Innovation ecosystems for climate tech in Africa:
Seizing opportunities to place local context at the heart of investments focused on climate change

Final report

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About the author: Sam is a researcher based at Chalmers University of Technology in Sweden. His research explores the role of different people and places in systems change. He has a particular focus on how systems change is envisioned between the Global North and South, and on how efforts to drive change (primarily investment and innovation) can be done in a way that maximises benefits for a wide range of people and places while minimizing risks and negative impacts.

About Katapult Africa: Katapult Africa, in collaboration and with support from the UK-Funded RISA Fund, is furthering our scope of activities, drawing on research to further inform our investment and acceleration strategies, and engage and build the innovation ecosystem, working across RISA sectors of innovation, climate and agriculture. This initiative will further support our tailoring of the Katapult model to Africa and align with RISA fund objectives of innovation system strengthening, and strengthening synergies between research and innovation systems. More about Katapult on www.katapult.vc

Executive summary

The objective of this research was to understand how Katapult and the organisations it collaborates with envision different aspects of the African climate tech innovation ecosystem. The research investigates how the innovation ecosystem for climate technologies is understood or desired to function, how the arrival of finance alters the circumstances of recipient organisations, and what "careful" or "context-sensitive" practice by ecosystem actors (especially investors, investment intermediaries and technical assistance providers) might look like. This report was informed by interviews with 23 respondents conducted in November and December 2023. These respondents are a combination of upstream investors based outside the African continent, investors based within Africa, technical assistance providers to the innovation ecosystem and founders of active startups.

Respondents envision an ecosystem with innovations which serve the needs of a multitude of different actors, existing in different overlapping ecosystems and with varying degrees of proximity to "local" contexts and end users[1]. There is broad consensus regarding the positive impact that well-designed investment into the ecosystem can bring. There is similarly broad consensus that innovations are highly valuable when they are tackling the concrete needs of end users, typically within sectoral production ecosystems such as agriculture or aquaculture. However there is recognition that innovations are often also designed to service the needs of other actors (both within the ecosystem and from other systems) including the widely varying needs and priorities of external investors. Some ecosystem actors speak very positively about their experiences with investors who have a deep understanding of local needs. Other respondents describe demands made by investors which may be burdensome; and critique the import of technologies and development of ecosystem infrastructure in Africa perceived to primarily reflect the expectations of overseas investors. While actors may debate the extent to which specific technologies and infrastructures are imposed from outside, this nonetheless indicates that key aspects of the ecosystem may be perceived by actors very differently; and may symbolize positive or negative views of the ecosystem more broadly (e.g. as something more homegrown or more imported).

Respondents describe how the experience of founders receiving investment is a complex process, containing a mix of clearly desirable changes (e.g. ability to hire more staff, invest in technology and leverage investor networks); alongside changes with a mix of positive and negative aspects (e.g. streamlining the business model to no longer serve the poorest customers); or less desirable changes associated with substandard investment practices (e.g. being pressured by investors, or the trends of the global tech innovation ecosystem more broadly, to use externally developed "flashy" technologies which do not fit the local context). Other concerns raised by respondents include that the ecosystem excludes potential entrepreneurs based on income level, gender and also geographic location (i.e. if an individual does not live in, or is unable to travel to, the regional ecosystem hubs of Rwanda, Nigeria, Kenya and South Africa). There is a sense that possible entrepreneurs may be deterred or unable to participate in the ecosystem if their backgrounds, daily lives and commitments do not fit the entrepreneurial archetype which some respondents feel is signaled by the current funding landscape. Respondents point out that many African citizens would struggle to participate in the current ecosystem as founders due to their lack of disposable income to take risks with, as well as day-to-day responsibilities (for example to their families) which limit their flexibility. End users are also often envisioned more as passive recipients of innovation as opposed to active agents.

There is almost[2] total agreement that local contexts should play a central role in investments made into the African Climate Tech Innovation Ecosystem, and that context-sensitive financing represents a significant investment opportunity. However there is also consensus that it is not easy to get right, that there is no "silver bullet" to context-sensitive practice, and that historically it has often been overlooked due to imbalances of power weighted in favour of overseas investors who look for startups that resemble innovations in their home markets. Nonetheless, respondents agree that many actors in the ecosystem are working hard to overcome these challenges. Best practices

[1] "Local context" is understood throughout the report to refer to the context of the end users, who are those individuals expected to ultimately derive benefits from innovations. For examples end users may use technologies, access platforms or undertake activities differently. This is typically a startup's customers, for example farmers accessing better crop inputs, although depending on the business model the startup's direct customers may be an intermediary who then extends products or services to end users.

[2] For caveats to the role of context, see section 4.4 sub-heading "Caveats to the importance of context".

highlighted by respondents include having investment teams with a strong mandate located within African countries; having finance flows which are tailored and sensitive to fit local contexts (including working with local capital providers); having founders who are embedded in, and feel encouraged to place emphasis upon, local contexts; establishing trusting founder-funder relationships which facilitate honest and open exchange; leveraging local educational institutions as sources of innovations and entrepreneurs; and approaching founding and funding on a case-by-case basis.

To help seize opportunities and address challenges within the African Climate Tech Innovation Ecosystem, the following strategic areas of focus and indicative recommendations for investors and technical assistance providers are proposed:

1. Directing finance towards systems change

A. Increase finance available for climate tech innovation both *in* and *for* countries in Africa. There is broad consensus that funding flows which reach founders are driving material benefits for end users, and there are great opportunities for further investment. While there are complexities and risks associated with investing – as there are in any domain – these should not deter investors from investing in what is recognized to be a growing, vibrant and impactful ecosystem. One of the strategic impact logics described by respondents in this report relates to the reallocation of finance in global capital markets towards founders innovating within African countries for African citizens, and investors can play a key role in making this a reality by scaling up finance flows.

B. Describe the systems change you want to see as an investor (if applicable) in clear and unambiguous terms**.** If investors have an impact-related mandate, they can lead by example in the ecosystem through clarity and integrity in describing precisely which systems are envisioned to change through investment (i.e. primarily sectoral production systems) – and which stay unchanged. Create space for healthy and sensitive discussion around this, recognizing that the ecosystem recruits from a global talent pool are likely to have differing perspectives on which systems they think may need to change to achieve meaningful impacts..

2. Aligning investor priorities with end user needs

A. Reflect carefully on the needs that investors may be communicating (explicitly or implicitly) to founders. There is a wide array of investment needs from current and prospective founders, and a similarly wide array of financing modalities required (including for example grants, equity, debt and guarantees). Different financing modalities understandably require different kinds of demands and expectations from the investor side. Some expectations may be explicit (e.g. an expectation of a certain rate of return) or more implicit (e.g. a right to offer advice on technology decisions) and will vary a great deal between investors. Investors can proactively and transparently engage in dialogue about possible demands and expectations to build trust in the ecosystem; and send a coordinated and coherent signal to founders that the needs of end users should not be in competition with investor demands.

B. Work with founders to "localize" what climate change priorities can mean within the contexts that founders are working within, when investing specifically for climate change-related impacts. This is such that innovations have local needs as a starting point which then build in climate change considerations (while remaining rigorous in responding to the best available climate change science). Upstream investors can trust founders to deliver climate changed-related benefits *through* – rather than overriding – more localized priorities.

3. Bringing a wider range of founders and end users into the ecosystem

A. Invest in building strong and inclusive networks within the ecosystem which can easily connect actors between scales (i.e. international-national-regional-local) and showcase context-sensitive startups and finance flows as best practice within the ecosystem.

B. Seek out founders from communities of the end users who are ultimately intended to benefit from innovations, particularly founders working withing sectors such as agriculture who differ across categories such as income level, gender and age, including those whose needs may be overlooked by the current ecosystem. It can also be considered a strength that founders actively involve end users in the earlier stages of innovation, while keeping focused on developing viable products and services.

C. Broaden the geographic footprint of ecosystem activities where possible beyond the current regional centres, as well as taking the ecosystem to excluded persons, to develop an ecosystem beyond European and American

innovation system archetypes. This could include actively seeking founders from, and forging partnerships with, institutions across geographies which are accessible to a wider diversity of persons than the current ecosystem (i.e. technical colleges, cooperatives and informal institutions).

1 Introduction

Katapult has collaborated with a research consultant, Sam Unsworth, to investigate the innovation ecosystem related to climate technologies in Sub-Saharan Africa. The research design traces flows of finance related to climate technology innovation in Sub-Saharan Africa both upstream and downstream of Katapult. We have conducted interviews with key partners of Katapult to understand how they envision the innovation ecosystems which they work within and what good practice or examples of success are understood to look like. The hope is that this research may help Katapult and its partners - and the ecosystem more widely - move towards context-sensitive financing of climate technology innovation in Sub-Saharan Africa.

This research is structured around the following research questions, which have guided the research process:

1. How are investments, innovation and impact envisioned by organisations working with finance for “climate technologies”? What logics and narratives connect these visions of change together?
2. How are innovation ecosystems related to “climate technologies” envisioned in Sub-Saharan Africa by practitioners who play a role in - and potentially intervene with - these ecosystems? How and why do they seek to intervene?
3. What do flows of finance seeking to foster climate technologies “do”, in terms of material changes at more localized scales?
4. What kinds of practices could help to ensure that efforts to foster innovators and innovation ecosystems related to “climate technologies” are sensitive towards the localised contexts they seek to benefit?

This report begins by describing the research methodology in Section 2, followed by a brief summary of relevant background literature in Section 3. Section 4 summarizes the results of the study, structured around the four research questions above. Section 5 concludes with recommendations and potential directions for further work.

2 Research methodology

The primary research method used was semi-structured interviews combined with review of documentation and grey literature. Interviews were conducted during November and December 2023. 20 interviews were conducted, with a total of 23 individual respondents engaged (three interviews were attended by two people) from across the ecosystem. Following completion, audio recordings of all interviews were transcribed (maintaining requisite standards of data protection in line with the Data Processing Agreement) and then coded for themes using the software Nvivo.

To respect the promise of anonymity, all respondents’ views are fully anonymized, and the report does not indicate whether an individual respondent, if quoted, is upstream or downstream of Katapult. The analysis should be understood as a synthesis of the different visions, opinions, perceptions and perspectives shared by respondents, as opposed to a study aspiring towards an objective or “true” description of the ecosystem. Nonetheless, the text indicates when a particular view is shared by many respondents, and also quotations from the interviews are included throughout to demonstrate the rich detail provided by the respondents.

While the research design focuses on networks of actors connected to Katapult, respondents refer both to activities involving Katapult as well as broader activities they see and are involved in within the ecosystem. As such, this report should not be read as an evaluation of Katapult and is instead an exploration of the broader ecosystem which Katapult and other organisations operate within. References to investors, for example, refer to the array of organisations investing in the ecosystem rather than Katapult alone. The different groups understood by respondents to constitute or connect to the Africa climate tech innovation ecosystem, described in more detail in section 4.2, are as follows:

- Investors and grant finance providers
- Technical assistance providers
- Startup founders
- Governments and regulators

- Educational institutions
- Ecosystem conveners and commentators
- End users expected to derive direct benefits from innovations
- Sectoral production system actors (e.g. large agricultural firms, supply chain intermediaries)

While the interview questions placed emphasis on climate technologies specifically, many respondents spoke in general terms about technology innovation ecosystems, considering climate to be a subset of this wider ecosystem which is primarily differentiated by the desired impacts and the kinds of funders associated with this as a priority as opposed to being a fundamentally different ecosystem.

This study provides valuable insights from respondents regarding the African climate tech innovation ecosystem. It nonetheless has several limitations. Most notably, it is only a product of the respondents that engaged with the study. Several other respondents were unavailable for interview, which could have given the study a different composition. Furthermore, the author's identity as a European researcher commissioned by Katapult may have affected some of the responses provided, given the sensitivity of some of the topics discussed, as well as the fact that many of the respondents receive funding from Katapult. Nonetheless the interviews were conducted in an open and candid spirit and we believe they point towards several areas valuable for discussion.

3 Literature overview

3.1 Exploring who participates in climate technology innovation

The value and urgency of spurring innovation to address societal challenges such as climate change across the world is widely recognised (OECD, 2023). Related to this, there is also recognition of the importance of moving away from hard distinctions between innovation and diffusion/adoption which imply lower income countries are primarily sites of the latter (Zanello et al., 2021; Unsworth et al., 2023). Looking ahead, countries in Africa or the continent as a whole is increasingly envisioned as a hotbed of innovation and as a testbed for developing new solutions both for Africa and the world (Molla & Birru, 2023), generating jobs and wider economic development for the next generation of Africans in the process (Fox & Signe, 2022).

The concept of innovation has nonetheless been critiqued as originating in Europe and America and having a tendency to prioritize activities perceived to be "hi-tech" and undertaken by privileged actors with connections to overseas technology systems, educational opportunities and networks over more localized alternatives (Mavhunga, 2017). This connects to analyses of the comparative underperformance of innovation ecosystems in lower income countries being related to comparatively weaker education systems (Zanello et al., 2021). Enduring levels of inequality in African countries have been directly attributed to the inequalities in opportunity which are accessible to people on the continent, with such opportunities concentrated amongst a select few (Shimeles & Nabassaga, 2018). While this indicates a potential role of emerging innovation ecosystems to redress these imbalances, it also focuses attention on who is able to participate in these ecosystems, noting that economic growth (an outcome commonly associated with innovation (see Unsworth et al., 2023) in African countries has not been observed to automatically lead to reductions in inequality (Bhorat et al., 2016).

3.2 The role of investors in considering local context

Volumes of climate finance continue to increase (Bennett, 2023) in order to match both the urgency and scale of tackling climate change. Nonetheless, the gap between current financing available and the volume required for African countries to respond to the challenges presented by climate change[3] remains substantial, with USD 2.8 trillion required between 2020-2030 and current annual flows standing at only USD 30 billion (Meattle et al., 2022). More specifically, there is growing recognition of the need for – and diverse benefits associated with – investment in both climate mitigation and adaptation (Dicker et al., 2021). Concurrently, there are calls for increased investment into African technology innovation systems to kickstart economic development and job creation on the continent (Gurib-Fakim & Signé, 2022; Maher et al., 2021; Yongabo & Göransson, 2020). While the importance of such investment is clear, there are nonetheless risks associated with increasing investment in terms of its effects on local contexts. Several scholars

[3] Understood here as the Nationally Determined Contributions submitted by African countries under the Paris Agreement – see Meattle et al. (2022).

have alleged that innovation ecosystems at present serve the needs of donors more than local priorities. For example Nakyeyune (2022) in a comprehensive analysis of the technological innovation system for cooking in Uganda, finds that the system continues to be led by and reliant upon donor funding and preferences. This has led to a "structurally thin" ecosystem with little resilience to variations in external funding and limited capacity to innovate domestically. Some scholars argue that lower income countries are gradually becoming connected to sites of globalised capital accumulation which concentrate wealth from multiple locations in typically higher income countries or amongst elites in lower income countries (Harvey, 2004). These critiques can be understood as emphasising the importance of making investments in a careful way which is conscious of their possible wider implications for local contexts.

3.3 Innovation as substitution vs systems change

Literature has also explored what kinds of change and innovation are required to address societal challenges such as climate change, in relation to calls for – and claims by some ecosystem actors to deliver - "systems change". Distinctions have been drawn between innovation which explicit seeks to drive systems change, as opposed to innovation domains such as eco innovation which focus more on substituting components of a system without altering its overall design (Köhler et al., 2019). This raises questions around what the innovation within the ecosystem seeks to achieve, and which (if any) systems the innovations seek to change. More broadly, there are widening perspectives regarding the relationship between climate change and the global capital system which the African climate tech innovation ecosystem connects to; ranging from "capitalist realism" i.e. a belief that capitalism, while flawed, is the best system we have and that we therefore work within; to "capitalist catastrophism" i.e. seeing the system as the root of the world's problems and believing that even well intentioned initiatives will exacerbate inequalities within this system (Heron, 2023). Recognising the existential threat posed by the climate crisis, it is likely that individuals working within the ecosystem may increasingly reflect upon - or be subject to questions regarding these underlying concerns - in the coming years.

4 Results

The following results are structured around the four research questions. First the views of respondents are summarized, in response to each question. Quotations from the interview data are included throughout, labelled and numbered with "Q" to connect them to the text.

4.1 How are investments, innovation and impact envisioned by organisations working with finance for "climate technologies"? What logics and narratives connect these visions of change together?

Innovation is envisioned in several different ways by interviewees. This sub-section begins by summarizing the aspects of innovation which are emphasized by respondents – including processes, locations and outcomes of innovation – followed by the logics which connect innovation to investment and impact.

4.1.1 Aspects of innovation which are emphasised

- Processes and locations of innovation: one of the most commonly occurring understandings of innovation is that it occurs when technologies developed outside the African context are somehow contextualized to fit the realities of end users, encouraged by investors looking for relatively proven solutions (Q1, Q2. Some respondents note that this approach has drawbacks in terms of regional ecosystem strengthening, but rather that it is simply "the cheapest route and it's the fastest route…and to be honest I can't really fault [the investors]. It's the right business move". In contrast to this, another commonly occurring understanding is to emphasise innovation originating entirely from a local context, responding to local needs (Q3). Related to this, some respondents explain how they are, as locals themselves, intimately familiar with the national context from which their innovations are developed. Rather, the location to which their solution must be contextualized - and which becomes a key location in their innovation process - is the global tech innovation and capital system, typically populated by international actors and requiring different codes of conduct to their home countries (Q4). While these understandings are by far the most common amongst respondents, other less common perspectives on innovation include placing more emphasis on a combination of imported technologies and local development in innovation; on the importance of rigorous testing, feedback and iteration with users (regardless of where the solution was developed); or also on a more future-oriented innovation understanding which envisions African countries coming together to form an innovation "sandbox" within which innovations are developed and tested at national or subnational level before being translated to other national or global locations.

> *Q1 "It makes more sense for investors to find a technology developer in South Asia where there's more track record of successful technology companies growing, scaling, and ensuring there's investment and finding ways to modify the technology and implement. In Africa, if you're looking for sensor technology for aquaculture for example."*

> *Q2 "The way that I think about it for Africa and our presence there, it's a bit more for them to get access to technology, as opposed to driving the development of new climate tech solutions."*

> *Q3 "They are looking for African solutions first, meaning that these solutions are coming from the context. And they're not necessarily supporting European solutions to scale in the African context"*

> *Q4 "Outside Nigeria there is a way and manner of doing things so that the world of business and finance understands. And if you don't have that way and manner, then you are not seen as a credible person to back. That way and manner is what I learned at Yale. How to present an idea in a structured manner, how to use the right words in an investment committee meeting."*

> *Q5 "The role of the end users [in innovation] would be just to understand and adopt these technologies that are being delivered to them. Understand the rationality behind the shift, adopt and take the impact for their lives."*

The people emphasized in innovation similarly vary depending on which kinds of locations and processes are

emphasized. It is common for respondents to emphasize the role of end users as passive adopters of innovations, who will derive benefits but will play little role in the innovation process itself (Q5). Others, connecting to the emphasis on testing and refining above, envision a more active role for users as co-developers of innovations. Several respondents also reflect over the identities of the innovators themselves, pointing out that many Africans recognized as innovators tend to come from "elite" settings and that more efforts are required to give opportunities for innovators from technical colleges and lower income settings more broadly, particularly to women innovators.

- Outcomes of innovation: The most commonly emphasized outcome of innovation is tackling of the challenges facing African people today, particular systemic challenges spanning climate change, agriculture and food tech, and more broadly improving the daily lives of people by addressing their needs (Q6). Related to this, another outcome emphasized on the innovator's side is that startups and entrepreneurs become individually competitive to raise funding and scale across locations. Another commonly occurring outcome of innovation emphasized from a technological perspective is that the daily lives of all Africans - including end users (whose practices are described by some respondents as "traditional") - are transformed such that emerging technologies such as AI play a greater role (Q7). Some concerns are expressed about this process, but that there is little choice but to make the best of this process for the African continent as opposed to being left "behind".

> *Q6 "The innovation that's happening right now in the West, for example, in Silicon Valley out of the US, is sort of more of consumerism and social innovations. While if you look across Africa …I feel like we're solving real life problems."*

> *Q7 "All sectors I would say, are dependent and driven by tech and innovation. If you look at this modern world that we're living in, where AI is dominating every aspect of our lives, there's no way you cannot have technology driving every sector development, unless you don't want to develop with the other part of the world."*

A more critical perspective is that the outcome which innovation activities often lead to is the perpetuation of an innovation ecosystem in which the main objective is to secure further funding for fundings' sake, rather than scaling or meeting user needs.

Some respondents allege this process is ultimately led by the preferences of external investors and industry trends. Under such an understanding, a typical outcome is that "flashy" technologies and workspaces understood to reflect foreign ideals around innovation risk becoming prevalent in the African ecosystem (Q8). This can be understood as an undesirable alternative to innovation outcomes which are more embedded in addressing concrete problems.

> *Q8 "In the name of innovation, I've seen a lot of founders say "oh, there's this great climate crisis" and "now we've built this super [technology] that does this and that"…but that doesn't really do it in the long run. It just doesn't solve any problem"*

4.1.2 Logics connecting innovation to investment and impact

Respondents have highly varying approaches to describing how they think innovation activities can lead to impact. Across this variation, it is possible to recognize needs to be addressed, investments which are required and possible impacts which may result. These are summarized in Table X. Innovation, described above, can be understood as the link which addresses these needs, utilizes these investments and drives impact, embodied for example in Q9.

> *Q9 "if you invest in an entrepreneurial idea, if that idea succeeds, it's solving a social problem on the continent, it's enabling access to jobs, it's potentially improving economic revenue or GDP for that country. It's overall much more sustainable as a way of economic development than just handing out stipends to poor people. I think there needs to be less reliance on overseas capital."*

It is notable that these needs, investments and impacts are described at varying scales. For example, some needs are described in very contextually specific terms (e.g. the needs of a certain group/place/supply chain). In contrast with this, other needs may be described at a more aggregated scale; such as the need of the venture capital industry for sufficiently fast-scaling investments. Furthermore, needs and potential impacts can also be identified at the broader African or even global scale, for example in relation to the structure of global

capital markets or even the capitalist world system. A key trend is that climate change is recognized by many respondents to be of central importance, particularly in terms of the broader economic and social benefits which underpin increased resilience to climate shocks and longer term changes. Nonetheless, respondents also note that from an end user perspective, climate change itself may not be seen by them as a primary “need”, reflecting that it isn’t understood to be a day-to-day priority by most ordinary African people. While the potential impact of greater climate change resilience is considered of great value for end users, several respondents comment on the fact that climate change-related investments appear most effective when derived from concrete economic or social benefits desired by end users which also build resilience to climate change.

Table X: Connecting logics of needs, investments and impacts across the respondents

	Needs	Investments required	Impacts
Local and sectoral scale	● Needs identified bottom-up by founders which are complex across users, context-specific, fitting spending habits and capacities ● Need of farmers for healthcare ● Need of farmers for more productive land ● Need to reduce losses in supply chains ● Need of farmers for knowledge on inputs and accounting	● Revenues from customers which are re-invested by startups into business to grow company (key indicator of a promising startup) ● Investments by sectoral product/service providers in form of product discounts offered to startups (part of startup's value proposition)	● Greater resilience (including to climate change) of individual end users e.g. healthier and higher income families via access to better technologies, products, services and practices ● Less financial "handouts" to end users ● Sectoral systems change e.g. more productive and resilient supply chains
Startup / founder scale	● Need for capital to facilitate scaling ● Need of poorer people to have pathways to become entrepreneurs	● Investments into tech startups servicing key sectors (e.g. agriculture) for early growth ● Impact-focused investment looking beyond short-term financial performance ● Early VC investment crowds in other investment, facilitates scaling	● Repeated positive feedback loops for startups of raising finance and scaling ● Locally developed solutions which match the community's problems ● Technology solutions which scale rapidly across geographies, making founders and investors wealthy (considered negative by some when "copy paste")
African innovation and investment ecosystem scale	● Need of venture capital for scalable ventures ● Need of NGOs to reposition themselves away from traditional aid ● Need to invest NGO reserve capital ● Need of certain investors for "flashy" technologies which align with short term industry investment trends (considered detrimental) ● Need of climate change-focused projects for entry points in local communities which do not consider climate change a priority	● Targeted investments to fill gaps and build the ecosystem (although a risk that such investments may include poor quality or contextually insensitive investments)	● Examples of successful startups ● Economic returns for investors in African innovation ecosystem ● Growth and maturation of the African innovation ecosystem ● Trust built between actors ● Context-sensitive investment means less investment in "flashy" trend-driven startups, more investment where user needs are
Wider African scale (e.g. macroeconomic issues and goals)	● Need for jobs in African economies ● Need to stabilize African economies via tech-driven prosperity ● Need to address food security of continent ● Need to move away from traditional cooking methods ● Need for education in emerging technologies for catch up ● Need for greater resilience to climate change impacts	● Investments from LPs (including African LPs) which deliver returns which remain in Africa and are recycled out into the wider African economy for further economic benefits rather than repatriating to outside the continent	● Greater reliance on African rather than overseas capital ● Increased quantity and quality of employment opportunities ● Reduced poverty and inequality ● Greater resilience to climate change
Global macroeconomic scale (e.g. global capital markets,	● Need of global agriculture firms for supply chain sourcing data as a result of broad critique of supply chain injustices ● Need of higher income countries for carbon offsets ● Need of higher income countries for innovative trading parners ● Need of product and service retailers to access new markets	● International investment attracted by startups with diaspora founders ● Capital redirected away from higher income countries / climate-damaging assets towards lower income countries / climate-resilient assets	● African startups influence global landscape ● Global capital markets are realigned to support better societal outcomes and reduce inequalities between Global North and South ● Progress towards SDGs

recognized global issues/goals)	• Need to utilize globally emerging technologies • Need to disrupt extractive capitalist world system (not considered to be addressed by respondents) • Need of international actors to collaborate with DFIs	• Future investors from global elite universities more inclined to invest in Africa • Investments by international agriculture firms • Carbon finance from high income countries	• Extractive capitalist world system fundamentally altered (not considered to be addressed by respondents)

4.2 How are innovation ecosystems related to "climate technologies" envisioned in Sub-Saharan Africa by practitioners who play a role in - and potentially intervene with - these ecosystems? How and why do they seek to intervene?

4.2.1 Navigating between ecosystems

Respondents envision several different ecosystems within which they position their own activities, culminating in a complex array of systems.[4] The definition of each ecosystem is blurry and varies between respondents, but it is possible to demarcate the following two ecosystems understood to be focused specifically on innovation:

- The African technological innovation ecosystem. While most respondents described this ecosystem in Pan-African terms, they noted that in reality the ecosystem is focused on specific country nodes where ecosystem activities are concentrated (typically those with favourable infrastructure and regulations). This is the ecosystem that most respondents described in greatest detail – while the focus was specifically on climate tech, this appears to form part of a wider innovation ecosystem looking across technological domains. Key players can be summarized as follows:

    - **Investors and grant finance providers**: These include investors providing debt or equity at commercial rates, those investing at concessional rates (for example impact investors) and also actors providing grant financing or other products such as guarantees, with providers of different kinds of capital having similarly varied expectations for how investments should perform. These actors include Katapult and other regionally-based early-stage funds, international investors based elsewhere but focused upon African countries (e.g. DFIs, family offices) as well as national government funding for innovation. Beyond these relatively typical actors, respondents also place emphasis on the critical role of the family and friends of founders providing very early-stage financing before investors like Katapult become involved, as well as high net worth individuals, often members of the African diaspora, who are cited as key early-stage investors with a greater understanding of the risks and contextual sensitivities of investment in Africa than typical investors. Investors like Katapult provide additional technical assistance in addition to investment, which several respondents consider to be a key asset due to the strength of Katapult's networks.
    - **Technical assistance providers**: Several respondents discuss the accelerators and incubation programmes offered by various actors, often in connection to donors and NGOs. While these are recognized as playing an important role by several respondents in early-stage startups, they are also somewhat criticized for exerting undue influence on the direction of the system. Other technical assistance providers who are more positively appraised by respondents include knowledge partners such as talent scouts and other intermediaries who help investors not fully embedded in the local context to understand and identify promising investment opportunities, as well as mentors who help guide founders in their journey.
    - **Founders**: Several founders emphasized the value they derive from interacting with this ecosystem, particularly in raising capital as well as building their networks through activities such as Katapult's accelerator programme. Nonetheless, several founders did indicate that they only sparingly spent time engaging with this ecosystem, with most focusing more on their sectoral production ecosystem (described below) which typically includes their end users and revenue streams.
    - **Governments and regulators**: The role of governments and regulators is broadly recognized, particularly around setting policy direction and managing intellectual property. Several respondents pointed out how countries like Rwanda have clearly made their role in the African innovation ecosystem a strategic priority, with activity increasingly concentrating in a small number of countries.
    - **Educational institutions**: Several respondents emphasise connections to elite global universities such as Stanford, Yale and Oxford, both in training entrepreneurs and providing knowledge inputs. However, respondents also indicate a desire to refocus the ecosystem towards local rather than overseas universities, as well as technical colleges, to enable the ecosystem to source founders from a

[4] The description of ecosystems do not necessarily reflect what the author believes to be an accurate description of the ecosystem, but rather a synthesis of perspectives shared by respondents.

more diverse range of backgrounds. This is reflected by the way some existing founders emphasized the key role of their elite boarding school and its networks in helping them become a successful entrepreneur.

- **Ecosystem conveners and commentators**: Other actors are focused upon corralling and building relationships between ecosystem actors, for example in hosting events, as well as volunteer networks such as Africa Tech Vision. Specific media outlets are also cited as playing an important role in facilitating knowledge sharing within the ecosystem, as well as data on investment opportunities. Nonetheless one respondent raised concerns about how the infrastructure and events of the ecosystem give off an excessively globalized impression of the ecosystem.

- The global technological innovation ecosystem. No respondents placed emphasis on specific actors or roles being played by this ecosystem and it is not discussed in precise terms. Nonetheless, this ecosystem is understood by several respondents to generate many of the general-purpose technology inputs (e.g. app platforms, IoT components and software, AI programmes) which founders subsequently work with and find use cases in their contexts of focus. Similarly, the ecosystem is a source of mentors for African entrepreneurs, with respondents emphasizing the value of exchange across geographies. More negative perspectives on this ecosystem include that the global IP system is not effective in protecting the ideas of African entrepreneurs at present. Similarly, other respondents alleged that international investors encouraged their startup to work with an overseas technology provider whose services proved a poor match (described in more detail in section 4.4), indicating the importance of navigating carefully between these ecosystems.

These innovation ecosystems are then linked by respondents to other ecosystems which, while not described as "innovation ecosystems" per se, may have a connecting role to the ecosystems above through flows of capital, knowledge or technologies.

- Sectoral production ecosystems: These ecosystems are centred around a particular industry or value chain (e.g. fish farming) and include a combination of international value chain firms, worker cooperatives and supply chain intermediaries. Other system actors include insurers, local banks and other sector-specific finance providers, with lack of access to capital for sector actors cited as a key challenge by founders. Individual producers form a link to the local ecosystems below. Effective founders are envisioned to be embedded in these systems, while having the ability to navigate the other systems described.

- Communities and end users: These represent the localities of the end users targeted by founders, and/or often the founder themselves. They may closely connect to, or even be inseparable from, the sectoral ecosystems above (e.g. an agricultural community). Here, emphasis is placed on the growing population of young people, forming both a pressure on these young people to support their families and on governments for job creation, as well as being a market for founders and a potential source of future entrepreneurs. Founders often explain that their ability to develop good startups stem from their intimate understanding of specific local contexts, often where they grew up. As discussed above, several respondents comment that potential entrepreneurs from communities across Africa do not enjoy equal opportunities to participate in the broader African climate tech innovation ecosystem described above.

- Global capital markets: Global capital markets' primary role in relation to African climate tech innovation is to create the broader investment climate, including shaping how much "tourism capital" temporarily flows into the African innovation ecosystem and conditioning the general unwillingness of overseas capital to make large capital expenditure investments in Africa. Global supply chain actors in the sectoral production ecosystems (e.g. multinational agricultural firms) are likely to have stronger connections to global capital markets than to the local African investment landscape, and similarly African institutional investors (e.g. pension funds) are understood to typically follow global investment trends via indexed funds for example, rather than seeking to disburse funding locally. Nonetheless, Katapult's configuration of working with a local (Rwandan) investor seeks to work against this trend. One key benefit enjoyed by African diaspora founders is that many of them are understood to have gained experience in global capital markets, and that they subsequently connect these networks, knowledge and potentially investment flows to the African innovation ecosystem.

- Global impact-oriented finance and technical assistance ecosystems (development aid, sustainability, climate): This broad ecosystem includes the many development, sustainability and climate funding bodies and associated players (e.g. intermediaries, knowledge partners) that work to achieve desired impacts. Respondents indicate that some players within this ecosystem may be skeptical or resistant towards venture capital as a means to tackle societal problems, while others are actively trying to pivot towards this (for example NGOs seeking to make impact investments with their reserves). This broad ecosystem, particularly more traditional development aid actors, is perceived by some respondents in a negative light to have "for many years been transferring European solutions or American solutions to very different part of the world".

- Finance, business and technical assistance ecosystems of specific higher income countries which have significant financial disbursements to African countries: A sub-system of the ecosystem above is the finance ecosystem of specific higher income countries. Given the focus on Katapult and its upstream investors, Norway is the most notable example of this kind of ecosystem connection, although connections to the UK finance ecosystem are also apparent through RISA. These investors are based partly or wholly in these countries, are focused on the African technology innovation ecosystem, and leverage the specific development aid, climate finance and broader business and capital ecosystems of their home countries (and, in the case of Norway, other Nordic countries). For example this could mean investing through a partner institution, creating business opportunities for the private sector in their home countries, commissioning consultants or universities in their home countries to do research, or also utilizing their embassies to advise on activities in African countries.

4.2.2 Why do respondents play a role or intervene in the ecosystem?

All of the respondents interviewed for this study can all be situated within one or more of the ecosystems described above. Many of them actively seek to play a role in these ecosystems. Some of the recurring justifications – either used to intervene at present, or to call for future interventions - are listed below.

1. **To "contextualise" finance and technologies flowing from global systems or "preparing" users for them**. A key justification for intervening both in the African innovation ecosystem and in sectoral production systems, is to act as an intermediary for finance and technologies flowing from global tech innovation systems or capital markets (Q10). For example one respondent explains "How we make money is being the bridge between the communities that have the knowledge, and the solution".

Q10 "We work on including them [users] and preparing them for inclusion. Because as he said, there is no point to give a service to someone who cannot use it or not able to use it".

2. **To capture finance within the innovation ecosystem, understood as a donor-funded industry.** While this logic was broadly criticised, several respondents described the common practice of ecosystem players positioning themselves strategically to capture donor funding, either through ecosystem building or entrepreneurial activities. This is understood to be damaging to the long-term functioning of the innovation ecosystem.
3. **To refocus the African tech innovation ecosystem on founders, local capital providers and users rather than on NGOs and donors**. As described above, NGOs and donor programmes in particular have been much criticized as creating an industry in its own right. Thus, a key justification for intervening in the ecosystem by respondents is to refocus towards a more founder-centric system, as well as towards local capital providers to provide funding continuity (Q11).
4. **To diversify the talent pool of entrepreneurs within the African climate tech innovation ecosystem**. As described above, the current pool of talent is perceived to be relatively homogenous (Q12). Looking forward, altering this this is cited as a key strategic need by several respondents.

Q11 "The local capital is always going to be here. And so they can play a role in the journey through the next 20, 30 years […] so bring them in early. I think it is critical".

Q12 "It's exactly the same people [...] it's social, bright, well-educated, really privileged people. We share the same background. I see no difference between them and myself. Maybe they have had parents who have been less fortunate, but haven't we all? How to attract the talents from those who are not already enrolled in the same systems in schools and circles that we are all engaging in now globally...".

4.3 What do flows of finance seeking to foster climate technologies "do", in terms of material changes at more localized scales?

Respondents explain that the flows of finance invested by Katapult and other investors in the ecosystem have a wide range of effects at a localized scale. In broad terms, these can be split into the effects that investments have upon founders and their startups, and the effects upon the end users which these founders seek to serve. Some of these changes are clearly understood to be positive, whereas others changes may have a mix of positive and negative aspects. Changes also vary depending on what flows of finance are intended to do. Within this study, some investments are for capital expenditure, whereas other investments are focused more on operating expenditures or technical assistance around how founders run their companies and grow their networks.

4.3.1 Impact of financing upon founders and their startups

- **Desirable changes**: A number of positive changes are described by respondents stemming from the arrival of finance provided by Katapult and other investors in the ecosystem. These can be divided into the impact of investment in business operations, and the impact of joining accelerator programmes. Regarding the former, the core benefits include the ability to grow the team, including hire more specialist staff; to upgrade technology functions and to make them more accessible; to scale to serve more customers, including expansion to different markets; and to invest in much-needed physical infrastructure and equipment, if the investment can be used in this way (Q13). Regarding joining accelerator programmes, the networking benefits were emphasized greatly by several respondents. This is both in terms of the breadth of the networks, including other startups working in equivalent geographies, but also the depth and quality of interactions facilitated. Relationships with mentors who really empathized with and understood the situation of mentors were cited as being of particular value (Q14). Connected to this, the practical guidance around how to grow a business and interact effectively with other investors to raise more capital were also cited as highly valuable. Other benefits cited by respondents included being introduced to potential new clients or learning from the experiences of other startups. These positive changes are tied together by one respondent as an overall "mindset shift" of the founders as a result of receiving investment.

  > *Q13 "When we raised with Katapult, we were able to bring on board someone in tech, we were able to bring on additional field agents. It goes directly towards business purposes that we have outlined with the source of financing."*

  > Q14 [Regarding Katapult's accelerator programme]*: "It's not the number of people that you meet, but also the quality and what comes out of that. There are three extremely helpful contacts through this network that helped us a lot during this journey. So I think also curating this mentor list and keeping this alive and the mentors engaged, is super relevant and helpful".*

  Some respondents also pointed out approvingly the investors who actively encourage startups to do certain things. For example one respondent explained they valued being encouraged by investors to look at technologies globally and how to learn or draw ideas from this, explaining that "they prefer for you to have a global picture of everything because there's no need of reinventing the wheel. Once somebody has done something, you just need to adapt it and move on if it fits within your ecosystem". Similarly, another respondent explained how a key contribution of investors was to encourage startups to rigorously conceptualise and document the impacts they have – beyond financial returns – at an early stage.

- **Changes with positive and negative aspects**: Some respondents indicated changes which have both positive and negative aspects. For example one respondent explained that the arrival of finance "forced" them to professionalize their startup, including more concrete governance protocols. They reflect that this clearly helped them on their journey forwards, but also added lots of additional responsibilities. Similarly, another respondent explained that the arrival of investors and their demands for certain levels of financial

  > Q15 *"Those who are not willing to compromise on behalf of their end customer or end client to get the money, within a year or two they simply burn out. You have to make compromises [in terms of customers served]. The money talks."*

return lead startups to focus on certain customers (usually those with concrete demand and ability to pay for products) and pivot away from others. This has clearly positive aspects, for example by helping the startup to gain commercial traction and success by focusing on anchor clients which can underpin a sustainable business. Nonetheless, the respondent also observed that the compromises in this process often relate to "leaving behind" customers outside the anchor client group, often those with limited ability to pay for services (Q15). This is seen as an inevitable consequence of investment expecting a return, and a necessary step in scaling. Nonetheless, the respondent implied that funders and founders should be transparent about such compromises, rather than making claims such as "leaving no one behind"; particularly given it is often the lowest income end users who are left out of business models (Q15). Related to this, respondents also indicate that the role of the investor is not to direct the startup but rather just to monitor whether they spend the investment on what they committed to do, and then to accept that some startups will succeed and others will fail, noting that scaling is likely to expose weaknesses in the business model.

- **Potentially negative changes**: Several potential negative impacts are highlighted, all of which relate to investment practices and preferences which respondents felt are substandard, in comparison with the best practices summarized in the Section 4.4. These relate to unreliable investments, demands made by investors, and the broader effects on both the founders who receive funding and those who do not.

Unreliable investments can lead to poor business performance; for example investors failing to deliver on promised investments can be highly disruptive to business planning. Such disruptions may affect the startup's reputation with its customer base if performance is effected (Q16).

> Q16 *"They [finance providers] say they'll provide the finance, and then they change the terms. That has reputational impacts on us. It impacts our credibility in the marketplace. And the farmers also start to make plans of the back of the fact that they're going to be getting this finance. It also impacts them quite significantly."*

Respondents describe how the demands of some investors can potentially have a negative impact upon startups. Multiple respondents allege that overseas investors have a tendency to encourage founders to use technologies and platforms which come from outside the local context and which may not fit local conditions, with one respondent indicating that such solutions are often too expensive to fit the realities of running a business locally. Nonetheless, one respondent indicates that this trend continues despite its problematic elements, since investors recognize the desire of African founders to scale and their sense that certain technologies are necessary to achieve this (Q17).

> Q17 *"I'm looking to be known not just as a startup that is working with the rural communities; I want to be recognized by [a wider audience]. And so they [investors] know the problem they're helping to solve or the technology they're bringing on the table, it'll help me become more visible. And by noting that, then they put demand, and demand, and demand…"*

Related to the above point, other more subtle demands placed by investors include the heavy time commitment required to attend engagements which can interfere with core business activities, burdensome reporting protocols which differ between investors, and other time-consuming tasks (e.g. preparing additional documents and services), seen to be a result of the unequal power balance between investor and investee.

Less desirable changes are also described upon the founders themselves. For those who receive investment, one founder indicated that their desire and focus on helping their community begins to erode as they focus more upon the financial performance requested by their investors. Relatedly, another respondent commented upon how the ready availability of grant finance in the innovation ecosystem creates a skewed incentive for founders to pursue grant fundraising at the expense of focusing on their end users; that grant finance "can become almost like a drug where companies keep going back and back to the same one and never stretching to […] build a company to serve their

> Q18 *"Many of the women that we work with are women in their 40s or 50s. They have families, they have to take care of children, husband, household, working and their startup quite often. Many of them need to have a second income stream. They don't have those time, they don't have the time to go and sit somewhere in a fancy incubator space or accelerator space."*

customers". Finally, the characteristics of investment into the ecosystem and founders at present is indicated to have an exclusionary impact upon those founders whose daily lives and commitments do not fit the ideal entrepreneur archetype signalled by the funding landscape (Q18). Similarly, reflecting on the broader implications of the current funding landscape, one respondent explains that the investor preference for importing and adapting technologies from outside rather than developing from scratch domestically has a broader negative impact upon the startup ecosystem and economic performance (Q19).

> *Q19 "I think the biggest failure [of importing rather than innovating domestically] will be on human capacity, because you miss the chance to expose young African talents to the experience that will come from developing such technologies in-house or on the continent. It comes also with an economic downfall because investing in R&D [...] brings money into the continent, just to put it simply. I think the other downfall is that the ecosystem really misses a new opportunity to grow. Because of the reluctance of investors to invest in R&D in Africa, the ecosystem will always fall short in that department."*

4.3.2 Impact of financing startups upon end users

- **Positive changess**: Several respondents indicate the concrete benefits which end users enjoy as a result of well-designed upstream investments. Most notably these include increases in income, access to better products and services which closely match their needs and abilities to pay for solutions. This is understood to lead more broadly to greater resilience (including to the effects of climate change) in communities.

- **Changes with positive and negative aspects**: End users are described by respondents as often becoming more literate with modern technologies, which while broadly understood to be positive is also highlighted by one respondent to lead to the possible erosion or loss of valuable local knowledge (e.g. regarding plant varieties and resilient farming techniques). Similarly, business models also connect users to forces such as product marketing and consumer pressures for the first time.

- **Potentially negative changes**: The clearest negative impact, relating to the impacts described above on startups, is that when startups fail, they impact not only the founders but also the communities being served by them. Furthermore, other respondents point out that the arrival of investors typically leads to alterations to the business model, meaning the poorest customers are left out due to their inability to pay. They point out that "trickle down" arguments are made that benefits will ultimately flow to all individuals, but that perhaps this is an optimistic interpretation; that realistically, some people *will* be left behind under a venture capital financing model.

4.4 What kinds of practices could help to ensure that efforts to foster innovators and innovation ecosystems related to "climate technologies" are sensitive towards the localised contexts they seek to benefit?

A key theme running throughout the preceding sections relates to the role of context. While a concrete definition of "context" is not clear across respondents, it can be understood to broadly refer to the role played by the localities which are ultimately intended to benefit from investment; i.e. where end users (for example farmers) are located. This may or may not be the same location as where the founders and investors are from or based. While definitions and emphasis vary, there is almost total (allowing for the caveats described below) agreement that local contexts should play a central role in investment logics. However, there is also consensus that it is not easy to get right, that there is no "silver bullet" to context sensitive practice, and that historically it has often been overlooked due to imbalances of power weighted in favour of overseas investors. Many of the concerns voiced by the respondents in the preceding sections of this report relate to heavy-handed behaviours by external actors which have not sufficiently valued context in the investment process. To identify possible practices and actions which could help address this, the following section is structured around what is considered to be "best practices" by respondents which ecosystem actors can learn from.

4.4.1 Context-sensitive best practices

These best practices are grouped according to the following themes, followed also by some caveats offered by respondents around the role of context in investment:

- Investment teams with a strong mandate located within African countries
- Finance flows which are tailored and sensitive to fit local contexts (including local capital providers)
- Founders who are embedded in, and feel encouraged to place emphasis upon, local contexts
- Trusting founder-funder relationships which facilitate honest and open exchange
- Leveraging local educational institutions as sources of innovations and entrepreneurs
- Approaching founding and funding on a flexible case-by-case basis

- Investment teams with a strong mandate located within African countries: Building strong local investment teams on the African continent is a widely agreed upon example of best practice. Given the focus on Katapult, many respondents speak favourably about Katapult's decision to establish a "local" team and office in Rwanda to act as a regional hub. However this can refer more broadly to the importance of any investor looking to invest into the African climate tech innovation ecosystem locating core investment operations *within* one or more African countries. Several respondents indicate the central importance of this team having real decision-making autonomy in relation to any upstream investors or overseas offices (Q20), while maintaining close communication with them. Critical assets of local teams and hubs include a deep understanding of – and active role within – local capital markets, innovation ecosystems and sectoral ecosystems; strong networks of contacts which enable ease of navigation within and between countries from national through to the community level; and hiring teams which reflect a diversity of background, gender and perspectives, as well as an emphasis on staff who have themselves been founders or worked in startups locally in the past. Respondents also indicate that an asset of such local teams is a shared commitment to and passion for investment decisions which value locally developed solutions over overseas companies or the import of externally developed technologies (Q21).

> *Q20 "The team on the ground […] that's really number one [in importance]. And with proper decision-making power and agency; and sharing in the incentives and the long-term economic success as well."*

> *Q21 The process […] is to start with the African unit, with the African team, to select African solutions to African problems. And this is why we we are part of it, to bring that African perspective. It's not necessarily supporting Norwegian startups or Nordic startups to implement in Africa. And this is why I'm saying this challenge [of being sensitive to context] is not a matter in the approach Katapult is doing things.*

- Finance flows which are tailored and sensitive to fit local contexts: Related to the team above, respondents also place great emphasis on the characteristics of finance (and broader support) being aligned with context. The

> *Q22 – "We don't want to be Colonialism 2.0, you know, investing money and taking all the money out again in that sense, because we believe these will be good investments and give great returns in the long run. So for us, it's important that there's also local investors buying in on that. It*

central point made by several respondents is the value of working with locally based capital providers, reducing reliance on overseas investors. The value of such investors includes their deep understanding of what to expect from investments locally; the networks they bring; their potential to leverage more overseas capital due to increased confidence in the market; and the clear benefit of capital remaining within and recycling through the African economy (Q22).

Q23 – "The assessment of solutions [...] should go beyond the tech …to understand the context. I guess having people within the investment team that actually understand the African context, is going to be good because it's relatable. You know what a farmer can do, what a local can pay for. But if it's foreign investors, they might not understand that a farmer can't subscribe and give $10. It's just not possible for a local farmer to give [...] it sounds little, but they would rather stick to whatever they've been doing."

More broadly, several respondents describe the importance of calibrating investment preferences and expectations (particularly around what kinds of returns to expect, by when) to fit local realities; and that "Silicon Valley"-style venture capital expectations may not be realistic. Nonetheless, respondents also caution that this should not fall into the common trap of investing lower volumes and being predisposed to perceive African investments as risky. Possible means to avoid these trends and to be confident with investments includes funders having at least some degree of familiarity of the realities of the intended end users (both in terms of preferences and ability to pay for solutions) in order to help recognize viable propositions (Q23). Similarly, this can mean utilizing deep familiarity with local markets and strong networks to have a contextually informed understanding of what scaling could involve – and where challenges may be encountered - for startups within and between countries.

Recognising that investors rarely work in isolation but instead typically have both upstream funders themselves as well as co-investors, respondents also placed emphasis on the importance of trust between investors upstream, downstream and in blended financing in working towards a shared core mission that values locally developed and embedded solutions (Q24). Other perspectives include the value of tailoring technical assistance to the bespoke needs of individual founders as much as possible as opposed to more "boilerplate" models adapted from other contexts.

Q24 "What I like about this style of investment, and the way that capital flows here, is that there tends to be a good level of trust from upstream all the way to downstream, that you are allocating capital to those who are able to use it in the most effective way. So high level, our funders trust us to get to that, that we know what we're doing. And that trust, we try and sort of continue down to the companies that we're entrusting them with the capital, because they're the best people to deploy and to use it effectively."

Q26 "One core characteristic [of successful founders] is that they really understand the space. Some of them have actually been involved […] they've been farmers before. That is what we see with some of these great solutions that we take into the cohort. They really have a strong understanding, not just in terms of the surface context, but also the way people think, because it's been their space. […] they understand that in some of those markets, there are what you call maybe chairmen or maybe unofficial bosses [to navigate]."

Q25 "The usual cases often, are maybe founders that grew up in the diaspora coming back with the advanced knowledge and tech insights today. But what we've seen is the majority from the last cohort are actually homegrown founders."

- <u>Founders who are embedded in, and feel encouraged to place emphasis upon, local contexts</u>: A key aspect of context-sensitive financing is broadly recognized to mean investing in founders who are both embedded in, and place central importance upon, the local contexts they operate in. A growing

Q27 "When looking at a lot of the projects that are run in terms of reforestation and forestry in the cocoa sector, they don't necessarily make immediate sense to local farmers in this context […] when they themselves don't have the necessary inputs to farm the land, to pay for healthcare, or to just have a decent life with what they generate from their farm."

trend is recognized towards "homegrown" founders coming directly from the contexts they intend to benefit. This indicates recognition of the value of knowledge gained locally rather than elsewhere (Q25). Founders from other geographies – or diaspora founders returning home after periods spent abroad - are also recognized as having the potential to manage successful startups alongside "homegrown" founders, with diaspora founders uniquely well positioned to leverage and connect overseas capital and technology to local contexts. Nonetheless, what is recognized as essential is that these founders can somehow navigate the "local" scale sensitively and effectively. This relates both to understanding what end users really value, ensuring that users perceive a product, service or project as locally embedded, and being able to navigate highly varying business and market customs (Q26). Upstream, this means working with investors who share these values. A nuance to this highlighted by respondents is that founders may work with overseas sources of funding tagged to priorities such as climate, but they may have a greater sense of what is valuable to communities – which may be priorities such as health or income (Q27). Thus, upstream investors must trust the founder to deliver climate changed-related benefits *through* – rather than overriding – more localized priorities.

Q28 "I had to go to where the technology is working to see if it'll be able to work for the rural communities. And I went all the way to Malaysia, I went to Thailand, I went to Bangkok, and I saw rural farmers who are using the technologies. And I had to see the practicability of the technology among the rural communities. Are there farmers who are similar to my farmers who are using it?"

A final aspect of this is also how founders develop solutions, and what kinds of solutions they develop. There is broad agreement that the simplest and lowest cost solutions are likely to be most effective, overriding possible preferences from investors or founders for "flashy" technologies. While there is a broad preference for developing solutions domestically from scratch, as described in previous sections there is also a recognition that in practical terms, innovations will often be adapted from other contexts. In such cases, positive examples are given of founders being supported to leave their local contexts and visit other places to identify solutions which they can adapt to their context (Q28). This is in contrast to the inverse model in which overseas founders bring a technology from their own context to African countries. Similarly, tinkering with technologies or their instructions in simple ways to make them a better fit is also seen to be a valuable, easy-win way of improving community ownership of technologies (Q29). Related to this, there is recognition that as startups seek to scale across Africa, they are therefore adapting a technology developed in one context to other contexts. In this process, care is advised in understanding contextual differences and potentially redesigning the value proposition on a fundamental level to fit needs in new localities.

Q29 "There hasn't been much effort made to localize or translate [technologies] to local languages. Farmers and other actors have a challenge of understanding those kinds of languages, and lack the capacity to use the gadgets themselves[...] So some of those challenges of capacity and skills have slowed down the pace. There are some alternative approaches that are being used, including translation to local languages."

- <u>Trusting founder-investor relationships which facilitate honest and open exchange</u>: Bringing the two points above together, a central success factor in context-sensitive financing is understood to be a trusting relationship between the founder and the investor. Several respondents place emphasis on the importance of a good personality match and shared vision for the future between both parties. This trust is understood to manifest in autonomy around investment decisions for the founder. Furthermore, this trusting relationship is envisioned by one respondent to ideally manifest in a culture of open and honest feedback between contextually embedded investors and founders on which kind of ideas fit both sides, such that investors can learn from failed investments and founders can learn from ideas they had but which failed to attract funding (Q30).

Q30 "Investors should let founders know why they are investable - or why they were not, those that fall out of the pipeline. It would help the founders go back, think through their solution again and maybe come up with something better".

- <u>Leveraging local educational institutions as sources of innovations and entrepreneurs</u>: Related to previous sections, several respondents place emphasis on the importance of utilizing educational institutions in close

proximity to the localities intended to benefit. This can be both as a source of knowledge, but also of future founders. In response to the recognition described above of the "elite" nature of many innovators, and reliance on connections with elite global educational institutions, relying more on local institutions is seen as a concrete means of localizing both founders and solution development (Q31).

> *Q31 "If you look at many of the entrepreneurs that are going through these accelerator programs, they will tend to be in the middle to upper middle class. But there's a lot of talent that we're missing in the lower economic groups who tend to be in vocational schools. They're not in the university system where most of the accelerators tend to recruit from, they're in what is known as the vocational schools or the technical schools. These people […] do by the head, but they do mostly by the hands. They are technical people, who are crafts makers or engineering types of people, who are creating things which I think Africa needs more."*

- Approaching founding and funding on a flexible case-by-case basis: The above points may give off the impression that there is a reliable recipe which can be followed for context-sensitive financing. However, many respondents emphasise that one of the most important principles to being context-sensitive is rather flexibility to assess investments on a case-by-case basis. Related to this, one respondent emphasized the importance of being flexible if startups fundamentally change their business model in response to contextual factors (Q32).

> *Q32 "We see that in some of the startups in our cohort, they didn't start with the solution they're actually with at the moment. For example at the kickoff, some might start with, let's say, a complete software play; but with the understanding that the supply chains in Africa is broken. They then pivot to actually being a supply chain player. Pivoting is something we see a lot. The best pivots are those that are informed by the context. It's contextually built for Africa but it still changes to be more impactful or sustainable."*

- Caveats to the importance of context: Despite broad recognition of the importance of context, respondents offer several caveats to this message. Firstly, while mentoring relationships are cited as a key opportunity to share knowledge of local context, one respondent emphasized that for them, a match of personality and interests should matter more than coming from the same location (Q33). Relatedly, several respondents emphasized that while context is important, investors should not overthink or assume how "different" or not African countries are, but rather be humble and not make assumptions around these matters. Finally, respondents also emphasized the value of investment processes (such as investment committees) which include a diversity of perspectives, including those of higher income country-based actors where appropriate, and not necessarily according greater decision-making authority to local investors than international investors (Q34). Respondents indicate that discussions drawing upon such diverse perspectives can be productive in shaping robust and impactful investments, provided those involved are able to engage on an equal standing rather than through implicit hierarchies of authority.

> *Q33 "From my experience, I don't think localizing a mentor is really a criteria for making sure the mentor achieves this work [but rather…] the ability to understand you as an entrepreneur. Sometimes it is less about the industry. It is more about you as a person and you realize mentorship should be focused on the individual"."*

> *Q34 "[Investment committee] isn't a straight line. It is a vibrant conversation. Everyone feels really empowered to bring their perspective into it."*

5 Recommendations and further work

This report highlights a series of opportunities and challenges for the African climate tech innovation ecosystem, which can be grouped into different areas of strategic focus. These are summarized in Table 2 below, along with a series of recommendations for both investors and technical assistance providers within the ecosystem. These recommendations are structured around the opportunities and challenges identified in this report. Reflecting their exploratory nature, recommendations are broad areas to focus upon rather than rigidly defined actions.

Regarding possible further work, this report was prepared within a limited time period, and there are several areas in which this programme of work could be carried forward and expanded. In 2024, a webinar and/or an in-person event in Kigali is planned to discuss these findings in more detail. If there is interest, there may be potential to continue these discussions further into the future, particularly around shaping concrete examples of context-sensitive financing and developing practical strategies for investors to achieve this.

Furthermore, this specific research project will also provide raw data for the longer-term academic research project "Understanding Innovation Practices for inclusive and sustainable services" (funded by Chalmers University of Technology). This broader project explores infrastructures, understandings and practices related to innovation. The project has a particular empirical focus on institutions and actors undertaking innovative activities and seeking to drive innovation, such as private companies, innovation hubs, policymakers, and donor agencies. The research seeks to produce evidence which could help foster an inclusive innovation environment and in which a range of activities recognised to be innovation can thrive. As indicated in the research consent form agreed with respondents, all contributions referred to in subsequent publications will also be fully anonymized. Please get in touch if you are interested to participate in further steps of this research.

A final observation is that the data gathering for this report has been conducted via zoom and from a European researcher's perspective. The recommendations should therefore be seen a starting point to foster open debate and proposals rather than a finalized set of actions, and we welcome contributions to this agenda from other perspectives.

Table 2: Recommendations for investors and technical assistance providers in the African climate tech innovation ecosystem

Strategic areas of focus	1. Directing finance towards systems change	2. Aligning investor priorities with end user needs	3. Bringing a wider range of founders and end users into the ecosystem
Opportunities and challenges described by respondents	● *Opportunity to scale up investment into an ecosystem which is driving a range of benefits and which requires greater investment to achieve further impacts.* ● *Opportunity to harness the African Tech Innovation Ecosystem to deliver the precise forms of "systemic change" that respondents would like to see, along with the importance of acknowledging which systems are less likely to change through investment*	● *Challenge that investor needs and demands exert an excessive and problematic influence upon ecosystem functioning and direction* ● *Opportunity to invest in context-driven solutions that meet local needs as opposed to prioritizing "flashy" technologies*	● *Risk that "context" can be understood at a generalized national scale, rather than local scale, by overseas investors with limited familiarity with the location of end users* ● *Challenge that opportunities to become founders are limited to more privileged persons, and a passive role is implied for end users in processes of innovation* ● *Opportunity to proactively include potential underserved entrepreneurs based on income level, gender and also geographic location*
Recommendations for investors and technical assistance providers	1.A Increase finance available for climate tech innovation both *in* and *for* countries in Africa. While there are complexities and risks associated with investing – as there are in any domain – these should not deter investors from investing in what is recognized to be a growing, vibrant and impactful ecosystem. One of the strategic impact logics described by respondents in this report relates to the reallocation of finance in global capital markets towards founders innovating within African countries for African citizens, and investors can play a key role in making this a reality by scaling up finance flows. 1.B Describe the systems change you want to see as an investor (if applicable) in clear and unambiguous terms**.** If investors have an impact-related mandate, they can lead by example in the ecosystem through clarity and integrity in describing precisely which systems are envisioned to change through investment (i.e. primarily sectoral production systems) – and which stay unchanged. Create space for healthy and sensitive discussion around this, recognizing that the ecosystem recruits from a global talent pool are likely to have differing perspectives on which systems they	2.A Reflect carefully on the needs that investors may be communicating (explicitly or implicitly) to founders. There is a wide array of investment needs from current and prospective founders, and a similarly wide array of financing modalities required. Different financing modalities understandably have different demands and expectations from the investor side. Some expectations may be explicit (e.g. an expectation of a certain rate of return) or more implicit (e.g. a right to offer advice on technology decisions) and will vary a great deal between investors. Investors can proactively and transparently engage in dialogue about possible demands and expectations to build trust in the ecosystem; and send a coordinated and coherent signal to founders that the needs of end users should not be in competition with investor demands. 2.B Work with founders to "localize" what climate change priorities can mean within the contexts that founders are working within. This is such that innovations have local needs as a starting point which then build in climate change considerations	3.A Invest in building strong and inclusive networks within the ecosystem which can easily connect actors between scales (i.e. international-national-regional-local) and showcase context-sensitive startups and finance flows as best practice within the ecosystem. 3.B Seek out founders from communities of the end users who are ultimately intended to benefit from innovations, particularly founders working withing sectors such as agriculture who differ across categories such as income level, gender and age, including those whose needs may be overlooked by the current ecosystem. It can also be considered a strength that founders actively involve end users in the earlier stages of innovation, while keeping focused on developing viable products and services. 3.C Broaden the geographic footprint of ecosystem activities where possible beyond the current regional centres, as well as taking the ecosystem to excluded persons, to develop an ecosystem beyond European and American innovation system archetypes. This could include actively seeking founders from, and forging partnerships with, institutions across geographies which are accessible to a wider diversity of persons than the current ecosystem (i.e. technical colleges, cooperatives and informal institutions).

	think may need to change to achieve meaningful impacts.	(while remaining rigorous in responding to the best available climate change science).	

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