

FRACTAL PRINCIPLES

Background

During the FRACTAL project, trans-disciplinary learning processes were implemented that aimed to support climate resilient development in nine southern African cities. These processes resulted in several lessons for research and society, particularly with regard to working towards inclusive, contextual, proactive climate research and action.

The team brainstormed principles that underpinned climate resilience work in the project. Evidence from the programme was qualitatively analysed using the principles as a framework to uncover the mindsets and practices that supported 'the FRACTAL approach'.



3 Treating in context

View and treat entities (cities) in their wider context so as to connect current challenges with future planning.

A context led approach to problem exploration and solution generation allows researchers to discern the climate challenges, decision-making scenarios, and national-regional scale priorities.

An inclusive, collaborative learning lab approach helps to develop and fast track an understanding of city contexts and to surface lots of perspectives.

Include activities and dialogue that allow for surfacing of information that is not documented.

"It's not just conceptual joining up the dots, it's about how do you make this relevant, interesting and engaging to the people you are about to be confronted with in a city with a particular context." Researcher.



1 Respect & trust

Listen to one another, support emotional connection and have respectful conversations.

Commit time to investing in relationships.

Design activities to foster understanding of one another, and find common problems and areas of interest.

Maintain transparency with regards to the intentions of different partners and what is (or is not) possible.

Allow emotions to surface to support the complexity of interpreting and using climate science in a way that is meaningful.

"Instead of the scientists being high and mighty, they are people that bring different experience, and it is okay to ask questions. Without the trust... [people] would have an expectation of us to deliver a lecture and would be shocked if we didn't, so without the groundwork laid, it would have been quite tricky." FRACTAL climate scientist.



2 Bigger picture thinking

Acknowledge that risks related to climate variability and change result from multiple interconnected drivers.

Include a variety of stakeholders - different groups of people hold knowledge about the drivers of climate risk.

Humbly present climate knowledge as connected to a wider view.

Meet frequently and preferably face-to-face to "join up the dots".

Exchange knowledge amongst participants to facilitate the development of a *holistic* understanding of climate information, context, baseline challenges, city goals, potential development pathways and decision-making processes.

In Windhoek, the long-term role of the youth was recognised. A workshop highlighted their potential to become climate 'champions' who can help to secure future climate resilience in the city.



3 The social element

Include activities and events that support socialising, bonding and having fun so participants can connect as people.

Initiate activities and events that encourage socialising. Bonding supports the development of a shared desire to collectively solve problems.

Create opportunities to learn in less formal ways and in different spaces, encouraging people to ask questions and to spark different modes of thinking.

Engage with humor and fun in learning processes.

At the 3rd Learning Lab in Lusaka, facilitators set up a popular 'fireside chat'. Experts sat at different tables and learning lab participants could approach them to ask questions in a relaxed space.



4 Catalyse African agency

Work towards African-owned solutions, based on local research and capacity.

Focus on flexibility, iteration and emergence so that contextual needs can emerge and are not imposed from outside. International researchers acknowledge their (lesser) role alongside local researchers and decision makers.

Support existing/emerging climate 'champions' and local problem-solving as well as the mainstreaming of climate knowledge.

Encourage commitment from stakeholders to take ideas forward after a project has ended.

In Maputo, an early warning tool for climate-induced vector- and water-borne diseases was developed based on local research, assisted by the FRACTAL process.



6 Neutral space & enabling process

Well designed programme and well planned process to support cohesion, coordination and effectiveness.

Use third, neutral or 'safe' spaces for engagements with sensitive facilitators so people are able to challenge ideas without being reprimanded.

Design activities to encourage active learning and to value listening as much as talking. Maintain the core agenda while allowing for flexibility and iteration.

Foster relationships between different stakeholders to support learning and collaboration beyond a project's lifetime.

"I think it's the really safe environment that I enjoy... Feeling like everyone's knowledge is valued and how everyone is working together." FRACTAL researcher.



9 Inclusivity & collaboration

Acknowledge the value of all stakeholders, appreciate all input, co-explore knowledge and co-produce solutions.

Enable participatory dialogues by: valuing diversity; using accessible language; creating common ground and showing the importance of collaboration; attempting to remove the power of single dominant knowledge holders; grounding conversations in the real world with which participants can engage; and utilising diverse methods for different voices and information to emerge.

Aim to create a dynamic space for knowledge exchange and solution generation by bridging the gap between researchers, decision makers and other city stakeholders. Demonstrate the common ground between mandates and the value of collaboration.

"Barriers and boundaries were broken down quite a bit; people felt like they were in the room because their opinion mattered. I thought that was very valuable." FRACTAL researcher.



7 Process-driven iteration

Set some explicit overarching goals, but aim to generate methods and outcomes through iterative processes.

Aim to develop context-led, holistic contributions towards usable knowledge.

Support processes that can absorb changes and spontaneity (based on needs), recognising the need for ongoing adaptation, and open to iteration.

"The City of Windhoek was very flexible to the process and the FRACTAL team did not impose anything but allowed the process to shape itself." Windhoek participant on the process of engaging representatives from different departments to explore water security during the development of the city's Integrated Climate Change Strategy and Action Plan.



8 (Un)comfortable differences

Welcome complexity, open-mindedness and be comfortable with different ideas, values, inputs and processes.

Seek to create safe, constructive dialogue by embracing diverse perspectives and learning styles. Allow for moments of discomfort.

Accept differences and contradictions between evidence-based science and complex social dynamics in the decision-making realm in order to foster common ground and terminology.

Move away from a siloed, homogeneous science approach towards a heterogeneous, transdisciplinary approach for forward-looking dynamic co-exploration.

"One is able to move beyond their field and... to speak the language of the other, which is crucially important if we're... going to say something is really co-explored, co-produced, etc." Lusaka researcher.



10 Link current, past & future

Reflect on past experiences, current trends and case studies for learning, adapting and future visioning of development pathways.

Establish connecting current challenges with future planning as a core project objective.

Integrate past experiences, key themes in similar case studies, current city-specific objectives, and future trends with an eye to exploring options for future sustainability.

Create a culture of reflective enquiry within learning processes. This is important for inclusive and extensive problem solving.



The climate risk narrative exercises in the cities supported participants in envisioning climate impact scenarios as if they were dealing with it now, bringing the urgency closer. This prompted active engagement on how negative impacts might be felt, how management actions may have sanctioned those effects, and how less desirable scenarios might be circumvented.



11 Networks & relationships

Building networks and relationships across spaces, skill sets, synergies and expertise.

Establish platforms for communication and developing interpersonal relationships. Also foster relational skills, working in different ways with different people.

Develop regional networks by connecting researchers, decision makers and stakeholders.

City-to-city learning exchanges required substantial coordination but allowed for learning and built meaningful networks across cities. For example, the Durban-Lusaka exchange led to Lusaka participants signing the Durban Adaptation Charter.



12 Embedded researchers

Pronounced role of early career embedded researchers within local city governments to bridge science and decision-making.

Embedded researchers (ERs) work as knowledge intermediaries and use their skills, passions and networks to link climate change information with local priorities in city decision-making contexts.

ERs bridge siloes, build relationships and connect researchers with city stakeholders for maintaining engagement, building capacity within institutions and harnessing receptivity towards climate information.

"The ER is right at the centre of enabling. You need to make sure you bring together the right kind of people that are going to efficiently input into whatever product you want to have at the end of the process." ER.

Further information

FRACTAL was initiated in 2015 as a trans-disciplinary group of researchers from partner organisations across the world.

The research team set out to advance scientific knowledge about regional climate responses to human activities and work with decision makers to integrate this knowledge into climate-sensitive decisions at a city-regional scale. Working across disciplines in the scientific community, the team fostered strong collaboration between researchers, city government officials and key decision makers in southern Africa.

The FRACTAL project completed in mid-2021.

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