DEVELOPMENTAL STATES, THE ROLE OF EXPERTS AND CAPE TOWN'S WATER CRISIS

By ***Mike Muller***

Mike Muller is a visiting Adjunct Professor at the University of the Witwatersrand's School of Governance. He is a Professional and Chartered Engineer (SA and UK) and a Fellow of the South African Institution of Civil Engineering and the Water Institute. He was a member of South Africa's first National Planning Commission from 2010 to 2015.

Mike Muller

While most of our water supply is dependent on rainfall, Mike Muller points to several other factors that have contributed to the water crisis in Cape Town. Among these is the relationship of technical experts to politicians and wider society and the role that environmental activists have played in determining how water supply and demand has been managed.

A water crisis has been constructed in and for Cape Town that, in some respects, has been imaginary. The complete 'Day Zero' shutdown of supplies that had been predicted was not going to happen, despite two years of low rainfall (2015 & 2016) and one year of real drought (2017). It continues to be unlikely, even if nature inflicts a succession of similar years. It is a real possibility albeit of low probability.

On the other hand the crisis was real. Cape Town's Metro Municipality actively enforced restrictions on consumption which, in the city's more affluent suburbs, required citizens to spend a few months living like the majority of their compatriots. The city's summer consumption fell to below 600Ml/day (million litres) from previous summer maxima of up to 1200Ml/day. The shocked reaction to what national government described as 'the new normal' suggested that they failed to understand the irony. Nor was it evident that the drama occurred despite repeated advice to prepare for such events.

Wider restrictions on all users of the Western Cape Water Supply System (WCWSS) impacted on jobs and revenues in the region's agricultural economy. Tourism has also suffered after foreign media globalised the domestically manufactured myth that Cape Town could be the first city in the world to run out of water.

These events raise important questions. Are politicians, their officials and the broader society able to take timely and appropriate decisions about complex, long-term challenges? Whose voices are heard when decisions are ››

Whose voices are heard when decisions are taken, why are others ignored, and at what cost?

taken, why are others ignored, and at what cost? Have we understood the role of technical agencies in successful developmental states or simply abdicated responsibility to politicians to follow focus groups and lobbyists along the most immediately attractive path?

And why so little attention to the far worse circumstances endured regularly by far more of Capetonians' compatriots? 'Sunset clauses' in the 1996 Constitution give substantial autonomy to local government, a last bid by the outgoing Nationalist government to secure control of its constituencies' privileges (Cameron 2001), leaving many people hidden in the long shadow of sunset federalism. Yet, now that it is in trouble of its own making, Cape Town demands that national government should pay the cost. Has South Africa's urban elite come to terms with what it means to be part of the emerging urban Africa in this third decade of democracy?

COMPETING PERSPECTIVES ON DROUGHT'S IMPACT

Competing perspectives emerged about the management of what was characterised as a drought crisis. Domestic users were concerned about the way in which the pain of restrictions was distributed. Despite the stated (and objective) urgency of reducing the city's water consumption, some areas and activities were initially exempted from formal restrictions. While the business sector was exhorted to save water, it was not formally obliged to do so. Supply to central business districts, tourist facilities and large shopping centres continued.

Then there was agriculture. Some city dwellers were outraged to learn that farmers were still being allowed to draw water from the same system that supplied the city. Yet agriculture remains an important part of the regional economy. A sudden curtailment of agriculture would lead to serious financial losses and, potentially, many bankruptcies. Once orchards and vineyards die, it would take years to bring them back into production, if farmers were willing – and able – to make the investments needed. Meanwhile, at least 50 000 seasonal jobs were at immediate risk (Engineering News 2017). The region's winelands are also central to its tourism 'brand', supporting jobs and revenue across the hospitality sectors. So while city authorities wanted farmers to share the burden and reduce their consumption, they did not suggest that their supplies be cut entirely. Western Cape farmers have already led the way in water use efficiency, because it was the only way to sustain and expand their businesses rather than shoulder any social responsibility.

> **. . . many poorer communities were accustomed to living with less than 50 litres per person per day.**

Back in the city, while attention focused on suburban restrictions, it was noted that residents in many poorer communities were accustomed to living on less than 50 litres per person per day, if only because of the burden of fetching and carrying water. For them, little changed. 'Day Zero' plans were to cut off suburban households and provide water at standpipes. Supplies in poorer 'high density' areas would be maintained in part because many water saving interventions had already been made in places like the Cape Flats which are ideally suited to water saving through pressure reductions (McKenzie and Wegelin 2009). The clear message from these communities was that 'we have already saved, now it is your turn'.

Nonetheless, residents with links to the rural areas of former Bantustans recognised that they were still better off in the city. In many rural municipalities, the reliable availability of safe household water supplies has been declining, an anecdotal trend confirmed by household surveys (StatsSA 2016). Even where there is water supply infrastructure, it is not uncommon for months to pass without any water coming from the taps. This problem is, typically, most acute in hot weather when water is most needed.

Cape Town residents have thus remained a privileged community in the wider South Africa. These different perspectives on the same societal event beg for a more careful interpretation. And they offer a lens through which to view the dynamics of the wider society as well as to understand the particular challenges for developing countries of managing the complex systems on which 21st century cities depend.

COLONIAL PREVARICATION MEETS POST-COLONIAL SOCIAL PREFERENCES

Cape Town has been here before. A century ago, the city was running out of water as demand exceeded the supplies from springs on Table Mountain. "Will it come to this?" asked a Boonzaier cartoon in 1918, showing a queue of (white) people with buckets in front of the City Hall. Local village councils were dithering about whether to cooperate to build the Steenbras Dam or one at Wemmershoek. Most of them had amalgamated into a single City of Cape Town administration in 1913, largely to deal with the water challenge (Wall 2017). But the debate continued for some years and construction was further delayed by a shortage of imported materials following World War One. The small first phase of the Steenbras Dam was only completed in

1921; by 1928, it already had to be substantially enlarged.

The city's growing population, together with the region's expanding agriculture, required continued supply expansions. To meet these needs, national government completed the Voelvlei Dam north of the city in 1952 and the Theewaterskloof Dam in 1979. Both lay outside the city limits, serving the wider area covered by the WCWSS. There was less controversy about these dams which, initially, primarily served government's farming constituency and were funded from government's budget.

But old habits reasserted themselves with the new actors of the 1990s. Technical studies of the region's WCWSS had indicated that, if there was a drought, there would be significant shortages. The Skuifraam Dam on the Berg River was identified as the most cost-effective intervention to reinforce the supply. But, by the time the project was ready for implementation, it had become controversial. Then Minister, Professor Kader Asmal, was also chairperson of the World Commission on Dams whose secretariat was based in the city. Allowing a major dam to be built would affect his standing as chair of what was nominally an objective process (although it was dominated by anti-dam NGOs). So Asmal demanded that the city undertake substantial conservation measures before he would approve construction.

Permission for the dam to be built was finally granted by new Minister Ronnie Kasrils. But even after Cabinet approval and a funding agreement was reached between the city and national government, there were still objections. Dynamised by the 2002 Johannesburg World Summit on Sustainable Development, a South African Civil Society Water Caucus called for the Minister to "prohibit construction of new large dams (e.g. Skuifraam) until full demand-side measures are undertaken" (Bond 2004). Court action was threatened to stop construction. Fortunately for Cape Town's citizens, a minor drought and resulting supply restrictions in the following year weakened the resolve of the objectors and the dam was eventually completed in 2009. (Ironically, during the current crisis, some of the objectors now reluctantly agree that the dam has saved the city from a real calamity.)[1] ››

Disputes about large infrastructure projects are common, particularly with large public water projects where the immediate need is not obvious and the project raises policy issues. The specific concerns and the parties involved inevitably change over time, reflecting changing, often ephemeral, social dynamics and preferences. On the Berg River Dam, social movement campaigners allied with the region's strong environmental conservation organisations. Agriculture sought simply to maintain its existing allocations, not seeking any additional water (although the project improved the reliability of their supplies). Meanwhile the wider citizenry stayed on the sidelines, relying on their municipality to do whatever was necessary to sustain reliable services, except in Franschoek where they lobbied for the jobs and housing benefits offered by the project.

Whatever the drivers, these dynamics create potentially disastrous delays and invite sub-optimal decisions. Most politicians focus on short-time horizons, at best from one five-year electoral cycle to the next. But major infrastructure projects usually take much longer from conception to inauguration – two decades in the case of the Berg River Dam. And, because of the decadal time scale, important lessons are not learnt, as Cape Town has shown. How can public policy successfully achieve long-term goals in such a short-term environment?

. . . South African environmental activists who are particularly active and influential in Cape Town . . . must share responsibility for the city's failure to act appropriately and timeously.

VULNERABILITY: THE RESULT OF NATURAL VARIABILITY AND HUMAN (IN)ACTION

Procrastination is particularly dangerous in water resources management because it allows vulnerabilities to grow, unobserved, until an event like the current drought occurs. Managing supply from natural systems is effectively about managing the risks created by climate variability and, specifically, variable rainfall. South Africa's rainfall varies dramatically from place to place as well as across and between seasons. The flow in rivers and streams is even more variable because the conditions of the landscape determine how much rainfall runs off or seeps into the land. Aside from generic wet and dry seasons, these variations are unpredictable. Rainfall cannot be forecast accurately from one week to the next. River flows are even more uncertain and the threat of climate change introduces further unknowns, although the evidence is that the best way to prepare the water sector for climate change is to strengthen its ability to manage 'normal' climate variability.

The engineering professions, hydrologists, climate scientists and statisticians use historic data on rainfall, river flows and underground resources to model a range of possible water futures. Using historic variability data, they make thousands of simulations of possible sequences of rainfall and river flow to estimate the probability of extreme droughts and floods. From this they calculate the reliability of supply from a given system. Different user sectors have

. . . another important lesson from Cape Town is to keep politicians distant from operational involvement in the management of complex systems that require a long-term perspective.

different risk tolerances. Typically, agriculture can accept restricted supplies once every ten years; urban users, once in fifty years; critical sectors such as electricity generation aim for a one in two hundred year risk.

Future demands for urban water are equally complicated to estimate since they are driven by many factors. Population numbers and household incomes are important but so too are parameters such as the physical size of household plots. Municipal water supply tariffs may affect consumption in lower income households but not in those with higher incomes. Water efficiency measures such as low flush toilets also make a difference but they are only installed in new houses. And changes in peoples' water use habits are hard to predict.

A further critical dimension of water demand is the efficiency of management by the water suppliers themselves. Non-revenue water, water that is not metered as well as water lost to leakage before it reaches consumers' premises, varies from a best of around 15% to over 50% in smaller municipalities (McKenzie, Siqalaba and Wegelin 2012). But, while potential savings can be estimated, predicting organisational

performance is often guess work. However, better management of water used in public institutions can often make an immediate difference.

Given estimates of future demands, supply options can be identified – South African practice describes this as a 'reconciliation' process. Options include both infrastructure to augment supplies, such as new dams, measures to reduce demand such as leak control or intermediate solutions, such as the reuse of wastewater. The recommended choice and sequencing of supply options is usually based on their unit costs. These methods have proven to be robust. Where the recommendations have been followed, as in the country's critical Vaal River System, needs have been met. Where they have been ignored, as currently in the Nelson Mandela Bay Metro, shortages have been experienced.

For Cape Town, the 2007 reconciliation study recommended three interventions be implemented by 2015 to get the city to 2030: Increased diversions from the Berg River to Voelvlei Dam; development of the groundwater of the Table Mountain Group aquifer; and then reuse of wastewater. Those perspectives have remained consistent over time. In 1970, the city's longer term dependence on water reuse and desalination was already recognised. In 1986 it was stated that by 2007, the city would have to consider the utilisation of groundwater, reuse of wastewater and desalination. In 2007, the timeline for these was extended to 2015. In 2012, the National Development Plan recommended a programme of major water resource investment projects, including "Western Cape water-reuse and groundwater projects, which are to be completed by 2017"[2]. In 2013 these recommendations were repeated but not accepted by the City (Muller 2017a). All the options mentioned are now being executed with great urgency.

SCARCITY CONSTRUCTED AT THE POLITICAL INTERFACE BETWEEN CITIZENS AND TECHNICIANS

The technical recommendations for Cape Town proved to be remarkably accurate. But why were they not translated into collective action? Is it just an inevitable hazard of democracy? Can such mishaps be afforded or avoided?

The cost of earlier interventions would have been substantially less than the cost of dealing with the resulting shortages. Since water projects will not be fully used unless a 'worst case' rainfall scenario occurs, such investments are best considered as insurance. The 'peril' insured is the threat of water shortages; the finance charge is effectively an insurance premium. On this basis, early investments to augment reliable supplies from the WCWSS would have been fully justified. A rough estimate, based on published data, is that

- R1 billion invested in 2015, annual finance cost = +/-R70 million
- Investment delayed to 2022, total savings = R490 million
- Direct cost of water shortages = R2.5 billion, and rising.

So, while the city saved R500 million by not investing in 2015, it has already incurred direct costs (revenue loss and cost of emergency works) that is five times that. In addition, indirect costs include loss of business income and damage to the city's tourism brand. Yet cost was an explicit consideration for city leadership. The councillor responsible stated in April 2017 that "in our context, it is not practical to ring-fence billions of rand for the possibility of a drought that might not come to pass" (Limberg, 2017). And, since the city was already in the grip of (still relatively mild) restrictions, she added that "it is impractical to fast-track supply schemes of sufficient scale quickly enough to compensate for a drought". These statements illustrate, at the very least, a failure to understand the nature of water management challenges.

This elementary failure highlights the gulf between the world of practitioner and politician and the cost it imposes on citizens. It raises questions about the role of technical experts in public management (Muller 2017b). Literature about effective developmental states emphasises the importance of ensuring that technocrats are effectively 'embedded' in public management systems with sufficient autonomy to do their jobs (Evans 2008). Perhaps because the technical cadre in South Africa is still predominantly white and from the *ancien regime*, they are not 'embedded' and it has been easy to ignore them. But while this may be a general problem, it cannot easily be applied to the case of Cape Town under an administration led by the Democratic Alliance.

This points to two wider issues, the societal rejection of the expert and the influence of external lobbies. Many environmental movements in Europe and North America vigorously oppose the construction of new infrastructure, advocating the management of demand and greater reliance on eco-system services (see, for instance, Palmer et al 2015). As illustrated on the Berg River project, this narrative has been adopted by South African ››

. . . better management of water used in public institutions can often make an immediate difference.

environmental activists who are particularly active and influential in Cape Town. They must share responsibility for the city's failure to act appropriately and timeously.

While there is ample evidence of over-investment in the developed countries of the north, where populations are stable if not actually declining, the south faces huge challenges. Sub-Saharan Africa's urban populations are expected to grow by 720 million people by 2050 (United Nations 2014). It is going to require huge investment – and innovation and discipline – to meet their bare minimum requirements of water supply and sanitation. Cape Town (and South Africa) is not immune from these trends and requires policies and programmes that respond to them. This was not recognised in Cape Town's decision making.

TOWARDS SOME CONCLUSIONS

Water management traditionally progresses by taking advantage of crises such as floods, droughts and cholera. Can Cape Town's current crisis contribute to a better understanding of the underlying technical challenges of achieving water security and encourage more effective action to address them? More ambitiously, does it support transformation of South Africa's still deeply distorted society? The evidence so far is not encouraging.

Despite the direct economic losses in jobs and business revenues and the damage to the city's valuable tourism 'brand', there is as yet little evidence of systematic reflection by key political, business or wider civil society interest groups. Their responses to date appear to have been driven by narrow, short-term interests rather than a desire to understand and address the longer-term strategic issues.

At a political level, the city's administration sought to characterise the drought as 'unforseeable'. Yet, over the preceding decade, the planning models used were consistently recommending that investments be made to increase supplies. Even more damning was the city's own admission that its approach was guided by the view that it could not invest "... for the possibility of a drought that might not come to pass". But there was no divergence between political parties about the singular need for demand management. This position, initially promoted by national Minister Kader Asmal in the 1990s, was enthusiastically adopted by city authorities controlled by opposition parties and later claimed as their own.

The cost of earlier interventions would have been substantially less than the cost of dealing with the resulting shortages.

Some responsibility must thus lie with the (formal and informal) environmental lobby groups that promoted this approach to the exclusion of other interventions. Their northern environmental narrative contributed to the marginalisation of other sources of technical advice. This is not out of keeping with the broader global trend to reject 'experts'. But in South Africa, the rejection of the expert is accentuated by the social divides that separate what is still a predominantly white technical class from the black majority. We are a long way from having the 'embedded technocrats' envisaged by Peter Evans as the core of effective 21st century developmental states. Meanwhile, environmental activists appeal to easier and emotionally attractive 'green' themes.

Yet Cape Town's total reliance on demand management was, politely put, poorly informed by the objective nature of the risks that this entailed or by an understanding of the drivers of growing demand. The continued promotion of essentially northern narratives also reflects a poor understanding of the challenges posed in the south by the combination of dramatic urbanisation overlain by climate change, whose impacts are orders of magnitude greater than in Europe and North America.

This once again simply highlights the failure of better informed domestic voices to be heard. So another important lesson from Cape Town is to keep politicians distant from operational involvement in the management of complex systems that require a long-term perspective. Their role should rather be to ensure that the institutions responsible have clear mandates and the support needed to achieve them. The ANC has demonstrated the importance of this principle with Eskom's contribution to the national electricity crisis. Through its failure to manage water effectively in Cape Town, the DA has now demonstrated that this is a generic political issue.

However, party politics did contribute to the failures. The contestation between local DA politicians and the national ANC government meant that the City ignored warnings from national planners while national government allowed them to do so. But these were acts of omission rather than commission. The political criticisms that ensued were largely narrow attempts to manage the political impact of the crisis, complicated by the internal politics playing out in the DA in Cape Town.

In two areas, the city has managed relatively well. The first has been widely recognised – management of water distribution and reduction of

non-revenue water sets benchmarks for the rest of the country. Receiving less attention has been its efforts to protect the interests of poorer communities. This is unfortunate because, in most South African cities, these communities account for a substantial proportion of water use and managing their water use is challenging. In Gauteng, a relatively minor short-term supply crisis in 2016/7 saw supply to poor communities cut by administrative fiat, some for many days. So there is a particular need to learn lessons in this area.

Less creditable were the repeated suggestions by both the Provincial Premier and Deputy Mayor that national government's failure to build and pay for the necessary infrastructure had contributed to the problems (Yeld 2018). This was stated to be a budget issue. Yet, just outside the city, the Berg River Dam stood as a practical demonstration that all that was needed to fund infrastructure interventions was the city's signature on a supply contract.

In this appeal for national funds, to mitigate a largely self-made disaster, we see a reversion of the city to its sunset clause roots. The assumption remains that former colonial centres must be privileged even if their 'crisis' leaves them better off than many other communities. Missing from the narrative of city and provincial politicians was a recognition that the autonomy they enjoy was based on the assumption that they would themselves fund higher levels of service because they are so much more productive. Rather, we see demands for the city to be treated exceptionally, even as it enjoys and insists upon its autonomy. When poor judgement leads it into difficulty, and it has failed to take out insurance, it wants to be treated as part of the national collective, a public sector equivalent of 'privatise the benefits, nationalise the costs'.

Finally, one thread that runs through this review is the specific challenge of effectively harnessing technical expertise to support public policy decision-making in complex sectors. In pre-1994 South Africa, that expertise was produced through the training pipeline of government bursaries and post graduate 'pay-back' employment. The technical cadre learned and practiced together and even when they eventually dispersed into diverse institutions in the public and private sectors, they could draw on the social capital and trust of that shared background. Equally, the politics of the time meant that there was a greater degree of trust between political communities.

The weakening of South Africa's technical agencies has seen the training and development pipeline dry up, undermining what had once been a formidable community of practice. Societal trust has also been lost in the current conjuncture. The challenge for the third decade of South Africa's democracy must be to nurture supportive complementary relationships between the political classes and a new technical cadre. That could yet create the basis on which to engage with the wider society in search of the elusive democratic developmental state to which many of us still aspire.

The continued promotion of essentially northern narratives also reflects a poor understanding of the challenges posed in the south.

REFERENCES

Bond, P., 2004. Water commodification and decommodification narratives: pricing and policy debates from Johannesburg to Kyoto to Cancun and back. Capitalism Nature Socialism, 15(1), pp.7-25.

Cameron, R., 2001. The upliftment of South African local government? Local Government Studies, 27(3), pp.97-118.

Engineering News, 2017. Work-drying-up-in-western-cape-drought. Accessed at http://www.engineeringnews.co.za/article/work-drying-up-in-western-cape-drought-2017-10-26

Evans, P., 2008. In search of the 21st century developmental state. The Centre for Global Political Economy, University of Sussex Working Paper 4. Brighton, Sussex.

Limberg, X., 2017. No shortage of planning, letter published at https://www.businesslive.co.za/bd/opinion/letters/2017-04-24-letter-no-shortage-of-planning/

McKenzie, R. and Wegelin, W., 2009. Implementation of pressure management in municipal water supply systems. EYDAP Conference "Water: The Day After", Greece.

McKenzie, R.S., Siqalaba, Z.N. and Wegelin, W., 2012. The state of non-revenue water in South Africa. Water Research Commission.

Muller, M., 2017a. Understanding the origins of Cape Town's water crisis, Civil Engineering, Johannesburg, June, pp.11-16.

Muller, M., 2017b. Decolonising Engineering, South African Academy of Engineers Annual Lecture at University of Cape Town, November. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3081745

Palmer, M.A., Liu, J., Matthews, J.H., Mumba, M. and D'odorico, P., 2015. Manage water in a green way. Science, 349(6248), pp.584-585.

StatsSA 2016. GHS Series Report Volume VIII: Water and Sanitation, in-depth analysis of the General Household Survey 2002-2015 and Community Survey 2016 data, Statistics South Africa Pretoria 0001.

United Nations, Department of Economic and Social Affairs, Population Division. 2014. World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352).

Wall, K., 2017. Honouring Cape Town's Centenarian: The Ancestry of Steenbras Dam, presented at IMESA. Accessed at https://www.imesa.org.za/wp-content/uploads/2017/11/Paper-11.pdf

Yeld, J., 2018, Cape Town is paying for national government failures, say officials. Accessed at https://www.timeslive.co.za/news/south-africa/2018-03-02-cape-town-is-paying-for-national-government-failures-say-officials/

NOTES

1 Declaration of interest #1 – As Director General of the national Department of Water Affairs, the author was responsible for this process and signed the contracts for the project's implementation.

2 Declaration of interests #2: in 2011/12 the author drafted these lines in the NDP after consultation with DWS officials who said that there was no need to mention the Voelvlei diversion, because it was already 'on track'. NA