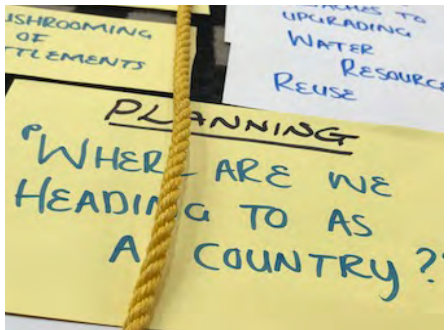
ProSus

Promoting Sustainability Solutions

November 2019

IN THIS ISSUE

City highlights



On the cover: A public mural depicting water in Cape Town, South Africa. Photo: Julia Cumes

Welcome

By the START International Team

Since its inception in 2015, the Future Resilience for African Cities and Lands (FRACTAL) program did things differently. "Business unusual" is a recurrent theme in this issue of ProSus Magazine.

Departing from the conventional way that climate information is produced and disseminated, FRACTAL strongly emphasized knowledge co-production that integrated science with decision-making to produce relevant and actionable climate information in the context of water and energy security. The effort spanned nine cities in southern Africa.

From the outset of the FRACTAL project, researchers from different disciplines, city officials and representatives from the water, energy and health sectors worked together to identify "burning issues" in their cities, and iteratively engaged to co-develop solutions to build resilience to these issues.

The articles featured in this magazine demonstrate FRACTAL's novel philosophy and approach. The stories from cities and partners provide concrete examples of how FRACTAL has advanced understanding of, and engagement around, climate risks in urban areas. The relationships forged through FRACTAL are an enduring legacy of this effort.

At START we are proud to have been a part of this effort. Our sincere thanks to the UK's Department for International Development and the Natural Environment Research Council, which funded the project, as well as to all partners involved, especially the city teams and the Climate System Analysis Group of the University of Cape Town who led the project.

Windhoek Learning Lab, August 2018

SHIFTING THE WAY CITIES ADDRESS CLIMATE ISSUES

By Alice McClure, FRACTAL Project Coordinator, Climate System Analysis Group

It's challenging to provide a concise overview of FRACTAL; to do justice to the various elements and the countless lessons that have been learned. I've tried to capture some of the key concepts, methods and outcomes from work undertaken over the past four years in this opening piece... but FRACTAL is somewhat of a kaleidoscope in terms of the 'take home messages'. Luckily, this ProSuS issue provides several perspectives of the work undertaken, the lessons learned and the major outcomes.

The overarching aim of FRACTAL was to co-produce relevant climate knowledge to support resilient development pathways of African cities. Its three main objectives were to deepen understanding of city specific contexts, unpacking urban climate change risks and impacts; to explore the decision-making space in the FRACTAL cities and look for opportunities to better incorporate climate knowledge into decision-making contexts; and advance understanding of physical climate processes that govern the regional system (observed and simulated) and develop robust and scale relevant climate information.

DOING THINGS DIFFERENTLY

African cities are complex, characterized by emergent properties and dynamism. Acknowledging that most modalities of climate services are largely supply driven and rarely begin with the multiplicity of climate sensitive development challenges in these cities, FRACTAL aimed to do things differently from the beginning, focusing first on understanding the decision context and allowing climate information needs to emerge over time.

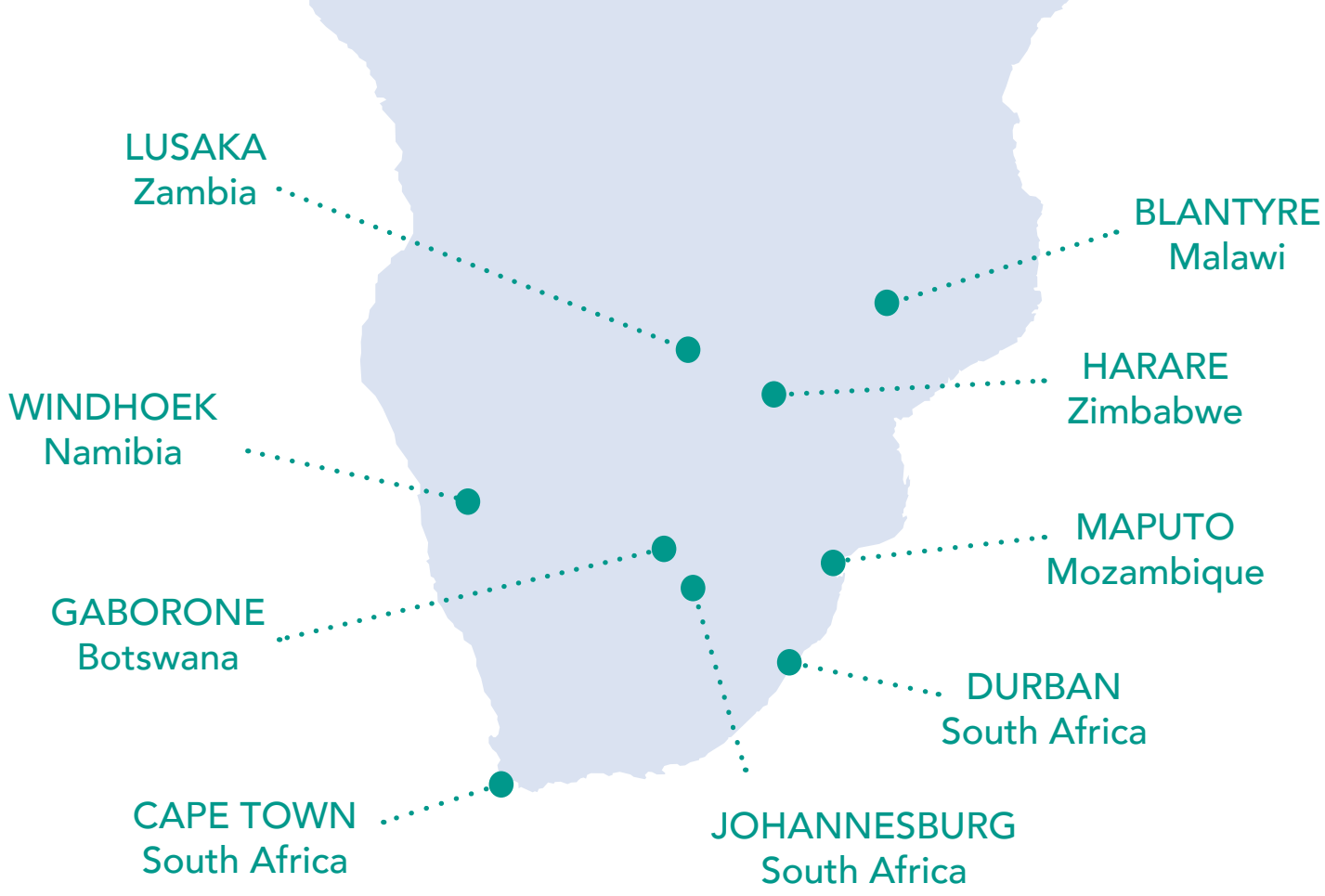
This approach explicitly acknowledged the importance of contextual decision processes in southern African cities and challenged the notion that the most notable barrier to climate resilience is a lack of topical research, climate change information and user platforms.

Academic knowledge is important for our understanding of southern African cities but only provides a partial picture, so FRACTAL worked to uncover the complementary societal knowledge as well. Project objectives were achieved through iterative, transdisciplinary, city-driven learning, supported by rigorous investigations within and across academic disciplines. The project team included decision-makers, technicians, NGOs and civil society in Blantyre, Cape Town, Durban, Gaborone, Lusaka, Maputo, Johannesburg, Lusaka and

FRACTAL
FUTURE RESILIENCE FOR AFRICAN CITIES AND LANDS

The **Future Resilience for African Cities and Lands (FRACTAL) project** addressed the challenge of providing accessible, timely, applicable and defensible climate information that is needed by decision-makers operating at the city regional scale in southern Africa.

Funded by DIFD and NERC, FRACTAL is part of the Future Climate for Africa (FCFA) program, which aims to generate fundamentally new climate science focused on Africa, and to ensure that this science has an impact on human development across the continent.



Windhoek, as well as a broad range of researchers spanning disciplines of *inter alia* urban geography, social science, decision theory, impact modelling and climate science, within southern Africa and abroad.

CREATING SPACES FOR CO-PRODUCTION

FRACTAL trialed novel transdisciplinary methods for bringing stakeholders and knowledge types together so that each city's unique issues could be co-defined, climate change risks explored and opportunities for resilience collaboratively framed. These spaces included exploratory city learning labs, field trips, games, roleplays, social evenings, training events, high-level breakfasts and very honest discussions about how scientific knowledge is generated; what is the evidence used, and what are the decisions and trade-offs that need to be made to arrive at a knowledge product? Learning labs anchored the learning processes in each city. Learning labs are engagements that include a variety of stakeholders in framing problems that they perceive as relevant and urgent, and contributing knowledge in an attempt to improve or change the situation. An embedded researcher approach was also implemented, allowing researchers to straddle the science-policy interface by sitting within local decision-making organizations. This framework has been well received and replicated in FRACTAL cities, encouraging good working partnerships. Another novel method that was trialed in FRACTAL was co-production of Climate Risks Narratives (CRNs): stories that paint pictures of the potential future of the city under a changing climate, produced by all participants of the learning labs. Narratives were initially developed as climate information communication devices because traditional methods generally use complicated visualizations and technical jargon that is not easy to interpret. These traditional methods also generally fail to effectively communicate and promote conversations about uncertainty, an aspect that was explicitly acknowledged through co-development of CRNs by exploring multiple potential climate futures. Narratives gained traction by allowing participants of learning labs access to complex science so that they could build stories in their heads that explained the information with which they were engaging.

TAKING STOCK

Several impacts have been realized through these methods, related to personal experiences, research frontiers, institutional learnings, and decision-making for resilience in southern African cities. The team is still busy capturing knowledge that has been generated, particularly related to: climate dynamics and processes in the southern African region; the characteristics of these cities; climate risks within local development contexts; decision-making structures and pathways relevant to climate change resilience; understanding the value of climate information within these; as well as types of climate information that might be useful for people making decisions in southern African cities.

We have also gained much understanding about inclusive, collaborative and participatory approaches for dealing with complex issues such as climate risks in southern African cities.

The transdisciplinary approach implemented in FRACTAL allowed for all involved to unpack the unique socio-economic, governance and physical characteristics of each city in order to understand climate sensitivities and enable decision-makers and planners to consider these sensitivities.

Apart from gains in research, numerous other impacts are evident. The types of activities that were prioritized in FRACTAL (i.e. across different organizations and cities), as well as the mechanisms for implementation of these, have contributed to strong relationships and networks. Through these networks, decision-makers and researchers in southern African cities are able to broaden their perspectives and learn from best practices, especially from cities facing similar challenges in the same regional context.

Learning processes within and across cities that support joint exploration of issues, as well as knowledge sharing and co-production, provide inspiration and support for stakeholders who are tasked with dealing with climate change. Building trust is crucial and this trust has benefits beyond the project.

Other impacts include increased awareness in all cities; of the risks posed by climate change in these contexts and potential ways of managing these risks. Much of this knowledge was generated through co-producing CRNs with stakeholders in Blantyre, Cape Town, Gaborone, Harare, Lusaka, Maputo and Windhoek.

This is a brief overview of some of the FRACTAL work. Examples of research, impacts and reflections are featured in this issue. Enjoy!

FRACTAL PARTNERS INCLUDE:

The Maputo waterfront, Mozambique. Photo: Rohan Reddy

A NEW WAY TO DO CLIMATE SCIENCE

How and why was FRACTAL different from the many projects that aim to produce climate information for decision-making? We asked Chris Jack, from the Climate System Analysis Group, what set FRACTAL apart.

Climate science has greatly evolved in the past 20 years. After an early focus on producing numbers, data, and running models, there was a growing realization that data alone wasn't necessarily improving decision-making because of the difficulty in translating and understanding it in decision contexts. Thus, in the last decade, there has been a strong shift towards making data, primary information and science outputs more relevant and more applicable to decision-making.

> **FRACTAL provided crucial insights in understanding why, even when relevant information is available, good decisions are sometimes still not happening.**

For a long time climate scientists have had quite a naive view of how decisions are actually made - we kind of imagined that the information we provided landed on a table somewhere, with all the right people around it, engaged in a rational and well structured process that resulted in a decision.

In practice, decision making on climate information is more complex. Thus with FRACTAL we took a deep dive into understanding decision-making, exploring formal and informal governance, working with people who are making decisions in southern African cities, and looking at how information flows through a network of people when decisions are made.

The other area we dived deeply into with FRACTAL was the problem space. We identified what we called the "burning issues" for each city, and we tried to go much deeper than simply finding the relevant climate variables or statistics. For example, for an issue such as flooding in peri-urban areas, we tried to understand the problem, what decisions would need to be made, what possibilities were on the table, and only then we did begin to identify what science would be relevant and how we could turn the science into information so that people could engage with it.

It was a much deeper unpacking of the context than I've ever seen in a climate science project.

Instead of spending a lot of time on complex climate science analyses, we explored how existing science efforts are useful, looking at issues such as understandability. Sometimes simpler science may result in better decisions than very complex science, because it's understandable and people can engage with it.

Other key factors are transparency and trust, and we worked quite a bit around building trust between scientists and decision-makers, creating sort of networks in which people trust each other and by extension the information that is being shared through these networks.

In summary, rather than just focusing on more science, we looked at existing information and tried to find value in it. Rather than just exploring information needs, we also looked at connecting people, knowledge and perspectives. Rather than just building capacity, we built relationships and trust. This new way of framing how we do climate science is what sets FRACTAL apart.

INNOVATIVE APPROACHES TO BRIDGE SCIENCE AND POLICY

How did FRACTAL bring together people and knowledge from different domains? We asked Anna Taylor, from the Climate System Analysis Group, to describe some of FRACTAL's innovative methods.

FRACTAL created opportunities for bringing together people and sets of knowledge from across different domains, using a number of methods that we could call "innovative". In fact these approaches are not completely novel and have been used before in other contexts, but not as part of your regular climate science-oriented project.

A common thread among these approaches is the recognition of the importance of engaging and spending time with each other, literally sharing each other's spaces - for example visiting another city, or working from within the government or university offices. Sharing those spaces really help people understand the knowledge each one can bring, and blend that knowledge in useful ways.

FRACTAL's "innovative" approaches include:

LEARNING LABS

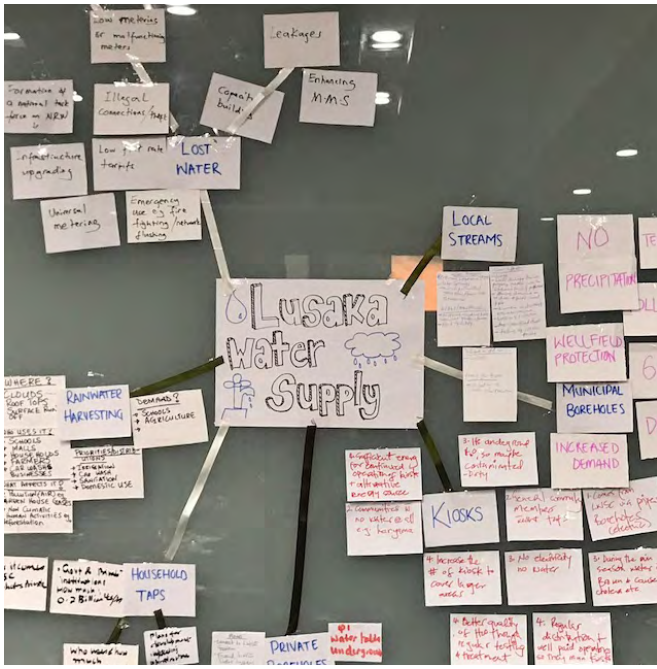
A central part of the city engagement processes, "learning labs" were held several times in each of the cities and brought together a diversity of actors from within the city and from other FRACTAL partners or cities. The most significant aspects of the labs were their interactive and iterative nature - over the four years of FRACTAL, several events were organized in each of the cities, allowing the conversation to grow, deepen and connect diverse knowledge about climate and urban matters.

TRAINING

We organized a variety of training activities in FRACTAL cities. For example, in a couple of cities we gathered political representatives - councilors - to discuss climate change and the role of leadership in climate action in the context of their cities. We also held technical training events for city officials working in water management or climate change, so now many city councils have designated "climate champions". We also invited FRACTAL stakeholders from various city governments and universities to the University of Cape Town Winter School, a course that unpacks various aspects of developing and using climate information. This engagement proved to be quite impactful for the participants.

CASE STUDIES

We developed a series of case studies to shine light on "real decision-making" as it happens in context, trying to unpack how these processes play out in each of the cities. We tried to move beyond the simple translation and communication of climate information, but rather to understand decision-making so to bring in climate knowledge in a way that resonates and has an impact.



From top left, clockwise: Participants engage during a learning lab in Windhoek; FRACTAL Embedded Researchers and ER Coordinator; exploring Lusaka's water supply; Harare stakeholders interact during a learning lab.

CITY EXCHANGE VISITS

Stakeholders moved out of their familiar context to visit other cities in the region to meet counterparts, look at similar projects, interventions and potential solutions. This proved to be a successful approach to engage stakeholders, build new knowledge together and start feeding into processes affecting decisions and actions within the cities.

CLIMATE NARRATIVES

We tried to build a rich story, or narrative, with multiple story lines around how the climate is evolving in each of the cities, identifying the information available and the research needs, and how that may play out in different contexts. This was a novel way to bring in new sources of information and deepen existing ones.

EMBEDDED RESEARCHERS

Mandating researchers to work both with the city government and the university allowed for deeper understanding, better knowledge transfer and sharing, as well as production of new knowledge.

UNPACKING RECEPTIVITY AS A KEY FOR IMPACT

We asked Dianne Scott, from the University of Cape Town's African Centre for Cities, to tell us more about FRACTAL's transdisciplinary governance research.

One of the aspects that differentiated FRACTAL was the focus on **governance research** to support FRACTAL's goal of integrating climate science into decision-making. We looked at the particular configurations of water and climate change governance in each city, looking at the architecture of decision-making. We identified the hard elements - the actors, policies/ legislation, institutions, forums, etc. - and we were able to uncover some of the soft elements which are quite informal and implicit - the relationships and power relations between actors, and their informal interactions.

While other research in this space assumes a linear relation between producers of climate knowledge and local officials, FRACTAL, on the other hand, cultivated a **dialogical relationship**. Typically, climate projects speak in highly abstract and unfamiliar conceptual terms about the intricacies of climate patterns or governance, or use highly normative terms about what should be done differently. This is unlikely to achieve a sense of safety and openness.

FRACTAL used experiential learning processes to dig deep in the local, socially relevant questions. The new knowledge we were gaining through research was iteratively emerging during the learning lab engagement processes. In other words, we learned from the bottom up, and that has resulted in a much more "local" knowledge focus in the governance spaces of seven cities, very different from the siloed approaches used by other climate services projects.

Through this inductive, bottom-up learning we came to understand that this approach created a **receptivity** to new ideas and ways of viewing local problems.

Receptivity goes further than simply opening up, it entails actively and critically reflecting on one's own knowledge and that offered by others. As such, receptivity to other frames of reference is in no way passive. Rather it is a way of engaging, thinking and acting in relation with others that is open and considered, with a willingness to share, to let go, to take on and arrive at new insights and new ways of thinking and being.

> **Receptivity - of decision-makers, scientists and other knowledge-holders and actors - can be exercised and increased, so as to enhance the co-production of climate information and its use in making decisions about urban development and management.**

The FRACTAL **learning labs** were set up as safe spaces where all participants were considered equal and everyone's knowledge was valued. During these engagements participants began to stand in the shoes of others and understand other points of view. This mutual learning process cultivated receptivity, and provided participants with the opportunity to develop a more informed and broader understanding of the issues discussed. Social science literature revealed much thinking about this concept which advanced our understanding further.

The labs' collaborative and participatory processes did indeed foster the receptivity and reflective judgement of the actors involved - including city stakeholders who will be more willing to integrate climate information when taking decisions that will impact future pathways for their cities.

Site visit to a water treatment plant during a learning lab in Lusaka, Zambia. Photo: Bettina Koelle

EARLY INDICATIONS OF IMPACT

Structural and relational shifts that support climate resilience take time to produce visible results, and some of FRACTAL's impacts will only be evident in five or ten years from now. We asked Alice McClure to pinpoint a few examples of shifts that have already been observed as a result of FRACTAL.

CITY STRATEGIES

In **Lusaka**, climate change has been included, at least conceptually, into the city's 2017-2021 strategic plan. Between the older strategic plan and the most recent one, you can see a vast shift in how climate change is conceptualized, and how it links to the urban development context. FRACTAL is actually acknowledged in the new plan, for its contribution to help conceptualize and problematize climate change in the city.

In **Windhoek**, the city had been wanting to develop a climate change strategy and action plan, and thanks to FRACTAL's engagements the new "integrated" strategy is based on an approach involving many people and organizations in the process.

CITY EXCHANGES

City exchanges contributed to support shifts in some of the cities in which engagements have been less intense. For example, the FRACTAL team in **Gaborone** applied learnings from a city exchange with **Windhoek** when developing a climate change plan for the local municipality in Gaborone.

NEW THINKING

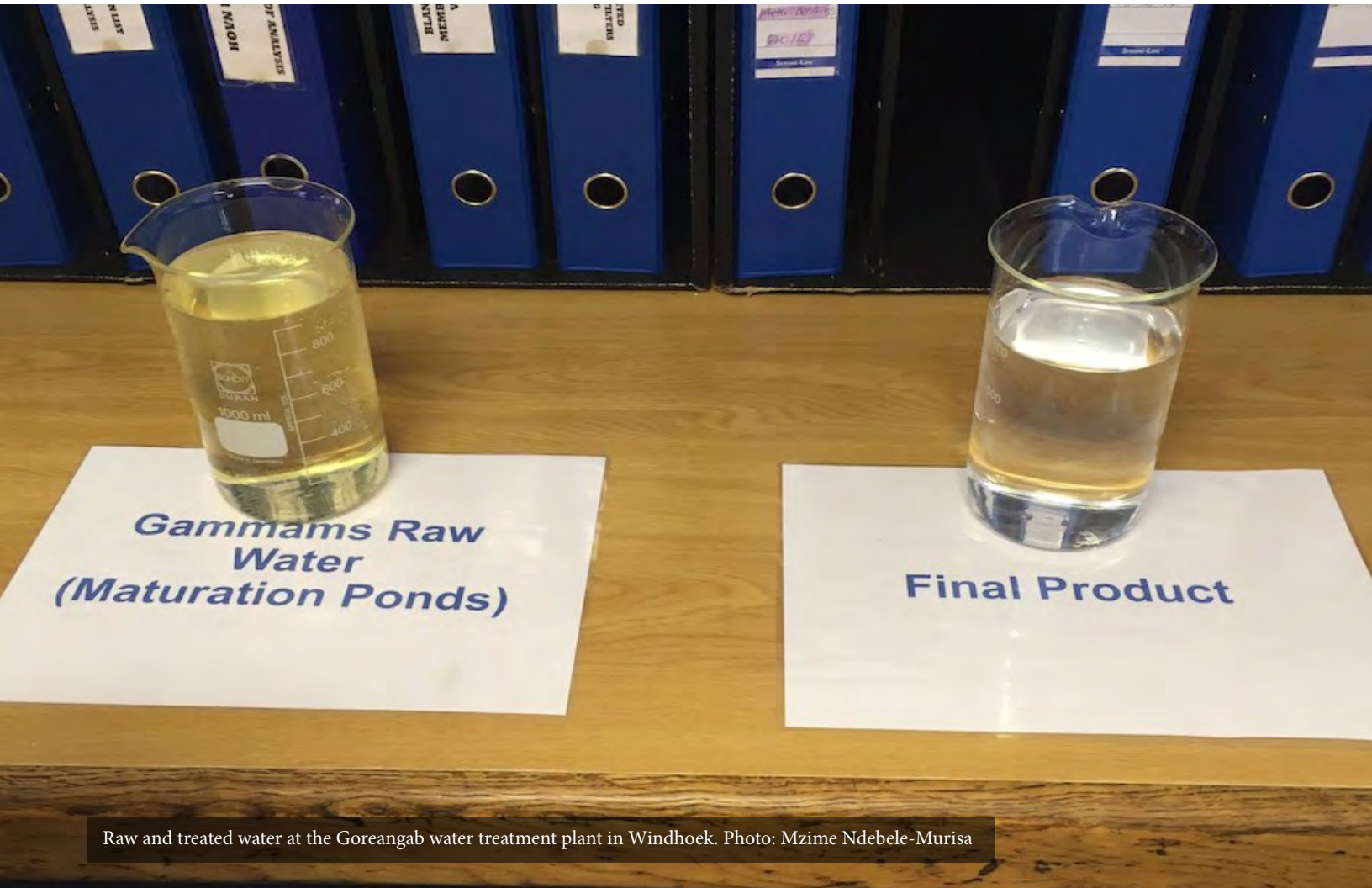
We see signs of people thinking differently about climate change. The various trainings that were organized have helped increase awareness about the risks that are posed by climate change in the local context, as well as the uncertainty that is related to future climate. I noticed this increased awareness during recent conversations in **Lusaka** and **Windhoek**.

RELATIONSHIPS

There is a strong legacy of relationships, not only within the broader group of actors involved in problematizing climate change, but also more functionally between the universities and the municipalities. For example, in **Windhoek** and **Harare** the university and the local municipality are developing a Memorandum of Understanding; in **Lusaka** the university is strongly involved in the process of thinking about water security and how to handle it in the future; and in **Maputo** the municipality has reached out to the local university to ask for help in establishing an urban resilience hub that deals with climate change issues.

The other "Day Zero": Shining light on water scarcity in the city of Windhoek

Climate variability, coupled with Windhoek's rapid population increase, poses a number of challenges to Namibia's capital city - from water and energy shortages, to poor sanitation and waste management. To support decision-makers in addressing these challenges, a team at the University of Namibia investigated the links between water, livelihoods and governance in the context of urbanization in the city.



Raw and treated water at the Goreangab water treatment plant in Windhoek. Photo: Mzime Ndebele-Murisa

In early 2018, the city of Cape Town appeared on the first pages of international newspapers, counting down to "Day Zero", the day that water supply would be so low that the city's taps would run dry. Luckily, "Day Zero" did not materialize, and the water crisis slowly disappeared from the news.

Outside of the media spotlight, however, persistent water scarcity remains a real threat for a number of other cities such as Namibia's capital, Windhoek. Like other countries in semi-arid regions, Namibia is characterized by variable and unpredictable rainfall patterns that lead to droughts and water scarcity. This climate variability, coupled with Windhoek's rapid population increase, poses many challenges - from water and energy shortages, to poor sanitation and waste management, and related health problems.

As part of the FRACTAL project, and through a START grant, a team at the University of Namibia investigated water, livelihoods and governance in the context of urbanization and climate change in Windhoek. We asked Prof. John K.E. Mfune, Associate Professor and Head of Department of Biological Sciences, Faculty of Science, at the University of Namibia, to tell us more about the study.

"The combination of a changing climate and rapid urbanization is having an impact on water-stressed cities like Windhoek," said John. "Understanding the link between governance, water security and livelihoods can help us move towards more sustainable management of water resources and advance approaches that increase the resilience of communities."

Prof. John K.E. Mfune, Associate Professor and Head of Department of Biological Sciences, Faculty of Science at the University of Namibia

"The study we developed in support of FRACTAL examined Windhoek's water governance, and looked at the influence of drought on the sources that supply the city with water" continued John. "We provide modelling of hotspots of water demand and supply, as well as synthesized baseline data on water quantity trends for Windhoek's sources of water. This data is very relevant to understand and incorporate climate information into the city's decision-making."

"For example, the Swakop River, which provides water to Windhoek, is increasingly experiencing severe droughts, posing a challenge for the growing urban and rural population of Windhoek and surrounding areas. Plans to ensure a sustainable water supply should consider the river's cyclical droughts" explains John.

"As for water governance, we developed a case study on the Ujams Waste Water Reclamation and Treatment Plant, which treats water released from the northern industrial areas of Windhoek. This treatment plant not only addresses potential groundwater and environmental pollution, but also makes available treated water that can be reclaimed for irrigation or fed back to the industrial plants, relieving pressure on the city's potable water supply."

"In true FRACTAL fashion, we worked closely with various institutions and stakeholders, including the City of Windhoek, the Multidisciplinary Research Centre at the University of Namibia, and Namibia Water Cooperation (NamWater), the government-owned company that manages and supplies water in Namibia" explains John. "This co-production approach is new and unique in our field, but it is also key to make the research a success."

EXPLORE MORE

The Story of Water in Windhoek: A Narrative Approach to Interpreting a Transdisciplinary Process

Scott, D.; Iipinge, K.N.; Mfune, J.K.E.; Muchadenyika, D.; Makuti, O.V.; Ziervogel, G.

Water 2018, 10(10), 1366, https://doi.org/10.3390/w10101366

Connecting cities with national level actors to scale up climate action

A Small Opportunity Grant funded by FRACTAL, managed by START and implemented by ICLEI Africa, enabled national and city stakeholders from Lusaka, Zambia and Windhoek, Namibia, to engage in discussions on the cities' contribution to national and international climate change commitments.

The ICLEI Africa team discusses highlights and impacts of the Cities and Regions Talanoa Dialogues organized by ICLEI and partners in 40 countries.

Cities around the world have been in the spotlight for their ambitious climate plans and actions, and climate researchers have been supporting them to access better data and build more resilient decision-making pathways. But connections between local and national level governments, and local and national level research, need to be strengthened to see climate action scaled up. ICLEI Africa has been at the forefront of strengthening multi-level governance on the African continent through its continued implementation of multi-stakeholder dialogues.

In 2017, facilitative dialogues took place around the world to take stock of progress towards the long-term goals of the Paris Agreement, and the implementation of Nationally Determined Contributions (NDCs). These dialogues were known as Talanoa Dialogues - *Talanoa* is a traditional Fijian word used in the Pacific region to reflect a process of inclusive, participatory and transparent dialogue. The ethos of the dialogue was to bring together stakeholders to discuss cross-cutting challenges in a space conducive to honest and open communication.

Participants gathered in Windhoek (Namibia) to discuss how they could collectively raise climate ambitions. The Dialogue included representatives from the Namibian National Climate Change Committee (NCCC), national Ministries of Environment and Tourism, Fisheries and Marine Resources, the Development Bank of Namibia, the National Youth Council, the City of Windhoek and others.

The Cities and Regions Talanoa Dialogues had a specific focus on enabling discussions related to how cities and towns engage with and contribute to national and international climate change commitments, policies and plans. The dialogues were a way to facilitate critical multi-level governance and knowledge sharing. They were launched at the ninth World Urban Forum in 2018, with the Global Covenant of Mayors for Climate & Energy (GCoM) and the United Nations Human Settlements Programme (UN-Habitat) as special partners to ICLEI.

While cities have inspired a ground-up movement of action on climate, national governments also have a critical role to play in advancing coordinated action of cities, together with civil society, the private sector and other non-state actors. National governments can play a catalytic role in raising finance for subnational governments by establishing enabling legislation and providing clarity on the mandates and responsibilities of different tiers of government. Sectors such as water and energy particularly require coordinated decision-making across multiple levels of governance, with key mandates held by national governments.

ICLEI and partners coordinated more than 60 Cities and Regions Talanoa Dialogues in 40 countries, including eight held by ICLEI Africa and partners in seven African countries. The outcomes of the African Cities and Regions Talanoa Dialogues served as crucial input for both official meetings of UNFCCC supreme bodies as well as at numerous side events held at COP24, providing a set of hands-on suggestions to enhance the level of NDC ambition through multilevel governance approaches based on the unique perspective of Africa, highlighting the need for access to finance, technology and capacity building for achieving sustainable urban development in a holistic, inclusive manner.

High-level findings from these eight Dialogues included lessons on:

COORDINATED REPORTING

Subnational governments are already implementing ambitious climate actions, and engagements between national and subnational governments allow these actions to be reported on and profiled for increased uptake.

ACCESSING FINANCE

With additional resources and targeted capacity building, successful projects being implemented at the local scale can be scaled-up and developed into bankable projects that attract international finance.

BUILDING LOCAL OWNERSHIP

With the creation of safe spaces for subnational and national government actors to interact, subnational actors can better align their actions to meet national targets, building momentum from the ground up.

IDENTIFYING CAPACITY STRENGTHS AND GAPS

Coordination and communication, both horizontally between subnational governments and vertically between subnational and national governments, can help multi-scale and multi-sectoral actors build networks and identify technical capacity strengths and gaps that can be built on for the implementation of NDCs.

FOSTERING CITY-TO-CITY LEARNING

Rich sharing of lessons occurs when cities meet to discuss the barriers and enablers they face when implementing climate action. By enabling such engagements that then contribute to the implementation and revision of a country's NDC, not only leads to a more inclusive and transparent NDC, but also avoids similar mistakes being made, and increases the harnessing of good practice.

The aims of the Dialogues spoke directly to FRACTAL's efforts to host open forum discussions through learning labs and dialogues of their own, bringing together multiscale, transdisciplinary actors to discuss local issues of climate change in nine southern African cities and regions.

EXPLORE MORE

Talanoa Dialogues in Africa: highlighting the value of multi-level governance for climate action

A learning journey: water, energy and governance in Harare

Multidisciplinarity and co-production are still "business unusual" for many scientific research projects. The FRACTAL Harare team that adopted these approaches for a study on the city's water, energy and governance shares learnings from this experience.

As other cities in southern Africa, Zimbabwe's capital Harare has been grappling with variable and unpredictable rainfall patterns, which, together with other factors such as rapid population growth, are taking a toll on the city's resources. In 2018, two of the four city dams completely dried out, causing widespread water shortages.

Under the FRACTAL project and thanks to a grant from START, through USAID funding, a team at Chinhoyi University of Technology has looked at the city's water and energy systems. This project proved to be a learning journey on many levels, as Chipo Plaxedes Mubaya, Senior Lecturer and Researcher at the Chinhoyi University of Technology explains.

A girl fills a water container at a borehole in the Budiriro suburb, Harare, Zimbabwe. Photo: Kate Holt / IRIN

"The study's findings highlight how the temperatures around Harare have increased, and the rainfall patterns have become more and more erratic, influencing directly the water levels" says Chipo. "We interviewed Harare residents, who showed accurate perceptions of these changes, as well as of risks, vulnerabilities and adaptation strategies."

"However, the results of the study are only some of the learnings. For this project, we used FRACTAL's approach of multidisciplinarity and co-production, and what we learned from these methods is equally noteworthy," explains Chipo.

> **"Instead of doing research in our university's offices and hoping that it would be taken up by the practitioners, we engaged them since the beginning, striving to produce knowledge and solutions collectively."**

"At the inception meeting, for example, we sat together with representatives from the City Council, from various Ministries and from the Zimbabwe National Water Authority, among others, who brought to the table the challenges they experience in their day-to-day role as water suppliers."

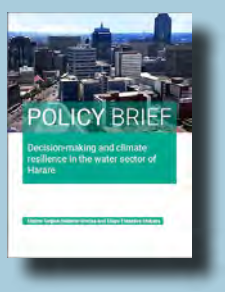
However, collaboration doesn't come without challenges, and the team had to find creative ways to address bureaucracy and the delays in obtaining approvals and data. "Enrolling embedded researchers to work at the Zimbabwe National Water Authority and at the Harare City Council was a changemaker," says Chipo. "They played a key role in facilitating data collection and stakeholder mapping, as they had the opportunity to observe, interact and pick out stakeholders involved in the water and energy sectors in both the formal and informal space. And their role was much broader - they were crucial in building a relationship of trust with these organizations that is still strong and that has allowed us to continue working closely with them on other projects."

"FRACTAL also provided many other learning opportunities. The Harare team, for example, participated in two exchange visits to Lusaka and Windhoek" says Chipo. "The city of Lusaka experiences similar challenges related to water supply and wastewater management, and we were able to exchange coping strategies with their team. In Windhoek, we focused our attention on the city's water conservation measures and renewable energy efforts as well as their private-public partnerships in the water sector, a successful strategy that we included in our recommendations to Harare city stakeholders as well."

"We could go on and on listing learnings from the project, as all the stakeholders involved developed new knowledge, networks and perspectives. But one opportunity that I would like to point out as a conclusion is the gatherings that Future Climate for Africa held for actors involved with FRACTAL and other projects" concludes Chipo. "These gatherings were not only useful to learn about the latest developments, but also to exchange and reflect on the complementarity of past and existing efforts, to avoid repetition and build on the strengths of other projects towards greater impact."

Chipo Plaxedes Mubaya, Manager, International collaboration office and Senior Lecturer and Researcher, Chinhoyi University of Technology, Zimbabwe

EXPLORE MORE



Policy Brief: Decision-making and climate resilience in the water sector of Harare

Building a sustainable future for Harare – Summary of a Global Environmental Change grant project

THE BRIDGE BETWEEN SCIENCE AND PRACTICE

Insights from FRACTAL's embedded research approach

Tackling climate change in cities involves a wide array of coordinated and sustained actions across a range of sectors and scales, requiring collaboration and shared knowledge.

Embedded research is a novel approach to address this complexity – it involves co-producing robust and actionable knowledge, thereby strengthening the governance of climate change in cities.

Seven embedded researchers were placed in the municipality offices of cities partnering on the FRACTAL project. They worked with city officials, policy-makers and scientists to translate existing knowledge from research into policy and practice and vice versa, and to co-develop new knowledge around shared urban development and climate change questions.

We sat down with Anna Taylor from the Climate System Analysis Group (CSAG) at the University of Cape Town, who coordinated embedded research within FRACTAL, to understand how the model worked in practice, its benefits and impacts, and the future of such an approach.

HOW DID YOU FIRST GET INTRODUCED TO EMBEDDED RESEARCH?

Anna Taylor: Since my undergraduate studies at the University of Cape Town (UCT), I have always been drawn to the interface between environment and society, nature and people. After my studies I joined the Stockholm Environment Institute (SEI) - an international policy think-tank - and this allowed me to start working at the science-policy interface in various contexts. I saw first-hand the disconnects between the worlds of science and policy, especially at the local level, and the difficulties associated with bringing abstract ideas and concrete practical needs together to generate shifts in thinking and actions. I began to reflect on how I could bridge these two spaces, translating science for people who are not scientists, but also helping to identify research questions based on actual needs.

Later on, as PhD student at UCT, I had the opportunity to experience the embedded research approach first-hand. UCT had just established a "knowledge exchange" partnership with the City of Cape Town, and I was able to spend three years working inside the city government, exploring and contributing to how local climate adaptation was taking shape which gave me a real insight into decision-making at the city scale. When UCT started shaping the proposal for FRACTAL, I was able to include ideas on an embedded researchers component that would increase the interactivity of the process of knowledge co-production.

HOW DID THE EMBEDDED RESEARCH MODEL WORK IN FRACTAL?

A.T.: Within FRACTAL we had three full-time embedded researchers in Windhoek, Lusaka and Maputo, two shorter-term embedded researchers in Harare, a postdoc full-time embedded researcher in Durban, and a very brief embedded researcher working on a project in Cape Town. In total, seven embedded researchers across six cities, but in different capacities.

"Embedded researcher" means something generically, but what really matters is the specific context, and the specific people, organizations and issues involved, and that shapes what kind of tasks the embedded researcher will be doing. My role as Embedded Researcher Coordinator was to facilitate the learning process, and support the embedded researchers as they navigated the worlds of government and academia, acted as intermediaries between officials, politicians, researchers and other city stakeholders, organized engagements and trainings, co-produced the outputs needed, and reflected on and documented insights and lessons learned.

WHAT WERE THE CHALLENGES OF OPERATING IN SO MANY DIFFERENT CONTEXTS AND HOW DID YOU OVERCOME THEM?

A. T.: There were two factors that made for the differences - the city context and the different backgrounds of the embedded researchers.

They had a considerable variety of trainings, of levels of academic qualifications, and of experience working as professionals outside of academia. Some of the embedded researchers were obtaining their Master's degrees, others had already finished their PhDs; some had worked for a number of years in a professional role, others were fresh out of academia. They also came to the role from different disciplines: urban planning, water management, conservation/environment, etc. So everybody needed a different kind of support, and what I tried to do was to create an environment where they were also supporting each other. I facilitated the process, but everybody participated, sharing both the questions and the challenges they were facing in their specific city context, and then sharing with each other expertise and experiences that might help address some of those challenges.

We had some budget for capacity building, and we were able to bring together embedded researchers at conferences, both to learn from others but also to present on their embedded research experience. We also built in sessions for the embedded researchers to meet and reflect on what they had learned, and prepare for their presentations. We put emphasis on not only building knowledge and skills, but also the confidence to operate in these different spaces.

Embedded research is a real hybrid role. Usually somebody is either an official or an academic, and they learn how to write or talk like an academic or like an official. Whereas we ask embedded researchers to do a bit of both. So it was about slowly building the skill sets and confidence to operate in both these spaces.

WHAT HAS BEEN THE BENEFIT OF ADOPTING AN EMBEDDED RESEARCH MODEL WITHIN FRACTAL AND WHAT IS OR WILL BE THE IMPACT IN YOUR VIEW?

A.T.: The biggest benefit of having embedded researchers as part of the project was that we had somebody regularly building relationships between scientists and policy makers, and maneuvering between the two. You can bring researchers, practitioners and policymakers into a room for a day or two, but when the meeting ends they go back to their institutions and their usual way of working. Embedded researchers can keep the relationship going, and ensure that the work of both scientists and policy makers remains relevant to the other group.

The Lusaka team, for example, developed a set of policy briefs that really weave the science and the policy problems together in a much tighter way than if scientists only had written them. These documents are now helping decision-makers see the problem slightly differently.

Another example is the adaptation plan of the city of Windhoek. The city was going to develop a plan anyway, but with the help of the embedded researcher they were able to do it in a much

SNAPSHOTS

FRACTAL's embedded researchers share experiences and lessons learned

"Co-developing learning and outputs is vital and must focus on the prioritized needs of the city. This requires us to move from our comfort space into unfamiliar terrain to deliver relevant products with and for the city."

Brenda Mwalukanga, Lusaka, facilitating a learning lab

"To be a link between the academy and the public authorities to increase the understanding and use of climate information, the embedded researchers need to be available, dedicated, humble and not afraid to make mistakes!"

Hecrálito Mucavele, Maputo, taking notes during the Maputo City Dialogue

"It takes time for the different partners to adopt the embedded researchers approach as the relationships take time to develop. Following both institutions' rules and regulations may be conflicting at times. Thus patience is needed."

Kornelia Iipinge, Windhoek, during a learning lab

"Being an embedded researcher has been one of the most challenging, but rewarding and capacitating experiences I've ever had. It demands tenacity, initiative, perseverance, resourcefulness, and confidence."

Lulu van Rooyen, Durban, presenting at the Lusaka-Durban exchange visit

"The embedded research approach provides one way to understand the contextual needs for climate information that is timely and relevant. Success of the embedded researcher approach requires commitment, building trust and taking risks from both parties."

Rudo Mamombe, Harare, on a site visit with members of the Harare City Council

"Being an embedded researcher was a learning curve that offered the opportunity to gain and sharpen 'people skills' as I met with stakeholders from within Harare, and across the broader FRACTAL and FCFA project."
Sandra Zenda, Harare, interviewing a resident from the Vainona suburb

more rigorous cross-cutting fashion, drawing a little bit more on the available science and with a better understanding of what climate risks and vulnerabilities mean.

Embedded researchers were also involved in coordinating trainings with city government councilors in each of the cities. There is a sense that these trainings helped increase awareness and openness among politicians, and their ability and interest in engaging more critically with climate or adaptation decisions.

It is hard to claim impacts strongly, because there are many processes that are still ongoing, but I think that we can definitely point to early indications that we are on a slightly different pathway then we would have been without FRACTAL.

WHAT IS NEXT FOR THE FRACTAL EMBEDDED RESEARCHERS?

A.T.: Some of the embedded researchers will go back into their municipal roles, now with a larger network of academics, and international partners to draw on, and a very different understanding of what climate change means in their city. Some of the embedded researchers will progress as academics, and I think they will be much more drawn to that applied space - the demand for socially relevant and actionable research is so high and yet our universities are not well structured to deliver that.

I would love to slowly grow a network of alumni embedded researchers. After this experience, your career direction is never the same, you are suddenly so alive to these different worlds and how they need to come together to make progress on an issue like climate change.

EXPLORE MORE

"An Embedded Researcher approach to integrate climate information into decision making in southern African cities: lessons from FRACTAL"

Working paper by Lulu Pretorius, Anna Taylor, Kornelia Iipinge, Brenda Mwalukanga, Hecrálito Mucavele, Rudo Mamombe, Sandra Zenda and Alice McClure.
The working paper's main points are also available as a webinar recording.

Katutura, an informal settlement in Windhoek, Namibia. Photo: Andi Gentsch

Teamwork, tools and technology: Advancing solutions to cholera and malaria outbreaks in Maputo

An interactive platform linking long-term climate and health information will help decision-makers in Maputo better address the risk of vector- and water-borne diseases outbreaks. The platform, developed by the FRACTAL Maputo team at Eduardo Mondlane University, has also attracted the attention of the Ministry of Health that asked the team to develop a similar tool at country-wide scale.

Collecting groundwater for domestic use from an informal source in Boane, greater Maputo region. Photo: Genito Maure

Fighting cholera and malaria in Mozambique is no easy task. Informal settlements, in the capital Maputo as well as in the rest of the country, provide fertile ground for these deadly diseases that spread through contaminated water and mosquito bites.

Extreme weather events such as tropical cyclones are becoming stronger and more recurrent, increasing the vulnerability of the communities. In 2019 two of the strongest tropical cyclones ever recorded in Mozambique, Idai and Kenneth, caused unprecedented devastation and flooding, as well as a wave of water- and vector-borne diseases outbreaks in the wake of the storms.

To help authorities address more proactively the spread of these diseases, Genito Maure and his team at Eduardo Mondlane University have been developing an early-warning tool that helps predict outbreaks based on the weather conditions. We asked Genito to tell us more about the project's innovative approach.

"The idea sparked in March 2017. As part of the FRACTAL project, we sat down with Maputo municipality officers and stakeholders to discuss how climate change might affect the city and what climate information would be most useful to decision-makers – we all agreed that one of the first priorities to explore was the link between the weather and outbreaks of malaria and cholera," explains Genito.

Thanks to a grant managed by START under FRACTAL, Genito's team developed an interactive tool that uses the weather forecast to estimate the risk of outbreaks of malaria, cholera, and other vector- and water-borne diseases in Maputo. "We were ready to deploy the tool, but unfortunately there was a leadership change at the city level, and we are now working with the new leadership to get them familiarized with all our FRACTAL activities. However, the tool attracted the attention of the Ministry of Health, that asked us to work on a similar platform, at country-wide scale."

The interactive platform links long-term climate information with data regarding malaria outbreaks, that has been extracted from old databases made available for this project.

The tool uses state-of-the art technology to identify patterns in the data – an artificial intelligence system based on mathematical approaches called Generalized Additive Mapping and Self-Organizing Maps. These approaches allow to clearly reveal and map non-linear relationships between climate data and outbreaks of diseases using geographical information systems, and ensure that the tool will be able to self-understand and adapt to a changing climate in the future.

With timely information on where and when malaria outbreaks are likely to happen, decision-makers will be able to trigger measures to prevent or better contain outbreaks, such as fumigating sites, cleaning clogged sewage systems, or ensuring that appropriate quantities of resources such as mosquito nets and vaccines are availed.

"The rainy season is fast approaching, and with it the peak of malaria outbreaks. This year, decision-makers will have access to timely insights that will help them have a real impact on the communities" says Genito.

"But our work doesn't conclude here. We are already looking at expanding the country-wide tool to cover cholera and other diseases, but also to include socio-economic elements, to make sure that it takes into account adaptive capacities and vulnerability."

Genito Maure, Assistant Professor at the Faculty of Science of Eduardo Mondlane University, Maputo, Mozambique

Learning across borders:

City exchanges to increase resilience, forward thinking and improved urban planning across southern African cities

Cross-city learning was a key research and working theme of FRACTAL, and city exchanges provided a good opportunity for engaging in experiential and social learning among cities.

City exchanges facilitated the sharing of ideas, good practices, knowledge and experiences framed around transdisciplinary research.

The idea behind these exchanges was that cities in a similar geographic region and that potentially face similar development issues can benefit from sharing knowledge and information, lessons from successes and challenges as well as innovations related to building urban resilience.

The city learning exchanges were undertaken through site visits and dialogues, with the visiting city representatives engaging with the host city's stakeholders and communities. The hope was that visitors would then take the learning and experiences back to their cities and institutions for further knowledge sharing as well as championing the implementation of some of the aspects learnt.

In addition, the city learning exchanges provided the opportunity to co-identify similar problems across the FRACTAL cities, co-develop solutions and cross-pollinate on viable decisions that could be made to build resilience to the effects of climate change in cities. Relationships between and among the visiting and host cities were strengthened, partnerships were fostered while also contributing towards capacity development.

The examples from FRACTAL show that, while each city has its own specific context, good practices and lessons learned are broadly transferable and that social, experiential and structured learning can be an innovative way of engaging city stakeholders such as representatives from academic institutions, city and government organizations.

Cross-city learning proved to be a useful approach in increasing city resilience, forward thinking and improved urban planning across southern and African cities.

The city exchanges were sponsored under the FRACTAL Small Opportunity Grants and START's Global Environmental Grants.

EXPLORE MORE

The upcoming paper "City-to-city learning and knowledge exchange for climate resilience in southern Africa" will unpack city exchanges within FRACTAL. Stay tuned to learn more about the paper release.

FRACTAL 2017-2018 CITY EXCHANGES

"Cities across southern Africa do not interact enough due to limited resources, and sometimes the solution to our problems might be lying across the border.
The city exchanges were beneficial not only to us, but also to the officials who travelled with us - they could see alternatives for some of the problems they face in the city. The exchange trips strengthened the collaborative spirit between partners, creating tangible opportunities for partnering beyond the project."

- Gilbert Siame and Wilma Nchito, Lusaka

"While each city in the region is unique, there is still room to learn from each other, and this is true not only for academics but also for city stakeholders and the city authorities themselves.
The exchange allowed me to expand my networks with Harare city stakeholders, and to learn even more on transdisciplinarity, beyond the knowledge I had already acquired under FRACTAL."

- Chipo Plaxedes Mubaya, Harare

"Learning from seeing and doing is crucial. By learning how other cities work, you can better understand what is working and what is not working in your city.
The exchange allowed me to learn about differences in informal settlements, water supply systems and solid waste management in Windhoek and Lusaka."

- Kornelia Iipinge, Windhoek

"It is always a privilege to learn from city counterparts from other countries. We often experience similar problems, but cities deal with them differently.
City exchanges are a great opportunity to build stronger networks and collaborations, and personally for me the exchange has been an opportunity to learn even more about our city, because of initiatives that were showcased during the exchange."

- Lulu van Rooyen, Durban

Pioneering new approaches to tackle urban flooding in Lusaka

Everyone in Lusaka still remembers vividly the rains that flooded the city and the country ten years ago. In the first months of 2009 Zambia experienced the worst floods in 40 years, causing loss of lives, displacing over 20,000 families, and damaging agricultural fields, roads and buildings. Since then, every year during the rainy season, downpours leave highly populated areas of Lusaka submerged with ankle deep water for weeks on end.

"Climate change, and the heavy rains that hit the city, are obviously one of the main causes of the floods. However, many people fail to acknowledge the role that infrastructure and governance play in driving and worsening the situation," says Dr. Gilbert Siame, Lecturer and Researcher at the University of Zambia, and Director of the Centre for Urban Research and Planning.

Flooded street in New Kanyama, Lusaka, Zambia. Photo: WSTF Kenya

"Some areas of the city have developed informally and lack proper structures to drain excess water. And another major issue is the management of solid waste – garbage that is left uncollected ends up blocking the drainage systems."

Through a grant provided by START under the Future Resilience for African Cities and Lands (FRACTAL) program, Gilbert's team has looked into flooding in two of Lusaka's flood prone wards, Kalikiliki and Kanyama, with a particular focus on the role of waste management. "Efforts to improve the management of solid waste need to be driven by a grassroots movement. As part of this project, researchers from the University of Zambia and representatives from the City Council have involved the communities at all stages – from identifying the problems, to collecting and analyzing data, to proposing solutions," explains Gilbert. "This co-production approach ensures that we ask and answer research questions together, and that the research outcomes will be comprehensive and immediately actionable."

Residents, researchers and municipal authorities developed together solutions that will increase the efficiency of the current waste management process, lowering the risk of flooding. A new flood preparedness and response model that embeds waste management was also co-developed during the project, bridging gaps between actors involved in solid waste management and flood response at all levels in Lusaka.

"Some of the recommendations from the project have already been implemented, for example removing secondary dump sites - waste is now taken directly from the communities to the designated dumpsites, improving the quality of urban environments and reducing flood risk in the city. Other recommendations, such as waste separation, remain to be implemented," explains Gilbert. "The future looks bright though. Thanks to FRACTAL we have connected with several stakeholders within the city, and we are continuing to work with various institutions on different projects. For instance, the city asked us to participate in the development of Local Area Plans for 12 city wards. We will also keep convening quarterly mini-learning labs during FRACTAL's extension period, and we are actively participating in bids for research grants to continue implementing some of the FRACTAL innovations in the city."

"One of the major takeaways from the project is that some solutions to urban flooding do not need more money, but more commitment from stakeholders," concludes Gilbert. "The energy in the room, when we all came together to discuss the research findings and how they will improve daily life in the community, was absolutely inspiring. The ties that have been created between the Lusaka City Council, the University of Zambia and the communities are a precious asset that will last and may be useful to solve other challenges in the future. The project also showed the importance to develop climate solutions for African cities that are people-centered and address urban climate risks and reduce poverty."

Gilbert Siame
Lecturer and Researcher, University of Zambia, and Director of the Centre for Urban Research and Planning

EXPLORE MORE

Four policy briefs were co-developed by FRACTAL and LuWSI (Lusaka Water Security Initiative) with contributions from a range of Lusaka city stakeholders.

1. Water Supply
2. Groundwater Pollution
3. Groundwater Levels
4. Flooding

CHALLENGING PERSPECTIVES, INSPIRING LEARNING: MASTER'S STUDENTS REFLECT ON THEIR EXPERIENCE

A conversation with Dorothy Ndhlovu (Lusaka), Rudo Mamombe (Harare) and Peter Mulambia (Lusaka), Master's students involved with FRACTAL.

WHAT HAVE YOU LEARNED FROM THIS EXPERIENCE?

Dorothy - My experience with FRACTAL has been extremely educative and inspiring. I learned about how countries across southern Africa experience and address water insecurity. I have acquired practical research skills, such as using data collection tools. During learning labs, I have also learnt about distillation processes in climate science, receptivity and power relations.

Rudo - Being an embedded researcher was my first experience in the field of co-exploration and co-production of knowledge, and provided an opportunity to explore both the professional and academic worlds. I acquired skills in the corporate world as I engaged with stakeholders in the water sector during meetings and other day-to-day activities at the Harare City Council. From working at the university, I gained skills, including in writing, conducting social science research, data analysis, and disseminating results.

HAS YOUR PERSPECTIVE ON THE URBAN CLIMATE ISSUES FOR YOUR CITY CHANGED?

Peter - This experience has challenged my previous understanding of water crises in Lusaka. I now have a better understanding of all the contributing factors - climate, infrastructure, city planning, urban poverty, and above all, governance and urban management. I also now have a better understanding of the need for integrated knowledge and skills, and collaboration among all stakeholders, to achieve urban water security.

HOW HAS THIS EXPERIENCE INFLUENCED YOUR PROFESSIONAL AND PERSONAL TRAJECTORY?

Peter - Learning from community initiatives has been very interesting for me as an urban and regional planner. I have learned to look at the community perspective, and to accommodate community interests and wishes in urban development interventions.

Rudo - The FRACTAL project was the gateway to my career path as it provided my first work experience and postgraduate opportunity soon after I had completed my undergraduate studies. Working with senior researchers, fellow embedded researchers, and other FRACTAL partners has helped me sharpen my scientific writing and teamwork skills, and opened doors for future collaborations.

Dorothy - This experience has widened my understanding of water insecurity in Africa, and I have acquired a number of skills - from research skills to project management, teamwork and problem-solving. I have also met and been inspired by experienced researchers, local and international, and I feel more passionate than ever about building a career in climate change and water security in southern Africa.

From left to right: Dorothy Ndhlovu, Peter Mulambia and Rudo Mamombe

Market in Blantyre, Malawi. Photo: Jenny Matthews

A tale of two cities: Learning labs unpack decision-making pathways in Blantyre and Harare

By Rudo Mamombe (Harare) and Tawina Mlowa (Blantyre)

Over six hundred kilometers (350 miles) apart and across a couple of country borders, the two cities of Blantyre and Harare participated in a synchronized process aimed at building an understanding of decision-making in the context of water and climate change in the two cities.

This process, based on the assumption that African cities face similar development challenges and can share and learn from each other, was supported by a FRACTAL Small Opportunity Grant and carried over by two university research teams in Blantyre and Harare.

Activities were coordinated and replicated in both cities in order to have a comparative analysis and for cross-city learning.

LEARNING LABS

FRACTAL's first city learning labs were convened in both cities to unpack decision-making pathways for the water sector and to recommend a suite of actions for improved decision-making under a changing climate.

Learning labs are a platform for bringing together researchers, city practitioners and stakeholders in the city. In FRACTAL, they have mainly been used to collaboratively identify 'burning' issues and to consequently develop objectives for research and dissemination of project findings.

The learning labs in Blantyre and Harare brought together diverse stakeholders from the city municipalities, relevant ministries and other organizations based in the city and build upon previous FRACTAL work such as the Global Environmental Climate (GEC) research in Harare and climate narratives in both cities.

Stakeholders included representatives from the Blantyre and Harare City Councils, Zimbabwe's Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement, Community Water Alliance, Blantyre Water Board, Water for People, Electricity Generation Company and the Southern Region Water Board, Water Users Association, Malawi Bureau of Standards, Department of Climate Change and Meteorological Services.

Blantyre Learning Lab participants

The Blantyre early-career researcher attended the Harare learning lab and vice-versa as part of the comparative analysis while ICLEI facilitated the labs and used innovative facilitation methods from which participants drew lessons.

UNPACKING DECISION-MAKING PATHWAYS

During the learning labs, three decision case studies were unpacked in order to develop an understanding of decision-making pathways for water in the cities. These case studies were classified as short-term, medium-term and long-term decisions and they unpacked the what, who, why, when and how parts of the decisions. Participants then identified opportunities and challenges in decision-making and suggested ways of improving decision-making for the water sector based on the case studies.

In comparison, the two cities had more similarities than differences in their water sector as the decision case studies of both cities focused mostly on environmental aspects and environmental protection.

Similar challenges identified in both cities and across all the decisions were: inadequate funding for the water sector; limited stakeholder involvement; conflicts between practitioners; lack of coordination; governance challenges; lack of proper implementation and monitoring; lack of proper information/ research gaps.

Stakeholder engagement was highlighted as one of the opportunities in decision-making in both cities as it was emphasized that decision-makers can make use of a wealth of knowledge that exists among stakeholders and within communities.

Similar challenges that are faced in both cities include negative political influence, lack of funding to support effective water provision, integration among stakeholders working in the water sector, and up-to-date policies that speak to each other.

The case studies highlighted several opportunities for decision-making in the water sector such as the prospect of clean environments; employment creation through various projects; funding opportunities from funding bodies that promote projects of an environmental sustainability nature; decentralization which provides an opportunity for communities to take part in decision-making. An interesting difference in terms of decision-making from the two cities was that in Blantyre climate extremes were mentioned as one of the decision foci themes whereas in Harare this was not the case.

A visioning exercise was conducted under the theme how we want decisions to be made whereby participants collaboratively identified ways of improving decision-making processes for the water sector. These included: reducing negative political interference; improving stakeholder consultation processes when making decisions; making decisions with the future in mind rather than only planning for the present; and increasing collaboration and communication of research findings. It was emphasized that the central governments should have an oversight role in decision-making rather than negatively influence some decisions. The two cities also demonstrated the need for evidence-based decision-making where scientists and researchers play a critical role in co-producing knowledge and informing policy.

Harare Learning Lab working group

The talk of the town

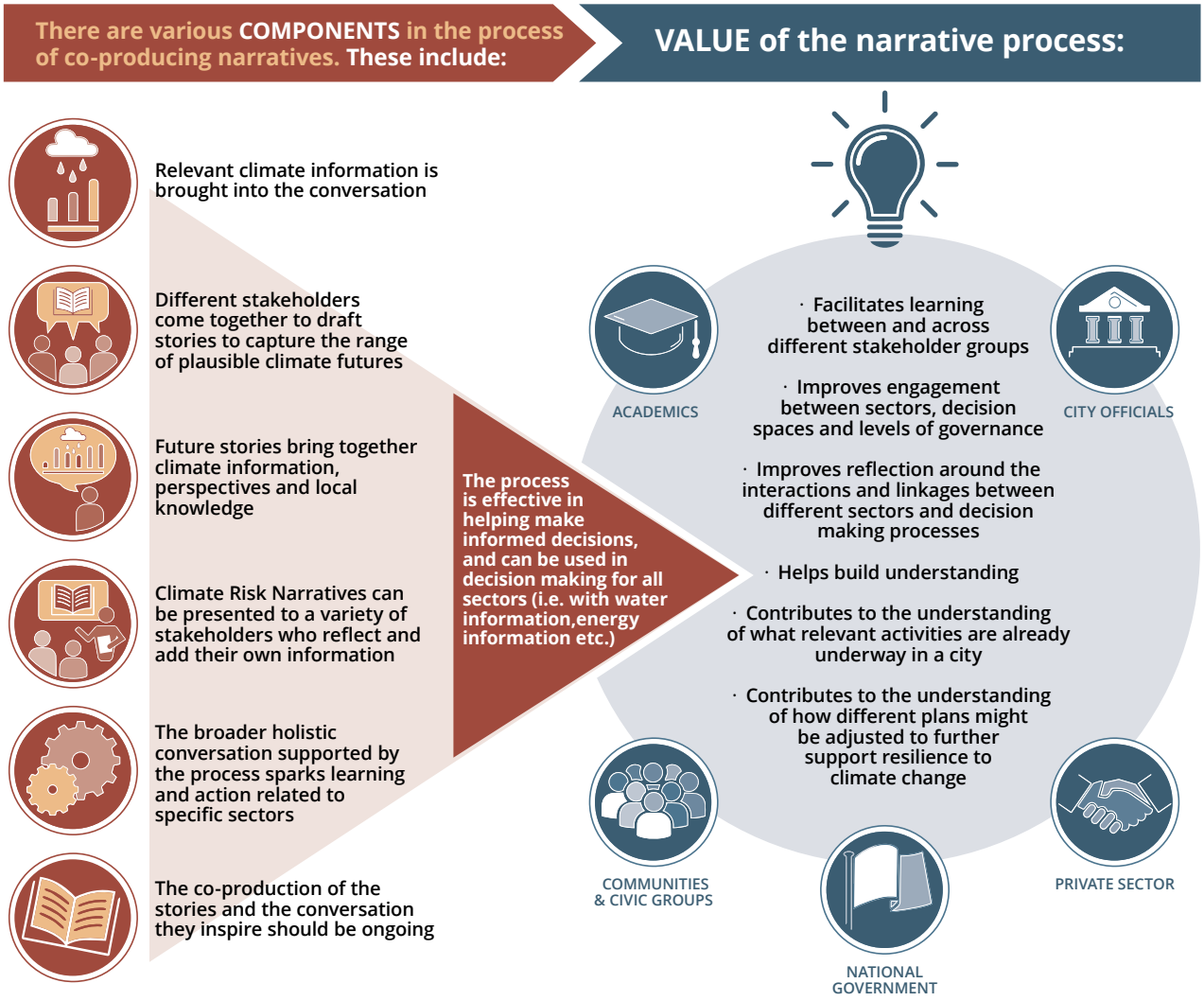
Climate Risk Narratives spark conversation around possible futures and how to deal with climate uncertainty

Graphics by ICLEI Africa

Climate Risk Narratives are essentially stories incorporating a range of plausible climate futures.

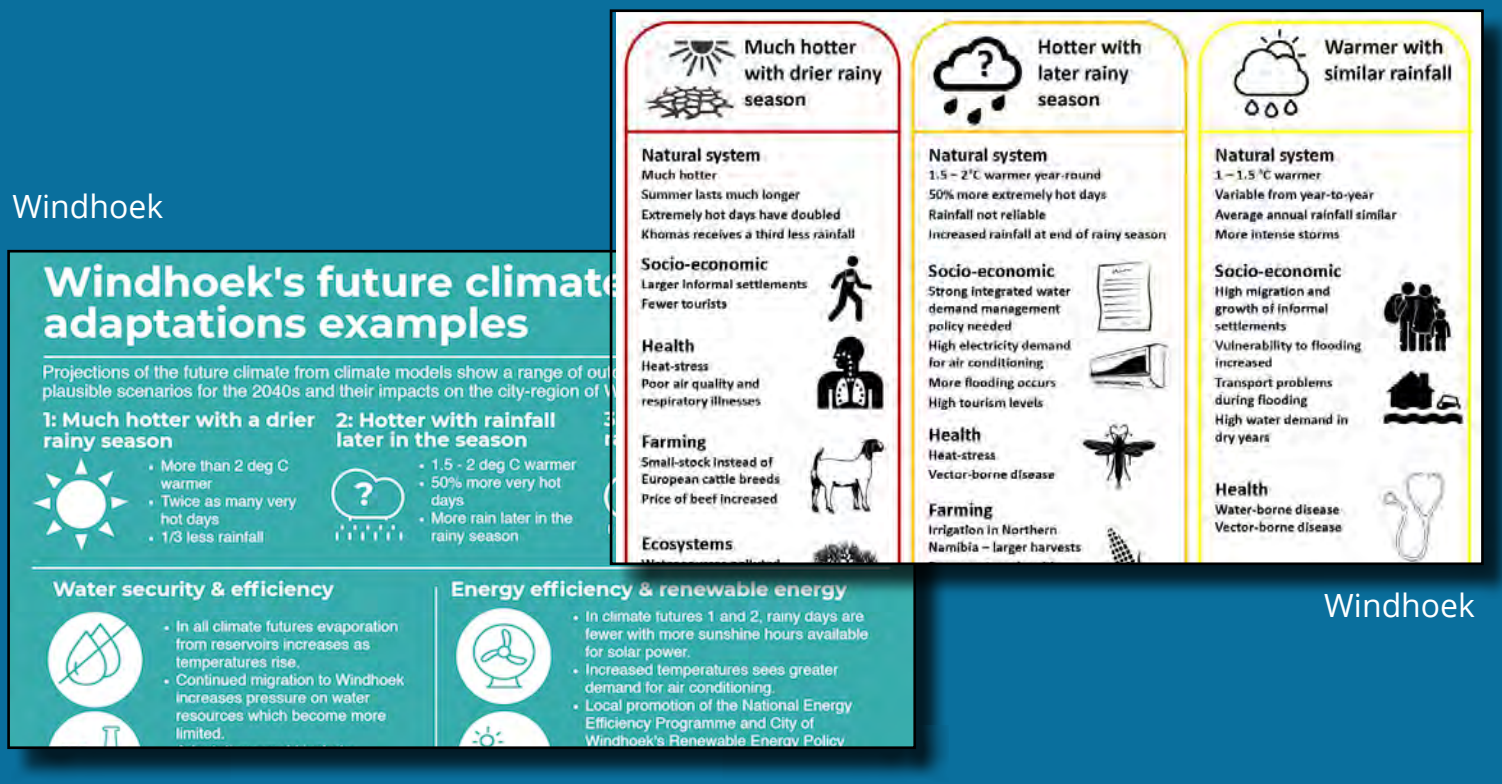
Ideally, diverse knowledge and different perspectives on possible climate impacts, such as knowledge from academics, city officials, national government, the private sector, communities and civic groups, come together in the co-production of these narratives.

Climate Risk Narratives should be updated to reflect ongoing interactions between climate, social and environmental aspects. Co-developing these should be an ongoing conversation between all of the different stakeholders.



Developed in collaboration with ICLEI, CSAG
Funded by START, NERC, DFID, FCFA

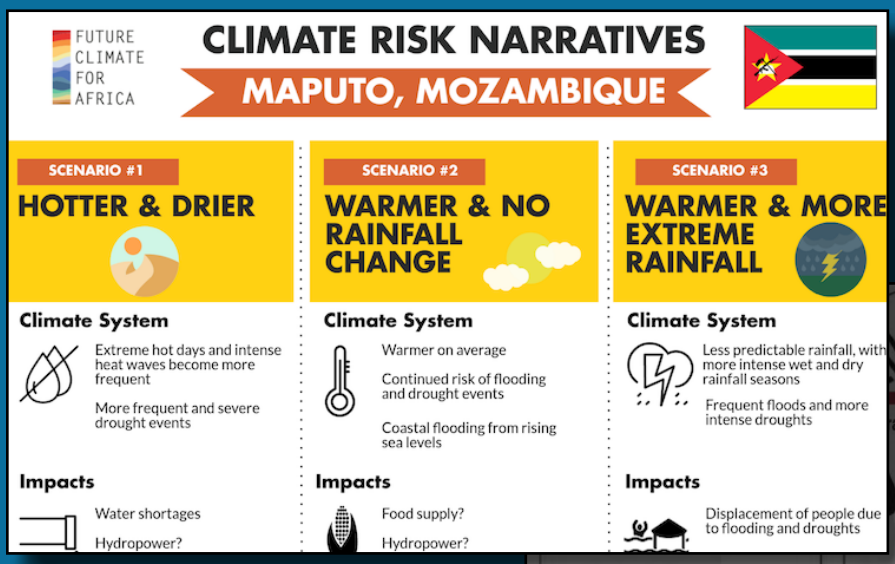
Windhoek



Windhoek

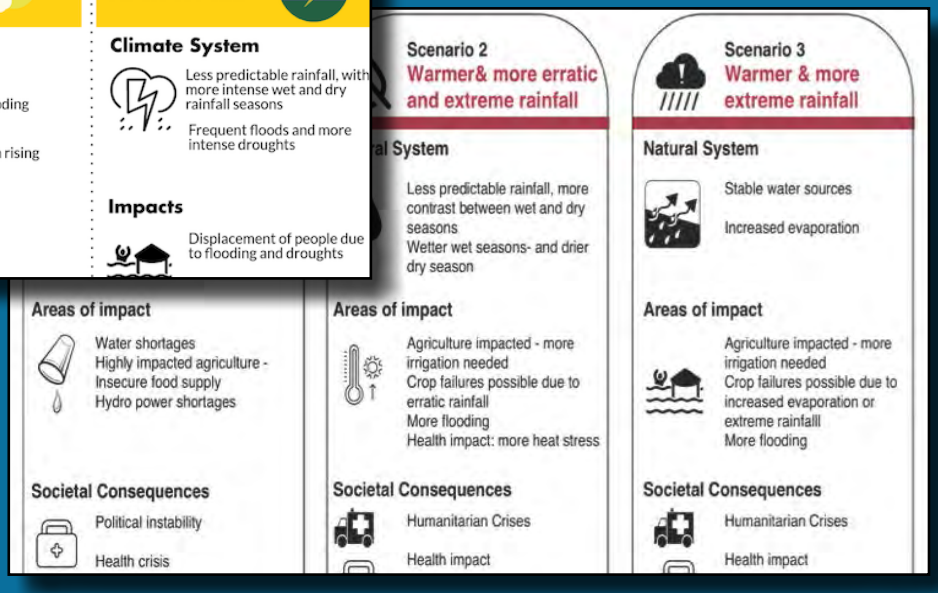
CLIMATE RISK NARRATIVES INFOGRAPHICS

click on the images to open the full infographics



Maputo

Lusaka



ProSus is a biannual e-magazine published by START International.
www.start.org/prosus_magazine

START provides opportunities for training, research, education and networking that strengthen scientific skills and inspire leadership for advancing solutions to critical sustainability challenges.

START

www.start.org

startinternational start_intl start-international-inc