Policy Paper

POLICY LANDSCAPE FOR CLIMATE TECH VENTURE ECOSYSTEM ACTIVATION IN SUB-SAHARAN AFRICA

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GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) is the German development agency that supports sustainable development in over 120 countries. Commissioned primarily by the German Federal Ministry for Economic Cooperation and Development (BMZ), GIZ provides technical assistance, policy advice, and capacity building across sectors including climate, energy, and economic development. Within the CATAL1.5°T initiative, GIZ acts as the main implementation agency in its function as Accredited Entity (AE) to the GCF and recipient of funding from BMZ.,contributing expertise in programme design, ESG aspects, climate finance mobilisation, and ecosystem strengthening to support early-stage climate ventures in Latin America and West Africa.

CATAL1.5°T [kæt l st] is an initiative funded by the Green Climate Fund (GCF) and the German Federal Ministry for Economic Cooperation and Development (BMZ). It aims at empowering early startups ventures addressing the impacts of climate change in developing and emerging markets with a focus on Latin America and Francophone West Africa. The initiative centers on a Pre-Acceleration and Acceleration Programme that offers financial and technical support to start-ups and young businesses with highest climate mitigation impact and growth potential, aiming to help mobilize further private capital.

The CATAL1.5°T team also collaborates with incubators, accelerators, venture capitalists, policymakers and other stakeholders to boost investments, drive dialogue and foster resilient local climate innovation ecosystems.

In West Africa, CATAL1.5°T is implemented by the following organisation:

GIZ - Make-IT in Africa: a pan-African digital and tech entrepreneurship initiative implemented by GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit). It supports the growth of inclusive and sustainable innovation ecosystems by strengthening the capacities of entrepreneurs, ecosystem builders, and policy makers.

Investisseurs & Partenaires (I&P): an impact investment group dedicated to supporting small and growing businesses in Sub-Saharan Africa. Through tailored financing and strategic support, I&P promotes inclusive growth and local entrepreneurship with strong social and environmental impact.

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Climate KIC: Europe's leading climate innovation agency and community, creating climate-resilient communities and fighting climate breakdown by mobilising systems change in countries, regions, cities, and businesses. Together with partners across the globe, Climate KIC orchestrates solutions and facilitates learning to bridge the gap between climate commitments and current reality, driving faster and more ambitious action.

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Briter is a leading business intelligence company focused on fast-growing economies across emerging markets and beyond. Briter data covers 10,000+ companies and investment data across Africa, Latin America and the Caribbean, and Asia, and provides data insights to corporates, development finance institutions, governments, and investors globally. Briter has been the research partner of CATAL1.5°T in conducting this study.

Abbreviations

AICC	Africa Innovation and Climate Change initiative (Kenya, research context)
ARIPO	African Regional Intellectual Property Organization
CAT	Climate Action Tracker
CDKN	Climate and Development Knowledge Network
Co-Creation Hub	Co-Creation Hub (Nigeria)
COMNACC	Comité National sur les Changements Climatiques (Senegal)
DER/FJ	Délégation générale à l'Entrepreneuriat Rapide des Femmes et des Jeunes (Senegal)
EPRA	Energy and Petroleum Regulatory Authority (Kenya)
GCIP	Global Cleantech Innovation Programme
iHub	Innovation Hub (Kenya)
IFC	International Finance Corporation
IP	Intellectual Property
NACOSTI	National Commission for Science, Technology and Innovation (Kenya)
NCCCS	National Council on Climate Change Secretariat (Nigeria)
NCCP	National Climate Change Policy (Nigeria and Ghana)
NDC	Nationally Determined Contribution
NERC	Nigerian Electricity Regulatory Commission
NERSA	National Energy Regulator of South Africa
NEV	New Energy Vehicle
NiMet	Nigerian Meteorological Agency
PCC	Presidential Climate Commission (South Africa)
PMU	Programme Management Unit
R&D	Research and Development
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme (South Africa)
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Management
SNCCS	Stratégie Nationale de Changement Climatique du Sénégal (National Climate Change Strategy)
TIA	Technology Innovation Agency (South Africa)
TTO	Technology Transfer Office
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WASCAL	West African Science Service Centre on Climate Change and Adapted Land Use

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Executive summary

Climate change presents both a profound risk and a generational opportunity for Sub-Saharan Africa (SSA). As the region faces rising temperatures, water stress, food insecurity, and energy challenges, climate tech ventures, defined as startups and SMEs developing and commercialising technologies designed to mitigate greenhouse gas emissions and increase adaptive resilience to climate change, offer a pathway to resilient growth. From clean energy to climate-smart agriculture and mobility, climate tech ventures can not only advance climate goals but also catalyse job creation, attract investment, and strengthen economic sovereignty.

Despite this potential, the climate tech venture ecosystems in SSA are still in the early stages of development. Most countries are building the foundational blocks: research and development (R&D) funding levels remain modest, intellectual property (IP) frameworks are evolving, climate data is scattered across agencies and projects, and venture support structures are only beginning to align with national strategies. Rather than reflecting a deficit, this signals an opportunity for governments to take leadership in shaping the enabling conditions for climate innovation.

This report applies a systemic approach to climate tech policymaking, emphasising how interlinked policy domains - R&D and innovation, research-to-business translation, market creation, infrastructure enablement, and institutional readiness - must be developed in parallel. By investing in the right mix of policies and institutions, governments can create pathways that de-risk private investment, strengthen domestic innovation systems, and accelerate climate solutions.

Approaching the policy priorities under a systemic approach brings out the following four priority areas for public initiatives:

- **Investing in R&D facilities and universities**

  Public investment in R&D can strengthen universities and research institutes as engines of innovation. Linking research outputs to national climate strategies and facilitating technology transfer into ventures ensures that discoveries move beyond the lab and into the market.

- **Establishing patent and intellectual property protection**

  Building effective IP and patent protection systems creates a sustainable pathway for entrepreneurs to commercialise climate technologies. Legal recognition of climate-related innovation also increases investor confidence and supports cross-border technology partnerships.

- **Designing centralised climate data and intelligence platforms**

  Climate innovation depends on reliable, accessible data. Centralised data platforms that integrate citizen science, government datasets, and market information can empower innovators, guide investors, and strengthen evidence-based policy design.

- **Developing climate tech innovation hubs**

  Specialised hubs that can bridge the gap between research, entrepreneurship, and investment. By bringing ecosystem actors together, fostering collaboration and linking ventures with technical support, financing and market access, these centres can create the networks and trust needed to accelerate the scaling of climate technologies.

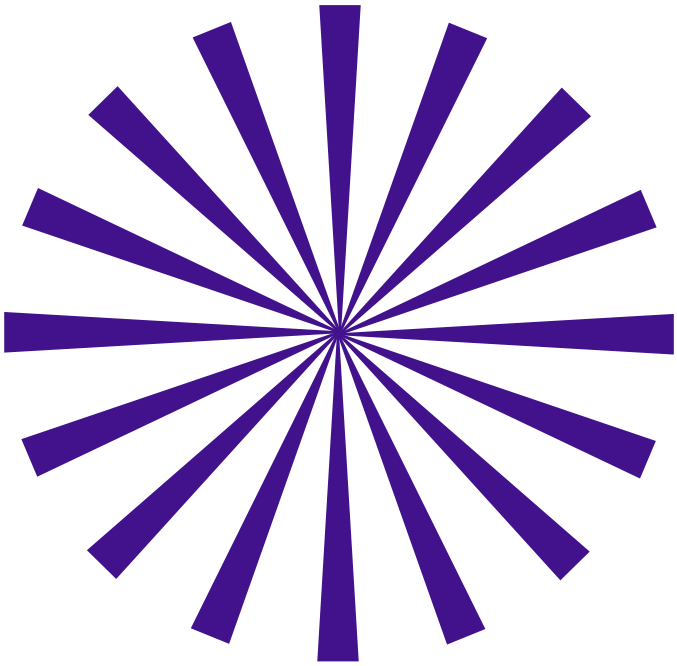
The Senegal case

This report seeks to provide a concrete example through Senegal of how such a systemic approach can take shape.The actions defined during the Senegalese Forum on Climate Tech Investments offer a concrete roadmap to translate research into ventures, convene diverse stakeholders, and foster trust-based networks. Pursued in a coordinated way, these actions can transform this early-stage ecosystem into a relevant centre of climate innovation.

Conclusion

To conclude, public-led policies and initiatives remain central to overcoming the systemic barriers that climate technology ventures face in Sub-Saharan Africa. But overcoming these challenges need to be a joint effort through a systemic approach that positions governments as conveners and facilitators within a broader ecosystem of universities, accelerators, financiers, corporates, and civil society. When public policies are linked with these actors, they help build feedback loops between research, business, and market demand that accelerate the development and adoption of climate tech solutions.

Looking forward, governments in SSA can take practical steps towards building the above four policy priorities to strengthen policy frameworks for climate technology ecosystems. Taken together, these measures offer a roadmap for governments to move beyond fragmented interventions and instead build systemic, resilient ecosystems capable of amplifying the opportunities currently present in SSA and seize the opportunity to position themselves as a global leader in climate resilience and sustainable growth.



1 | Introduction

The Sub-Saharan African (SSA) region faces disproportionate climate challenges, including rising temperatures, erratic rainfall, and increasing drought frequency, that impact the growing population in both urban and rural areas[1]. Climate tech ventures, a term used to describe startups or micro, small and medium-sized enterprises (MSMEs) that address mitigation and adaptation efforts through technology and innovation, are playing an increasing role in responding to these vulnerabilities. They develop products and services such as solar mini-grids, drought-resistant seeds, water-saving irrigation technologies, and waste-to-energy systems[2] that both reduce emissions and strengthen resilience.

This growing ecosystem of solutions is a part of a broader global movement where climate tech ventures are estimated to increase their market share value from $700 billion to $2 trillion by 2035[3]. This growth in climate tech innovation is a part of ongoing efforts across public, private, and research organisations to make greater strides towards reaching the Sustainable Development Goals (SDGs). The European Union, the Gulf countries, and the United States have introduced several policy-led incentive packages to attract more climate tech ventures to set up operations[4]. Climate tech investments globally are likely to continue to grow, despite the uncertainties introduced by the change in the U.S. presidency in 2025[5].

Despite this promise, SSA's climate tech ecosystem remains nascent and faces structural constraints. For example, the agriculture and energy sectors are largely characterised by informal structures, limiting formal market mechanisms and regulatory reach[6]. At the same time governments also face fiscal constraints and competing development priorities that limit direct subsidies or large-scale R&D investments for domestic innovators. As a result, domestic innovators struggle to access the enabling conditions needed to scale their solutions.

To overcome these constraining factors and developing a climate tech ecosystem in SSA, it requires both domestic political commitment to prioritise and enable innovation and global financial support from donors, other government actors, and private investors to move the needle forward[7]. Most importantly, it requires a **systemic approach** that aligns the roles of governments, financiers, research institutions, and entrepreneurs in a coordinated effort. This approach needs to be linked with enabling policies, R&D capacity, finance, and markets. To that end, the report proceeds as follows:

1 IPCC AR6 (2022)
2 GSMA, Emerging Trend in Climate Tech Innovations (2023)
3 International Energy Agency, Energy Technology Perspective (2024)
4 Climatetech Policy Coalition, A New Era for ClimateTech (2024)
5 Lisa Rubinstin, Carbon Equity, Survival of the Greenest: Investing in climate tech under Donald Trump (2024)
6 World Bank, Climate Resilient Investment in Sub-Saharan Africa (2023)
7 GSMA, Emerging Trend in Climate Tech Innovations (2023)

1. **Chapter 2**

   Examines the characteristics of the climate tech venture ecosystem in SSA, highlighting distinctive business models, financing patterns, and challenges.

2. **Chapter 3**

   Introduces the rationale for a systemic approach, showing why ecosystem coordination and multi-stakeholder collaboration are critical.

3. **Chapter 4**

   Assesses the policy landscape in SSA, focusing on the foundational elements of innovation ecosystems - R&D, intellectual property, data systems, and innovation hubs.

4. **Chapter 5**

   Provides a deeper dive into Senegal as a case study of how governments can activate nascent ecosystems through targeted coordination and financing.

5. **Chapter 6**

   Concludes with steps for governments in SSA to strengthen overall policy frameworks for the climate technology ecosystem.

By connecting these perspectives, the report offers a roadmap for policymakers, investors, and innovators to jointly strengthen SSA's climate tech ecosystem and unlock its potential for resilience, green growth, and inclusive development.

2 | Climate technology venture ecosystem in SSA

The recent report from CATAL1.5°T Initiative on Climate Tech Venture Landscape in SSA shows that the climate tech venture ecosystem in SSA is still at a relatively early stage of development, especially when compared to the global climate tech landscape. Important developments in renewable sectors and climate-smart agriculture technologies exist, but many of these opportunities are concentrated in a few large markets like Kenya, South Africa, and Nigeria, with public funding availability and private sector interest across a broader set of sectors. Yet many other markets across the region remain relatively small with low levels of climate tech activity and traction.

These following key traits however show that many of the SSA ecosystems are at an inception stage where enthusiastic, new climate tech ventures are emerging, but face structural and market challenges to take off and later scale.

Opportunities

- **Climate technologies as a lever for leapfrogging**

  Climate technologies are important levers that can leapfrog existing industries and populations into a more sustainable and climate-resilient future, both by replacing non-renewable energy sources and by improving equipment and processes that otherwise contribute to high levels of emissions or waste.

- **Climate resilience through bundled services**

  Climate tech ventures also help build climate resilience by bundling services together. Such bundling is already a ground reality in SSA among last mile fintech players, who combine financial inclusion with climate resilience- by bundling services. Such a model makes each intervention more effective than if delivered in isolation. For example, Apollo Agriculture acquired a large consumer base through its solar irrigation pump and high-quality inputs, and is now able to deliver additional "bundled" services such as financing and climate-smart agronomy training. Insurtechs such as Pula and Ibisa bring climate resilience to a growing number of people by bundling their data-based risk assessments and quicker payout services through fintech services.

Challenges

- **Navigating Scale, Viability, and Impact**

  The development and deployment of climate tech in Sub-Saharan Africa follow distinctive patterns.Large-scale projects targeting systemic impact require patient capital capable of absorbing nonlinear profitability and long waits for returns. These conditions tend to favor B2B or B2G models led by major corporates or governments—for example, Rio Tinto QMM's wind facility in Madagascar, financed through project finance and imported European technology. By contrast, climate tech ventures operate in a more fragmented space, experimenting with B2B, B2C, and B2G models to balance commercial viability with reaching underserved segments. Development finance institutions (DFIs) and foundations reinforce this orientation by funding ventures that design high-impact products for excluded consumers.

  While this generates important social benefits, it also challenges scaleability, as ventures must adapt pricing to local willingness to pay. Climate tech startups therefore face a difficult trade-off: pursuing highly scalable solutions versus focusing on deeply targeted, impactful

interventions. This balance is especially hard to strike for homegrown technologies. Success stories, such as SunCulture's use of imported solar panels to deliver irrigation pumps subsidized through carbon credits, demonstrate the potential of hybrid approaches. Yet they also reveal a limitation: many of the most visible successes continue to rely on imported products rather than homegrown innovation, underscoring how difficult it remains for local climate tech ventures to identify business models and funding strategies that deliver both scale and sustainability.

- **Market access challenges**

  Climate tech ventures differ from other venture sectors, such as fintech or e-commerce, in that the climate tech ventures' market is not clearly defined and hence difficult to access and support in a targeted manner. Climate techs are developing green solutions across a broad range of brown industries, from highly organised oil and gas or construction sectors to highly fragmented but high-emission-incurring agriculture and mobility sectors. Market access and customer acquisition costs against these highly established markets are challenging, especially in SSA, where value chains carry a high level of informality and consumers are highly price sensitive. As a result, climate techs need highly adaptive business models, favourable policy frameworks, and funding instruments to keep their products and services affordable for the users.

- **Need for systemic support**

  Moreover, climate techs that need to develop technologies based on hardware, science or nature-based solutions need much more systematic support. This support needs to be a multisectoral effort including research and development funding from public sources, including academia and government-sponsored research institutions, as well as corporates and other SMEs that can connect developing technologies to the market. In the SSA context, this multi-sectoral support for climate tech R&D and manufacturing is limited. For example, there are a few homegrown geolocation or satellite companies. This, in turn, makes it difficult for data-based climate tech ventures to follow suit. Another example of the lack of systemic support is the lack of solar panel facilities across SSA, which makes renewable climate techs rely on imported technologies and navigate foreign exchange (FX) risks for their core technology.

Addressing these challenges is not a responsibility of a single sector, but rather require a more systemic and multi-stakeholder effort. With this context as the background, this report delves more on the role of public policy in strengthening and enabling the market development and climate technology development for market commercialisation, and in doing so links how other stakeholders are involved to implement those public policy agendas.

3 | Adopting a systemic approach in policy development for the climate tech ecosystem

Public sector actors are central in setting longer-term strategies and national priorities, mobilising funding for strategic R&D, and incorporating inclusivity and sustainability goals into the policy development process (see Chapter 4). These activities, in turn, influence the incentives for financiers to invest in the climate tech market. However, the public sector and financiers are not the sole drivers of developing an innovation ecosystem. The broader network of actors, or "village"[8], that needs to be coordinated through the public policy in a systemic approach, includes:

- **Government**

  Should act as catalytic orchestrators for innovation and climate adaptation, mitigation, and resilience by creating regulatory certainty regulations, building infrastructure, investing in R&D, fostering collaboration among other actors, and mobilising finance.

- **Investors and donors**

  Public, philanthropic, and private financiers that provide financial support and market launch strategies to climate tech ventures. Financiers help ventures take ideas to early-stage ventures that find their product market fit, and help commercialise and scale ventures through medium to late-stage funding.

- **Ecosystem support organisations (ESOs)**

  Incubators, accelerators, venture builders, and technical advisors provide technical assistance and financial support to help early-stage ventures find product-market fit and to provide investment readiness support for ventures.

- **Universities & research centers**

  Provide technical training, skills development, and facilities to bridge research and entrepreneurship, providing labs, testing facilities, and mentorship to bring technologies from prototype to market.

- **Corporates & existing market**

  Corporations and existing "brown" SMEs that can adopt climate tech innovations within their production or operational capacity, and help connect climate tech innovations to the broader marketplace.

By taking on a systemic approach to policy assessment, this paper advocates for practical tools to facilitate collaboration across different actors. One emerging model for developing a coordinated innovation ecosystem is climate tech innovation hubs (CTIHs). CTIHs are strategic platforms aimed at accelerating locally rooted innovative climate tech solutions and are based on existing initiatives such as MIT REAP[9] and UNIDO GCIP[10]. Putting this model into practice, demonstrates that ecosystem success depends less on who is present and more on how they collaborate with trust, alignment, and shared goals. They achieve this by convening and connecting local actors within an innovation ecosystem in a multi-phase process to foster climate-driven technologies and collaborative networks. In other

8 Jamil Wyne, Forbes, Time to build climate innovation ecosystems (2024)
9 MIT REAP, Accelerating Entrepreneurship and Inclusive Economic Growth
10 UNIDOS, Global Cleantech Innovation Programme

words, integrating key enabling factors for entrepreneurial success bridges top-down policies with bottom-up innovation, aligning public institutions, private sector actors, and civil society around shared climate priorities. CTIHs are not merely spaces for incubation. They are strategic platforms that cultivate collaboration, align incentives, and act as catalysts for a green transformation of the economy.

In this sense, CTIHs represent a practical embodiment of the systemic approach, translating high-level policies into collaborative, place-based innovation ecosystems. They do not operate in isolation but rely on a supportive policy environment that enables research-to-market pathways, safeguards intellectual property, and provides access to reliable data. The following chapter therefore turns to an assessment of the baseline policy landscape in Sub-Saharan Africa, outlining the foundational conditions required for effective climate tech ecosystem development.

4 | Policy landscape assessment for climate tech innovation ecosystem development in Sub-Saharan Africa

The baseline policy framework for activating the broader innovation ecosystem needs to be in place and implemented before developing a sector or industry-specific innovation ecosystem, such as the climate tech ecosystem. Policies for developing the baseline innovation ecosystem are still nascent and in earlier stages of development across the SSA[11]. Therefore, this policy assessment focuses more on the baseline policies that build infrastructural and institutional capacities to enable other actors' involvement. These underlying policies include research and development (R&D) policies, an intellectual property (IP) protection framework, and the development of climate sector innovation centres. This chapter will take a closer look at these policy landscapes, including examples from key SSA countries where applicable.
Some key areas of action to harness innovation opportunities are :

Some key areas of action[12] to harness innovation opportunities are:

1. Investing in R&D facilities and universities that promote technological development, and also encourage technological transfer beyond labs to ventures
2. Establishing patent and intellectual property protection through legal entities to ensure that commercialising innovation can be sustainable, and ventures can access these structures.
3. Designing a centralised data and intelligence centre that provides information to map climate technologies and to find market entry opportunities.
4. Developing climate tech innovation hubs that provide specialised support for climate ventures, bringing together experts from the broader ecosystem actors to create synergies.

4.1. Investing in research and development (R&D) facilities and universities

Public investment in climate-related R&D is essential in early-stage innovation, where risks are high and commercial returns are uncertain. In more mature markets, governments fund climate tech through research grants, university programmes, and joint public–private consortia. Despite this importance, investments in climate-related research remain modest across most African countries. Public R&D expenditure is consistently below 1% of GDP[13], and the fragmentation among public policy developing bodies, implementation bodies, and oversight bodies weakens coordination and priority-setting. Increasing R&D spending requires strong policy commitment and public funding, as well as capacity development at research organisations.

R&D efforts for climate tech innovation are particularly important in developing locally adapted technologies that are tailored to address local climate risks. Examples of locally adapted technologies are drought-resistant crops that are tested in local soil, off-grid energy solutions cater to the local level of connectivity and environment, and solutions like solar energy-enabled cold chain solutions to reduce post-harvest loss[14], which is a prominent value chain issue in SSA. Providing structured and sustainable R&D support contributes to the generation of new technologies through research, experimentation, and development.

11 NEPAD, Integrate innovation and emerging technologies into Africa's socio-economic development (2021)
12 UNDP Accelerator Labs
13 UNESCO, African perspectives on scientific freedom: insights from policy and practice in 6 countries (2024)
14 Climate Policy Initiative, Landscape of climate financing in Africa (2024)

South Africa stands out with stronger R&D systems. The Presidential Climate Commission laid out the Just Energy Transition Investment Plan (JET IP) to scale out investments for decarbonisation and GHG reduction[15] for the 2023-2027 time period. The JET IP is steered by institutional bodies such as the Presidential Climate Commission (PCC) and a dedicated JET Programme Management Unit (PMU), which coordinate multi-stakeholder engagement and drive sectoral R&D alignment[16].

Kenya has been increasing its academic and research institutional capacity. Long-standing bodies like the Kenya National Academy of Sciences (KNAS) support science-policy synthesis, where climate is becoming more mainstreamed[17]. New structures like the Kenya Advanced Institute of Science & Technology (KAIST) at Konza Technopolis[18] are part of the public plan to boost postgraduate research in engineering, ICT, agriculture, biotech, and energy systems.

Nigeria has a strategic R&D policy intention, but financing and infrastructure capacity to support university and lab capacity can be improved. Nigeria's NCCP (2021) mandates investment in science, technology, and innovation to promote climate-responsive solutions across priority sectors[19]. LT-LEDS presents a long-term vision (2050+) for building a resilient, low-carbon economy through enhanced R&D capacity and climate innovation[20]. Yet, financing to support these policy directions remains limited. Only USD 2.5 billion reached climate activities in 2021/22, which is far below the USD 27.2 billion needed annually[21]. Both the NCCP and the adaptation strategy prioritise capacity building in research institutions to support climate-responsive innovation[22].

Ghana has enacted enabling laws (e.g., Renewable Energy Amendment Act 2020) and structures to mobilise finance, but continues to rely on generalist laboratories in universities, with limited dedicated climate-tech R&D infrastructure[23].

In the **Ivory Coast**, institutional capacity for climate innovation R&D remains focused on agriculture but is limited in other climate-related sectors. The Centre National de Recherche Agronomique (CNRA) is a strong national research hub with multiple stations and a mandate to tailor agro-tech innovations. CNRA promotes from crop productivity to resource management in rural smallholder farmer communities[24]. CGIAR's AfricaRice is based in Abidjan and operates a regional research centre with a focus on rice resilience and sustainable systems[25].

With an increasing attention given to climate technology R&D promotion across SSA, as demonstrated above, the public sector needs to continue to play a catalyst to funding and coordinating the ecosystem. Publicly-led initiatives could increasingly focus on technology transfer offices through existing universities, joint venture programmes with industry players such as renewable energy companies or telcos, and create "lab-to-market" programmes at R&D centres. Future growth lies in aligning R&D with national climate priorities of each country and ensuring that research outputs are accessible to entrepreneurs and scalable beyond academic settings.

15 South Africa's Just Energy Transition Investment Plan (JET-IP)
16 JET IP Brochure (2023-2027)
17 National Research Fund Kenya (2024)
18 KAIST, Kenya-AIST to Open in September 2024, (2023)
19 National Climate Change Policy (2021)
20 Okafor, C. C., Madu, C. N., Nwoye, A. V., Nzekwe, C. A., Otunomo, F. A., & Ajaero, C. C. (2025). Research on Climate Change Initiatives in Nigeria: Identifying Trends, Themes and Future Directions. Sustainability, 17(9), 3995. https://doi.org/10.3390/su17093995
21 Climate Policy Institute, Landscape of Climate Finance in Nigeria 2025 (2025)
22 UNDP Climate Change Adaptation
23 UNDP, ENVIRONMENT AND CLIMATE CHANGE IN GHANA POLICY BRIEF (2021)
24 Centre National de Recherche Agronomique
25 AfricaRice

4.2. Patent and intellectual property (IP) protection

Patents and intellectual property protection help ensure that innovators developing new technologies can recuperate the heavy upfront R&D cost and help attract investors by legally protecting the technology. An IP protection policy framework requires cooperation between legal entities that provide and implement legal protection, research organisations that develop and apply for patents, innovators that translate the patented technologies into commercial products, and technical assistance providers that help ventures navigate the legal frameworks.

In **SSA**, the UNDP Climate Information for Resilient Development in Africa (CIRDA)[26] digitises historic records and climate archive data on climate impact on agriculture, fishing and floods. The CIRDA also works with national digitisation strategies to provide technical assistance on data storage, legal frameworks, developing in-house capacities, allocating budgets, and acquiring budgets. The CIRDA works with Gambia, Malawi, Sierra Leone, Tanzania, Uganda, and Zambia.

In **South Africa**, the Technology Innovation Agency (TIA), under the Department of Science and Innovation (DST), plays a central role in facilitating the commercialisation of R&D outcomes, providing funding and youth innovation programming, with a mandate that includes climate-oriented innovation in agriculture and the bio economy[27]. TIA provides R&D and technology-to-commercialisation grant funding to support MSMEs, innovation hubs, technology transfer offices, and science parks[28]. South Africa is one of the biggest producers of patents and knowledge products in Africa[29], and the infrastructure for intellectual property (IP) protection extends to climate tech innovation.

Kenya is advancing a formal National IP Policy and Strategy (NIPPPS) development, which aims to strengthen IP protections, support local innovators, and align IP with national industrial goals. NIPPPS was drafted in 2012 with the support of WIPO at the global level, and Kenya has four main governmental agencies supporting intellectual property and patent policies: Kenya Industrial Property Institute (KIPI), the Kenya Copyright Board (KECOBO), Kenya Plant Health Inspectorate Services (KEPHIS), and the Anti-Counterfeit Agency (ACA)[30]. Kenya has a history of patenting green technologies, such as Agerton University's Pyrethrum Solar Driers[31]. Other IP protections include utility models under the Industrial Property Act of No. 3 of 2001, which gives protection for incremental innovation[32]. In addition, as a member of WIPO, Kenya utilises WIPO GREEN, which is a platform that connects climate-positive technologies to potential users[33].

IP and patent support systems exist in **Nigeria**, but explicit IP provisions for climate tech within policy remain underdeveloped within the National Climate Change Policy (2021).

Ivory Coast is a member of OAPI and is bound by TRIPS-compliant IP laws. It provides protection for patents, trademarks, industrial designs, utility models, and geographical indications under a unified regional system[34]. The government launched a National IP Policy and Strategy in 2025 to strengthen IP governance frameworks and support innovators[35].

Ghana's IP legislative framework is robust, but not necessarily specialised for climate tech, including

26 UNDP CIRDA
27 GTAC: The Role And Efficiency of the Technology Innovation Agency in the Commercialisation and Development of Intellectual Property from Publicly Funded Institutions (2022)
28 OECD, STIP COMPASS (2025).
29 Makhoba, Xolani and Anastassios Pouris, (2019), "A patentometric assessment of selected R&D priority areas in South Africa, a comparison with other BRICS countries", https://doi.org/10.1016/j.wpi.2018.10.001
30 Tracing Kenya's Journey Towards a National IP Strategy and Policy (2025)
31 Burnett, Duncan, Farrell, Graham and Kiiru, Mary (2002) Strategies for the development of a competitive pyrethrum-based pesticide sector in Kenya. Final report (NRI report no. 2695). Technical Report. Natural Resources Institute, Chatham, UK.
32 https://www.wipo.int/wipolex/en/legislation/details/17211
33 Turning green ideas into gold? The role of Intellectual Property in fostering Green Innovation in Kenya (2024)
34 ITA - Côte D'Ivoire
35 WIPO - Côte D'Ivoire

the Patents Act (2003) - Act 657, Trademarks Act (2004), Industrial Designs Act (2003), Copyright Act (2005)[36]. In 2024, Ghana ratified the ARIPO Arusha Protocol to enhance plant variety protection for key agri-tech innovation[37]. Institutional policies, for instance, CSIR and the University of Ghana, provide structured IP ownership, licensing, and revenue-sharing processes[38].

In **Tanzania**, the National Institute for Medical Research (NIMR) launched a refined IP policy in 2022, offering clear IP governance, commercialisation frameworks, and a benefit-sharing model. While these IP policies are not climate-specific, they can be emulated in climate tech industries[39]. Despite guidelines encouraging climate adaptation integration into sector planning, there is a gap in dedicated funding or infrastructure supporting climate-specific R&D, particularly in university or innovation settings[40].

Zambia has a formal IP legal framework that covers patents, trademarks, copyrights, and industrial designs[41]. Nonetheless, enforcement gaps and low public awareness remain.

Senegal is gradually strengthening its systems for IP and technology commercialisation, such as participating in regional IP frameworks and encouraging technology transfer[42]. However, practical uptake remains limited due to low awareness among researchers and entrepreneurs.

Legal frameworks for intellectual property exist in many SSA countries, but enforcement and climate-specific application remain uneven. Public institutions at the national level need to strengthen the implementation procedures as more technologies appear, and create practical communication channels with the climate tech industry to reflect the fast-changing environment in its policy. Growth opportunities lie in strengthening the implementation capacities of national IP policies and subsequently building specialised IP support services for climate-tech ventures, and embedding IP literacy in public universities and research centres.

4.3. Designing a centralised data and intelligence platforms relevant for climate tech

Centralised data and intelligence platforms sharing information on climate, whether, land or ocean usage are helpful tools for both policymakers and the climate tech ecosystem. Frequently updated data on the national and subnational climate conditions provide evidence for policymaking, while these data enable interoperability across ventures and the underlying data needed to develop technologies. Data availability also helps investors and funders gain confidence by accessing transparent market information. An example of this is a national soil health information database, which helps governments identify fertiliser subsidy needs and for soil health ventures to develop specialised products based on current demand conditions. To gather and host up-to-date centralised data, collaboration is needed across data collectors (often government agencies or field agents), government agencies that host and maintain quality, and policy research institutions that advocate for these platforms.

Nigeria is starting to democratise climate data, though institutional systems to integrate citizen and agency-generated data into R&D efforts remain nascent. The National Climate Change Policy (NCCP) outlines the need for robust climate monitoring and data systems to guide adaptation and mitigation planning[43]. Dataphyte, a leading data-journalism platform, launched Nigeria's first public Climate Data Hub, empowering citizens to report climate-impact observations and contributing to

36 COUNCIL FOR SCIENTIFIC AND INDUSTRIAL, RESEARCH - GHANA INTELLECTUAL PROPERTY POLICY (2021)
37 SABA IP, Ghana: Implementing the ARIPO Arusha Protocol (2024)
38 UNIVERSITY OF GHANA OFFICE OF RESEARCH, INNOVATION AND DEVELOPMENT (ORID) INTELLECTUAL PROPERTY POLICY
39 National Institute for Medical Research, Intellectual Property Policy (2022)
40 United Republic of Tanzania Vice President Office, GUIDELINES FOR INTEGRATING CLIMATE CHANGE ADAPTATION INTO NATIONAL SECTORAL POLICIES, PLANS AND PROGRAMMES OF TANZANIA (2012)
41 Sampa, Precious and Sazib Hossain, (2024) Innovation and Intellectual Property Rights: A Case Study of Zambia. DOI:10.36348/merjem.2024.v04i06.002
42 Intellectual Property Helpdesk - Senegal (2022)
43 National Climate Change Policy (2021)

wider data availability for innovators[44]. The National Council on Climate Change Secretariat (NCCCS) oversees climate data, requiring coordination across national and sectoral GHG inventories and policy tracking[45].

Ghana's National Climate Change Policy (NCCP) and the National Climate Change Master Plan (2015–2020) emphasise the establishment of climate data systems to inform planning and resilience actions[46]. The policy urges decentralised implementation across regional, district, and community levels with mechanisms for monitoring and evaluation to make climate data actionable[47]. Ghana's climate strategies call for mainstreaming climate considerations into development policies, including shared data tools and institutional coordination frameworks. The NCCP mandates interagency collaboration and use of scientific knowledge alongside indigenous systems[48]. Yet nationally accessible digital platforms or collective intelligence tools for climate tech innovators are largely absent.

Zambia has developed climate monitoring systems through the National Adaptation Planning (NAP4CR) and Second National Communication (SNC) processes, including tools like the GHG inventory system and MRV platforms managed by ZEMA and other sector institutions[49]. However, integration of citizen-generated climate data from agricultural communities or informal urban systems into formal innovation channels remains limited. Current national climate frameworks emphasise sector coordination and stakeholder participation but lack digitally shared platforms or dashboards to align innovators, researchers, and policymakers around real-time data and innovation needs[50]. There is an opportunity to transform these coordination mechanisms into functional tools that support climate-tech venture development.

Ivory Coast's Climate-Smart Agriculture Investment Plan emphasises using real-time climate and agronomic data to guide resilient farming strategies, such as the National Agrometeorological System Project. Datasets like CSA Compendium support data-based policy making[51] by compiling peer-reviewed articles and data for farm practices across the country and other SSA countries, and this information helps make evidence-driven decisions for Climate Smart Agriculture (CSA) policies . Renewable energy targets within its new Sustainability-Linked Finance (SLF) Framework include rigorous monitoring, such as using remote sensing and geospatial data to link borrowing costs to environmental outcomes, enhancing data collection infrastructure. While there is not yet a central data platform to integrate climate data for R&D efforts, the National Commission on Climate Change under the Prime Minister's office and the Carbon Market Bureau are institutional data-aggregation nodes for climate data[52].

Senegal has developed a range of policies and strategies to address climate change, integrating R&D considerations into its broader development agenda. Senegal has a dual challenge of achieving economic growth while addressing climate risks, particularly in agriculture, coastal zones, and infrastructure[53]. Senegal's Nationally Determined Contribution (NDC) includes measures to enhance data collection, climate monitoring, and technology transfer. However, stronger researcher–policymaker linkages is needed for implementation[55]. Similar to the Ivory Coast, Senegal has implemented sectoral-specific initiatives with development agencies such as FAO-UNDP's SCALA project[56], which is improving climate reporting and data systems for agriculture.

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44 Dataphyte Archive
45 Nigeria's first biennial transparency report to the UNFCCC
46 World Bank Climate Support Facility Ghana Climate Change Law Development (2022)
47 UNDP Climate Change Adaptation
48 World Bank Climate Support Facility Ghana Climate Change Law Development (2022)
49 UNDP Climate Promise, Climate Action Zambia
50 UNDP & Republic of Zambia, ENABLING ACTIVITIES FOR THE PREPARATION OF ZAMBIA'S SECOND NATIONAL COMMUNCIATION TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC) PROJECT
51 World Bank, CLIMATE-SMART AGRICULTURE INVESTMENT PLAN: COTE D´IVORE (2019)
52 IFC, Government of Côte d'Ivoire Collaborates with International Financial Institutions, Development Partners, and the Private Sector to Catalyze Climate Finance (2024)
53 World Bank Senegal Country Climate and Development Report (2024)
54 Senegal - Country Climate and Development Report October 2024
55 Senegal: bridging the climate research and policy divide (2024)
56 UNDP SCALA programme in Senegal (2023)

While many of the SSA countries recognise the creation and access to reliable climate data, developing these centralised and open data is a big undertaking. While ministries, meteorological departments, and environmental agencies collect valuable data, they are at the test or pilot stages of development, meaning that the data sets are still fragmented, lacking standardization and open accessibility. Publicly-led initiatives have begun to consolidate climate data, for example through national climate information systems and adaptation platforms, but these efforts are rarely tailored to private sector use. The next phase of growth will build upon more centralised and integrated data on climate-relevant sectors. Better data can attract more private sector confidence and strengthen evidence-based policymaking and attract international partners by demonstrating transparency and coordination.

4.4. Specialised support for innovators through climate tech innovation hubs (CTIHs)

Climate tech innovation hubs (CTIHs) are a coordination node in transforming early-stage ideas into scalable solutions. These hubs act as a central convening point and knowledge transfer facilitator to bridge the gap between researchers, entrepreneurs, and investors. By clustering expertise in market segments like climate-smart agriculture, renewable energy, and water management, these centres provide more specialised support to increase prototyping capacity, improve business training, and harmonise policy advocacy. Beyond venture support, CTIHs also function as policy feedback loops, offering governments real-world insights into technological readiness and enabling a more adaptive policy environment.

In **Ghana**, the Ghana Climate Innovation Centre (GCIC), was established in 2016 at Ashesi University through a World Bank Climate Technology Program grant[57]. The Ghana Climate Innovation Centre (GCIC) supports climate-smart enterprises across sectors like energy efficiency, solar power, waste management, water purification, and agricultural innovation. The centre provides incubation space, mentoring, policy advocacy, and early-stage financing. The centre helps ventures access both technical and business support. Since its inception, GCIC has incubated hundreds of ventures, mobilised millions in capital, and facilitated measurable CO_2 avoidance[58]. In 2024, GCIC partnered with AgriTech firm Farmerline to empower smallholder farmers with digital tools, benefiting over 12,000 individuals through incubation and extension services[59].

Nigeria and **Kenya** also have GCIC equivalents such as Nigeria Climate Innovation Center (NCIC) and Kenya Climate Innovation Center (KCIC), which also have a similar mandate of bringing together government stakeholders, academia, SME support systems, and startup incubation and acceleration support that are specialised for climate tech ventures. Though not strictly climate-focused, broader tech incubators like Co-Creation Hub (Cc-HUB) and Ilorin Innovation Hub in Nigeria are expanding into themes relevant to climate technology, such as energy, agri-tech, and urban resilience. Their immersive entrepreneurial culture, co-working facilities, and funding linkages make them fertile grounds for climate-tech ventures to tap into local innovation ecosystems.

The CATAL1.5°T initiative is also another example of an international donor-led initiative contributing to developing systemic connections across the climate tech innovation ecosystem. The CATAL1.5°T initiative, as an incubator and accelerator, supports climate-tech innovation across Francophone West Africa. The initiative's programming expands to training and providing technical assistance to other ESOs looking to better support climate tech ventures. The initiative is implemented through partner local investors and ESOs to bring more awareness and attention to climate tech ventures in the Francophone West African ecosystem. Further, GIZ, one of the implementing organisations of

57 World Bank Ghana Climate Innovation Centre (2016)
58 Ghana Climate Innovation Center
59 Farmerline

the initiative, is creating conversations with the public sector actors and convening the climate tech innovation ecosystem actors through national forums. Their goal is to de-risk ventures and build an investable pipeline across sectors such as circular economy, mobility, and smart infrastructure[60].

Early versions of climate tech innovation hubs are emerging in key markets across SSA. These hubs provide incubation, technical training, and linkages to investors, filling gaps that universities and research institutes cannot address alone. Growth opportunities lie in scaling this model across in other countries, and embedding the CTIHs more firmly in national development strategies. CTIHs should be positioned as a key partner that are linked to public procurement and industrial policy priorities. By positioning themselves as anchor institutions, publicly-supported CTIHs can connect ventures with broader ecosystem actors (the “village”) and scale the burgeoning ecosystem in a more systematic way.

60 Make It Africa

5 | Senegal as a proof of concept for the systemic approach

5.1. Background

Senegal is still an emerging climate tech ecosystem with a small but growing set of climate tech ventures and research centres that are working on clean energy, waste, agri-tech and mobility solutions. Public interest is rising[61] supported by national frameworks such as the Startup Act and the Code de l'Environnement[62]. Yet, the ecosystem still faces the challenge of moving from a nascent state to one with critical mass.

In 2024-25, the Senegalese government together with the United Nations Industrial Development Organization (UNIDO), along with Global Environment Facility (GEF) and Green Climate Fund (GCF), conducted in-depth assessments highlighting the need for stronger policy commitment and implementation capacities to bring stakeholders together. Senegal thus offers a valuable case study of the "activation phase," when governments and partners must establish foundational building blocks for scale—lessons that are also relevant for Francophone West Africa.

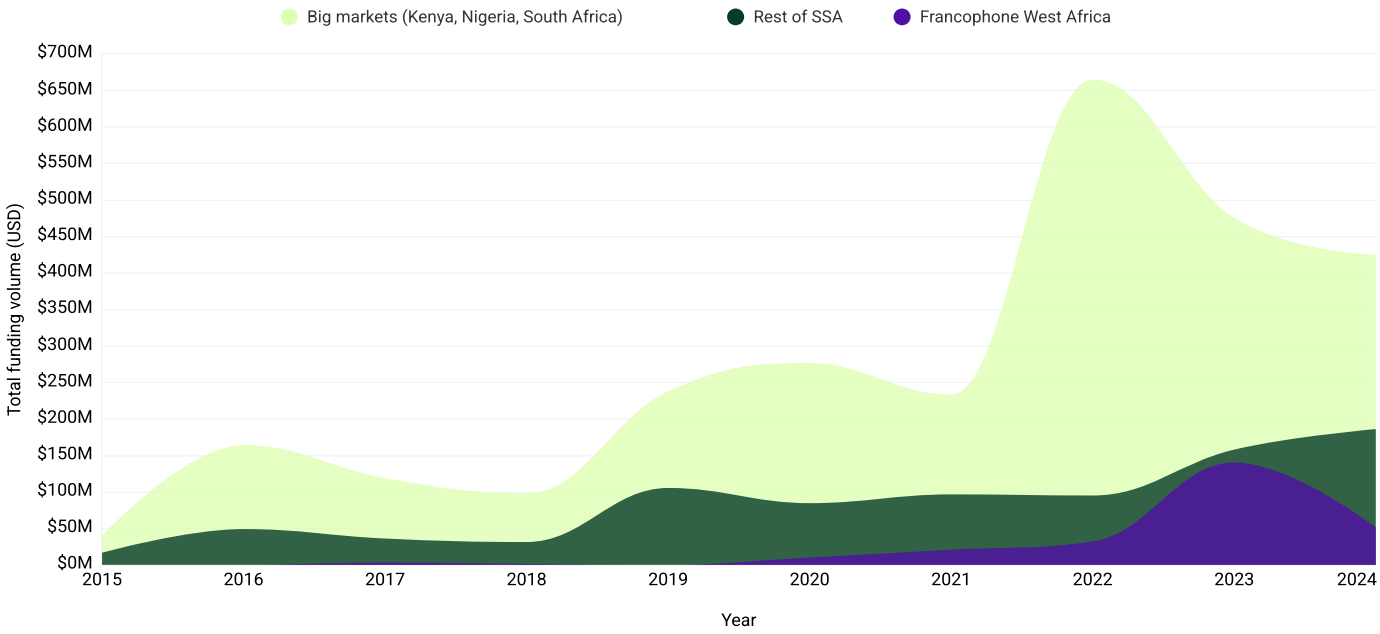
Against this backdrop, Senegal was chosen as the pilot site for progressing the conversations for increasing support in creating a better enabling environment through increased financing for climate techs. The Senegalese Forum on Climate Tech Investment (25 June 2025 in Dakar) co-organised by the Ministry of the Environment and Ecological Transition (METE), UNIDO GCIP and GIZ under the framework of the CATAL1.5°T Initiative, convened policymakers, development finance institutions, investors, research bodies, and accelerators such as CTIC Dakar to design context-specific solutions, strengthen Senegal's clean tech ecosystem, and contribute lessons to the global climate investment agenda.

5.2. Senegal's climate tech innovation ecosystem

Senegal faces urgent climate challenges from desertification and water scarcity to urban waste and reliance on imported fossil fuels. Senegalese climate tech ventures are in part addressing these challenges through scaled-out decentralised energy access through solar energy. Three main ventures contribute to most of the funding raised in these sectors: Ignight Energy Access (formerly Oolu), Baobab+ (offshoot by Baobab group, now sold to BioLite), and SolarBox (raised $1m pre-seed funding in 2024). Agri-food tech follows suit, with a focus on on-farm solutions, mainly catering to smallholder farmers.

61 Senegal: bridging the climate research and policy divide (2024)
62 World Bank Senegal Country Climate and Development Report (2024)

Figure 1: Climate tech ecosystem growth in SSA



Because the ecosystem is still at an early stage, investors and hubs focusing on climate tech ventures are not yet visible. Most of the funders are sector-agnostic early-stage investors and corporate funders, while ESOs are also more focused on general ICT startup support rather than climate-specific ventures.

FIGURE 2 | Climate Tech Venture Ecosystem Actors in Senegal

5.3. Stakeholders involved in Senegal's systemic approach to climate tech innovation development and adoption

Senegal has established a layered institutional architecture for climate action that combines government ministries, public agencies, research centres and donor-backed programmes. Senegal has the opportunity to convert these building blocks into a connected, sustainable institutional ecosystem that routinely supports R&D, prototype demonstration, and the commercial scale-up of climate technologies. Senegal's institutional stakeholders for climate tech innovation development includes the following core institutions:

- **Ministry of Environment and Sustainable Development (MEDD)**

  Leads national climate policy, NDC coordination, and sectoral integration. By embedding R&D targets in national plans and convening cross-ministry working groups, MEDD can align climate innovation with finance, energy, and agriculture.

- **COMNACC (National Committee on Climate Change)**

  Multi-stakeholder forum for aligning ministries, donors, and civil society on climate priorities. Strengthening its secretariat would enhance its role as a durable convenor linking research outputs with policy.

- **Centre de Suivi Écologique (CSE)**

  National data hub producing GHG inventories, vulnerability maps, and modelling. Standardising datasets and enabling third-party access would position CSE as the backbone of climate-tech R&D.

- **Agence Nationale de la Statistique et de la Démographie (ANSD)**

  Integrates climate indicators into national statistics, supporting market sizing and longitudinal research for investors and startups.

- **SENELEC and ASER (energy delivery & electrification agencies)**

  Energy agencies that translate policy into deployment by setting procurement standards, piloting renewable solutions, and creating market signals for innovators.

- **DER/FJ (Délégation à l'Entrepreneuriat Rapide des Femmes et des Jeunes) and Dakar Innovation Hub/incubators**

  Provide early-stage finance, incubation, and mentoring. Stronger university linkages and R&D fellowships could make them conduits for research commercialisation.

- **Universities and research units such as Cheikh Anta Diop University and WASCAL partners**

  Source of applied research and capacity. Expanding tech-transfer offices and spin-out incentives would improve translation into investible prototypes.

- **Development partners and programmes, such as UNDP SCALA, World Bank, AfDB, JETP partners**

  Offer financing, technical assistance, and pilot projects. Coordination through MEDD and COMNACC is essential to avoid duplication.

- **Regional bodies, such as ECOWAS, ECREEE, WASCAL**

  Provide standards, shared research, and cross-border scaling opportunities for Senegalese innovations.

5.4. Next steps to strengthen the enabling environment for the Senegalese climate tech innovation ecosystem

Policymakers, financiers, and ecosystem support actors have agreed on the next steps following a systemic approach at the Forum for Climate Tech Investment.

1. Commitment to establishing a national coordination mechanism for climate tech under the leadership of METE, aligning roles across ministries and agencies.
2. Agreement on the need to operationalise existing frameworks, such as the Startup Act and the Environmental Code, to incentivise climate tech ventures.
3. Recognition of the importance of introducing innovation finance tools, such as a Cleantech Innovation Fund and innovation vouchers, to support early-stage climate tech ventures.
4. Policy alignment on strengthening the link between universities, research centres, and entrepreneurs through structured technology transfer pathways.
5. Support for embedding inclusion benchmarks (youth, women, and regional innovators) into national entrepreneurship and innovation programmes.
6. Endorsement of public procurement as a lever to create demand for climate technologies and encourage domestic adoption of local solutions

6 | Conclusion and next steps

Public-led policies and initiatives remain central to overcoming the systemic barriers that climate technology ventures face in Sub-Saharan Africa. Fragmented regulatory frameworks, limited financing structures, and challenges to enter the market continue to constrain the climate tech industry's ability to gain traction when the needs for climate technologies are greater than ever. By anchoring R&D investment, creating stronger intellectual property regimes, and fostering inclusive innovation systems, governments can reduce risks for private investors while providing the enabling conditions necessary for climate ventures to thrive.

Yet, public action cannot be effective in isolation. A systemic approach is needed, one that positions governments as conveners and facilitators within a broader ecosystem of universities, accelerators, financiers, corporates, and civil society. When public policies are linked with these actors, they help build feedback loops between research, business, and market demand that accelerate the development and adoption of climate tech solutions.

In this regard, climate tech innovation hubs can emerge as critical tools. They serve not only as incubators of start-ups but also as convening spaces where policymakers, researchers, and private investors can align priorities, exchange data, and test models for scaling climate technologies. Supporting such hubs provides governments with a practical tool for driving system-level coordination while embedding climate innovation within broader development agendas.

Looking forward, governments in SSA can take four priority policy agendas outlined in this report to strengthen policy frameworks for climate technology ecosystems. Taken together, these measures offer a roadmap for governments to move beyond fragmented interventions and instead build systemic, resilient ecosystems capable of amplifying the opportunities currently present in SSA.

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