# Principles for co-producing climate services: practical insights from FRACTAL

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There is growing emphasis on co-producing climate services, particularly to foster partnerships and mutual learning between stakeholders across the climate services landscape. This brief contributes to the body of knowledge on principles for co-producing climate services by reflecting on and sharing experiences from the Future Resilience of African CiTies and Lands (FRACTAL) project. FRACTAL was implemented from 2015-2021 in nine southern African cities as part of the Future Climate For Africa (FCFA) programme, with the main aim of co-producing climate knowledge that could inform climate-resilient urban development. Through transdisciplinary learning processes, which were anchored by "learning labs", societal stakeholders worked with researchers from various disciplines to co-explore decision contexts, identify knowledge and capacity needs, and co-design activities to respond to these. A retrospective and reflective study was implemented near the end of the project to identify principles that supported co-production of climate services during FRACTAL, as well as the practical activities and efforts from which these principles emerged. Principles that were identified as particularly important include:

**Respect and trust**: listening to one another and supporting emotional connections.

**Bigger picture (systems) thinking**: acknowledging that climate risks result from multiple interconnected drivers, and that different groups of people hold knowledge about these drivers.

**Treating in context**: context-driven climate research (i.e. context-led approach to exploring problems and thinking about solutions).

**The social element**: including activities and events that support socialising, bonding, connecting as people and having fun.

**Catalysing (local) agency**: Locally-owned solutions, based on local research and capacity.

**Work in neutral spaces with enabling processes**: a well-designed programme with objectives, boundaries and a carefully managed process at all scales (project scale, city scale, project team scale).

**Process-driven iteration**: some explicit overarching goals were set, but methods and outcomes were generated through iterative processes in which learning and reflection were important.

**Transdisciplinarity and (un)comfortable differences**: a transdisciplinary approach that is welcoming of complexity, integrates different types of evidence, encourages open-mindedness and is comfortable with differences in ideas, values, inputs and processes.

**Inclusivity and collaboration**: a genuine acknowledgement of the importance of different stakeholders, an appreciation of all input (voice equity).

**Linking the current with the past and the future**: constructively reflecting on past experiences and current trends for learning, adapting and future visioning.

**Networks and relationships**: building networks and relationships across organisations and knowledge domains.

**Embedding researchers**: pronounced role of Embedded Researchers (ERs).

Many of the FRACTAL principles are similar to those that are documented in literature on principles for co-producing climate services more generally. However, several conceptual and practical developments were gleaned by reflecting on FRACTAL experiences, namely:

- engaging emotions of transdisciplinary participants and enabling personal relationships across stakeholders;

- presenting scientific information (e.g., forecasts and/or projections) in a "humble" way (i.e., not making climate information the focus);
- engaging in context-led (not context-informed) research through immersive transdisciplinary learning processes;
- directing specific effort and resources towards enabling participants to have fun and to socialise;
- facilitating active learning processes that support agentive action amongst participants of transdisciplinary processes;
- facilitating a "third space", in which participants can engage as equals and critically reflect on their practices in "home spaces";
- "trusting the process" (i.e. encouraging iterativity);
- acknowledging that often there is no single right answer in such complex social and decision contexts;
- using topical, contemporary development and resilience issues to help a variety of participants to meaningfully interrogate climate risks in the future;
- introducing a pathways framing to link current decisions with the past and future;
- emphasising the importance of learning networks across regions; and
- embedding researchers in decision-making contexts as pivotal transdisciplinary researchers and knowledge brokers.

When face-to-face engagements were not possible in 2020 and 2021 as a result of COVID-19, the FRACTAL team built on much of the social capital that was established prior to the pandemic. Several principles were strengthened through virtual methods e.g., such engagements allowed a diversity of stakeholders to take part in transdisciplinary learning processes, which supported 'inclusivity and collaboration' and 'networks and relationships'. These engagements did, however, introduce challenges for applying some principles, particularly when participants battled to secure connectivity to support effective online engagement. In these instances, FRACTAL attempted to support engagement by purchasing technical equipment and data bundles. Another challenge associated with virtual and/or hybrid engagements related to challenges for facilitators and participants alike to notice body language and subtle facial expressions of other participants, which are important in relational learning processes.

*Figure 1. FRACTAL participants engage in a learning lab game*

While people across the globe increasingly strive for effective and meaningful co-production of climate services, there is also a growing acknowledgement that there is no single 'recipe for success' to enable this way of working. A set of guiding principles, such as those presented in this brief, provides a more flexible and adaptable approach for guiding co-production. It is the hope of the FRACTAL team that these principles will be applied and tested in follow on work to better understand their applicability and universality. For more information, see the full working paper on "Principles for co-producing climate services: practical insights from FRACTAL".