



FRACTAL

FUTURE RESILIENCE FOR AFRICAN CITIES AND LANDS

Mega learning lab



13 & 14 April 2021

Virtual (Zoom)

•Blantyre: ODL building, Polytechnic College Main Campus, Blantyre

Gaborone: Avani Hotel, Gaborone

Harare: Holiday Inn, Harare

Lusaka: Protea Bonanza, Lusaka

Windhoek: Roof of Africa, Eros, Windhoek

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Contents

Mega learning lab	1
Introduction.....	1
Preparation and process	1
Sessions and learning outcomes.....	2
Day 1: Framing the FRACTAL mega-lab.....	2
Session 1: introduction	2
Quick ice-breaker exercise	3
Programme for the day.....	3
Session 2: Update on FRACTAL	4
Day 2: Digging into issues in cities (face-to-face roundtables and virtual).....	9
Session 1: City roundtable	9
Session 2: Feedback from roundtables & looking forward	9
Session 3: Feedback from cities while building the tree of knowledge.....	9
Session 4: Taking lessons learned from FRACTAL into the future through the FRACTAL declaration .	12
Session 4: closing the mega-lab	14
Reflection and feedback on the event.....	15
Reflections within the core team	15
Feedback from participants	16
Annex A: Participant list	19
Annex B: Mega-lab agenda	21
Annex C: City roundtable notes	22
Blantyre roundtable.....	22
Gaborone roundtable.....	27
Harare roundtable	28
Lusaka roundtable.....	30
Maputo roundtable	41
Windhoek roundtable.....	42

Introduction

FRACTAL represents a broad collective of researchers, practitioners, government, and societal stakeholders actively engaged in learning and action in urban climate resilience across southern Africa. FRACTAL has been implemented over two phases, funded by FCDO and NERC: i) the initial phase (2015-2019); and ii) the extension phase (2019-2021).

At the end of the extension phase, FRACTAL aimed to apply an approach that has been used in the project (i.e. learning lab) across southern Africa to promote learning and innovation that supports southern African urban climate resilience across the region and identify actions and next steps.

The **FRACTAL mega learning lab (i.e. mega-lab)** took place between 13-14 April using a blended approach. This involved city-based round table physical meetings of about 10-15 stakeholders and virtual engagements using Zoom to allow the city round tables to connect and teleconference regionally among themselves.

The objectives of the event were as follows:

- Bring delegates from FRACTAL cities together to share key FRACTAL insights and learn from one another.
- Consider important next steps (regionally and in cities) based on these key processes and lessons.
- Discuss ways of sustaining FRACTAL accomplishments in the cities beyond FRACTAL project.
- Demonstrate the learning lab methodology beyond the FRACTAL team.
- Promote creative learning (the science) and innovation (policy and actions) about climate resilience in Southern African cities.

Preparation and process

A core team designed the FRACTAL mega-lab process. This team included PIs from Blantyre, Gaborone, Harare, Lusaka, Maputo and Windhoek, as well as research assistants from these cities. It also included the project co-PI, coordinator (at CSAG) and several team members from ICLEI Africa, RCRCCC and SEI.

New agreements were set up between UCT and university partners to support the flow of additional resources to support the city roundtables. These agreements included budget for additional human resourcing, hiring a research assistant, equipment/media hire and some small logistical snacks (originally earmarked for travel to support cross-city learning). This additional budget complemented budget that was left over from the extension phase in cities as many city teams had not been able to implement the planned climate resilience learning activities due to COVID-19 restrictions. The leftover budget that was initially earmarked for climate resilience learning processes was used to secure the venues in cities. The PIs were responsible for recruiting research assistants to support the mega-lab in cities.

New agreements were also set up between UCT and ICLEI Africa, RCRCCC and SEI to support additional human resourcing for the event.

The core team (described above) met frequently before the event to design the mega-lab process (~once per week for ~1-2 months) and to discuss logistical aspects of the mega-lab.

The PIs decided on key themes that would be explored during the roundtables in cities. These themes were bound by three very broad questions: i) key insights; ii) actions and leadership going forward; and iii) points of connection and collaboration.

The event was implemented over two days (13-14 April 2021). The first day, which was hosted mostly virtually using Zoom (<https://www.zoom.us/>), included an overview of the mega-lab and an update on FRACTAL. This first day also provided the framing for the second day. The second day adopted a blended approach of face-to-face roundtables in the morning and a plenary session in the afternoon to share feedback from roundtables and consider how FRACTAL lessons might be taken forward. The image below shows an overview of the process, as was planned before the event.

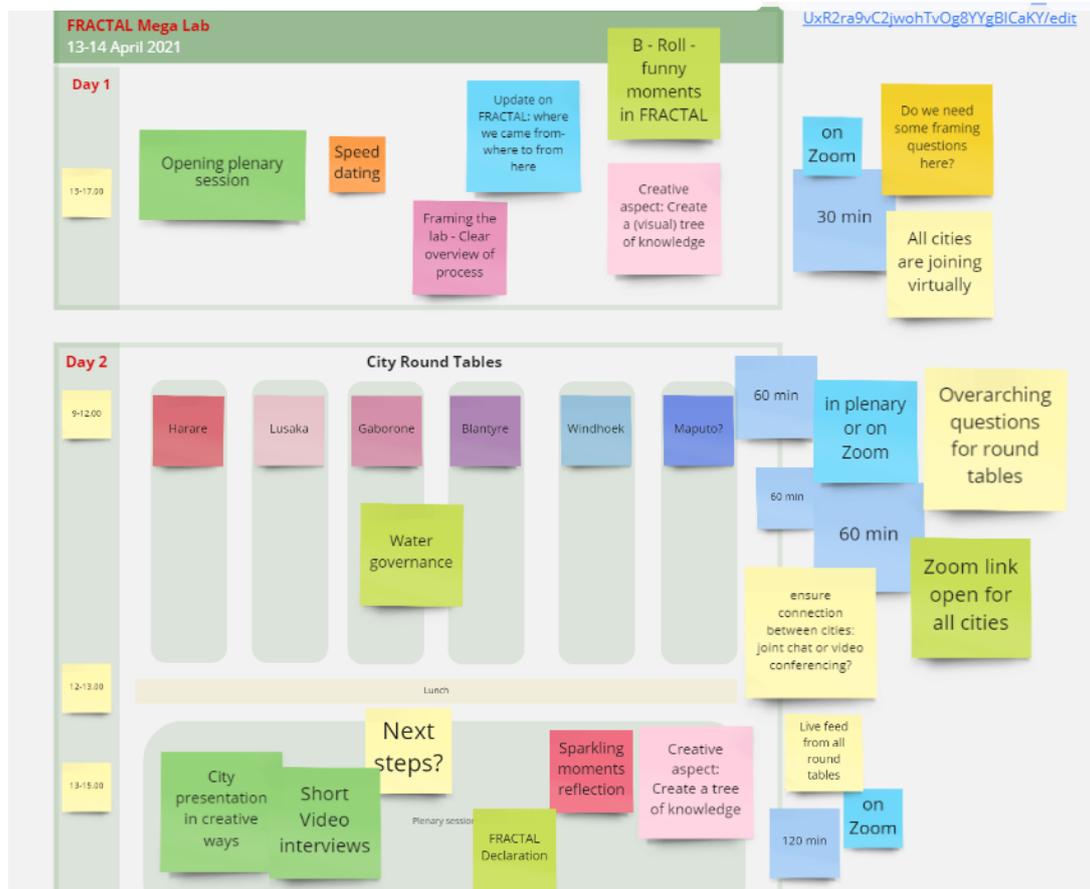


Figure 1. Virtual mega-lab planning board

Sessions and learning outcomes

Day 1: Framing the FRACTAL mega-lab

Session 1: introduction

Most of the mega-lab participants logged on virtually on the first day, apart from participants in Gaborone and Lusaka, who had met in person on the first day and therefore dialled in virtually as a group.

Gilbert Siame (Lusaka PI) kicked off the meeting with an introduction to the mega-lab. He expressed gratitude for having been part of the FRACTAL journey for six years. He also expressed great happiness at having the opportunity to think about what this type of work means going forward. Gilbert warmly welcomed virtual participants, particularly those dialling in from FRACTAL cities.

Gilbert reflected on what the team has done together and what this means going forward. He prompted listeners to think carefully about what it means to do research that has meaning in the policy space. He invited listeners to think about FRACTAL as a tree. Once upon a time, the idea of FRACTAL seeded (2014) when people said: “*imagine doing research that informs decision making*”. FRACTAL, the brand, emerged. Over the years, the stem became strong through various initiatives, a growing team, learning from others etc. Over time, the team began seeing the fruits of their labour, which included outputs but also impacts and outcomes in cities. These included new ideas, tools and structural changes within governance. Ideas continue to evolve and considering climate change became a part of the everyday way of working in southern African cities.

Gilbert then invited people to think of FRACTAL as a family, stating he has a robust network beyond southern Africa. Many people who have engaged in FRACTAL think similarly.

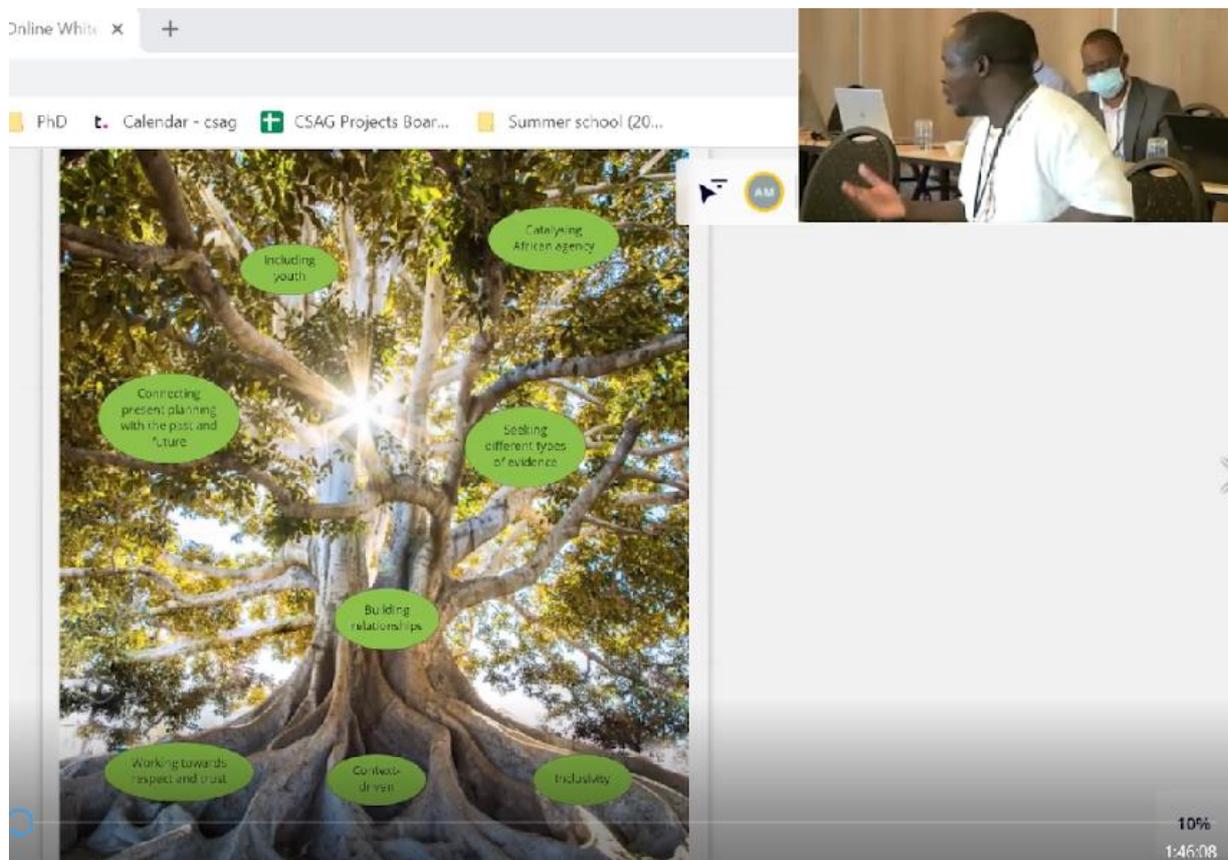
Gilbert invited people to think of FRACTAL as an innovation in the way the team is organised and do things. He emphasised the way FRACTAL does research (for policy and practice), the way the team frames the questions, and the importance of flexibility.

Gilbert also invited people to see FRACTAL as a disruptor in the university and city system: something that needs to be nurtured and to grow.

Gilbert emphasised that FRACTAL is a way of undertaking research in the rapidly changing context of climate change and cities. He asked what it means for all participants to sustain the FRACTAL approaches and methodologies. He mentioned that FRACTAL has been guided by principles such as respect and trust, looking forward, thinking bigger picture etc. He explained that FRACTAL had created a space for he and others (not from a climate background) to be able to speak about climate change more confidently. He also emphasised the principles of networks and African agency: “it is us who are articulating the issues”.

He then introduced how and why the FRACTAL mega-lab came about: i) to take stock of the learning and imagine the future in this space of work; ii) to imagine what this means going forward (especially with the pandemic); iii) to understand the “eureka moments”, to think about questions that were left unanswered and what are the new questions that can be posed? (looking back on the burning issues of 2016); iv) imagine opportunities to sustain the processes that FRACTAL has initiated.

Gilbert finished his introductions stating “**FRACTAL will end. The process, the inspiration, the motivation, the innovation, the leadership will not end**”.



Quick ice-breaker exercise

Bettina then introduced herself and Eddie from RCRCCC, who were the main facilitators for the event. Bettina and Eddie ran a speed dating exercise, during which participants were asked to move into a breakout room (or to another person in the room in Lusaka and Gaborone) to share their passions with one another for three minutes.

Programme for the day

Alice then provided an overview of the two days (the programme)

Session 2: Update on FRACTAL

Chris provided an update of FRACTAL. He shared a picture that reminded him of the FRACTAL process (see right) because, similar to this picture, so much going on and it is often hard to keep a handle of everything.

Chris emphasised that the FRACTAL team have come a long way, showing pictures from the first FRACTAL meeting (2015). He also provided an overview of activities during the extension phase, which has included a lot of consolidating, sharing of lessons learned etc. In particular, he mentioned the [FRACTAL/STARTcast podcast series](#), the [FCFA podcast series](#), as well as many panels, conferences and webinars in which FRACTAL team members have contributed.

Chris shared an update on some of the more traditional outputs that have been produced over the past year, including the working papers and journal articles. Chris spoke about the role of FRACTAL authors in the [IPCC AR6 process](#) (~11 team members). He also mentioned the links to broader networks ([EPIC-N](#), [LIRA2030](#), [Adaptation Research Alliance](#) and more).

Chris reminded everyone that FCFA ends in June and that DFID merged with FCO to become the Foreign, Commonwealth & Development Office (FCDO). He also spoke about the implications of budget cuts from overseas development assistance. He explained that we, as the FRACTAL team, have some assurance that CLARE is continuing towards COP27. Chris then handed over to the city PIs for an overview of what has been happening in FRACTAL cities. Updates from the cities were captured using the miro board (see below).

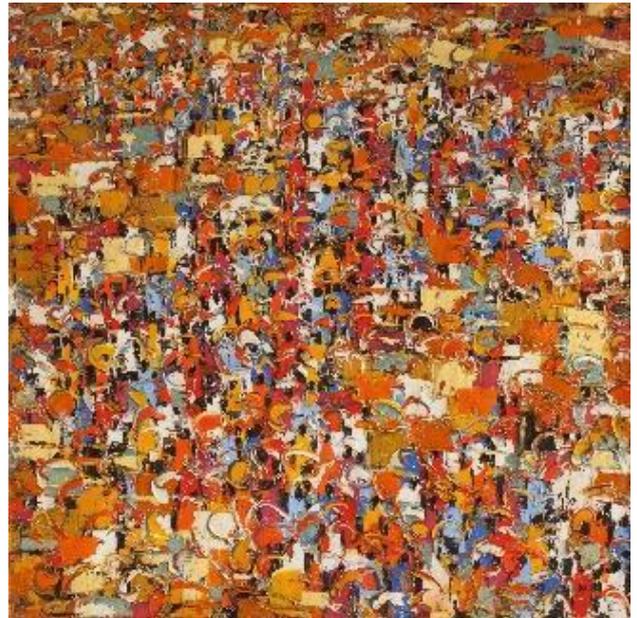
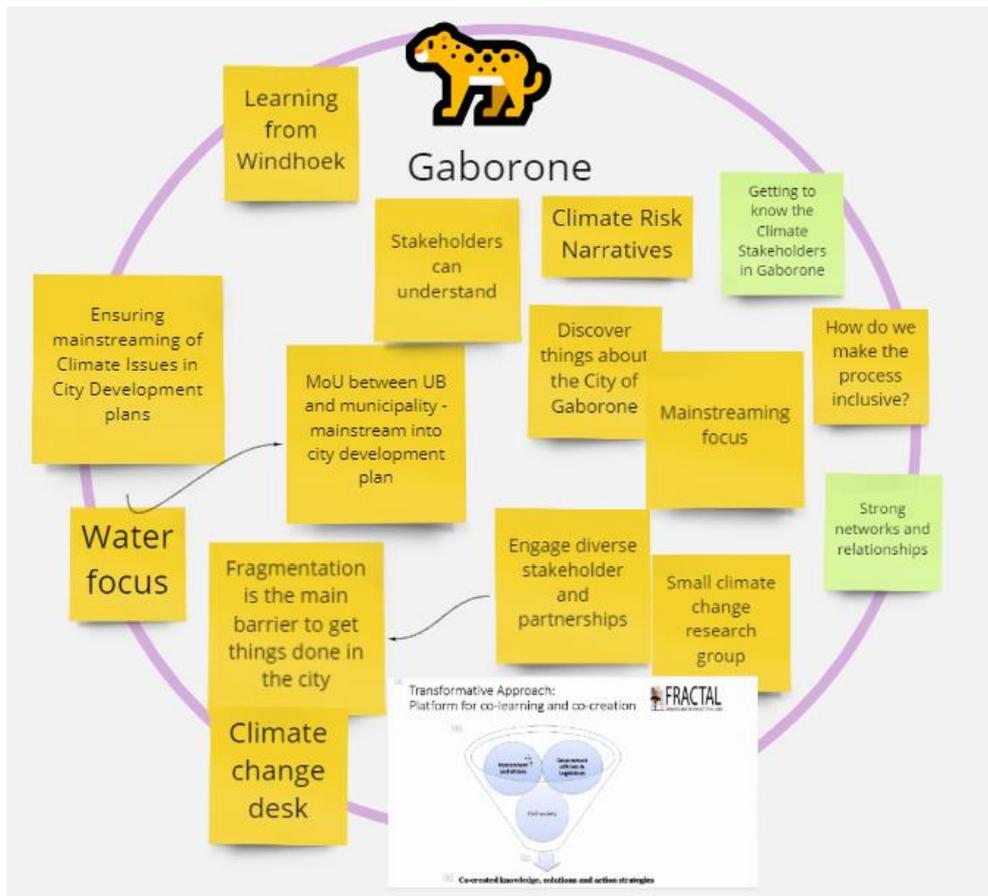
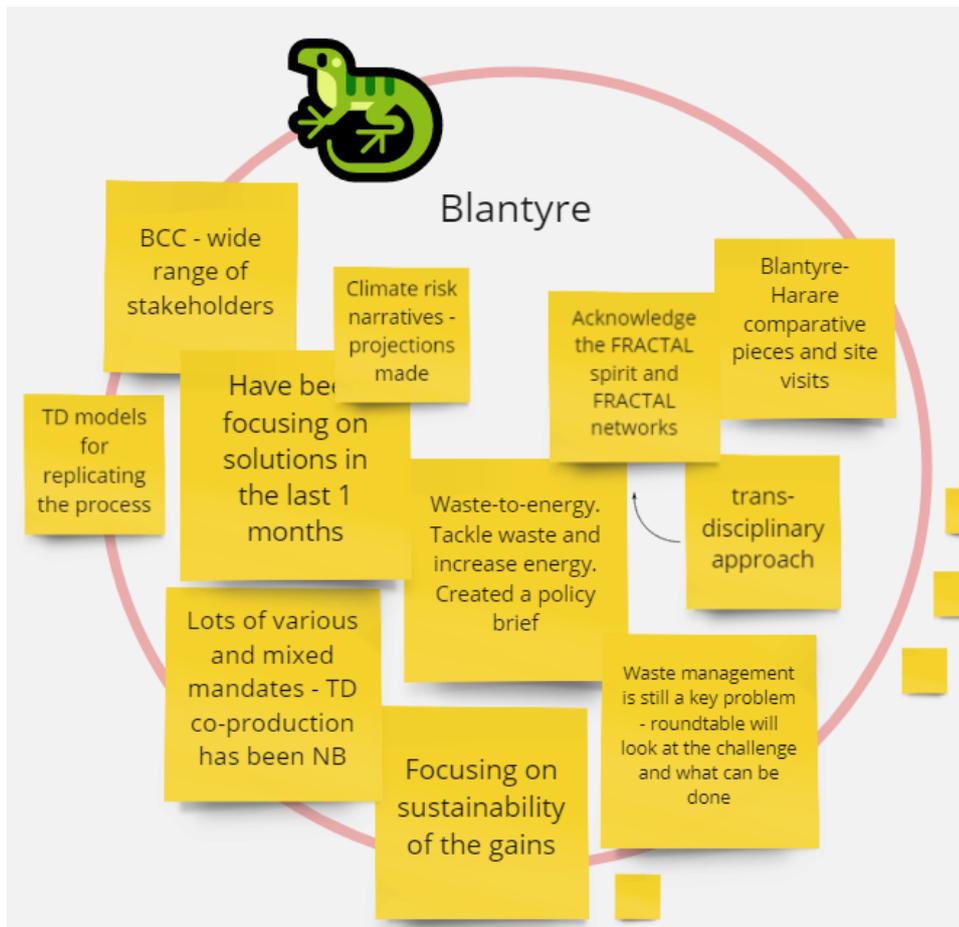
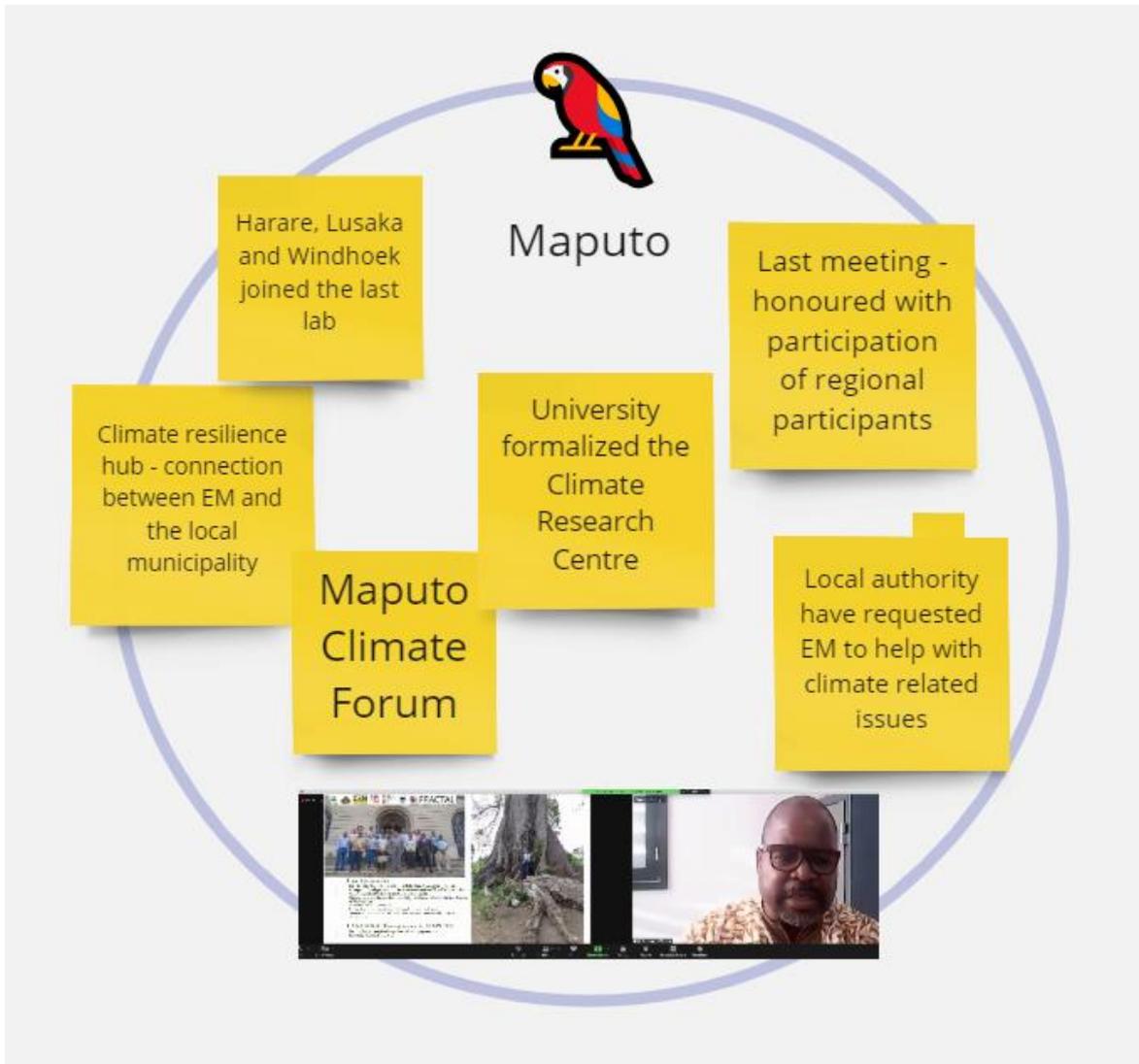


Figure 2. Ghanaian Market Intrigue (Ablade Glover)









Bettina then ran an ice-breaker, during which people reached out to those “sitting” next to them in the Zoom frame. If they “touched hands” with their virtual neighbours, they were invited to cheer.



Day 2: Digging into issues in cities (face-to-face roundtables and virtual)

Session 1: City roundtable

The morning of mega-lab day 2 included city roundtables, most of which were face-to-face except for Maputo, which was conducted online using a Zoom breakout room. Roundtable themes, as decided by PIs and participants, focused on:

- Blantyre: Waste management and climate resilience
- Gaborone: Sustainable Pathways for the City of Gaborone (focus on governance)
- Harare: Answering questions: what has been achieved or the outcomes of the FRACTAL project? What are the gaps or what should have been done differently? What needs to be done going forward and what can be taken forward in the climate change desk or other upcoming projects?
- Lusaka: discuss how to sustain FRACTAL lessons and further explore the Water-Energy-Climate nexus
- Maputo: discuss ways to support the urban resilience hub
- Windhoek: continue the FRACTAL journey, with a focus on the following: biodiversity management in Windhoek and its importance to city resilience, resource mobilization for climate resilience and sustainability – climate champions for driving climate change information and integration at city level.

The roundtables took place from 09h00-12h00, after which roundtable participants took a lunch break. See Annex C for notes from the roundtables.

Session 2: Feedback from roundtables & looking forward

Bettina kicked off the afternoon with an audio surprise, which included voice notes from several team members, which were sent before the mega-lab. You can [listen to this audio surprise here](#).

Session 3: Feedback from cities while building the tree of knowledge

Sukaina then facilitated a session during which feedback was garnered from the city roundtable discussions to build the FRACTAL tree of knowledge. Brief notes, which were taken during the inputs from various cities are shared below, and an image of the tree of knowledge are shown below. More extensive information on the roundtables is included in Annex C.

Windhoek

The roundtable noted the importance of focusing on biodiversity to support reducing risks linked with climate change, which can be coordinated through the climate desk. The city has many open spaces where biodiversity can be maintained and promoted. Stakeholders noted the importance to try at city level to develop land-use plans that clearly demarcate areas. The next step should be to develop a city biodiversity policy. Stakeholders recognise that a large proportion of residents/communities of the city (i.e. informal areas) need to adequately included in decision-making so that their impacts are not left out and damage does not continue. The capacity of decision-makers needs to be developed on linkages between climate and biodiversity.

The Windhoek team posed a question to other cities: how do other cities plan to take forward lessons and activities under circumstances where FRACTAL is not funded? Maputo participants responded: there is a need to co-develop projects across the region and take these to funders/institutions

Gaborone

The roundtable started with unpacking what the following statement means to all participants: “The cost of inaction on the impacts of urbanisation and climate change are not sustainable from any perspective”. A discussion on this statement highlighted that there is a need for action, and that sustainable climate change action is about meeting social, environmental and economic needs.

The Gaborone roundtable then focused on governance: the roundtable believed this is still the missing link that will improve action towards climate change.

There is a need for structured guidelines for development, and so that oversight institutions that do not abuse their powers. A key challenge in Gaborone links to innovation: there is therefore a need to develop innovative governance processes and systems. Innovative governance challenges include: limited priority guidance for development, lack of continuation of projects across change in leadership, inaction of research undertaken by technocrats. Suggested efforts towards addressing governance challenges include: i) developing a vision that touches on integrated climate planning; ii) reviews, amended policies and guidelines that strongly advocate for environmental/climate change issues; iii) taking advantage of the recently approved national spatial plan to develop environmental targeted guidelines; iv) multi-level governance – all relevant government and non-governmental departments need to be involved; v) recognising the role of planners as boundary agents – strategically place planning efforts; and vi) developing robust and stronger civil society engagements and structures.

Planning processes can and should be made more inclusive by developing regulatory frameworks that ensure environmental/climate change issues are fully integrated into plans, solving the issue of resident ignorance on what is going on in the city through technocrats, political and traditional engagements, improving the transfer of knowledge across sectors, implementing targeted civil society support (and youth), establishing an active and empowered civil society movement, increasing the presence and number of civil society groups (through NGOs) that speak to the rights of the city residents, making use of knowledge engagement tools.

The Gaborone requested input from the Windhoek team on ideas to kick-start civil society participation. The Windhoek team suggested that the Gaborone team should consider vertical and horizontal advocacy.

Blantyre

Issues currently facing the city in terms of solid waste management include *inter alia*: i) inadequate facilities and equipment for transport and treatment of solid waste; ii) high solid waste collection and transport costs; iii) no segregation of solid waste at source; iv) land fill site is overloaded beyond design and capacity; v) high capital required for landfill site rehabilitation. At an institutional level, issues link to financial, political, technical aspects. At a national level, decentralisation of solid waste services is incomplete but there is inadequate support.

Opportunities under solid waste management, which are underway, include seeking investors in the waste to energy chain (they are available), undertaking impact assessments, discussions on power purchase agreements.

Opportunities linked to climate resilience include *inter alia* national and local climate resilience strategies, which are in place, institutional arrangements, which are in place for disaster risk action.

When reflecting on how the Blantyre City Council might deal with the issue of solid waste sustainably, the following points were made: enhance Public Participation Processes in solid waste management, educate civic residents, hand over the function to the Blantyre Water Board, build capacity in Blantyre City Council, innovate and expand the city revenue base, enhance partnerships with key stakeholders from joint project proposals, control development as per by-laws, enhance partnership with policy and regulatory authorities, enhance disaster preparedness, ensure conducive policies at national levels, ensure continued market availability, involve other players in waste collection, raise awareness at source on waste collection and sorting

When considering how Blantyre City Council can better deal with the aspect of climate resilience, the following suggestions were made: operationalise resilience strategies at national level and city level, finalise regulatory frameworks that are still in draft, develop capacity for institutions and personal, civic education, clear financing mechanisms for climate action

On the question of how Blantyre City Council can garner political and stakeholder will needed to mainstream knowledge developed into decision making and/or policy, the following suggestions were made: develop robust engagement frameworks with communities and households, take advantage of existing congruence of plans and actions of sub-governments/regulatory frameworks, engage with national government for improved empowerment of the BCC to enforce and regulate policies, so to support decentralisation.

Maputo

Participants emphasised that there is a need to sustain FRACTAL-related work that has been implemented in the first phase. The FRACTAL team (into the future) can help by: including climate budgeting creation knowledge generation aspects, continuing support for collaboration in raising awareness of climate issues in city/regions, including in the discussions on communal urban mobility issues, co-designing trainings.

The entry points for continuing the climate-related work are: accessing the city GHG aerosols footprint and potential impacts and suggest equivalent sinks via creation of green parks, identifying overlapping aspects with other mandates, co-developing joint climate innovations and R&D proposal.

Proposals to upscale to other cities/regions in Mozambique: increase climate science role in data access and provision to sub-regional scales.

Lusaka

The objectives of the round table were established as: capacity building for running projects, discussing how to fund current and future initiatives, keeping the FRACTAL conversations going, sustaining the project and growing the FRACTAL network, engaging the private sector, discussing the climate change desk at LCC, peer-to-peer learning, proof of policy reform.

Outcomes to prioritise as the way forward (in Lusaka) include: engaging with the private sector, enhancing policy briefs, radical ideals versus media platforms and youth development, dynamic knowledge management, identifying institutions that can be part of research agenda.

Harare

Through FRACTAL, engagements were implemented across all departments in the city which culminated in the formulation of the climate change help desk. Participants of events have also learnt about priority projects and lessons from other cities. Numerous capacity building engagements were implemented, and an MoU was put in place between Chinhoyi University and the City of Harare for continued increased awareness. A water resilience plan was also developed.

What are the ways forward?

- Continued capacity development – need to create an industrial pack for understanding GHG emissions.
- Develop CC related innovations.
- Create a website for information sharing.
- Develop local environment climate action plans.
- Position low emission development strategy at the forefront.
- Prioritise dealing with urban mobility and waste management.
- Guide with green infrastructure development in the city.

FRACTAL principles process

During the extension phase, the FRACTAL team aimed to synthesise lessons and evidence from the first phase of project and present findings in a way that is easily digestible. The team was hoping to report on practical ways to implement transdisciplinary climate resilience learning processes in line with FRACTAL approaches (i.e. uncovering the practicalities of the FRACTAL “black box” and “magic”), as well as efforts to scale these processes, which were to be implemented during the extension phase. The team decided to tackle this by articulating and exploring approaches and mindsets that supported FRACTAL transdisciplinary climate resilience learning processes: to make these understandable and tangible for those who are interested in implementing similar processes. The team decided that it would be most useful to articulate ‘principles’ that framed the transdisciplinary climate resilience learning processes in FRACTAL, as well as ways in which these principles have been engendered. The steps for co-developing and testing these principles are listed below.

- FRACTAL partners brainstormed principles.
- Brainstorming output used to develop the 13 principles as the initial framework, which were shared with the broader team for feedback.
- 13 principles discussed at the strategic partners call on 24 November 2020, after which the analysis framework was shared for comment. Enablers and barriers added to the framework based on feedback.
- Research assistant analysed documentation published on the website using the framework (learning lab reports, impact stories, FRACTAL meeting reports, working papers etc., (n = ~60). Findings synthesised in a summary table.
- FRACTAL team reflected together on these principles.
- FRACTAL principles updated based on reflections from the team.

The team is in the process of considering ways in which the principles are taken forward and shared more widely.

Chris stressed that the important aspects of FRACTAL work, which are captured in these principles, have emerged in the city roundtable and cross-city discussions at the mega-lab. So, the FRACTAL team proposes to engender these into the future using the declaration.

Chris acknowledged that the ways in which the declaration can be used will depend on peoples’ roles, their institutions etc. People are not obliged to sign the declaration. He provided an overview of the declaration (see below)



Future Resilience for African CiTies And Lands (FRACTAL) declaration

(Not legally binding)

We, the undersigned, hereby declare that we will aim to engender a set of principles that support inclusive, contextual and proactive responses to climate challenges faced in southern Africa cities and beyond. These principles apply across the realms of research, society, policy, and planning.

These principles have been collaboratively developed based on the lessons learned during the FRACTAL project (2016-2021) and are described below.

1. Recognise climate change as an urgent challenge and adaptation as an ongoing journey
2. Catalyse African agency to drive the climate change adaptation journey
3. Treat climate challenges in context with a holistic and systemic approach
4. Include a diverse group of stakeholders into the climate change conversation (build productive networks and relationships).
5. Work towards respect and trust amongst different stakeholder groups, with diverse experiential knowledge, in the climate change adaptation journey
6. Support intergenerational equity through the climate change adaptation journey

7. Connect the present planning with the past and future
8. Seek and interrogate different types of evidence and information (including science and everyday experiences of people on the ground) to understand climate risks and design responses
9. Catalyze climate sensitive policy and action

By signing this declaration, we acknowledge the importance of these principles for tackling urban climate change issues. We will always consider these principles in conversations, interventions, policy and planning processes related to climate change adaptation. We also endeavour to evolve these principles as we continuously learn about climate challenges and appropriate responses.

Presented on 14 April 2021 during the FRACTAL mega-lab

Chris then opened to plenary for comments and questions on the declaration, which are captured below

- Richard Jones (UK Met Office): why just southern African cities? FRACTAL is having an institutional impact on the Met Office.
- Alice McClure (CSAG): It would be nice to think about this declaration as a "live" document that continues to be updated as we learn about responding to climate change across the region
- Burnet Mkandawire (and Blantyre team): for sustainability of FRACTAL gains, for climate resilience, we must recognise the importance of continuous process of garnering political and stakeholder will.
- Lapologang Magole (and Gaborone team): should this cover our desire to form an active network?
- Anna Taylor (ACDI): How do we envisage this declaration being used going forward? How will it be kept alive? Is it a case of introducing it at future FRACTAL-related events? And appending it to MOUs/MOAs between partners in cities? What else?
- Deon Shekuza (Windhoek): learning from other processes – perhaps we could include the idea of operationalising the intergenerational equity
- David Mwamba (GIZ Lusaka): if the declaration is not limited, I would like to propose the ninth principle, but I would like to preface the input by stating the declaration is heavily prefaced on knowledge and research. FRACTAL is made up of researchers and societal stakeholders. The ninth principle we propose is catalysing climate-sensitive policy and action (being direct about influencing action).
- Bernard Thole (UM, Blantyre): ways to take forward: i) lobby for formal recognition of the declaration with our city councils; 2) encourage participant cities to formally enter into agreements MoUs.
- Lapologang Magole (and Gaborone team): government counterparts support this but say that getting the government to sign will be a mammoth undertaking (going through councils etc.). They are happy to take these forward individually but it will take a long time to do this at an institutional level.
- Bettina Koelle (RCRCC): the important point is to use the energy to do effective adaptation action at the city level. Let's direct energy at implementing principles instead of trying to get it signed by government departments.
- Gilbert Siame (UNZA, Lusaka): we debated these principles for ~30 minutes. We considered these to be principles to be based on lesson learned through FRACTAL. Not that we are committing anyone to anything but are saying "we, the undersigned, consider the principles important and will shape future work". By framing it in this way, we seemed to have full support and subscription to the principles.

The city roundtable members were assigned responsibility to consider how the declaration might be taken forward.

Session 4: closing the mega-lab

Bettina thanked everyone for attending the mega-lab and for bearing with the team throughout the experience/experiment. She thanked DFID/FCDO and NERC for allowing the flexibility along the FRACTAL journey. She thanked the CCKE for their support. The biggest thanks went to the cities, to the participants, embedded researchers and everyone else who made different parts of the journeys possible.

The mega-lab ended with a Jerusalema dance off.

Reflection and feedback on the event

After the event, two separate processes were implemented to generate feedback on the event: the core team reflected amongst themselves and a Google Form was sent out to participants to garner their feedback.

Reflections within the core team

Team member	What worked well	What didn't work well, what could we do better/what could we add next time?
Alice	Team coming together and being very flexible. Technical challenges in Blantyre – Jess on call to figure those out while others busy with other elements. Keeping on our toes for one another and supporting one another well in the new endeavour.	Some technical challenges with sound and video. Could we connect everyone in the virtual space beforehand?
Gilbert	<p>Whole process went way beyond expectations – congratulations to all. The balance in the conversations and facilitation between face-to-face and online went well. Successfully managed to keep everyone in the room and engaged. That experiment turned out successfully – can inspire others. It's not easy – I have participated in several others and usually the online audience is left out.</p> <p>The discussion on the resolution/declaration and how it was concluded was great. A number of ideas started to emerge – in Lusaka, they are planning a small ceremony for the declaration so that it's signed off and commitment is shown by LCC. It's a great way to sustain the momentum</p>	It was challenging to start on time – this was the disappointing part. It's a long-standing problem but emphasised when others are waiting in their room and Lusaka is not ready to start.
Chris	A lot of the credit goes to city participants, city leads and everyone at roundtables	<p>How can we connect the face-to-face activities to virtual better? Felt a bit blind virtually – didn't know who was at the roundtables. Get a sense of who is in the room.</p> <p>Process of how roundtables are visible to one another and virtual participants.</p> <p>How can roundtable participants all contribute into a connecting space? A lot of pressure for one person to be that conduit. How might more people participate?</p> <p>How do we start this process "cold"? Can we find ways of getting one-on-one connections (more quickly) on which we can build?</p>
Bettina	<p>Really exceeded all expectations. Want to thank everyone to pouring heart and soul into experiment. Think there are few teams who could pull this off. Great to hear from Gilbert that the iteration from the virtual to face-to-face to hybrid was nice. Reasonably short times.</p> <p>Highlight: Gaborone communicating with Windhoek to have a conversation.</p> <p>Liked hearing people say what is special about their city</p> <p>Liked having the miro board – point of connection and allowed virtual participants</p>	<p>Maybe use breakout rooms more innovatively – cross-city group discussions (e.g. the science lab)</p> <p>Allowing smaller groups of people to connect</p> <p>More mindful about activities so that people don't feel left out in physical or virtual space.</p>
Jess	Proud and honoured to be part of the group. Pre-established relationships and culture of fun/co-production	Maybe nice if virtual participants can listen to roundtables?

	is important to be able to pull this off. In-city partners are also critical for this kind of event.	
Mzime	Think it was a huge success, a lot because of the collegiality and also facilitation. Was great to have people step up when others were experiencing challenges.	Harare was fortunate to have a hotel with a webcam and other facilities for blended approach. The dry run to test facilities. Also had implemented a blended approach before the event – had practice.
Rudo	Was a great success. Liked the diversity of groups in city roundtables. Great facilitation online and holding programme together. In general, technology issues weren't huge.	The miro board works well for the virtual participants but was more challenging for face-to-face (shifting from physical to virtual)
Dorothy	Very surprised that it was smooth... was expecting a difficult time! Particularly impressed with coordination and facilitation, and the flexibility. All starting on the same page. The WhatsApp group was very effective to keep connected	Breakout rooms could have worked better – it didn't work very well (speed dating?) Monitoring both the physical and virtual space was hard but still possible. The time management was not great
Erikka	Really went well because of teamwork. Liked the fact that different cities could engage with one another and this brought the idea of being in one room – asking questions. Learned the miro board beforehand – was able to populate the outcomes from the city roundtable. Thanks to everyone for making this engagement a success.	Breakout room was worrisome for the introduction part – was in a breakout room with someone on mute. Good idea to hire individuals to help with technicalities – speaker would not have worked so was good that there was flexibility.
Sukaina	Heart was warmed by the long-term relationships and the way that has been sustained in the cities. The momentum from early engagements still there. Seeing the same people in the room. Everyone felt comfortable asking questions of one another – Lapo asking questions of Windhoek. Amazed at how well it all worked.	Can we find out from the survey if other people “in the room” felt the same way? Miro board looks beautiful but had the feeling that maybe it wasn't as used by everyone – maybe more useful for some people than others?
Genito	Although virtual, the facilitation team made possible a MegaLab of hybrid participation to take place smoothly. It was interesting to see city participants interact freely.	Our “language barrier” issue in Maputo was not accounted for. We, that would require additional technological approaches to tackle translation issues without interference with the larger group. The absence of the Chancellor who had agreed to participate, due to a last moment higher level commitment

Feedback from participants

What was particularly good

- The mega-lab was a good opportunity to share information and knowledge transfer regarding the climate change issues and challenges in my country and the southern Africa region.
- There was cross pollination of ideas.
- The diversity of inputs; the sense of connection across the region.
- The round table discussions.
- The learning between cities - in city round tables and teleconferencing - learning across cities.
- Hearing about the amazing progress being made in all the cities, reconnecting a bit with old friends and meeting a couple of new people.
- It drew participants across the FRACTAL cities thereby enabling cross city learning.
- Connecting again with the FRACTAL network.
- The ability to get the shared experiences from other cities made the local discussions more fruitful.

- About how the 9 cities have benefited from FRACTAL activities in terms of waste management and sustainable development.
- The workshop methodology and the learning from other cities.
- Seeing and learning what others are doing in their respective cities.
- Very informative and involved the decision makers making it more impactful.
- It was good because we shared climate change experience between cities it shared.
- The energy displayed by participants and lessons learnt from other cities.
- The cross-city interactions.

What was challenging

- The climate change is already affecting many countries across Southern Africa and urgent actions are necessary to be taken now in terms of adaptation and mitigation. The Fractal mega-lab, maybe can provide an enabling policy framework covering management, planning functions that facilitate and support local institutions for adaptation and mitigation to urgently build capacity at all levels to respond to the challenge of climate change in the Southern Africa region.
- The time was too short fully implement all our targeted climate change mitigation projects.
- I found the Miro board a bit hard to follow
- Online in-city participants were not given sufficient opportunities to actively participate.
- Not being able to engage fully in any of the city roundtables (did not request to do so virtually as felt this would be disruptive).
- The internet connectivity was not so good in the morning of the second day. In addition, the mega lab funding was very inadequate as it could hardly cushion a decent venues' expenses.
- Fully engaging in the roundtables.
- We experienced a lot of connectivity challenges (Malawi Team).
- It was the poor Network connection and the sound system.
- Not much except that we needed more time to deliberate on some issues.
- The declaration to be signed is not binding.
- Navigating the virtual space.

Suggested changes

- The format is good, maybe this can cover more regions of the country. For instance, we can have the lab in Beira City (Mozambique), as the place that the climate change its affecting the people in the real sense of the word. The region is cyclically hit by tropical storms that cause serious damages in people and infrastructures.
- Maybe a closing session capturing an action each person intends to take off the back of the event.
- A slot to be created for online only participants to share their ideas and perspectives.
- Maybe have a break-out group on generating new research findings to share with wider audiences.
- The mode was excellent. Perhaps going forward we will need to invest a lot in technology.
- Perhaps more time for the cities to ask questions to each other - rather than just report back for learning
- I would suggest having an independent internet Moodle for stronger connection.
- Maybe make it three days' workshop based and two days site visits.
- The format/tools were fine, but it needs to held at least twice a year not once a year as some issues are better tackled while they are still fresh in our minds.
- In future, there should be consultations or engagement of city mayors and government senior officials so that attendants can make binding decisions, and where possible, there must be a forum that caters for them, just to bring them on board with the process.

I wonder...

- Fractal project continues.
- Everyone sees the same as me.
- How the declaration will be institutionally embedded and exercised.
- If how we will keep the Fractal community active across the cities after 30 June.
- How we will continue both the FRACTAL learning journey and the sharing of its outcomes.
- Whether there are prospects of another research project like FRACTAL in future.
- What the mega-lab has put into motion?
- I wonder whether there will be a FRACTAL 2.0
- How our cities will achieve full sustainable development, sometimes theory does not reflect what is happening on the ground.

- When the next learning lab will be.
- If my ideas will fully be taken and am given the opportunity to pilot
- How our cities will look like in the next 50 years if we do not address climate change issues affection our cities
- I wonder if the declarations signed will see the light of day (i.e. whether there will be buy-in by the principals within government structures).
- How wonderful and sustainable cities will be when we all fully commit to undertaking what has been stipulated in the declarations.

Anything else you'd like to share

- Being in Fractal lab was an opportunity to interact with people of different cultures and backgrounds across southern Africa region, I learnt a lot and I created a friendship network.
- I would like the lab to keep on conscientizing the cities to keep abreast of all current and future technologies on climate resilience particularly in fulfilment of sustainable goal 11, 6 and 7.
- Thanks for all the effort, it was amazing!
- Real life examples of climate change effects.
- We have used the regional declaration in our grant application to UNEP for Ecosystem-based adaption to climate change in Lusaka.
- Reconnecting with the FRACTAL family gave me the motivation to continue sprint through to the IPCC WG I finishing line!
- Stakeholders' enthusiasm has been growing immensely towards the end of the project.
- The limited participation I had were very eye opening.
- I enjoyed so much the roundtable discussion as they proved to break hierarchy barriers interms of interaction.
- I find these very educative and eye opener especially when it comes to sharing with other colleagues in other countries.
- All is good.
- Please facilitate collaboration in climate change research between cities.

Annex A: Participant list

Name	Organisation/work
Ackley Kananji	Blantyre City Council
Alexis Ali	Electricity Generation Company (Malawi) Limited
Alfred Muriya	City of Harare
Alice McClure	UCT
Amos Mtonya	Dept of Climate Change and Meteorological Services
Andrew Zimba	Lusaka City Council
Anna Takaendesa	Ministry of Local Government and Public Works
Anna Taylor	UCT
Baleseng Jila	Gaborone City Council
Bettina Koelle	RCRCCC
Boniface Olubayo	Somarelang Tikologo-Environmrnt Watch Botswana
Brenda Mwalukanga	GFA Consulting Group
Brian Zvomunya	City of Harare
Burnet Mkandawire	University of Malawi
Bwalya Funga	Lusaka City Council
Chandapiwa Molefe	Alexander von Humboldt Foundation
Charity Denhere	Climate Change Management Department
Charles Mabika	City of Harare
Chipo Mubaya	CUT
Chips_mc@hotmail.com	Urban Innovations
Chris Jack	CSAG/UCT
Daniel Mwalwayo	MALAWI BUREAU OF STANDARDS
Dauson Noniwa	Blantyre Water Board
Dave Ramathlare	Gaborone City Council
David Nonde MWAMBA	GIZ
Deon Shekuza	NAYoRE
Dereck Mamiwa	The Malawi Polytechnic (University of Malawi)
Dorothy Ndlovu	UNZA
Eddie Jjemba	RCRCCC
Emmanuel Kanjunjunju	Blantyre City Council
Ephraim Mwepya Shitima	Climate Change & Natural Resources, Ministry of Lands and Natural resources
Erikka Mokanya	University of Namibia
Fernando Congolo	National Institute of Meteorology
Flavius Kamwani	Blantyre City Council

Name	Organisation/work
Genito Maure	Eduardo Mondlane
Gilbert Siame	UNZA
Grace Hikuama	???
Hankie Uluko	Malawi University of Science and Technology
Hardlife Mudzingwa	Community Water Alliance, Harare
Horatius Ikgopoleng	University of Botswana
Inga Boye	Namibia Housing Action Group, Windhoek
Izidine Pinto	University of Cape Town
James Cullis	Zutari
Jess Kavonic	ICLEI Africa
Joel Kabika	University of Zambia
John Mfune	University of Namibia
John Taulo	Malawi University of Science and Technology
Joseph Daron	Met Office, UK
Judith Mujegu	City of Harare
Julia Negumbo	City of Windhoek
Kamilla Adgamova	UNDP Zimbabwe
Keone Kelobonye	University of Botswana
Kulthoum Omari	University of Botswana
Lapologang Magole	University of Botswana
Lisben Chipfunde	City of Harare
Martin Shikongo	City of Windhoek
Maxwell Mbulaje	Environmental Affairs/Environmental officer, Blantyre
Melkisedik Namupolo	Shack Dwellers Federation of Namibia
Mrs Judith Mujegu	Harare City Council
Mutakela Kingsley Minyoi	University of Botswana
Mzime Murisa	START International
Nachilala Nkombo	WWF Zambia
Nguza Siyambango	University of Namibia
Nguza Siyambango	University of Namibia
Nyasha Nyahwire	Ministry of Local Government and Public Works, Harare
Olavi Makuti	City of Windhoek
Paulo	Zutari
Raul Chilaule	Maputo Municipality Council - Head of Environmental Management Department
Rebecca Ilunga	C40 cities
Richard Jones	Met Office Hadley Centre, UK

Name	Organisation/work
Roy Bouwer	SouthSouthNorth
Rudo Mamombe	Chinhoyi University of Technology
Ruth Butterfield	SEI
Salome Msango	FRACTAL
Samden Seunda	Blantyre City Council
Sandra Nhapi	City of Harare
Sergio Machava	Water Research Institute- IIA, Maputo
Shadrack Chabwera	Water Users Association, Blantyre
Sibusiso Innocent Sithole	City of Harare
Smiso Bhengu	eThekweni Municipality
Sukaina Bharwani	SEI
Suman Jain	University of Zambia
Taboka Mabayani	Department of Town and Country planning, Gaborone
Titose Chilume	Gaborone City Council
Tiyamike Haundi	The Polytechnic, UNIMA
Tlameo Evelyn Tshamekang	Department of Town and Country Planning, Gaborone
Uakazuvaka Kazombiaze	City of Windhoek
Uchizi Mtonga	LuWSI
Vanilly Mbeha	Shack Dwellers Federation of Namibia, Windhoek
Wellington Mitole	Water For People, Blantyre
William Chimzinga	Blantyre City Council
Wilma S. Nchito	University of Zambia

Annex B: Mega-lab agenda

Time (SAST)	Session	Logistical notes
Day 1 (13 April): Framing the mega-lab		
15h00-15h30	Welcome & introductions	All participants to meet on Zoom
15h30-16h00	FRACTAL update	
16h00-16h30	Overview of the mega-lab Introducing the FRACTAL declaration	
16h30-16h45	Surprise 1	
16h45-17h00	Reflection, recap and logistics for day 2	
Day 2 (14 April): Roundtables and cross-city learning		
Session 1: city-specific roundtables		
09h00-12h00	Roundtables	<ul style="list-style-type: none"> • City-specific roundtables • Virtual roundtables (including Maputo)

12h00-13h00	Lunch	Different locations
Session 2: cross-city learning		
13h00-13h15	Surprise 2	All participants to meet on Zoom
13h15-14h15	Roundtable discussion feedback Growing the FRACTAL tree of knowledge	
14h15-14h30	A moment to reflect on the tree of knowledge & declaration	
14h30-14h45	Next steps and 'signing' the FRACTAL declaration	
14h45-15h00	Reflection and wrap-up	
15h00-16h00	Potential social event in cities	City-specific locations

Annex C: City roundtable notes

Blantyre roundtable



Dr Burnet Mkandawire, as a Director of the Ceremony, welcomed all present to the meeting and requested a volunteer to open with a word of prayer before starting the meeting. He informed delegates that the purpose was to share key FRACTAL insights, discuss burning issues, and next steps towards sustaining lessons for development of Blantyre city. He informed delegates that FRACTAL has been operating in Blantyre from 2017, and has so far registered the following successes/gains:

From the first phase (main FRACTAL)

- Developed Climate Risk Narratives (CRN) for Blantyre city up to the year 2040.
- Explored ways of converting wastes into energy under the Innovation Fund Research (IFR) Project. Note: The City Council is currently launching into the deep on this as a means of tackling its waste management challenges
- Secured small opportunity grants which were used for development of a policy brief and monitoring early career researchers (ECRs)
- Trained Blantyre City Council Directors/Management in NDCs at Ku-Chawe Inn, Zomba on 7th May 2019; Theme: CLIMATE CHANGE AWARENESS, TRANSFORMATIONAL LEADERSHIP & UNPACKING DECISION MAKING PROCESSES for climate resilience in the City

From the second (extended) phase

- FRACTAL Dissemination Seminar was conducted at Sunbird Kuchawe Inn, July, 2019.
- FRACTAL established an effective communication mechanism with City Stakeholders.
- A model was developed for replicating the transdisciplinary climate knowledge co-production process
- FRACTAL Blantyre in collaboration with its partners co-authored a paper that was published in a special issue with Systems Journal, namely: Application of Systems-Approach in Modelling Complex City-Scale Transdisciplinary Knowledge Co-Production Process and Learning Patterns for Climate Resilience Systems.
- Developed a Memorandum of Understanding between the City Council and the University of Malawi
- Conducted a number of stakeholders workshops

The Acting Principal of the University of Malawi's Polytechnic Campus, Associate Professor Dr. Nancy Chitera officially made welcome remarks, and commended the Blantyre City Council for its good relationship with the institution

The Acting CEO of Blantyre City Council (BCC), Mr Costly Chanza, was the guest of honour. He commended the FRACTAL for its positive impact on waste management drives and resilience of Blantyre city to natural disasters like floods. He pointed out the mutual benefits enjoyed by both BCC and the University, and expressed the BCC's commitment to ensuring that there are healthier working relationships with FRACTAL, The University, and all the other institutional stakeholders that attended the meeting.

The Learning Lab attracted 15 external and 5 internal delegates (FRACTAL researchers) from the University as well as a Research Assistant solely engaged for the mega Lab logistical support

Two presentations were made by the Deputy Director of Health & Social Services at BCC, Mr Samden Seunda; and Assistant Director of Leisure, Culture and Environment, Mr William Chimzinga prior to the main proceedings

Mr Samden Seunda presented on Waste Management Initiatives by the BCC, since solid and liquid waste management was a major challenge for the city. He provided a background information of Blantyre city

Area of 228 km² , 23 wards with a population of about 994,517; 70% of which reside in informal settlements.

Only 16% of residents are connected to the city's sewer line, thus the liquid waste collection is very minimal.

There are five liquid treatment plants available in the city using the following treatment methods: Trickling filters, Aerated lagoons, Waste stabilization ponds, Oxidation ditches and Septic tanks. Liquid waste is treated in 4 main stages of generation, collection, treatment and disposal.

Approximately 475 tons of solid waste are generated per day, collected in skips, bins and transported in tractors, compactors and skip handling vehicles.

1) Challenges of Solid waste management

Failure by residents to segregate waste, high operational costs, aged fleet, some fleet is as old as 18 years; inadequate capacity, facilities and equipment for solid waste treatment

2) Challenges of liquid waste management

Aged sewerage system, overloaded sewerage system, poor effluent quality, and high population growth

Way forward

- 1) BCC needs to outsource solid waste collection to private operators
- 2) Conversion of Solid Waste to Energy, with Public, Private Partnership in mind
- 3) Hiring of refuse collection vehicles from private transporters
- 4) Engagement of solid waste treatment interventions(e.g., composting)
- 5) Promotion of waste segregation at source
- 6) Waste Segregation at source advocated in the new By-Laws

b. Mr William Chimzinga presented on City Climate Resilience

The presentation focused on on greenhouse gases and their effects at regional and global levels, and outlined the institutions that deal with the management of disasters management; and Laws and Policies on climate environment, water resources and the BCC strategic plan

He further outlined the challenges in planning and implementation of disaster management activities, namely: financial, political, technical, incomplete decentralization and inadequate support from key stakeholders

6. Roundtable discussions followed, guided by the following burning issues:
 - a. How can BCC deal with the burning issues sustainably?
 - b. How can the BBC sustain the gains made?
 - c. How can BCC garner the political and stakeholders' will needed to mainstream knowledge developed into decision making and/or policy?
7. Delegates were divided into 3 groups where each group handled one burning issue as reflected in the questions above
8. After the group discussions a team leader from each group made a presentation of the content of their discussions as follows:
 - a. Group 1: How can BCC deal with burning issues sustainably?

The group identified two key burning issues of waste management (Solid and Liquid) and Climate Resilience. The following were presented as possible ways in which the BCC can effectively handle the key issues sustainably:

Waste management

- Private entities should take part in the waste management process, i.e., transporting, treatment, recycling and disposal
- BCC should raise community awareness on sustainable ways of minimizing waste generation which are Recycle, Reuse and Reduce
- BCC should conduct mass civic education and sustainable ways of waste management such as sorting of waste at source
- BCC should promote citizen participation in waste management
- BCC should promote the manufacture of goods from recycled waste by implementing deliberate initiatives like reduced licenses and other fees

Climate Resilience

- BCC needs to pre-plan and equip itself to handle any natural disaster.
- BCC should promote the use of environmentally clean energy
- BCC has to enhance partnership with other stakeholders that promote environmental management
- Capacity building of BCC employees and regular tailor-made training on management of disasters

- b. Group 2: How can BCC sustain the gains made?

The group noted that FRACTAL has had positive impacts on Blantyre city and thus brainstormed on the possible ways in which the city council can sustain these gains in the areas of waste management and resilient cities.

Waste management

- BCC should promote public awareness of waste collection points and encourage usability to the public
- Increase and diversify waste collection centers and facilities to increase the volume of waste collection
- BCC should maintain an enabling environment for key players to participate in management of waste
- BCC should maintain transparency and accountability in handling waste management funds

- BCC should promote safe handling and security of waste management equipment and facilities to minimize maintenance cost and loss due to theft

Climate Resilience

- BCC should have a clear financing mechanism for climate change projects and action plans.
- BCC should prioritize financing of climate change projects and action plans
- BCC should be conducting regular evaluations of the climate change projects to analyze their impacts on the environment

Group 3: How can BCC garner the political and stakeholders' will need mainstream knowledge developed into decision making and/ or policy?

The group tackled the mainstreaming of knowledge developed by FRACTAL in waste management and resilient cities as a single entity since it leads to decision making and/or formulation of policies. The following were the possible streams in which the knowledge can be developed into actionable plans and/or policies:

- i. Citizen participation in policy/ decision making processes
- ii. Engagement with the public at household level so that they should easily adopt waste management and resilient climate policies
- iii. Implementation of soft policies to improve the building standards/ quality in slums and informal settlements to minimize the impact of natural disasters on property and life
- iv. City councils should be given their own vast chunks of land to develop, manage and control it to solve the problems that come with management of already developed land, i.e., slums

9. The delegates reached a unified position with respect to the three key issues raised in the round-table discussions, which was presented by Dr. Bernard Thole, as follows:

- Inadequate facilities and equipment for transport and treatment of solid waste
- High solid waste collection and transport cost
- Lack of segregation of solid waste at source
- Liquid waste treatment plants overloaded and beyond design capabilities
- High capital required for liquid waste treatment plant rehabilitation and upscaling

The following were the main gains in the waste management:

- An investor in waste to energy value chain was identified
- An Environmental and Social Impact Assessment (ESIA) was carried out by the investor
- Discussions are underway for power purchase agreements (PPAs) between the investor, Malawi Energy Regulatory Authority (MERA) and ESCOM

The following were the main issues towards climate resilience development:

- At institutional level (BCC): financial, political and technical
- At national level: incomplete devolution in terms of decentralization and inadequate support, holistically.

The climate resilience gains are:

- Formation of the national climate resilience strategies
- City-wide climate resilience strategies
- Institutional arrangements for disaster risk response

Summary of the three key questions for reflection

Going forward with respect to question 1: How can BCC deal with burning issues sustainably?

- 1) Enhance public- private partnerships in solid waste management.
- 2) Civic educate residents on reduce-reuse/ recycle-recover in waste management.
- 3) Handover liquid waste treatment functions to Blantyre Water Board (BWB)
- 4) Innovate and expand city revenue base
- 5) Enhance partnership with key stakeholders for joint project proposals
- 6) Control development as per by-laws
- 7) Enhance partnerships with policy and regulatory authorities (memorandum of understanding and operational procedures)
- 8) Enhance disaster preparedness: currently, mostly responding to disasters

Going forward with respect to question 2: How Can BCC sustain the gains made?

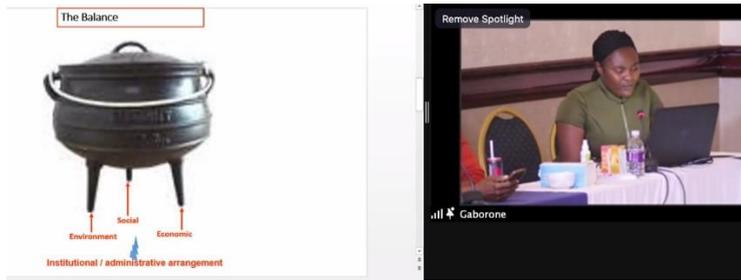
- 1) Form conducive policy at national level
- 2) Ensure continued market availability for products made from waste
- 3) Guarantee adequate supply of solid waste to the proposed power generation plant
- 4) Involve other players in waste collection
- 5) Sensitize city stakeholders on waste sorting and collection at source.
- 6) Develop appropriate waste transfer stations
- 7) To sustain resilient climate gains:
 - a) Operationalize resilience strategies at national and city level
 - b) Finalize regulatory frameworks that are still in draft
 - c) Build capacity for institutions and personnel
 - d) Engage in civic education on resilient climate.

Going forward with respect to question 3: How can BBC garner the political and stakeholder will needed to mainstream knowledge developed into decision making and/or policy?

- 1) Robustly promote engagement frameworks with communities and households
- 2) Take advantage of existing congruence of plans and actions of sub-governments/ regulatory institutions with BCC plans.
- 3) Engage with the central government for continued empowerment of BCC to enforce and regulate policies within their mandate in the city.

10. The Mega Learning Lab ended with a vote of thanks by Dr. Burnet Mkandawire and closing remarks by the Acting CEO of the BCC, Mr. Costly Chanza. Then the delegates were ushered into a City-partners networking activity while they were taking refreshments.

Gaborone roundtable



Theme: Sustainable Pathways for the City of Gaborone

Why do we need sustainable pathways to deal with climate change?

- The cost of inaction on the impacts of urbanization and climate change are not sustainable from any perspective;
- The city cannot afford to let things take place organically, we need to interfere. We need action. We need to develop a programme or strategy to act;
- Action starts with governance. It starts with the recognition that action is needed;
- Technical knowledge is there but it won't give us solutions that we need and its not sufficient without governance.

What elements of governance are important for consideration in the context of climate change?

- The city needs a structured set of procedures and guidelines to facilitate long -term planning on climate change and resilience building;
- It is important to also have oversight institutions that are independent, whose function is to oversee the planning at the city level. However, the oversight institutions should not "take over" the governance and overstep their mandates. They too should also have their set guidelines to carry out their mandates and functions, and there should be accountability of the institutions;
- Governance structures need to be flexible enough to allow for learning from mistakes;
- Silo planning continues to be a problem. Sometimes it implies that one issue is being done at the expense of another. Planning aspects is problematic because other depts will plan for others. Planning needs to be strategic.
- Politics of governance and political interference is a real challenge when it comes to planning. Some of the problems associate with this include 1) no continuation of projects because governments come with their own agenda; 2) priorities change and some of the projects are left hanging;
- Technocrats provide technical recommendations, and stop there. In many cases, the technocrats have done their work. Problem starts when it comes to decision making. So in the end it looks like the technical work is not done, and it looks like they are not doing their work. But the decision maker has the final say.
- Innovation is there there but need a vision from leaders at the city level.

How can we improve/ innovate around the current institutional situation?

- Support the development of a regulatory framework - eg town and country planning act does not have a strong environmental provision. Eg the National Spatial Plan (NSP) has provisions for environment, but they need to be backed by the law. Plans are there but not implemented. Someone can come up with a project that is in contrary to the plan. The NSP is a framework that was designed to align with national pillars- 8 pillars. The how/ implementation is aligned to the ministry. As part of implementation, can develop area specific guidelines for each sector.

- Support citizen engagement- Citizenry lack of information- therefore need CSOs. Knowledge dissemination and sharing. Lack of watch dogs. Support CSOs. Youth can be included and supported- a youth network.
- Have to create spaces at the table for CSOs, there has to be a deliberate effort.

Harare roundtable



The round table was held on the 14th of April 2021 at the Holiday Inn Hotel. The Harare round tables focused on the following questions:

1. What has been achieved or the outcomes of the FRACTAL project?
2. What are the gaps or what should have been done differently?
3. What needs to be done going forward and what can be taken forward in the climate change desk or other upcoming projects?

The Harare City Council (HCC) officials; Ministry of Local Government (MoLG); UNDP; Community Water Alliance, global change System for Analysis, Research and Training (START) International, were part of the round tables.

What has been achieved?

Rudo Mamombe (CUT) facilitated the round table discussions which started off by a reflection on the FRACTAL journey in Harare whereby all the major events/ activities conducted under FRACTAL were listed in order to refresh the participants' memory. Participants were then asked to reflect on their personal experiences with FRACTAL and highlight some of their outstanding moments within the project and also highlight on what they think were the outcomes/ achievements of the project. The following points were highlighted by the participants:

- FRACTAL managed to bring on board different actors from different department. Most meetings used to involve only those in specific sectors for example climate, water etc. The FRACTAL project managed to engage the Harare City Council, Civic Society practitioners and intellectuals
- There have been more discussions on climate change and impacts in the city's operations. Before the ER joined the Harare Water department, there were no discussions on climate change but as of now the department is now working on a Climate resilience strategy.
- The city is now drawing up a new wetland map showing wetlands that are occupied and the remaining ones. It is now easier for the city to approach industry and talk to both the owner and the occupier to mitigate the destruction of wetlands
- The FRACTAL project contributed to capacity building for example through climate change training for city officials
- FRACTAL triggered the establishment of the Climate Change desk under the city's Environmental Management Unit which is a functional structure for climate change issues across departments. There was a lot of fragmentation on communication on climate change but the desk has brought all

departments on board. The city is 'now talking with one voice'. The city has come up with Local Environmental Plans (LEP) in each ward

- The city's 2021 budget now has climate change activities
- The FRACTAL project contributed to awareness raising of climate change and resilience issues by engaging all stakeholders
- Learning about projects in other cities that HCC has taken on board which are specific to communities especially on cleaning rivers (LIRA project)
- There is now appreciation of research to authenticate issues
- The city developed partnership agreement with CUT targeted towards youths under the Human Capital department in the city
- FRACTAL triggered officials to get into research and personal development through training/degrees. One of the city officials is now registered to do a PHD and another city official has now registered for an MSc, specialising in women and the environment
- FRACTAL created a platform for knowledge sharing and city to city learning (south to south). Local authorities are overwhelmed and had no idea on how to deal with climate change but through FRACTAL, have managed to share information with other cities in southern Africa. The city has managed to learn that some issues do not only affect Zimbabwe alone but other cities
- FRACTAL has managed to bring a link between practice and the academia and a holistic perspective
- FRACTAL has contributed to the building of relationships and trust

What are the gaps or what should have been done differently?

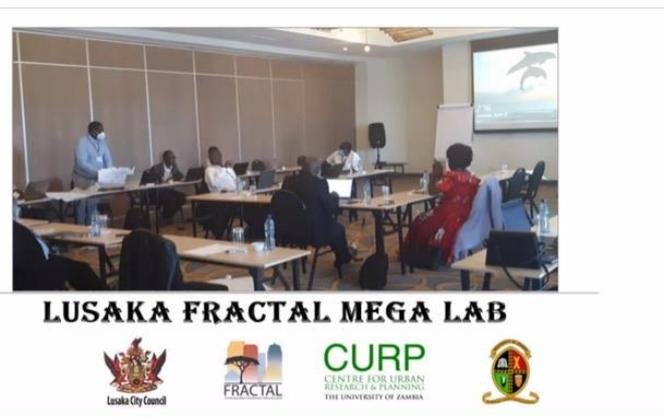
- Climate change needs a lot of emphasis and engagement at lower levels (residents and primary schools) which can be beneficial in addressing vulnerability for example in women
- There is need for a resilience strategy for the city in totality instead of just focusing on water resilience
- There is need for a holistic project that focuses on other sectors such as health, transport etc as FRACTAL concentrated on water
- There is need for a city adaptation plan/ strategy so that the city can co-exist with the bad situation and come up with nature based solutions
- The city is not yet aligned to the National Development strategy, currently does not have capacity to measure gases for instance pollution
- There is need for capacitation in terms of technical skills and equipment and these should be budgeted for
- There is need for a Monitoring and Evaluation plan as part of the action plan in terms of how to monitor and evaluate progress towards set targets
- There is need for a climate change manual to guide operations and this can only be done through research
- There is a general gap in that most projects do not focus on the infrastructure side so there is need for infrastructure focused projects, for example FRACTAL did more on behavioural change. There is need for infrastructure to support some principles for example hand washing. The city can then drive behaviour change on something that exists i.e. hardware

What needs to be done going forward and what can be taken forward in the climate change desk or other upcoming projects?

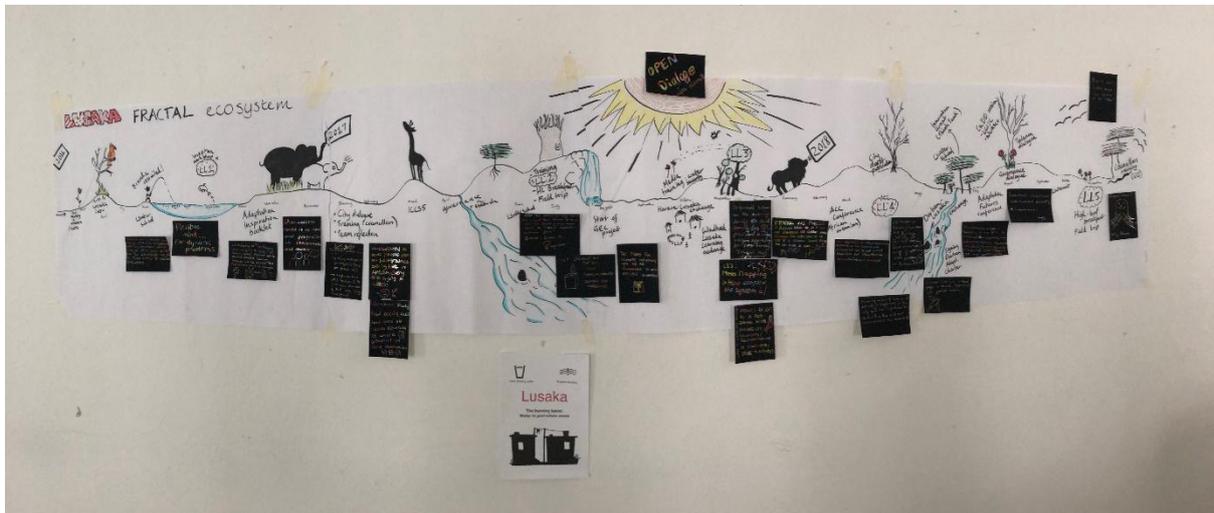
- The Ministry of Local Government is planning to cascade FRACTAL lessons to other cities and use Harare City Council as a pilot city (there are 32 local urban authorities and 60 rural district councils)
- Technical plus financial assistance on city resilience plan as well as integrated action plan to be put forward to residents and stakeholders
- Capacity building to develop proposals for research and funding for example GEF, UNFCC, GCF, FAO, Infrastructure Development Bank (the city needs to link up with accredited institutions)
- Climate change desk to become repository for decision-makers, residents, business, government departments etc
- Develop climate change templates to be used by climate change desk for example on how to capture issues/ information on climate change at daily, weekly, monthly or yearly basis

- Monitoring and evaluation strategy/ planning to evaluate/ monitor direct targets from resilient planning
- Resilience planning to transcend water and include other sectors such as energy
- Cascade national policies such as the Climate Policy and have a low emission development strategy that focuses on energy efficiency and also have a city adaptation plan derived from the National Adaptation Plan
- Develop template for local authorities to report on CDM and NDCs
- Climate change to be mainstreamed in budgets
- Awareness campaigns needed to bring more people on board, city can create a website for climate change
- Urban public mobility, HCC is working with the city of Munich for smart and alternative modes of transport
- Capacitate key departments and heads on climate change including finance, works, health, legal and roads. The training side of the city to organise stakeholders
- Engage the corporate world/ private sector
- The climate change desk and EMU has a lot of work to integrate departments, key players, stakeholders even without funding for example training of decision-makers, councillors, technocrats etc
- Through FRACTAL, we can harness/leverage platform for further work
- Promotion/ development of climate change innovations and engage universities or companies
- The EMU to coordinate different departments in the city (some projects that speak to a particular department in the city are not linked with that department)
- There is need to reconfigure/redesign city's institutional framework through local government to look at how the city is structured so that it delivers
- There is need for a steering committee to sell the idea of climate change to city departments. The steering committee should include the academia, the parent ministry (Ministry of local government), civil society to talk about issues with the executives in the city (sometimes the executives need to be convinced by an outsider)
- The city can have a plan where different actors can pick on their interests for example WASH experts etc
- Green social enterprises to generate revenue (innovation)
- The city of Harare to become the link to all the projects within the city so as to avoid fragmentation
- There is need for funding on mitigation

Lusaka roundtable



The Mega Lab was organised as a hybrid event with 25 Lusaka based Fractal project stakeholders meeting physically at Protea Hotel Bonanza in Chongwe District of Lusaka province while others joining online. The meeting was opened with welcoming remarks by Dr. Gilbert Siame who appreciated everyone for their efforts and gave a brief background of the FRACTAL project. Based on the Fractal ecosystem, he briefly outlined the major millstones in the project from 2016 to 2021.



Fractal journey in Lusaka and the region (Source, Fractal)

He further highlighted that the purpose of the lab was to engage at a level where we can have a way forward as a city after FRACTAL, to learn and cater to some of the unfinished ideas of the project by framing them into labs which can redefine science and the way in which science is viewed. At this point the round table discussants paired up and introduced each other while the fractal veterans shared some fractal insights and most memorable moments.



Remarks by the Head of Department, UNZA

Dr. Khonje was then called upon to give opening remarks before calling upon the Guest of Honour. He welcomed everyone that was coming from outside the institution, the University of Zambia and stated that the project began with the aim of trying to understand the relationship between climate change and development and bridge the gap between the two if any. He stated that towns and cities are engines of growth and by 2030 more than fifty percent of the globe will be living in urban cities, hence there was a need to face the changes that will come with growth, to be able to build urban areas that are climate resilient, habitable and inclusive. With these few remarks he called upon the Dean of the School of Natural Sciences.

Opening Remarks

On being called upon, the Dean informed the meeting that the School of Natural Sciences has co-hosted the Future Resilience for African Cities and Land Project (FRACTAL) with Lusaka City Council for the past 6 years. He stated that he was pleased that the project has continued to pioneer knowledge in building climate resilient cities through learning labs and dialogues.

He was also pleased that the project has continued to demonstrate ways to bridge the gap between research activities and development action in rapidly exchanging contexts, stating that the project differed from other research projects because it places an emphasis on transdisciplinary research which involves various types of researchers and technocrats which has shown how experiential and expert knowledge can be used.

Secondly, the project emphasises on partnership building through its demonstration of establishing knowledge coalitions. He further stated that the project also devised creative ways of communicating climate information through a simplified research approaches and methods for the ordinary person. He said that FRACTAL had established the baseline upon which deliberate methods can be used to sustain the gains made and innovate more on how to work with the people most affected by climate change impacts in cities.

He finally, commended all for using FRACTAL as a platform for advancing knowledge in climate resilience. He also encouraged all to work harder to find collaborative ways to transition to a climate secure future for all. He called upon stakeholders to find ways to sustain what Fractal had achieved and build on the lessons. He emphasised, Fractal must not end when the project funding comes to an end.

Objectives of the round table

The team was guided into drawing the objectives of the round table which was organised to discuss how to deepen research that bridges the gap between climate research and urban development. The participants were grouped into four teams with fractal veterans pairing up with recent members and the following objectives were drawn:

- i. To have conversations around capacity building for running projects
- ii. To have conversations around funding of current and future initiatives [identify potential funding source] for continuing with some elements of Fractal.
- iii. To have conversations on how to keep the FRACTAL conversation going through LUWSi
- iv. To sustain and build on the project and grow the FRACTAL network around Zambia
- v. To continue engagement with focus on the private sector
- vi. To establish and launch a climate desk at LCC
- vii. To devise programs to continue peer to peer learning in both Zambia and Lusaka and abroad ensure that the networks formed continue as they provide opportunities for several things in terms of future work and also continuing with some of the ideals in the fractal project.
- viii. Key issues were identified over the life of the Fractal project from 2016 till date and some lessons and questions emerged such as:
 - i. Identify policies that fractal engaged with and actually influenced
 - ii. There have been certain establishments including direct relationship of informants to the shaft 5 and mass media protection efforts.
 - iii. Consideration of engagement with large scale, national level policies.
- ix. To identify the lessons that have been learnt and establish whether the project achieved what was intended.
- x. Link FRACTAL objectives to government priorities such as Ministry of National Development Planning and the local authorities. This would provide resources for implementation. While policy briefs are important and needed, there was inadequate planning on acting on them. Need to therefore put into consideration therefore need to align them with national and city level priorities that give direct opportunities for uptake.
- xi. Localisation of Fractal process as it was observed that there was a lot of influence and control from Cape Town and there was need for the agenda to be set locally and also to lead the process. This has been an ongoing reflection including having local facilitation and questions being answered by local stakeholders and getting them to lead the process which can be much more sustainable.
- xii. The need to continue with learning labs and stakeholder collaboration and continue to foster dialogue to make sure there is resilience.
- xiii. Engagement with authority. While fractal engaged much in learning labs, the level of engagement with the policy makers themselves at city level. Need for a learning lab purely for that cohort of people so that they can have an indepth understanding of some of the things that happen.

Learning from Fractal journey, methods, and approach

A learning lab approach was used and groups were created based on the FRACTAL journey that has been embarked on so far. Four groups were created which needed to identify the key lessons learnt, the gap on what could have been done better and what should be carried forward.

i. Embedded Researcher Approach

The team asked two questions in order to meet the objectives:

- i. *How did you measure and monitor climate information.*

ii. How where you able to use the climate information.

Key Lessons learnt/ Outcomes

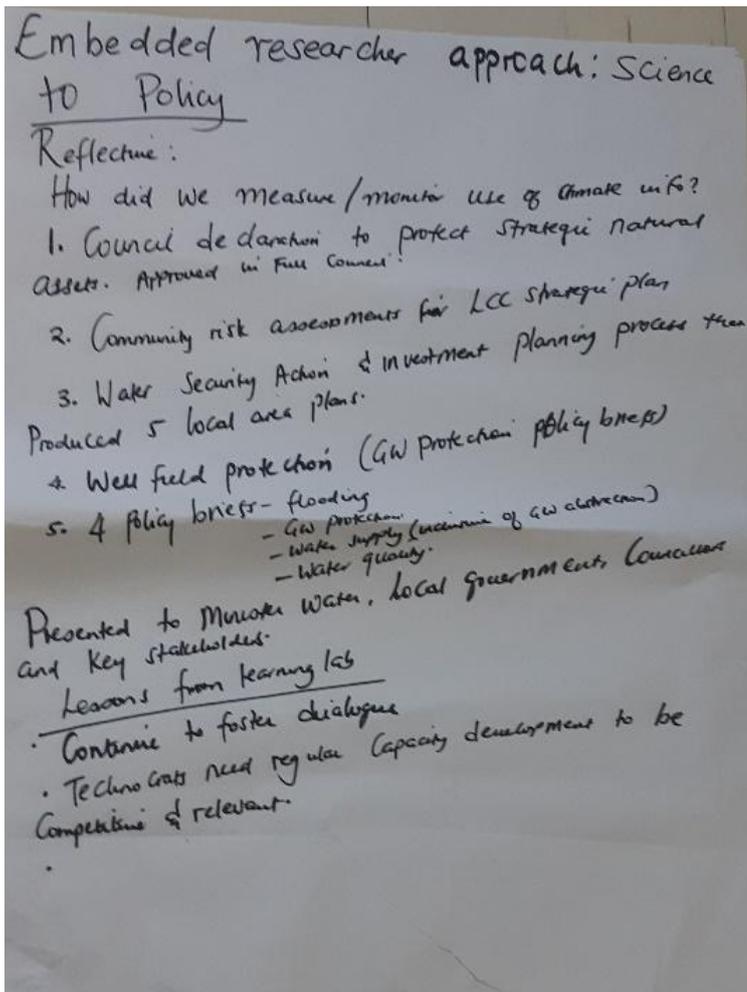
- i. Lusaka City Council passed a resolution to protect strategic natural assets and this was approved in the Full council.
- ii. Community risk assessments have been incorporated in the Lusaka City Council strategic plan.
- iii. The Water security action and investments planning process produced five area plans.
- iv. The well field protection is an outcome of this project.

What to carry forward

- i. Continue to foster dialogue.
- ii. To continue building capacity of technocrats for regular capacity development.
- iii. Continue with learning labs
- iv.

v.

vi. Figure 1: Reflections from the embedded researcher



ii. Dialogue Labs

Useful for in-depth stakeholder thinking and helps us to do climate projection on climate narratives.

Key Lessons learnt/ Outcomes

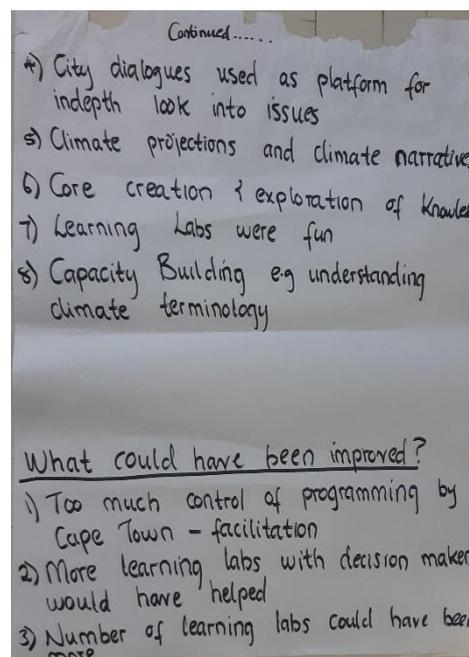
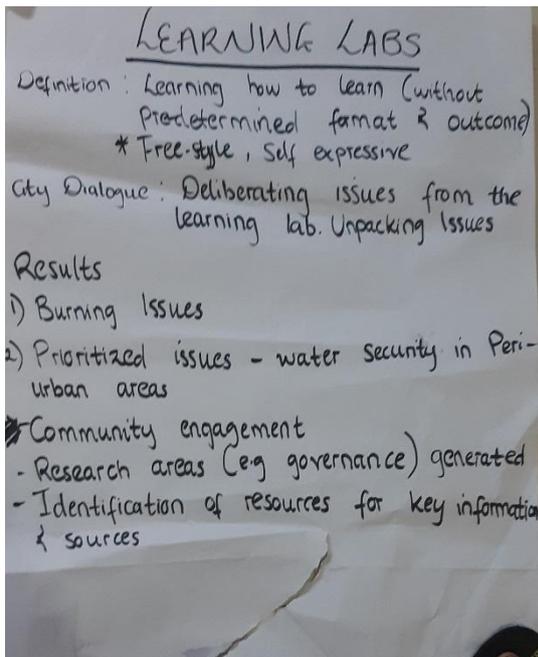
- i. Water security in peri-urban areas place an emphasis on community and stakeholders.
- ii. Flexibility of the process
- iii. It's a highly participatory process
- iv. Stakeholder collaboration such as the relationship that has been developed between FRACTAL and LUWSi and beyond that friendships that have been developed.
- v. Capacity development in clarifying climate terminology.
- vi. Process of continues reflection and adaption

What could we have been done better?

- i. While appreciating the importance of working with international experts, the workshop recognised the need to ensure more local control so that the process draws on practical experiences, builds capacity in local experts and allows for more examples to be from familiar sources. This was noted in the area of programming, facilitation of events and financing. The lab recommended for a careful balance between local input and international support.
- ii. Could have engaged more decision makers in the learning labs as a parallel learning process for decision makers. This could have involved reaching out to higher levels of government such as ministries, and directorates. The Zambia Met Department could have been better engaged from the very beginning.

Way forward

- i. Going forward stakeholder collaboration should continue and the learning labs should continue.
- ii. Going forward there is a need build capacity in local experts to design and facilitate fractal-like innovations.
- iii.



iv. Policy briefs

The group focused on the policies that have been influenced as a result of the FRACTAL project.

Key Lessons learnt/ Outcomes

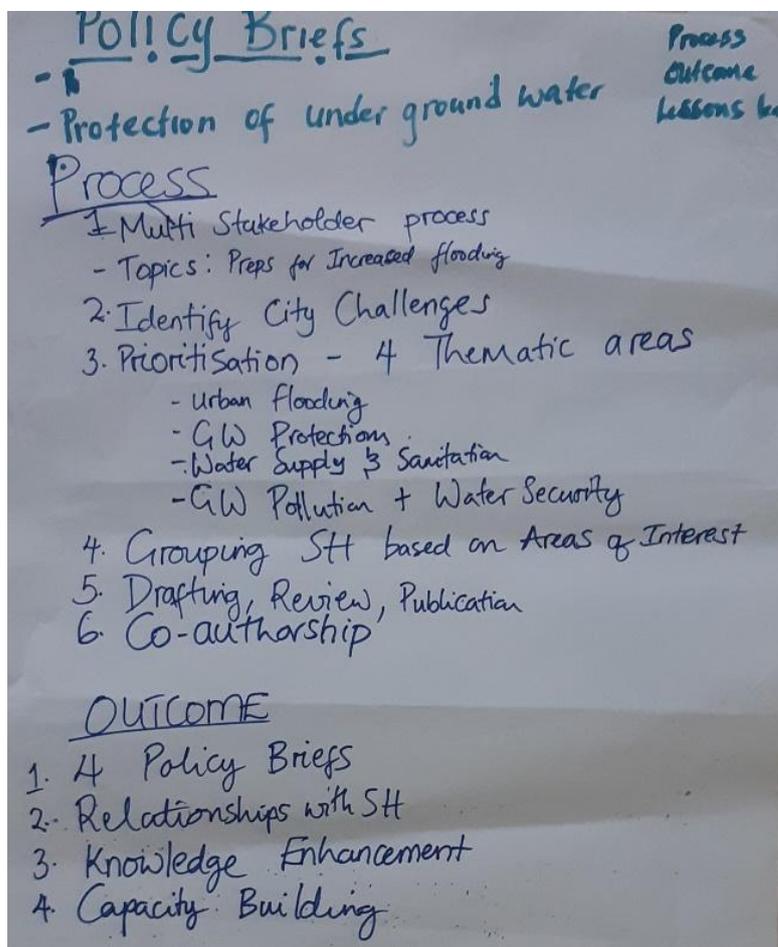
- i. It is a multi-stakeholder process to identify issues affecting Lusaka in line with climate change.
- ii. Through the process the participants have been able to identify city challenges.
- iii. Prioritization of four areas which have also resulted in formulation of policies-Urban flooding, ground water protection, ground water pollution and water security, water supply and sanitation presented to local government, councillors, Minister of water and key stakeholders.
- iv. Drafting groups of stakeholders based on areas of interest
- v. Drafting, review and publication.
- vi. Co-authorship was very important. Some LCC staff indicated that Fractal offered them an opportunity to participate for the first time ever in co-authoring a policy briefs. "We are used to receiving the policy briefs, but to co-author, it was exceptional and empowering"- reflection from LCC staff.
- vii. Relationships with stakeholders
- viii. Knowledge enhancement
- ix. LCC has passed a By-law was passed to bury some pit latrines within the communities to protect ground water.
- x. Capacity building

What could we have been done better?

- i. Engage political authority from inception for the purpose of uptake
- ii. More political representation on policy brief.
- iii. Dissemination and publicity of information should have been more.

Way forward

- i. Uptake should be planned for as part of the process
- ii. Engage more stakeholders, ensure there is more impact and influence.
- iii. Give specific key areas to specific lead institutions so that they can do the publicity and dissemination themselves.



iv. Peer to peer learning

The peer to peer learning process was a mentor and mentee kind of relationship involving city to city approach with visits to cities like Windhoek and Durban. The process also utilised technical guidance with both local and international support, brainstorming workshops were using the resources of experts and application and field excursions.

Key Lessons learnt/ Outcomes

- i. Enhanced knowledge or knowledge transfer.
- ii. Capacity building in various aspects among stakeholders.
- iii. Formed information and knowledge networks.
- iv. Multi stakeholder engagement and collaboration.
- v. Securing of ground water taken up by LUWSi

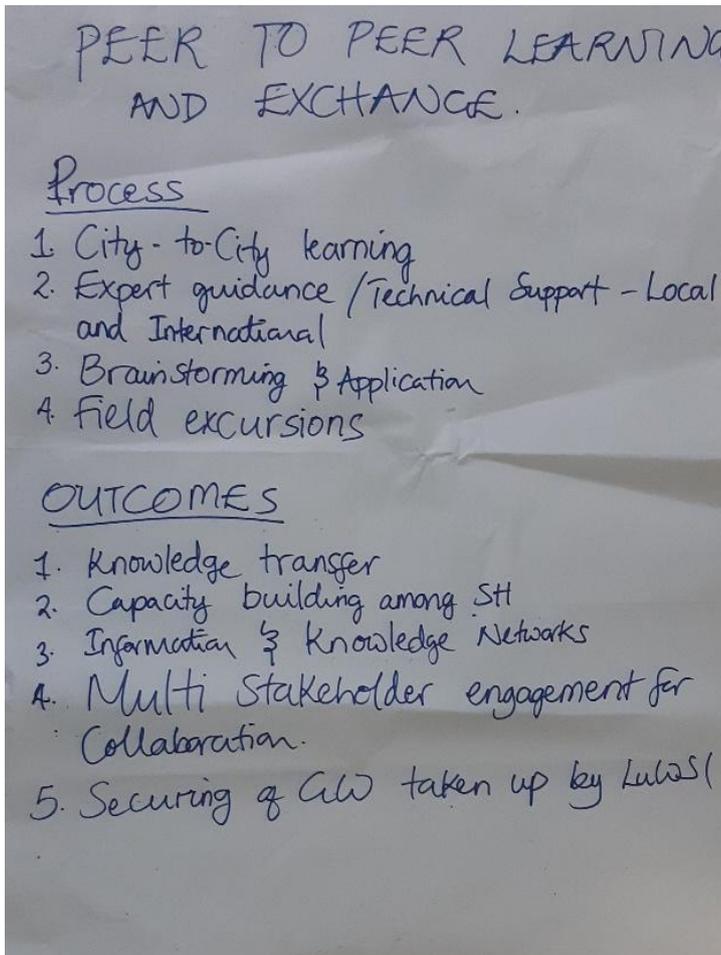
Lessons from other Cities

- i. Durban had a well-structured community participation and collaboration with local authorities.
- ii. Forward thinking by the local authority which had a master plan and budgeted for or dedicated resources.
- iii. Initiative of tree planting with communities.

- iv. Relationship between local authority and Kwa-Zulu Natal University.

Way forward

- i. Incorporation of lessons learnt into local area planning process.
- ii. Developing a knowledge repository is still outstanding going forward to ensure that such things are implemented.



v. Community engagements

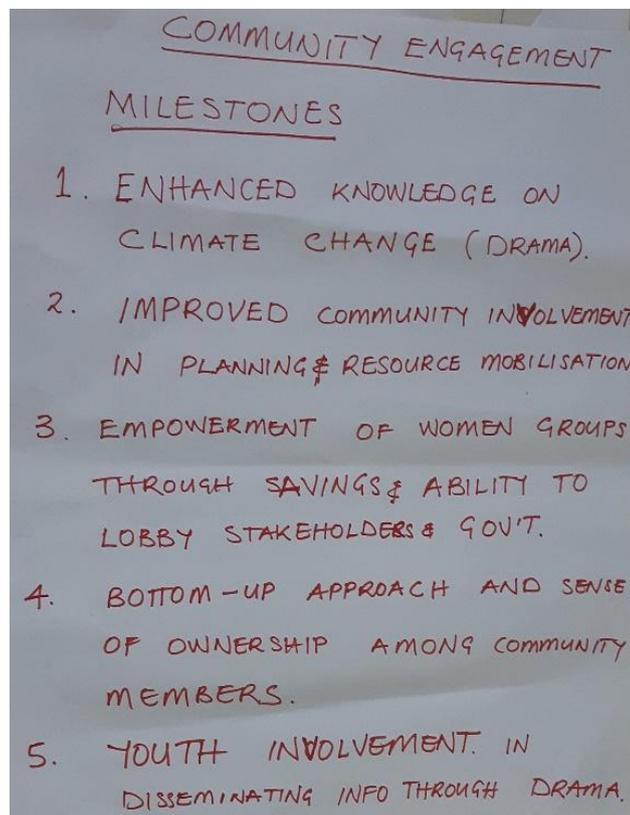
The general review of the team is that FRACTAL has been a good project because members have seen some actions being taken and policies being implemented as a result of the project activities.

Key Lessons learnt/ Outcomes

- i. Achieved involvement of young people and women in the process who used drama to sensitize the community on issues relating to climate change.
- ii. Achieved empowerment of women groups through savings and ability to lobby stakeholders and government.
- iii. The ability to use bottom up approach was enhanced in order to involve the community in the activities that are taking place.

Way forward

- i. The bottom up approach in the process should be carried forward to engage the community from the planning process and give them the sense of ownership.
- ii. Look to ensuring that some of the policy dialogue is not ending with civic leaders but should be pushed into parliament.
- iii. The need to link the city and local government system beyond the Lusaka city.



Fractal Update

Dr. Siame gave an update on the FRACTAL journey for Lusaka City and the updates on what key achievements have been made through the project.

- i. An app was developed in Maputo based on the research by FRACTAL
- ii. Ideas to establish climate change desks such as in Maputo and Lusaka.

He invited the listeners and participants to think of FRACTAL as a family, as a way of professional life. Look at it as a plant, something that needs to grow and nourished. To think of what it means as a way of life, which is guided by certain principles such as respect and trust, thinking big and looking forward, letting go of comfort spaces and imagine space that allows each one to think and to talk about how climate should be part of life because of FRACTAL which has been anchored by principles to build networks and relationships and to sustain and strengthen the African agency.

He stated that as the program draws to a close, the team settled on learning labs and drew a few objectives which include:

- i. To take stock of the learning and re-imagine the future in this space of work. Statistics indicate that cities will continue to be the measure of Sustainable Development Goals and science is clear that climate change is the elephant in the room so the question is how do we move forward?
- ii. To celebrate the eureka moments in the process of FRACTAL i.e. questions that have not been answered, things that excited us, what things require changing, rethink the base of 2016 versus where we are now.
- iii. To imagine the opportunities for sustaining the outcomes that the cities have achieved, the partnerships, the innovations and the learning.
- iv. To invite you to think about how this can continue and be expanded so that the outcomes of FRACTAL become permanent and can be carried on with everyone.

Lusaka city achievements 5 plans had been drafted and are being worked on

With regards to Lusaka City in particular, the following achievements were communicated:

- i. In 2019-2020 we continued working on the plans for water security investment action plans.
- ii. The city has been using the policy briefs particularly on ground water protection and zeroing in on some of the climate narratives that had been recounted by some of the climate working groups within fractal. The city has been working on protection of shaft 5 and mass media boreholes as they are important in the life of the city in terms of water. Fractal has been participating in supporting two parts of this aspect, firstly building capacity in the communities to enable them own the process as the idea is to get those

borehole sites to be echo parks and there has actually been support from other DFID and GIZ related finances. This work has been going on in fractal designs , and sensitization to be done in the communities that have been engaged to make sure there is resilience in the water and climate sector and is truly getting inspiration from bottom up ideas.

- iii. Continued discussions on ways to get people and institutions to share climate and urban development information in Lusaka
- iv. Another initiative that has scored success also via Education Partnerships for Innovation in communities (EPIC-N) that universities and governments work together to generate information that informs direct actions. External partnerships for innovation where partners and universities work together .Lusaka City Council has adopted this and signed a memorandum of understanding with the University of Zambia, fully signed. The MoU is a continuation of what FRACTAL has been doing because there are a lot of Fractal ideas in that agreement. Ideas have been aligned to continue the Fractal spirit.
- v. Expansion of the work to add energy component not just water and climate so as to discuss the nexus between water and climate as one cannot be gained without the other. ZESCO as the energy board has been fully active and participating in the activities and engaging on the

vi. Reflections

From the discussions of the day, the round table participants suggested the issues that would be taken forward in the fractal process. The day ended with a cross city connection and discussion as well as set objectives for the following day.



Lusaka roundtable discussants



DAY 2 OF ROUNDTABLE DISCUSSIONS 14/04/21

Summary of day 1

The second day began with a reflection on the discussions on day one. The objective was to identify the key issues from the previous day and determine that would be carried forward, expansion and or introduce in the

area of climate change and climate change adaptation and considered crucial for the City FRACTAL declaration.

Drafting of Lusaka City declaration- building ideas for next chapter of climate and climate change work in Lusaka

A. Private Sector Participation

As a way forward, the private sector participation is key in building adaptation and resilience in climate change although drawing them into the climate space is quite a challenge. It was noted that even at global level public finance will not be enough to fund the projects. However, the challenge would be in motivating the private sector which focuses on profit point of view, except this is done only through mitigation. The following were adopted for inclusion in the declaration and to carry forward:

- i. There is need to **package the dialogue** with the private sector in a way that makes them buy into it as a worthwhile investment and see how it can be translated to the city level. Taking electricity as an example, if climate change is not addressed then it means that water levels will be depleted and the generation of electricity will be affected consequently affecting businesses. It can then be framed as investment in ecological infrastructure and these are things that are beginning to make sense to most private entities.
- ii. **Initiatives such as the green bonds** can easily draw the private sector to participate in the stock exchange where private entities buy them as part of their contribution to the climate dialogue. If the mines for example bought the bonds then this would help the nation deal with climate issues and ultimately we may have better energy generation and have sustainability in terms of how much energy is going into the mining industry. We therefore need more dialogue and this could be a good platform to engage with them.
- iii. **Customising standards** for different sectors so to meet specific benchmarks by using incentives that they can enjoy. One common example where incentives in the private sector are seen is in Agriculture where certain standards have been developed for users to meet and when those standards are met there is great market for their produce. An example is Kawambwa coffee.
- iv. **The private sector is profit driven and this is what drives them:** So if we really want the private sector to be on board then there is need for the stakeholders to be **innovative** by increasing on their profit margins. The private sector needs to be convinced beyond reasonable doubt that they can enjoy low production costs and this can attract them. This can mainly be done on the climate resilience. Any future work that seeks to build adaptation and climate resilience needs to factor in private sector interests.
- v. **Promote investment in the environment:** The private sector has for some time been trying to invest in the environment in order to become resilient and sustainable. In areas like energy, recycling and there are even more investments in building materials that are climate sensitive. It is therefore imperative to identify the role of private players identifying areas where the private sector can play a critical role and incentivize them. For instance private investors wanted to be part of recycling waste and probably generate power from there but there was a lot resistance from the public sector and this has been the biggest challenge. The private investors had ideas of setting up hybrid power plants which uses solar and other mechanisms like burning coal or fossil fuels but these were frustrated because of public policy. Private Investors are capable of helping reach sustainable way of utilizing resources and therefore there is need to have their role identified. Private sector is interested but it is the policy environment and regulatory frameworks which are not conducive.
- vi. Need to contend with the risks posed by the competitive nature of the private sector because their greatest competitive element is cost management. In cost management the private sector does things that are not in the interest of the broader society but in the interest of their shareholders. Therefore there is need to look at the total nature of opportunities and the risks that come with that and there is need to also focus on private sector engagement must go hand in hand with private sector development because it is this that creates a locally driven private sector that is more likely to have the emotional connections to sustainability of the country that may not be there in multinational operations. Questions to pose and modalities to get them at the centre as a commitment. This to be carried forward.

B. Community Participation

The community should continue to be engaged through the bottom up approach and continue to engage the youths who are the future leaders.

C. Policy briefs

As a way forward, the following items were adopted for inclusion in the declaration and to carry forward:

- i. Enhancement of policy briefs by looking beyond civic leaders and push agendas to end up in parliament so that they become law. Uptake of policy briefs need to be pre-panned before formulation.
- ii. Establish mechanisms to engage with government ministries and cabinets cabinet office (particular departments that deal with climate related activities) and government entities so they there is uptake of research into government decision making processes such as public service division. It was noted that multi-layered government engagement is very key for future projects.
- iii. Engage with Parliament to allow us to go and present the declaration that will be made here and start dialogue with them on what has been done over the past four years and the results of Fractal research work and how they can assist in integrating the resolution in various legislation. The establishment of these mechanisms however needs funding and support similar to having a small project created out of the bigger project that will target ministries and higher level institutions for dissemination of research results i.e Research to policy which is critical to filling this gap in the country. This further calls for a broader scale engagement with specific target for uptake of certain things parliament, National Development Council and Cabinet office. The goal of these proposed higher level engagements is to influence large changes in the nation's policies, planning (budgeting) and laws.
- iv. Include more radical ideals via the use of media platforms to influence uptake of research as policy makers only speak when the multitude are speaking. Such initiatives can include television debates where people discuss issues about research and organisations' activities or projects. With the advent of digital migration, channels can be developed and can be called the Zambia documentary channel. A good example is the debate by scientists that was aired concerning forest number 27 and people became aware of the negative implications of destroying the forest on Lusaka's water resources. The media is very influential in taking up some of these tasks on climate. To make science a public good? Roll out wholly and present facts as certain policies are hindering the development in the country but the focus also needs to be emphasised on uptake.
- v. Dynamic knowledge and information management and informal knowledge systems. Having a dynamic knowledge management process forces one to forces one to engage with how they are communicating , generating and sharing the knowledge a lot of which is informal and it is in this informal space that people sometimes people are willing to share what they know. They are also willing to propose the radicle nature to say we have done this and it hasn't worked so how do we now escalate knowledge processes, do we now develop channels to communicate to the public and what channels are being used? when one has the dynamic knowledge focus then they are compelled to engage with some of the radicle and not so radicle ideas but there is need for a system that helps one push things forward.– Therefore unpack knowledge in a way that people understand it including the most "insignificant " person in the community especially for young people who are dynamic and fluid and can ask questions on climate and climate adaptation in theses spaces and outreach will become easier because knowledge will begin to flow even before it is presented in a packaged way. There is need to plan for demonstrative projects by creating smaller projects with a view to making a case for bigger development; contributing to science through the programs that are being developed.
- vi. Create bankable projects which can create a stronger link between climate science and developing programmes because uptake of policy prescription depends on the idea you have been pushing on the ground. Further a stronger connection to project development will build stronger cases to why project funding can be taken up.

If policy makers and the public are to be engaged there should be a mechanism of research to see which policies are impacting negatively or positively on climate change or the enviro moment because facts need to be presented in order to add a voice. Certain policies hinder progress of certain developments in the country. There is need to research and present to the policy makers that this is adversely affecting climate change and climate so that as we are telling them then policy makers will know that you are doing your work.

D. Funding

The main questions that were raised were that who can fund this research, whose agenda are we pushing and what knowledge do we need to make Lusaka a sustainable city?

- i. Identify institutions that can fund the research that will go into creating that knowledge. So that policy should be accompanied by facts.
- ii. Leverage on local funding and create our own agenda and use the platforms that exist in terms of LUWSi.

iii. Institutionalise our own agenda and identify resources within our own system.

E. Stakeholder Collaboration

As a way forward, the following items were adopted for inclusion in the declaration and to carry forward:

- i. Strengthen connection with the Ministry of Local Government and continue engaging with LUWSi.
- ii. Continuity of the project – there is so much opportunity to come up with one or two more projects so that the outcomes of FRACTAL do not die a natural death.
- iii. Climate change is an urgent matter and adaptation is an on-going journey.
- iv. To have programs embedded in institutions like LCC that can be supported by LUWSi.
- v. To have government recognise the private sector and be systematically engaged, their contribution spelt out and how long they will be involved.

Way forward and Conclusion

As a way forward the Lusaka round table participants agree that they would append their signatures/names on both the domesticated Lusaka City declaration and the regional declaration (see appendix 2). The stakeholders resolved to hold a small ceremony to officially sign the two declarations (Lusaka and Regional Fractal) declarations. This event will be held in June 2021 and LCC will be the convener alongside UNZA and LuWSi. The stakeholders resolved to ensure that future projects and applications for grants are informed by the two declarations. On actual physical signing of the two declarations, it was agreed that umbrella organisations such as LuWSi to represent civil society and corporate sector, UNZA to represent research and LCC to represent public sector- will sign the declarations. It was agreed that a small ceremony and cocktail will be held to sign and officially close Fractal project in Lusaka. The declaration was unanimously agreed to be the basis for application for funding for the continuation of the Fractal work and its ideals.

Maputo roundtable



Section I: Activities carried out during the Mega learning lab by the Maputo

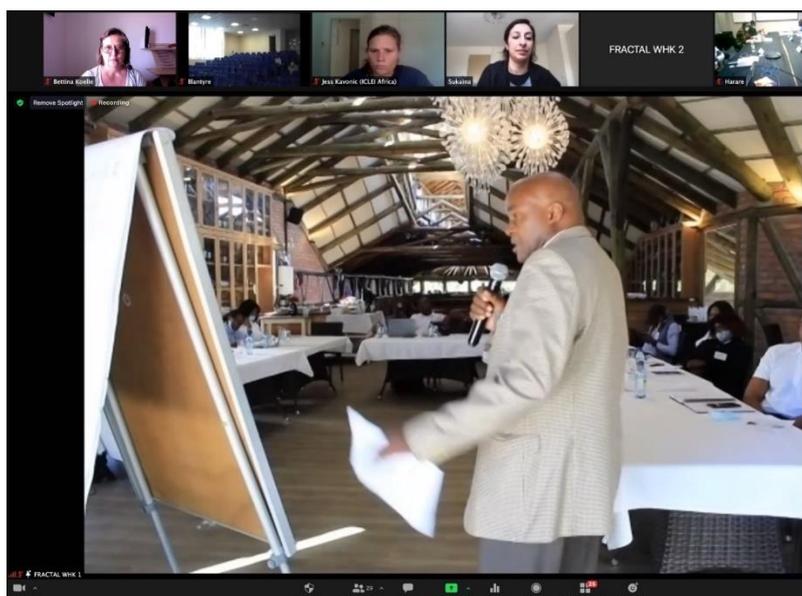
1. State of the report of the activities carried out during FRACTAL phase I submitted for approval by the councilor of the of territorial planning - Awaiting the date for the effect.
2. The Need to request support from FRACTAL for the realization of the Forum on Climate Change in the municipality of Maputo - The municipality of Maputo has approved several environmental plans and projects that aim to respond to the impact of climate change. The holding of this forum is seen as an opportunity to obtain funding for the implementation of these projects.
3. Analysis of the opportunities that the Maputo urban transformation project brings to the solution of the problems raised in the learning lab held in Maputo, related to sanitation, solid waste management, water supply and drainage - There is clear evidence that the financing that the world bank intends to make available for the requalification of the neighborhoods, construction of a new landfill and introduction of the implementation of the principle of separation at the source can reduce the impact of the problems identified for the city of Maputo

Secção II: Roundtables content

During the section II, we revisited the (then) burning issues raised on the initial engagements and how these have been addressed. Issues that were not addressed were identified, namely, Water harvesting and reclamation; WASH (especially water-borne diseases); waste management and flash flood risk maps (An example from Matola City inundation map done by INGC was used as an example for discussing flood risk issue). The roundtable also discussed how could FRACTAL help the Climate Resilience hub and was agreed that it would be through:

- (i) training in climate budgeting matters;
- (ii) Supporting collaboration in raising awareness of climate issues in the city/region, including urban planning;
- (iii) Include the Metropolitan Transport Agency in the discussions on communal urban mobility issues, through assessment of air pollution from the transport sector; and;
- (iv) Co-design training and proposals in climate related matters with the Municipality(ies).

Windhoek roundtable



Windhoek round table noted that in order to take up and continue the FRACTAL journey and march forward the fight for climate change resilience at city level the following were important for discussion:

- Biodiversity management in Windhoek and its importance to city resilience.
- Resource mobilization for climate resilience
- Sustainability – climate champions for driving climate change information and integration at city level.

Setting the scene

To set the scene, Mr. Olavi Makuti, an environmental officer from the city of Windhoek began the discussion by defining what biodiversity is and its importance at city level in order for all participants to have a clear idea of the terminology. He began by appreciating that Windhoek is home to a very rich biodiversity, which provides significant intrinsic values, economic and social benefits and importantly regulates climate change. He noted that natural capital is a crucial part of the city's effort in combating climate change. However, the biodiversity is continuously subjected to increasing multiple stresses emerging from both human land use activities and/or changes, climate change and increasing urbanization, this consequently results in substantial losses. He further noted that CoW cannot be climate resilient if issues of housing and lack of basic services e.g. electricity are not tackled. Thus, a discussion with representatives from Civil Society Organizations, researchers, youth groups and officials from CoW was imperative in order to identify key factors which will propel the city's direction towards achieving biodiversity protection while meeting the needs of the affected people. "Windhoek is all we have" we need to change course in order to protect biodiversity for our sake and that of the future generation to come.

1. Natural capital

The table appreciated that city of Windhoek not only has built infrastructure but there is open spaces in which biodiversity is contained. The state of natural capital was discussed by noting the efforts made and challenges that the city is experiencing:

Current efforts and challenges:

- The CoW made an effort to maintain biodiversity and encourage proper management and use through the development of a biodiversity inventory. The inventory however, is still in its infancy stages and need to be taken a step further in order to promote awareness, integration and encourage implementation.
- Land use planning is important at a city level. CoW need to develop a land use map in order to provide a foresight for future developments while supporting decision making with regards to biodiversity management and promotion.
- The city has a large number of people living in informal settlements who lack or have insufficient access to services like electricity and sanitation. This places more pressure on biodiversity in and around the city as individuals are dependent on biodiversity for food and energy provision, through the collection of firewood.

What to do:

- The city need to develop interventions that protect biodiversity and sustain the livelihood of vulnerable people equally. This can be done through the city's Climate Change Desk. This platform can promote and support the city's effort in upgrading the informal settlements so that they have basic services. In so doing, pressure placed on biodiversity as a result of sourcing materials for energy provision will be reduced.
- Although it is a major challenge at the moment, there is a need to speed up the implementation of the flexible land tenure system through a multi-stakeholder approach. This will increase inclusivity and reduce further environmental damage.
- Upgrade informal settlements, give people development rights to build conventional housing and access basic services.
- Introduce and promote affordable renewable energy technologies e.g. energy efficiency cooking technologies such as energy efficiency stoves and the use of pellets
- Encourage research innovation and development that promotes the greening of the city (can be done through small grants and by using students). Knowledge gathered can help the city understand its biodiversity, how to better manage it and further contribute to city resilience.
- Research approach should encourage ecological connectivity. Meaning, it should involve multiple stakeholders, consider cultural identity and adapt a proactive and collaborative planning process if biodiversity objectives are to be met.
- Promote urban agriculture
- Biodiversity strategy and action plan should be developed. UNAM and CoW Parks Division should work together on this project.

The table also felt that in order to take forward what FRACTAL has achieved, there is a need to address the issues of **governance**.

The following were highlighted:

- Promote the implementation of the Integrated Strategy and Action Plan – Ongoing approval process by the city council. Approval of this strategy will not only be key in addressing climate change related issues at the city level following a holistic approach but decision makers will be capacitated in addressing climate change issues. This will then allow climate change mainstreaming into their decision making process effecting the implementation of the ICCSAP.
- Promote and Implement multi-level governance structure – The multi-stakeholder steering committee for the ICCSAP is a good example as different stakeholders needs will be represented. This will encourage effective implementation and reduce influence from internal issues. In taking FRACTAL's achievements and efforts forward this point was noted to be important in addressing and encouraging city resilience.
- Package climate change information in a way that is useful and understandable to decision makers
- For a more improved and balanced leadership and governance on natural capital and climate change influence, leaders need to be sovereign in developing climate change or environmental related policies.
- Reduce bureaucracy in mobilizing resources that could influence climate change

2. Resource mobilization and sustainability

The table agreed that in order to implement various climate change mitigation and adaptation activities, there is a need to collaborate and source funds, internally or externally. The following were proposed:

- CoW to assign key performance areas to different departments in order to take up different aspects of the ICCSAP. This was believed to promote integration while addressing climate change issues within the city. By allowing various divisions to budget for climate change activities in their own spaces an integrated approach to addressing climate change and achieving city resilience can be attained.
- The table also explored the idea of multi-lateral funding which the city, other stakeholders like institutions of higher learning including other interested parties can generate funding that can address issues of climate change in the ICCSAP.
- Environmental levies were also identified as possible sources of funding for some climate change activities.
- Through the steering committee at the city, the table felt that it is important that this platform is used in identifying some Public and Private Partnerships opportunities.
- Explore multi-lateral funding from EH, GEF and from the GREEN climate fund
- The government should augment the city budget through subsidies in order to fund multiple climate change awareness, mitigation and adaptation efforts.
- Source funding from the line ministry (Ministry of Environment, Forestry and Tourism)

Sustainability

Lastly, the table agreed that there is a need to identify champions that will take up the activities that were planned thus encouraging sustainability in the long run.

In conclusion, the table noted that the points raised were practical and thus it will allow them to achieve and put forward climate change efforts within the city. The table also reflected that although much benefits have been derived from FRACTAL, the city and its partners need to find ways of generating money in order to augment the implementation of the ICCSAP. This will enable them to stay sustainable and move forward in the absence of funding. The table further called for collaborations from local towns and cities in order to share learnt lessons.

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