

Africa Storytelling Challenge— Notable Submissions: In Rebecca Illunga’s Words

Committed to championing scientific innovations and advancements, Illunga is affecting change in her community and throughout Africa—and this year’s judges of the Africa Storytelling Challenge lauded these impressive efforts. Recognized as a runner-up in this year’s contest, Illunga shares her essay submission below.

Trust me, I’m an engineer.

I wanted to be a civil engineer so that I could solve problems. My decision had yet to be questioned until someone asked, “then why didn’t you want to become a mathematician?” My response: because civil engineers can solve problems, with people and the environment at the centre of their solutions. In 2016, bachelor’s degree in tow, I found myself at the annual event for Future Resilience for African CiTies And Lands, or FRACTAL (because who doesn’t enjoy a complex mathematical theory as an acronym for an uncertain future?). I was in a room with stakeholders and partner institutions, not knowing that we were on the cusp of a learning breakthrough. FRACTAL is a project that is aiming to answer the question: How can we plan for climate smart cities in Africa? I am one of 70 researchers from partner organisations around the world; I am a novice to research, but I have been trusted to do what I do, well, as an engineer. An engineer walks into a room... I am pretty sure there is a joke that begins that way.

Make the complex, simple.

In the coming years, the growth of African cities will bring along with it change, challenges and opportunities. This growth will require cities to evaluate how they manage their resources and where those resources may have vulnerabilities. FRACTAL focuses on 9 sub-Saharan African cities and how their scientific knowledge about climate responses to human activities can be advanced. Ultimately, we aim to find ways to improve inclusion of this knowledge into decision-making processes, to contribute to more resilient development. As a civil engineer in water resource management, my focus area has been the city of Lusaka, Zambia, which is one of Africa’s fastest growing cities and for whom the Kafue river basin is a valuable natural resource. The water sector faces unprecedented challenges in a world that is ever more water scarce and impacted by climate change. As a newly-named researcher I wanted to link the “physical systems” of water with the “human systems” of knowledge and control.

I launched into looking at how a city focussed (city-centric) approach to adaptive decision support can inform water sector decision makers to plan for uncertain climate and social changes. Through co-discovery spaces called City learning Labs, FRACTAL stakeholders and researchers can co-facilitate in a space with an open mind and a somewhat open agenda. My research methodology, decision-scaling, required a bottom-up approach which begins with a stakeholder engagement and assessment of the city's water system. Using the stakeholder-defined water system, a model is developed and its response to climate and social variation is identified, after which a vulnerability analysis of the system is carried out to inform decisions. Every time we gather in a learning lab, we unpack the Lusaka city water system a little bit further, which allows us to add to the model developed.

Two years, and a trip to the Kafue river- later, I found that the modelling couldn't cease at a city-scale as there are several co-dependencies on the surrounding region that also contribute to the city-centric vulnerabilities. The complexities of the Lusaka city system required a look at the "whos" (actors), the "whats" (social issues) and the "whys" (climate), before we got to the "hows" (management actions). Although we found that climate did not directly impact the water supply of the city of Lusaka (sometimes research produces what you did not expect) we knew that it would have regional impacts that could translate into city-scale impacts. And so, my research journey continues, only this time into deeper waters (excuse the pun) looking at how the city-regional (Lusaka-Kafue) vulnerabilities of the water system to climate and social changes translate into city-centric impacts. This framework has the potential to be applied in other African cities; to identify adaptation solutions that perform resiliently for a range of related future scenarios and inform future water resource development decisions.

The biggest challenge I have faced throughout the research is that of: Will what I do be practically useful? Or will it become another report that gathers dust in a dimly-lit room? I soon realised that being a non-academic partner in FRACTAL allowed me the freedom to have a light bulb moment every time I gathered in a FRACTAL space. That has been my motivation: the process. Of getting people that are all passionate about something significant, and want to implement a change, into a room. Allowing them the space and the time to freely discuss their ideas and opinions, and then coming back to those ideas and fleshing them out a little bit more. Not necessarily working towards one correct idea or solution, but giving each idea the space to grow independently, eventually producing something that is useful. Knowing that what we do will, in its own way, contribute to one of the greatest environmental and societal challenges of the 21st century- the availability of water.

So why does this story, and my story within it, matter? Because every problem has a story, that, if told correctly, is part of the solution. Because this story tells of my experience but is a glimpse into the journey of many non-researchers entering a predominantly research space. Because we are drawn to stories that have characters that share our characteristics, to see our profession, in a story. Because to tell this story I had to gather information and make sense of this world that I've been a part of for the past 2 years; and I

would be negligent to not take part in the conversation. Because as an African woman in STEM, I have a critical role to play in Africa's development in a position that is heavily under-represented. I'm telling my story to teach, to intellectually stimulate, and perhaps, to inspire another, who wants to be a civil engineer, so that they can solve problems, to not discount the value that they add. An engineer walks into a room...

The content and views presented here are those of the individual Challenge participant.

About the Africa Storytelling Challenge

The inaugural [Champions of Science—Africa Storytelling Challenge](#) took place between May and August 2018. Open to all scientists doing innovative work in Africa, the contest drew more than 100 submissions. An independent selection committee of scientists, policymakers and science journalists reviewed the applications and selected the winners. Each winner will be awarded \$5,000 and will have the opportunity to share their stories at the 2019 American Association for the Advancement of Science (AAAS) annual meeting in Washington, D.C.