**Cape Town Drought Response Film Library**

**Mark New interview | 12 October 2018 | Duration: 1:00:42**

**KEY POINTS**

* The risk of a drought of this magnitude has increased three-fold because of the human influence on climate: without global warming a drought such as this would have occurred one third as frequently; we can’t say the drought itself is due to climate change but the risk of droughts like this is definitely increasing because of climate change
* In another 20 to 25 years the risk of a drought of this magnitude is expected to be about double what it is today; we therefore have to plan for that increased risk
* The WCWSS was preconditioned to have a higher risk of failure than people thought because it was modelled in a way that assumed the climate wasn’t changing whereas in fact it was changing; the impact of climate change on the WCWSS needs to be taken into account more robustly to give us a much better and more reliable estimate of what needs to happen in terms of planning for the evolution of the water supply system
* The first step of adaptation planning is understanding the sensitivity or vulnerability of the system, and incorporating this by means of scenario planning; we would possibly have been better positioned had that kind of probabilistic or scenario-based analysis been done right at the beginning; the kind of scenario planning that was happening at the end of the crisis should really become standard practice that is done all the time on an ongoing basis
* The notion of adaptation pathways: rather than having a huge master plan that leads you to build a massive system that might become redundant, think of a pathway where you have flexibility in the decisions you make through time as we learn more and more about what climate change is actually going to be doing
* Best option is probably some engineering to augment supply combined with a social-economic compact to agree to tolerate a slightly lower level of reliability, accepting going into crisis mode possibly every 25 or even every 10 years, thereby lowering the cost of developing the water resource system
* Big question on demand side: is the shift permanent; or if not, how high will rebound be?
* In the Western Cape the water supply system is dependent on the successful cooperation of a complex set of actors; but there are other models
* In addition, the Western Cape is very dependent on the national DWS to be good at what it does, and the department has essentially been malfunctioning

**INDEX**

00:00:06 Was the recent Cape Town drought due to climate change? The short answer is: not entirely; “what we’re trying to do is not say is this particular drought due to climate change but has climate change actually altered the risk of a drought of this magnitude?”; the risk of a drought of this magnitude has increased three-fold because of the human influence on climate: without global warming a drought such as this would have occurred one third as frequently; “we can’t say the drought itself is due to climate change but the risk of droughts like this is definitely increasing because of climate change”; fractional attributable risk determined with global climate models

00:06:00 Climate science projections for 2030s and 2040s: “the risk of a drought of this magnitude will go from a three-fold increase to something like a five- or six-fold increase in another 20 to 25 years”; a consistent trend of a drying climate in the south-western Cape; the baseline of the climate is shifting towards dryer and dryer conditions, shifting the distribution towards a greater likelihood of dry years in the future; the risk of drought of this magnitude is therefore expected to be about double what it is today; return periods: how frequently will such a drought occur? what was an extremely rare event becomes much less rare, something we might have to deal with on quite a regular basis; it might even occur once every twenty years, rather than being a “black swan” kind of event; with global warming we will be seeing many more black swans: “this is essentially the message that we’re putting across … not saying that every year is going to be like the last three years but the frequency with which events like this actually occur is going to become … much more regular”; we have to plan for the fact that the risk is changing

00:12:29 How should we incorporate expectations of climate change into water resource planning? Planning made tricky by uncertainty in projections; “what climate change actually asks of us is to be a little bit more flexible in the way we think about how this water resource system might evolve … embracing uncertainty rather than running away from it”; the first step of adaptation planning is understanding your sensitivity, your vulnerability; scenario planning and adaptation pathways: “rather than having a huge master plan that leads you to building this massive system that might become redundant, think of a pathway where you have flexibility in the decisions you make through time as we learn more and more about what climate change is actually going to be doing”

00:16:56 This kind of scenario work is being done for the Western Cape Water Supply System, with the reconciliation planning approach; problem up to now is that they have generally been assuming a stationary climate; as a result the estimate of what an additional dam would bring into the system doesn’t take into account how climate change might change the yield of the new dam and all the existing dams; “the missing bit for the Western Cape then I think is to do a much better job of understanding, of having scenarios of what climate change is going to do in terms of affecting the yields from the existing and the planned future augmentations to really understand when and how to modify that Western Cape system development plan to make it robust for climate change”; taking account of the impact of climate change on the WCWSS has not been done as robustly as it could have been done; this needs to be brought into it so that we have a much better and more reliable estimate of what needs to happen in terms of planning for the evolution of the water supply system

00:20:00 Demand management is a crucial part of all of this; understanding the demand side is a critical part of water resource planning because demand management is one of the cheapest options, compared to building infrastructure; strategic water managers worldwide have a preference for augmenting the supply side rather than affecting the demand side, because they control the supply side; big question is: have we now seen a permanent shift in people’s behaviour or not?; will there be a relaxation and how high will the rebound in demand be?

00:23:40 The way that planning happens in the WCWSS with the reconciliation process is quite good, and the conventional supply augmentation options have been identified; what needs to be done is to build in the analysis of how the risk is changing because of climate change; absence of underlying trend in current modelling; need to incorporate changing risk of dry events; “pretty sure that if we incorporated our knowledge of how the climate has changed into that analysis the reliable yield would be much lower” than the 1 in 50 year failure; simple maths would lead to conclusion that risk of failure is probably about three times higher; negotiation with society for social-economic compact for higher tolerance of failure; there is an economic cost with every increment in supply augmentation; there is a trade-off and a negotiation between engineering the system to be as climate-proofed as possible and the reliability of yield the system is going to provide; “it may be that actually the best option is to do a bit of more engineering to augment supply but actually also agree that we’re prepared to tolerate a slightly lower level of reliability” possibly going into crisis mode every 25 or even 10 years, thereby lowering the cost of developing the water resource system

00:30:13 Research and knowledge gaps for climate change adaptation in South Africa; one of the big changes that could happen is to have a set of national guidelines around how different entities within the water sector should bring climate change into consideration in their long-term planning; example from the UK that maybe South Africa could learn from; “something like that where there’s a structured way that actually forces the service suppliers and the water suppliers to actually be thinking strategically long-term I think is probably a big policy and regulatory gap in South Africa at the moment”

00:33:30 Different water management and supply models in South Africa; “in the Western Cape … we’re very dependent on the national department to … be good at what it does and we’ve had … a bit of a problem over the last couple of years where the national Department of Water and Sanitation has essentially been malfunctioning”; “when you’re dependent on a malfunctioning national department to be doing the strategic water supply planning then you can see that that could be a big contributory factor to the kind of crisis we’ve had right now”; in the Western Cape we have a very complex set of actors; there are other models

00:36:26 His research interest: understanding how the risk is changing and how different response options can offset or manage that risk; the idea of working for water: managing the catchments with a view to increasing water yield; how the drought propagates through into management decisions; catastrophe insurance as an alternative to over-engineering

00:40:28 The WCWSS was preconditioned to have a higher risk of failure than people thought because it was modelled in a way that assumed the climate wasn’t changing whereas in fact it was changing

00:42:08 One of the lessons: an understanding of the need to use scenario-based analysis; we would have possibly been better positioned had that kind of probabilistic or scenario-based analysis been done right at the beginning

00:44:53 Impression from the outside: at the start of the drought, the way the city government thought about risk and vulnerability “maybe was a little bit narrow and shallow”; some kind of scenario-based approach was missing; “at least some qualitative assessment of the likelihood of any of these end states … would then provide … a much stronger evidence base to make critical decisions at the right time to be able to navigate away from highly risky end states”

00:46:03 Demand is going to increase, and on the demand management side there is not much more the city government can do to keep it flatlining; there is going to have to be some form of supply augmentation; “what climate change does is it brings in additional uncertainty into those already uncertain projections of the demand / supply balance”; it is probably going to change the timing with which certain supply augmentations have to come in place; might also change the relative suitability of different augmentation options, as the robustness and reliability of the different options change in a changing climate

00:49:45 Climate change science is continually evolving; the evidence base is growing all the time and the ability to model the climate is improving; on the adaptation side there is an emerging experiential knowledge base as people are trying things with regard to climate change adaptation; “from a research point of view and a knowledge systems point of view we really have to be working hard to actually document what’s happening and analyse it and find out what works and what doesn’t work, learn from mistakes, be reflective, and build that knowledge base that enables us to make much better adaptation decisions as we go forward, so it’s not only about the climate science evolving, it’s about our own knowledge of how to respond that’s evolving as well”

00:52:24 The kind of scenario planning that was happening at the end of the crisis should really become standard practice that is done all the time on an ongoing basis; this also allows you to look well in advance and much more rigorously at your portfolio of augmentation options

00:54:32 With colleagues at the Climate System Analysis Group he looked at how this particular drought fits into a longer-term pattern; his main input was more in conversations with officials in Western Cape government; slow ten- to twenty-year cycles in Western Cape rainfall patterns

00:58:21 El Niño’s biggest impact is in summer rainfall region; relationship much weaker in winter rainfall region; in last ten years don’t see any relationship in winter rainfall region

**BIO**

Professor Mark New is Director of the African Climate & Development Initiative (ACDI) at UCT. He holds the AXA Research Fund Chair in African Climate Risk. He also holds a joint appointment as Professor of International Development at the University of East Anglia in the UK. He is a Coordinating Lead Author on the IPCC 6th Assessment Report: Chapter 17 – Decision-Making Options for Managing Risk. His research focuses on climate change detection, processes, scenarios, impacts and adaptation. Mark has been involved in the Cape Town Drought Response Learning Initiative since its inception in March 2018. His interest in the drought is around quantifying how much greenhouse gas warming has changed the likelihood of the drought, how this risk might change into the future, and how to manage this changing risk.

Website: <http://www.acdi.uct.ac.za/acdi/core-team/professor-mark-new>