa has cheap coal. It is tricky because what we want to do is keep resources at an affordable cost for the urban poor. As the water tariffs went up during the drought, we saw this impacting the urban poor. What happens is you have a household and it has four members, but then you have people living on that property in a backyard shack, et cetera, so on that property, suddenly you have 20 people. Households were allowed 350 liters a day at a reasonable cost, but as soon as you started using above that you paid a lot more for your water. In poorer areas where there were a lot more people on site, water bills became exceedingly high. That was an unintended

⁹ For some reporting on this, see: <https://www.bbc.com/news/world-africa-47232268> and https://www.washingtonpost.com/business/energy/why-eskoms-power-crisis-is-south-africas-top-risk/2019/05/29/70697bcc-81e4-11e9-b585-e36b16a531aa_story.html

consequence. The increased tariffs were not aiming to do that, but it was a product of the social fabric of our city. More understanding of the social dynamics, the equity dimensions, is really important. How do you get those who can afford to pay more for water, electricity and services to do so? Because, in Cape Town, there is cross-subsidization, meaning that better off households are paying more for water so that it can cross-subsidize the poor. If you earn under a certain amount per month, you qualify for an amount of basic free water. That is important to support going forward, but equally is a challenge for the city to manage when suddenly revenue from water sales drops.

Logan: It is now March 2020, a couple of years have passed since the drought, and you are working on a knowledge co-production approach to better understand how people in low-income areas have experienced access to water and related challenges.¹⁰ Could you tell us knowledge co-production is? And then about your project?

Gina: One of the things I feel quite strongly about in the work I am doing is that we need to understand the lived experience of those people who have challenges accessing water, who have poor sanitation and to understand what their experience was like of living through the drought. You often hear people say, 'the drought was terrible for the poor', but why was it? What was the impact? How is that different to before? The city is interested in moving forward and understanding more about this. I feel very strongly that if we want to adapt to climate change, we need to include those who are most vulnerable and who have direct experience of what the impacts are. So our project uses a tool called SenseMaker, which captures short

¹⁰ For some research on knowledge coproduction related to climate, see the work of Laursen et al (2018), Harvey et al (2017, 2019), Roue and Nakashima (2018), Wall et al (2017), Vincent et al (2018), amongst others.

narratives and related information about people's experience of water related issues. These stories are then made sense of by the respondent. These are people living in low-income areas who share their stories with the researchers and we unpack those stories. The important part about our project is that it is a co-production approach, where myself and a few other colleagues at the university are working very closely with an NGO and a social movement called the Western Cape Water Caucus. Over the last year, we have worked closely to think about supporting the caucus and what the caucus needs in order to do its work in the water sector. One of the things the caucus members felt very strongly about was that they wanted to develop their own skills as researchers. Through a four-day workshop process, together, we developed this SenseMaker survey instrument. Caucus members then went out and collected over 300 stories in their own communities where they lived. We then had another four-day workshop where, together as a team, we went through all the data, we unpacked it, we pulled out the common stories that we were seeing, and we found ways to present some of these stories so that the caucus members could go back to their communities and share these stories. They did that in the form of plays that they developed and posters. We also shared the outputs with the city of Cape Town. The city was really excited about this and interested in this because it has often been quite hard for the city to engage with communities directly because of the power dynamics and lack of trust from many of these communities with the city. People do not feel they have got the services that they have hoped for. Through this project, we are building the capacity of the caucus members to do their own research, to try and understand their own context and engage better with the City, so that they can then implement adaptation responses that are suitable from their own perspective.

Logan: This has been one of the motivations behind knowledge coproduction processes. Often, we have policies,

programs and services that are designed based on certain assumptions, but when implemented, there is a lack of take up or just a mismatch between needs and priorities. Knowledge coproduction is positioned as a way in which we can better create with communities, with those involved, the policies, services, and responses that align with priorities and needs. Are you seeing that this is occurring between the city and the research and the community?

Gina: It is starting to happen. Knowledge coproduction is a slow, hard journey. It takes a lot of time and effort, but I think it is so important. One of the things I said earlier is about relationships. It is also about building relationships. As these relationships are built, then we can start to explore options for new ways of engaging. We need time to figure out these problems collectively. They are not always the best approach, because of the time and resources involved but in certain instances, I think they can be so useful. One of the criticisms of the city of Cape Town, which is justified, is that the city has not engaged with citizens as much as it could have to understand where they are coming from and what their challenges are. Yes, it is hard, but there needs to be a shift. I think the city of Cape Town has recognized this and really saw this through the drought and saw how important it was to understand citizens and their needs and what they are experiencing. This kind of a project that we are running can really start to get to that. The question for me is: how does a city integrate this kind of data and enable the conception and collection of this kind of data? Because it does require a shift in how things have been done traditionally, in bureaucratic systems, where the municipality wants to be in control, collect data in a very ordered fashion that fits their models. However, we need to start finding new ways of recognizing diverse types of knowledge that give us more insight into the dynamics of the situations, if we want to have successful interventions.

Logan: To conclude, for those listeners and readers who would like to know more about what happened in Cape Town and the responses and so on, could you tell us about the Cape Town Drought Response Film Library?¹¹

Gina: There has been a lot of interest in what happened in Cape Town. We have had, and we still have to this day academics, journalists and students coming to Cape Town to find out about the drought. Many are contacting us from abroad and asking to speak to us about what happened and what we have learned. Of course, we want to share these lessons because we really feel that we did learn a lot and that these types of lessons need to be learned before crises hit other places. Together with colleagues, we have created something called the Cape Town Drought Response Film Library. This is an incredible resource lead by two of my colleagues, Peter Willis and Victor van Aswegen, who have done hour-long films of 30 key individuals who were central to responses during the drought. They are beautifully filmed interviews that are available for everybody to watch, once you have signed up to the site along with lovely summaries of each one. They capture experiences in real time because they were filmed a year ago when people were still in the midst of the crisis and reflecting on the crisis. It captures the perspectives at that time and pulls them together. There are also some short films that are now being developed that pull together these different themes and lessons around the drought. In fact, these shorter compiled movies have been used internationally with groups who have been thinking about what it means to respond to city-level drought crises. I really encourage you to take a look because you will find some wonderful stories from individuals as to what it meant to live through the drought.

11 Available at: <https://www.drought-response-learning-initiative.org/>

Logan: Thank you very much for your time today. This was a really interesting discussion and I hope it stirs interest for all of our listeners and readers. Those who would like to know more can check out the Cape Town Drought Response Film Library, we will also include the link in the annotated podcast along with many other resources. Thank you again for spending some time with us today.

Gina: Thanks Logan.

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