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Technology Executive Committee

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Revised draft knowledge product on climate technology incubators and accelerators in developing countries

Cover note

A. Background

1. As per Activity A.2.2 of its rolling workplan (2023-2027), in 2026, the TEC is to develop a knowledge product on incubators and accelerators, in collaboration with the United Nations Industrial Development Organization (UNIDO) as the lead partner for this activity.

2. At TEC 30, the TEC agreed on the scope of work under this activity[1] and launched the development of the knowledge product referred to in paragraph 1 above.

3. At TEC 31, the TEC considered a draft concept note for the knowledge product, and agreed on its objectives, scope and key elements.[2]

4. At TEC 32, the TEC considered a first draft of the knowledge product and provided guidance to the open-ended activity group for further development of the knowledge product, including key messages and recommendations for consideration at TEC 33.

B. Scope of the note

5. The annex to this note contains the revised draft of the knowledge product on climate technology incubators and accelerators in developing countries, developed by the open-ended activity group in partnership with UNIDO.

C. Possible actions by the Technology Executive Committee

6. The TEC will be invited to consider the revised draft knowledge product in the annex and provide guidance for its finalization.

[1] Scoping efforts to inform this work were conducted in the period of 2023-2025, including through engagement and consultations with the Adaptation Fund, the Climate Technology Centre and Network, the Green Climate Fund, and the Global Environment Facility.

[2] See TEC document TEC/2025/31/5.

Annex

[Placeholder for the exact title to be determined]

Foreword and acknowledgments

[Placeholder to be developed once the paper is in its final form]

Abbreviations and acronyms

[Placeholder to be developed once the paper is in its final form]

Executive summary

[Placeholder to be developed once the paper is in its final form]

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Chapter 1
Introduction, context and methodology

A. Background

1. Accelerating climate action requires countries to develop, deploy and scale-up technologies that reduce emissions and strengthen resilience. Under the Paris Agreement, Parties recognised that innovation is central to achieving long term climate goals and to supporting sustainable development. But innovation does not happen in a vacuum. It depends on strong National Systems of Innovation (NSI) – "a network of actors, institutional contexts and linkages that underlie national technological change" (TEC, 2023).

2. The performance of NSI depends on the quality of their actors (organisations that participate in technology development and transfer, technology firms, universities and financiers), institutional contexts and linkages (TEC, 2023), particularly universities and research bodies that produce and diffuse science, technology, engineering and mathematics (STEM) and entrepreneurial capabilities. A solid STEM and entrepreneurial education/training, research investment and platforms to test and develop projects are core components of effective NSI, as they enable knowledge creation, dissemination, experimentation, and the adaptation of technologies to local needs. Countries that invest a higher share of their gross domestic product (GDP) in research and development tend to have stronger STEM education systems and innovation systems (TEC, 2023). The average expenditure on research and development (R&D) as a percentage of the GDP in the G20 countries is 3,03%, while countries with low and middle income invest on average only 1,95% of their GDP in R&D[1]. Strengthening NSI, including through collaborative R&D, is critical to bridging the innovation gap.

3. Entrepreneurs are at the heart of NSI, as actors who translate knowledge, research, and technological capabilities into practical applications with market and societal value. They are creating the jobs of the future and could play a key role in driving economic growth in line with the Sustainable Development Goals (SDGs). Their ability to mobilise resources, take risks, and adapt solutions to local economic, social, and environmental contexts makes them indispensable actors in NSI.

4. To support entrepreneurs within NSI, incubators and accelerators (I&As) play a pivotal enabling role. I&As contribute to NSI functions,[2] particularly through supporting entrepreneurial experimentation (TEC, 2023). They help early-stage entrepreneurs turn ideas into viable climate solutions by offering technical assistance, business development services, access to networks, legal counselling and linkages to finance. They also help entrepreneurs break out of their isolation, encourage the exchange of experiences, and facilitate the sharing of resources. This is particularly important for developing countries, where entrepreneurial ecosystems are often fragmented, knowledge about new technologies is less accessible and risk capital is scarce. I&As can be critical connectors – linking innovators to markets, investors, and public support mechanisms.

5. The NSI concept has been widely used by both scholars and policy makers to explain how interactions between a set of distinct, nationally bounded institutions supports and facilitates technological change and the emergence and diffusion of innovations (Freeman C., 1995; Egbetokun A., 2025). The work of the Intergovernmental Panel on Climate Change (IPCC)[3] and the Technology Executive Committee (TEC) has further advanced the

[1] More information: https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS; and https://www.b20globalinstitute.org/tracking_r&D_expenditure_across_G20_nations.

[2] These are: knowledge development and diffusion, entrepreneurial experimentation, market formation, resource mobilization, and legitimation.

[3] Namely the chapter on 'Innovation and Technology Development and Transfer', in the contribution of the Working Group III to the Sixth Assessment Report.

application of NSI concept to the climate technology context, which also provides the conceptual framing for this paper to examine the role of I&As in advancing climate technology innovation in developing countries.

6. TEC's 2018 joint publication (UNFCCC, 2018) with the Climate Technology Centre and Network (CTCN) and the Green Climate Fund (GCF) highlighted several important insights that remain highly relevant today:

- Climate focused I&As constitute a limited share of the global I&A landscape;
- Entrepreneurs face systemic barriers, including limited access to finance, weak support systems, and fragmented links to climate technology markets;
- I&As can significantly reduce risk by helping entrepreneurs transform inventions into market ready technologies and connect with buyers, suppliers and investors;
- The effectiveness of I&As depends on the broader enabling environment – policies, institutions, finance, talent, and partnerships – within NSI. When these are weak, I&As struggle to perform their role.

7. These findings underscore both the large potential of I&As to support climate technology development in developing countries, and the structural gaps preventing them from operating at scale. Parallel findings from the synthesis report for the technical assessment component of the first global stocktake (TEC, 2022) prepared by the TEC in 2022, underscore persistent challenges that directly relate to climate technology I&As:

- Insufficient entrepreneurial ecosystems in developing countries;
- Scarce private finance for early-stage Research, Development and Demonstration (RD&D);
- Limited capabilities to adapt technologies locally;
- Lack of integrated enabling environments (policies, standards, procurement, skills).

8. Building on this foundation, and in response to guidance by Parties to the TEC,[4] this paper aims to advance the understanding of the design and operation of climate technology I&As in developing countries, promote their wider use, and enhance their integration into support provided to developing countries for technology action. I&As could help countries unlock innovation at scale within stronger NSI – allowing entrepreneurs, researchers, institutions, and policymakers to turn climate technology ideas into impactful, investable solutions that advance Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), technology action plans, and long-term climate and sustainable development strategies.

B. Objectives

9. This paper serves as an actionable resource with policy insights on the role and functions of climate technology I&As in stimulating technology RD&D, building effective ecosystems for entrepreneurs and notably for start-ups, and ultimately strengthening the NSI in developing countries. In particular, it aims to:

(a) **Provide an overview** of a diverse range of climate technology I&As in developing countries, including their sources of funding, services offered, institutions involved, and their positioning in the broader NSI – explaining how they work;

(b) **Identify practical pathways** for the development of funding proposals that incorporate I&As and seek to build effective ecosystems for start-ups – providing examples and inspiration for how they could be embedded within climate action and related support avenues; and

[4] See Decision 13/CP.24, para. 5, Decision 14/CP.24, para. 8, Decision 18/CP.27, para. 10, and Decision 10/CP.28, para. 9.

(c) **Offer policy insights** from and for the development and operation of climate technology I&As in developing countries, on what shapes their effectiveness and how they can be strengthened and better integrated within NSI.

10. It offers insights and practical findings with regard to conducive enabling policy environments and financing modalities for the design and operation of climate technology I&As in developing countries, and could inform climate technology policies, programmes and actions by country teams, national policy makers and National Designated Entities (NDEs), and their implementation partners.

C. Scope and methodology

11. The scope of this paper is defined in the TEC rolling workplan for 2023-2027. I&As, together with other support mechanisms for climate entrepreneurship and start-ups, play distinct but complementary roles across climate innovation systems. Chapter 2 provides an overview of the definitions, objectives, services and delivery models of I&As, while also referring to other related or emerging support modalities that may warrant separate analysis. In examining the contribution of these modalities to climate technology innovation, however, the paper refers to I&As collectively and adopts a functional perspective, drawing on the NSI framework. In particular, it focuses on the function of entrepreneurial experimentation, rather than on the specific institutional arrangements through which this function is delivered. Accordingly, the collective use of the term "I&As" should not be interpreted as implying that incubators and accelerators are equivalent or interchangeable. Rather, it reflects the recognition that developing countries may adopt, adapt and combine different support mechanisms, according to their national circumstances, institutional capacities and innovation needs, to strengthen entrepreneurial experimentation and climate technology innovation.

12. The analysis in this paper draws from multiple sources of information: a scoping exercise involving the CTCN and climate funds under the UNFCCC to conceptualize the work, a desk review to inform the analytical framework for the paper and the mapping exercise; a mapping of a curated set of 30 I&As in developing countries (see Chapter 3), semi-structured interviews[5] to enrich the mapping findings and develop in-depth case studies; stakeholder consultations for informing the mapping and triangulation and validation of findings, including at the regional NDE forums, and a peer-review process by innovation experts supporting climate technology I&As in developing countries[6]. It combines prior TEC analytical work, UNIDO's operational experience with supporting technological innovation, and insights from climate projects/programmes that include incubator and/or accelerator components. These institutional sources are complemented by existing mappings and secondary analyses drawn from peer-reviewed academic research, UN agencies, international organisations, development finance institutions, specialist innovation networks and national institutions. Together, they provide a coherent foundation for describing diverse I&As models and ecosystem linkages, without aiming for exhaustive global coverage.

D. Structure of the paper

13. Following this introductory chapter:

(a) **Chapter 2** provides concise definitions of I&As and their evolution;

(b) **Chapter 3** provides a synthesis of mapping results from the analysis of 30 climate technology I&As in developing countries and offers an overview of salient observations and insights from the mapping;

[5] List of institutions and programmes interviewed from May to June 2026: The Adaptation Fund (AF), the Global Cleantech Innovation Programme (GCIP), the Adaptation SME Innovation Facility (ASIF), the Asian Development Bank (ADB), the Kenya Climate Innovation Center (KCIC), Climate KIC.

[6] The review was conducted by experts from the Adaptation Fund, the CTCN, and the NDE of Uganda.

(c) **Chapter 4** offers practical insights regarding enabling conditions for effective positioning of climate technology I&As within NSI and the broader policy frameworks in developing countries, highlighting aspects such as coordination mechanisms and institutional linkages, inclusion and digital transformation;

(d) **Chapter 5** explores various modalities and approaches, through which climate technology I&As in developing countries are financed and sustained;

(e) **Chapter 6** offers practical insights for integrating climate technology I&As into climate-related funding proposals, drawing on examples from multilateral climate funds serving the Paris Agreement;

(f) **Chapter 7** presents concise key messages and actionable recommendations for country teams, national policy makers, and NDEs with regard to the development and operation of climate technology I&As in developing countries, with the aim to inform the design of more effective, inclusive, and scalable climate innovation in developing countries.

Chapter 2
Definition, function and evolution of climate technology incubators and accelerators

A. Definitions and types

14. I&As are specialised entities that support entrepreneurs and startups in the development and deployment of their technology solutions. I&As "provide broad-ranging support to entrepreneurs, helping them to develop business know-how, market connections and technical capacity, and providing guidance on sources and procedures for access to finance" (TEC, 2018). Climate technology I&As in developing countries sit at the intersection of sustainable development, innovation and climate agendas. While they share many characteristics with general business I&As, their climate focus distinguishes them in terms of their target beneficiaries, expected outcomes, financing models, and performance and impact metrics.

15. In developing country contexts – where innovation systems often remain thin, fragmented, or constrained by limited access to finance and institutional capacities (World Bank Group, 2020) – climate technology I&As could play a pivotal role in supporting entrepreneurial activities and empowering small and medium-sized enterprises (SMEs) to contribute to climate change mitigation and adaptation, while stimulating job creation and social inclusion.

16. While serving a similar function within NSI that is supporting entrepreneurial experimentation, 'incubators' and 'accelerators' can be differentiated (see table 1) along dimensions such as programme duration, cohort size, innovation readiness and maturity of supported venture (see Box 1), intensity of mentoring, equity staked, business model, and graduation criteria (OECD, 2021).

Box 1 - I&As and the innovation readiness of climate ventures

Effective I&As tailor their services based on the readiness of the ventures and start-ups they support and respond to their specific needs, drawing on their expertise, resources, and strategic focus. The innovation readiness of climate technology ventures may relate to the maturity of the technology itself or the commercial maturity of the venture, among other things.

The KTH Innovation Readiness Level™ framework (see Figure 1) provides a framework for understanding and assessing the innovation readiness of start-ups. In this framework, the Technology Readiness Level (TRL) is considered alongside five other readiness scales: Customer Readiness Level (validated market need and customer traction), Business Readiness Level (BRL) (a viable and sustainable business model), Intellectual-Property Rights (IPR) Readiness Level (intellectual-property protection), Team Readiness Level (the competencies and organisation to execute), and Funding Readiness Level (the capital secured to progress) (KTH Royal Institute of Technology).

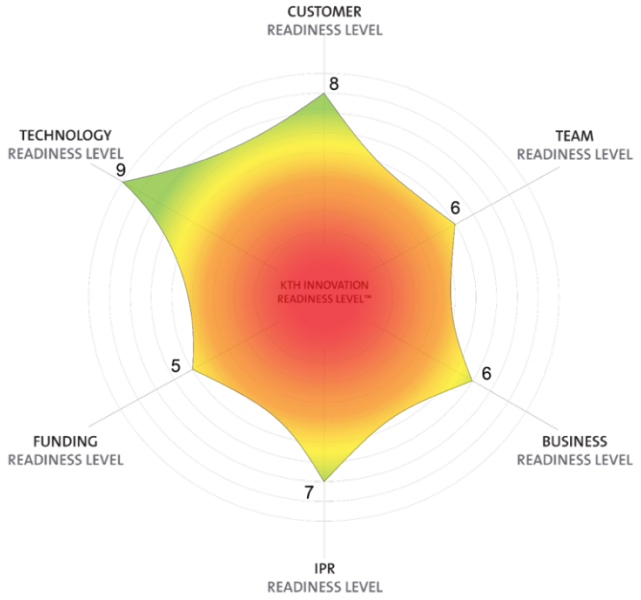

Figure 1: KTH Innovation Readiness Level

17. Incubators typically operate at earlier stages of the technological innovation cycle, which is commonly understood as comprising three phases: R&D, demonstration, and deployment and diffusion, supporting climate technology start-ups to overcome the so-called "valleys of death" in the formative stage during which the constitutive elements of an innovation system around a particular technology are set up (Bento, N. & Wilson, C., 2016; Gaddy, B. E., et al. 2017). Incubators offer a long-term nurturing environment – often spanning one to five years – providing workspace, business development services, technical assistance, and structured access to networks and finance.

18. Accelerators, by contrast, engage more intensively at the demonstration and early deployment stages, where successfully demonstrating a technology shows its utility and reduces the risk of failure (Hellsmark, H. et al., 2016). Accelerators operate through short, intensive programmes lasting three to six months, during which selected startups receive targeted mentoring, peer learning opportunities, and direct exposure to investors, often in exchange for equity (UNFCCC, 2018).

Table 1
Key characteristics of *climate* technology I&As (TEC, CTCN and GCF, 2018b)

Incubators	Longer-term programmes supporting ideation, research-to-prototype development, and early business formation. Common in university settings, donor programmes, and national hubs. Functions often include prototyping support, labs access, mentorship, market discovery, and founder skills building. Usually focus on TRL 1-4
Accelerators	Timebound, cohort-based programmes focused on validation, pilot preparation, investment readiness, and early commercialization. Common in private innovation hubs, corporate and investor-anchored programmes, and multi-country donor or multilateral initiatives; less frequently anchored in universities. Accelerators often function as "readiness engines", preparing start-ups to absorb blended or commercial capital and enter procurement or pilot partnerships. Sub-types: • Market-driven accelerators (corporate or investor anchored): provide access to testing environments, supply chains, procurement pathways, and scale-up finance.

	• Network-based or distributed accelerators: operate across multiple countries or regions using shared methodologies to overcome small-market constraints and ecosystem gaps. Usually focus on TRL 5-9
Hybrid models	Combine incubation and acceleration within a single institutional structure. Hybrids are particularly important in developing countries where early-stage pipelines are thin and start-ups require continuity across multiple TRL stages. Frequently found in universities, private innovation hubs, science and technology parks, and multi-country programmes led by international organisations.

19. The TRL is a widely used nine-point scale that measures the maturity of a technology as it advances from basic research (TRL 1), through demonstration, to full-scale, proven operation (TRL 9) (Mankins, J., 1995). It should be noted that TRL associated with the operation of I&As is rather indicative, as the TRL do not define obsolescence, nor do they account for manufacturability, commercialisation, or the readiness of organisations to implement innovations (European Commission, 2021). In developing country contexts, they may not fully capture the social, institutional, and market dimensions that shape whether a technology actually reaches end-users. Many of these limitations can be eased by using TRLs in combination with other indicators – such as access to finance, strength of linkages among actors, or employment in relevant sectors (Blanco, G. et al., 2022). This paper will include the TRL and the Business Readiness Level (BRL) (see Box 1) in the analysis of the mapped I&As (See Chapter 3) in order to examine both the technological and commercial maturity of supported start-ups through I&As.

20. I&As can also be grouped based on the mode of service delivery for supporting start-up ecosystems. Digital transformation has helped diversify the support modalities for entrepreneurship, leading to the emergence of new types of services and delivery models of I&As (see table 2).

Table 2
Modes of service delivery by I&As

Physical (place based) I&As	Anchored in dedicated premises that provide workspace, prototyping labs and face-to-face mentoring. These remain particularly relevant for start-ups and ventures requiring access to specialised equipment – for instance medical, pharmaceutical, biotech or hardware-intensive climate technologies with long gestation periods.
Virtual (digital) I&As	Delivering service online through e-learning platforms, e-coaching, virtual mentoring, recruitment and selection tools, and online communities of practice. Virtual delivery has been shown to lower delivery costs, broaden geographic outreach, and improve the inclusion of underserved entrepreneurs.
Blended I&As	Combining a physical anchorage with digital delivery of selected services. The Organisation for Economic Co-Operation and Development (OECD) identifies this hybrid as the most balanced approach for climate-relevant ventures, given that “delivery of online services alone, without climate-relevant aspect, would have little value to entrepreneurs” (OECD, 2021).

21. Taken together, the programme types set out in Table 1 and the service-delivery modes described above capture the most common forms of structured incubation and acceleration. They do not, however, exhaust the range of actors and mechanisms through which climate technology entrepreneurs and start-ups are supported in developing countries – a heterogeneity long emphasised in the academic literature (Hausberg, J. P. and Korreck, S. 2018; Pauwels, C et al., 2016). Several entrepreneurship support modalities and mechanisms operate outside the conventional cohort-based programme model (see Box 2). The mapping exercise conducted as part of this study takes into account the diversity of these modalities.

Box 2 - Entrepreneurship support modalities other than I&As (non-exhaustive)

- **Innovation competitions and challenge funds** mobilise entrepreneurs around a defined climate problem and channel prize- or grant-based finance to selected solutions, often surfacing ventures that more traditional funding routes would overlook (Nothstine, K., 2024; KTH Royal Institute of Technology)
- **Innovation bootcamps and innovation fellowships** provide a fast-paced, short-duration intensive learning model on a specific entrepreneurial or technological capabilities. Universities and other higher education institutions frequently use this format to stimulate innovation, entrepreneurial experimentation, and early-stage venture development.
- **Innovation academies** offer educational and training opportunities to nurture entrepreneurship.
- **Innovation labs** bring together diverse stakeholders in collaborative processes to generate, refine, and prototype solutions to predefined systemic challenges. Multilateral development banks, United Nations agencies, and other development partners increasingly employ this modality to foster climate technology innovation and cross-sector collaboration.
- **Venture studios** build and launch new businesses rapidly, developing ventures from inception in partnership with external co-founders (Moiana, D.G. A. & Rangone, A., 2025).

22. In practice, policymakers deploy a combination of entrepreneurship support modalities including I&As to address the evolving needs of climate technology entrepreneurs across different stages of venture development, while leveraging the full range of available support. The literature suggests that taking an ecosystem approach (Granstrand O. & Holgersson M., 2020) helps orchestrate these complementary interventions and maximise their impact. Within such systems, actors with a **'clustering' and 'coordination' function** play a critical role by co-locating and integrating multiple support modalities while connecting entrepreneurs with investors, research institutions, corporations, and public agencies. Innovation hubs (see the Cubo Itau case in Chapter 3), science, technology and innovation (STI) parks (UNCTAD, 2025), and centres of excellence are prominent examples of such organisations. Their value lies in the continuity and diversity of support, density of relationships, and the visibility they lend to the start-ups and ventures they host.

B. 2Evolution of climate technology I&As

23. I&As have rapidly become key drivers in the landscape of climate action, climate technology and within the broader NSI to help countries address their mitigation, adaptation, and crosscutting technology priorities under the Paris Agreement, including through strengthened RD&D systems, talent pipelines, and technology deployment pathways. The evolution of climate technology I&As is best understood as a process of socio-technical transition, shaped by changing actor constellations, shifting policy signals, and the progressive maturation of NSI.

24. Socio-technical transition processes including for climate technology innovation often follow the following stages: emergence, early adoption, diffusion, and stabilization (Patt, A. & Liliestam, J., 2018; Victor, D.G. et al., 2019; Blanco, G. et al., 2022). The evolution of climate technology I&As in developing countries broadly mirrors this arc, shaped by the maturation of NSIs and increasing alignment of the entrepreneurship support with the global development and climate agendas (Manning, S. & Vavilov, S., 2023). Climate technology I&As and similar entrepreneurship support modalities and mechanisms have evolved from being stand-alone, donor-driven pilots (emergence) towards structured acceleration programmes with regional reach (early adoption), systemic integration within national climate frameworks (diffusion), and a diversification of different types of I&As and the services they offers (diversification). The pace and context of this evolution differ in various countries and regions, depending on context-specific constraints and opportunities. Without being definitive, the general evolution of I&As can be describe in the following non-exclusive stages.

25. **Emergence of support for climate technology I&As in developing countries**: Early initiatives were predominantly donor driven incubation programmes, characterised by grant-based support, lightweight infrastructure, and a focus on ideation and early business development (e.g. InfoDev/World Bank Climate Innovation Centres). These models emerged largely in response to fragmented entrepreneurial ecosystems, weak market linkages, and limited access to finance (Gonsalves, M. and Rogerson, J. M. .2019). This initial, donor driven phase corresponds to what the IPCC AR6 describes as a formative phase for climate technology innovation systems – a period during which the conditions are shaped for a technology or institutional form to emerge and become established (Wilson, C. & Grubler, A., 2013; Blanco, G. et al., 2022). During this phase, capabilities play a key role: the build-up of entrepreneurial and technological capabilities can be enhanced by domestic measures, but also by international cooperation (Blanco, G. et al., 2022). The early Climate Innovation Centres (CICs) developed in early 2010s exemplify this dynamic: the centres are considered as one-stop-shops that could furnish an array of support services such as facilitating access to finance, business advice, policy support, education and training as well as technical assistance that would later sustain more advanced forms of innovation support (Gonsalves, M. & Rogerson, J. M., 2019). The CICs model is still being deployed today.

26. **Institutional diversification, regionalization, multi-country and network-based models**: A second phase could be marked by the rise of new organisational forms (Hausberg, J. P. & Korreck, S., 2018), including regionalised support models. Private, corporate, and hybrid accelerators have expanded in this era, and open innovation theory and social capital frameworks increasingly complemented earlier resource-based perspectives. Regional programmes such as those anchored in regional multilateral development banks, UN and specialized agencies (e.g. UNIDO Global Cleantech Innovation Programme) act as backbones of entrepreneurial activities where NSIs are still emerging. Through these arrangements, organisations experimented with blended methodologies that combined long-term incubation with cohort-based acceleration cycles to offset persistent ecosystem fragmentation. Moreover, there is a greater attention to inclusivity objectives – particularly gender and youth participation – and a growing interest in standardised approaches to climate impact measurement. Concurrently, regional accelerators expanded their reach by harmonizing tools and processes, strengthening cross border learning and enabling knowledge transfer across developing country contexts. This expansion of regional, network-based I&A models reflects a broader dynamic identified in the innovation literature: the role of knowledge spillovers in driving technological change. Spillovers – defined as the process by which knowledge embedded in innovations by one actor gives opportunities for others to create further innovations – are among the most potent drivers of innovation system performance (Aghion, P., et al. 2021; Blanco G. et al., 2022). In developing country contexts, the ability to absorb these spillovers is often constrained by insufficient domestic R&D investment, limited local knowledge, and weak institutional capacity (Blanco G. et al., 2022). By operating as multi-country networks – diffusing standardised methodologies, shared mentoring pools, and common measurement frameworks – regional I&A programmes function precisely as mechanisms to overcome these absorption barriers and enable knowledge spillovers to flow more effectively across national boundaries.

27. **Ecosystem approach, clustered support and system integration**: Recent years point to new dynamics, characterised by the emergence of finance-enabled and systems-integrated I&A models and a shifting global landscape of innovation systems. Genome's findings (Startup Genome, 2025) on the global startup ecosystem indicate that the landscape is undergoing its most dramatic shake-up in years, with Asia and Africa surging ahead. Reviews focused on developing countries (Egbetokun, A., 2025), highlight the heterogeneity and experimentation taking place across emerging ecosystems – including the proliferation of innovation hubs, science parks, mixed-model incubators, and policy-driven support structures. A recent study of 'innovation ecosystems' (Budden, P. & Murray, F.E., 2025) highlights examples of these geographic hotspots, also referred to as innovation clusters, hubs or districts, that bring together research institutions, entrepreneurs, corporations, investors, and governments across the Global South leading innovation across various thematic areas, such as smart cities (Singapore), fintech (Cairo and Dubai), media (Lagos) and energy (Rio de Janeiro). I&As are no longer seen as standalone support structures, but as system operators embedded within national climate and innovation frameworks. Programmes now

prioritise start-ups and ventures operating at higher technology readiness levels – particularly TRL 5–8 – where demonstration, piloting, and market integration pose significant challenges. The landscape also shows a rise in corporate and university-anchored hubs to stimulate innovation, as well as blended finance mechanisms designed to de-risk investment along integrated pipelines spanning ideation, incubation, acceleration, and access to climate finance.

28. Across different stages, persistent structural gaps that inhibit technological change, more often in developing countries (Ockwell, D. & Byrne, R., 2016), include insufficient mid-stage infrastructure, limited early-stage risk capital, fragmented policy environments, and weak linkages to finance. They are systematic failures of specific innovation system functions: resource mobilization, market formation, and guidance of the search (Blanco, G. et al., 2022; Falcone, P. M., 2023). Addressing these gaps requires not only scaling up individual I&A programmes, but also strengthening the NSI functions on which those programmes depend on (Ockwell, D. & Byrne, R., 2016).

C. Functions and value addition

29. The functions of climate technology I&As can be understood within the analytical framework of innovation systems. In addition to NSI, the IPCC points to the Technological Innovation Systems, Sectoral Innovation Systems, and Regional and Global Innovation Systems (Blanco G. et al., 2022) to provide a framework for analysing technological innovation processes. In practice, these systems are interconnected, which means that when looking at an initiative aiming to foster innovation for climate action at the national level, this may cover different sectors and technologies that may cut across national borders. Key functions of an innovation system include: knowledge development; knowledge diffusion through networks; guidance of the search (directing investments in consonance with market and policy signals); market formation; resource mobilization; and the creation of legitimacy to counteract resistance to change (Blanco G. et al., 2022).

30. Climate technology I&As contribute directly to several of these functions: they develop and diffuse knowledge through training, mentoring and peer learning; they help guide the search by connecting entrepreneurs to investors, procurement pathways and end-users; they support market formation for early-stage ventures; and they mobilise financial and human capital for innovation. Understanding I&As through this systemic lens reinforces the central argument of this paper – that I&As do not merely serve individual entrepreneurs, but contribute to overall functioning of NSI.

31. Findings of the 2018 publication by the TEC, the CTCN and the GCF (TEC, CTCN and GCF, 2018a) point to four core domains in which climate technology I&As deliver value:

(a) **Technical validation and infrastructure access:** Including prototyping labs, testing facilities, fabrication workshops, standards and certification guidance, and access to corporate or university R&D environments.

(b) **Business development and entrepreneurial capacity building:** Structured training, market intelligence, business modelling, IP support, sector-specific mentorship, and iterative validation. This is particularly critical in developing countries where entrepreneurship skills and climate technology literacy are uneven.

(c) **Investment readiness and catalytic finance:** Support for grant mobilization, seed finance, proof of concept funding, investor matchmaking, and blended finance preparation.

(d) **Ecosystem integration and system-level coordination:** Connecting ventures to ministries, utilities, research institutes, corporates, NDEs, financiers, and end users. These linkages reduce systemic fragmentation and enable pilots, procurement pathways, and technology adoption.

32. Climate technology I&As are well positioned to bridge the gap between upstream support and capability building – for example through the provision of R&D support,

technical training, prototyping assistance, and demonstration funding – which is critical for early-stage technologies characterised by high uncertainty, and downstream market uptake which is more targeted at later stages of the innovation process to scale-up innovation investments – for example through investor matching, market intelligence, procurement linkages, and investment readiness support (Aflaki, S., Basher, S. A. and Masini, A. 2021; Blanco, G. et al., 2022).

33. A more recent and cross-cutting function is tied to digital transformation. I&As increasingly deploy digital tools – virtual recruitment, e-learning, online mentoring and virtual communities of practice – to widen access for entrepreneurs who would otherwise face structural barriers to traditional in-person programmes. Evidence shows that the digital dimension of I&A services acts as a catalyst for the inclusion of women, youth, and entrepreneurs based outside major economic hubs while also lowering programme costs (OECD, 2021). This function gained particular prominence during the COVID-19 period, when virtual delivery proved critical to programme continuity. Increasingly, this digital dimension is understood alongside the green transition as part of a broader "twin transformation", in which the digital and sustainability transitions can be pursued together and mutually reinforce one another – digital tools enabling more resource-efficient, traceable and scalable climate solutions. Climate technology I&As are particularly well placed to advance this twin transformation, acting as intermediaries that help start-ups and ventures adopt digital capabilities while pursuing their green and climate objectives (UNCTAD, 2023).

Chapter 3
Mapping climate technology incubators and accelerators in developing countries

A. Overview of the mapping

34. The TEC in its previous work pointed to the need to develop a greater understanding of why, despite their potential benefits, there is a limited number of climate technology I&As in developing countries (UNFCCC, 2018). Despite the critical role that I&As can play in strengthening NSI and supporting early-stage climate technology entrepreneurship, their presence across developing countries remains sparse, unevenly distributed, and insufficiently documented.

35. This mapping aims to generate an updated, evidence-based overview of climate technology I&As operating in developing countries, without being exhaustive. The mapping aims to:

- Showcase the diversity of models and format of start-up support systems currently in place, focusing on I&As but also including hybrid and other formats;
- Examine the structure, financing, positioning within NSI, sectoral interlinkages and stages of innovation.

36. To achieve this, the mapping reviews a curated sample of 30 climate technology I&As operating in developing countries (see table 3). In selecting these initiatives, considerations were given to diversity, balance and analytical value, in terms of geographic coverage, thematic scope, stages of support, service offerings, financing models, host institutions and the actors involved.

37. This sample was curated on the basis of publicly available information, self-reported programme data, and stakeholder consultations. The analysis of the mapped initiatives presented in this section is subject to the authors' interpretation, and therefore, not definitive. The patterns, configurations and profiles described here are intended as analytical observations to support understanding of a diverse and unevenly documented field: they are illustrative rather than statistically representative or exhaustive. Where the mapping offers observations specific to incubators, accelerators or hybrid structures, these are highlighted; where the evidence concerns the field as a whole, observations are presented for I&As

collectively. Given the uneven distribution across formats – 16 accelerators, eight hybrids, five incubators and one innovation hub – format-specific observations are indicative rather than comparative.

Table 3
Geographic distribution, host type and programme format of reviewed I&As

Designation	Country	Geographic coverage	Climate focus	Host type	Programme format
Benibiz 2	Benin	Africa	Partial	International NGO (TechnoServe)	Accelerator
ClimAccelerator Africa	Multi countries	Africa	Dedicated	Multi-stakeholder consortium (GrowthAfrica, Carbon Trust)	Accelerator
Catalyst Fund	Multi countries	Africa	Dedicated	Private non-profit (Catalyst Fund)	Accelerator
500 Global – Sustainable Innovation Program	Multi countries	Africa	Dedicated	Private firm (500 Global)	Accelerator
Ghana Climate Innovation Centre (CIC)	Ghana	Africa	Dedicated	University (Asheshi University)	Incubator
Kenya CIC	Kenya	Africa	Dedicated	National non-profit organisation (KCIC)	Incubator
CTCN Youth Climate Innovation Programme (CTCN YCI)	Multi countries	Africa, Asia, MENA, Latin America	Dedicated	UN / multilateral organisation (UNEP-CTCN)	Hybrid
CATAL1.5°T	Multi countries	Africa, Latin America	Dedicated	Bilateral development agency (GIZ)	Accelerator
EnergyLab Asia	Cambodia	Asia	Dedicated	National non-profit (Energy Lab Asia)	Accelerator
ClimAccelerator Kazakhstan	Kazakhstan	Asia	Dedicated	University (Deutsch-Kasachische Universitat)	Accelerator
New Energy Nexus	Multi-countries	Asia	Dedicated	International NGO (New Energy Nexus)	Accelerator
Global Cleantech Innovation Programme (GCIP) Pakistan	Pakistan	Asia	Dedicated	UN / multilateral organisation (UNIDO)	Accelerator
IKEA Green Entrepreneurship Accelerator Programme	India	Asia	Dedicated	International NGO (TechnoServe)	Hybrid
Caribbean Climate-Smart Accelerator	Multi countries	Caribbean	Dedicated	Regional non-profit (Caribbean Climate-Smart Accelerator)	Accelerator
Bloom Cluster	Barbados	Caribbean	Partial	National Public body / government agency (Barbados Investment and Development Corporation)	Incubator
Eastern Caribbean Green Entrepreneurship Initiative	Multi countries	Caribbean	Dedicated	International organisation (GGGI)	Hybrid
GCIP Armenia	Armenia	Eastern Europe	Dedicated	Multi-stakeholder consortium (UNIDO, EIF)	Accelerator
ClimAccelerator Romania	Romania	Eastern Europe	Dedicated	Private innovation hub (Impact Hub Bucharest)	Accelerator
Greencubator	Ukraine	Eastern Europe	Dedicated	National non-profit (Greencubator)	Accelerator

Designation	Country	Geographic coverage	Climate focus	Host type	Programme format
Agrifood Business Incubator	Republic of Moldova	Eastern Europe	Partial	National non-profit (Eco-Village Moldova)	Incubator
MED ClimAccelerator	Multi countries	Eastern Europe, MENA	Dedicated	Multi-stakeholder consortium (BGI (Portugal), Chrysalis LEAP (Cyprus), MCAST (Malta))	Accelerator
Adaptation Fund Climate Innovation Accelerator (AFCIA)	Multi countries	Global	Dedicated	UN / multilateral coalition (Adaptation Fund, UNDP, UNEP-CTCN, UNIDO & WFP)	Accelerator
Spring	Multi countries	Global	Partial	Private innovation hub (Spring)	Hybrid
ClimAccelerator Colombia	Colombia	Latin America	Dedicated	Multi-stakeholder consortium (Universidad EAN, Connect Bogotá, Biointropic)	Accelerator
Cubo Itaú	Brazil	Latin America	Partial	Private firm (Itaú Unibanco & Redpoint eVentures)	Innovation Hub
Impact Hub São Paulo	Brazil	Latin America	Partial	Private innovation hub (Impact Hub São Paulo)	Hybrid
Berytech (Clyntech Accelerator)	Lebanon	MENA	Dedicated	Private innovation hub (Berytech)	Hybrid
UM6P StartGate	Morocco	MENA	Partial	University (Université Mohammed VI Polytechnique (UM6P))	Hybrid
Pacific Green Entrepreneurs Network	Multi-countries	Pacific	Dedicated	International organisation (GGGI)	Hybrid
UNDP Youth Business Incubator	Samoa	Pacific	Dedicated	Multi-stakeholder (Samoa Business Hub & UNDP)	Incubator

B. Key findings from the mapping

38. Sub-sections A-F below summarise the mapping results, reflecting the characteristics of the specific sample reviewed. The results should not be interpreted as indicative of broader global patterns. Instead, they illustrate the diversity of approaches within the initiatives analysed and may provide contextual insights into how climate technology I&As are operating in developing countries. Across the sub-sections below, each mapped I&A is characterised along several independent dimensions – its host and anchoring, its financing sources and instruments, its mode of service delivery, its stage of support, and its target group – rather than assigned to a single type. This multi-dimensional profile is deliberate: as the sample shows, the same initiative may be, for example, university-hosted, grant-financed, youth-oriented and regionally networked at once. Salient observations and insights emerging from the results of this mapping are discussed at the conclusion of this chapter.

1. Geographic distribution

39. The geographical distribution of mapped I&As (see table 3) is as follows: Africa (6) (excluding Middle East and North Africa (MENA)), Asia (5), Eastern Europe (4), Latin America (3), Caribbean (3), Pacific (2), MENA (2), Global (2), plus multi-region programmes: Africa and Latin America (1), Eastern Europe and MENA (1), Africa–Asia–MENA–Latin America (1). Among the mapping a sizeable portion (12) of climate technology I&As in developing countries are multi-country or regional programmes rather than single-country hubs.

40. All five incubators operate in a single country and are anchored in a national institution – a university, a national non-profit or a public agency. Multi-country modality is utilized in the mapped accelerators (8 of 16) and hybrid initiatives (4 of 8), illustrating a network-based configuration.

2. Focus by sector

41. The sectoral focus of the mapped I&As is diverse. There is a strong concentration of activities in 6 sectors: renewable/clean energy (20), energy efficiency (14), smart agriculture (11), transport (11), water (11) and waste management (11) (see table 4).

3. Stage of support: technology and business readiness

42. Based on the mapping (see table 5), support is densest around TRL 3–6 – the prototyping, validation and pre-commercial demonstration phases – where bridge programmes such as UNIDO's GCIP Armenia/Pakistan and the Ghana CIC take ventures from a minimum viable product (MVP) to investment readiness through structured acceleration, advisory and grants. By contrast, late-stage vehicles remain comparatively scarce, while only a handful of entry-point programmes consistently feed the pipeline before MVP. Taken together, the portfolio is strong at getting innovations ready (TRL 3–6) but thin at taking them to scale (TRL 7–9).

43. As mentioned earlier, both TRL and BRL have been considered in this review, to account for the complementary dimensions of technology and business maturity (see table 5), while recognising that a venture's maturity can be assessed through a broader set of analytical dimensions (see Box 1).

44. In the sample, incubators generally cluster at TRL 2–5, although one programme (Kenya CIC) supports ventures up to TRL 7. Accelerators span a wider range: five extend support to TRL 8, while two (Benibiz 2, EnergyLab Asia) focus exclusively on ventures below TRL 5. Hybrid programmes are the most heterogeneous, from CTCN YCI, which supports mostly ventures at TRL 3–4, to Impact Hub São Paulo, the only initiative reporting support across the full TRL 1–9 range. The only innovation hub in the sample, Cubo Itaú, is the only entry concentrated at the upper end, supporting ventures at TRL 6–9. As such, the programme format primarily reflects differences in the duration, structure, and intensity of support provided, rather than the maturity of the technologies supported.

45. Regarding the business-readiness dimension, the picture is similar but peaks earlier. BRL support concentrates around BRL 3-6 – from a defined value proposition through to a validated, investment-ready venture, with 26 of the 30 I&As active at BRL 3 and BRL 4 – and thins sharply beyond BRL 7. Crucially, business readiness tops out earlier than technology readiness: whereas several programmes carry ventures to TRL 8-9, only one reaches the equivalent business stage (BRL 8) and none BRL 9. The late-stage gap identified above is therefore more acute on the business side – programmes are, on the whole, better at maturing a technology than at maturing the venture built around it. The two indicators also diverge at the level of individual initiatives, which is precisely why neither substitutes for the other: for example, the CTCN YCI pipeline could support mature technologies (up to TRL 7) while engaging ventures at a very early business stage (BRL 1–3), whereas Spring shows the reverse, with business readiness running ahead of technology readiness.

46. Despite some programmes declaring access to "infrastructure or partner facilities", the mapping shows that the majority provide light or partner-based access, rather than full mid-TRL labs or pilot environments. In practice, startups often depend on external institutions for technical validation, limiting their ability to move efficiently toward demonstration.

4. Programme format

47. In the mapping (see table 3), 16 programmes are described as accelerators, 5 as incubators, 8 as hybrids and 1 innovation hub. These labels denote a programme's format - the duration and intensity of support – rather than a fixed type: the boundary is porous, and

the sizeable hybrid share (8 of 30) reflects how many initiatives deliberately combine incubation and acceleration within a single structure.

5. Services offered by I&As

48. The mapping of I&As indicates (see table 6) that the most common form of support offered by the studied I&As to entrepreneurs is training (21), closely followed by mentoring/coaching (19). Networking (17) and investor matching (17) are also frequently offered services. Access to facilities (4) and support during the pilot and prototype phases (5) are less common. All four initiatives offering laboratory access are incubators (Ghana CIC, Bloom Cluster) or hybrid initiatives (Berytech, UM6P StartGate). Accelerators concentrate instead on investor matching, investment readiness and networking – services requiring convening capacity rather than physical assets, and compatible with the short, cohort-based format they operate.

6. Financing and business models

49. The mapped I&As are primarily financed by public and multilateral sources (see table 5). 8 I&As explicitly combine public and multilateral sources, 7 are publicly funded, and 5 rely on public–private support. Smaller clusters involve mixed arrangements – 3 triple mixed models combining private, public, and multilateral finance. Purely private models remain the exception, with only 2 privately financed entries, 3 private–multilateral hybrids and 2 rely exclusively on multilateral support. Evidence suggests that early-stage climate innovation remains heavily dependent on public and development partner capital. All incubators in the mapped initiatives are financed from public and/or multilateral sources, with no private component. Private capital appears in 7 of the 16 accelerators and in 5 of the 8 hybrid models.

50. Concerning, the distribution of financial instruments offered by the mapped I&As, a predominance of grant funding (14 cases) is observed, while seed/equity funds appear in 3 cases and loan instruments twice. Voucher based mechanisms are mentioned twice, and 8 programmes do not include any form of direct financial support. This configuration suggests that many of the mapped I&As currently emphasise capability building activities, with fewer incorporating embedded financing components.

51. The mapping also shows that most of the 30 I&As operate small to medium-sized cohorts, typical of donor-backed, service-intensive models. Taken together, the financing and business-model patterns reveal an ecosystem that is grant-dependent, structurally undercapitalised, and shaped by public and multilateral investment logics, with only a few emerging examples of blended-finance or corporate-anchored models. This financial architecture helps expand access and capability-building – but limits progression into capital-intensive TRL stages unless complemented by more integrated, finance-enabled acceleration pathways.

Table 4
Overview of the reviewed I&As by sector

Designation	Generalist	Agrifood / Food Systems	Nature based resilience	Smart Agriculture	Transport	Environment, nature, biodiversity, ecosystem regeneration, land use	Circular Economy	Climate finance	Blue economy	Energy efficiency	Climate data & insights	Insurtech & climate risk financing	Carbon credit	Renewable/clean energy	Water	Waste management	Advanced, sustainable materials	Green buildings, sustainable cities	Disaster Risk Reduction	Green industry
500 Global – Sustainable Innovation Program		■		■	■	■								■	■					
AFCIA		■													■				■	
Agrifood Business Incubator		■																		
Benibiz 2		■																		
Berytech (Clyntech Accelerator)					■		■			■				■	■	■				
Bloom Cluster									■	■				■						■
Caribbean Climate-Smart Accelerator						■				■				■						
CATAL1.5°T				■	■	■				■				■						
Catalyst Fund				■			■		■		■	■	■	■	■	■				
ClimAccelerator Africa			■	■	■	■	■	■	■	■										■
ClimAccelerator Colombia	■																			
MED ClimAccelerator	■						■													
ClimAccelerator Kazakhstan				■											■	■	■			
ClimAccelerator Romania				■	■		■							■		■		■		
CTCN YCI		■			■					■				■	■			■		■
Cubo Itaú				■						■				■						■
Eastern Caribbean Green Entrepreneurship Initiative				■						■				■		■				
EnergyLab Asia					■					■				■						
GCIP Armenia					■					■				■						
GCIP Pakistan					■					■				■	■	■	■	■		
Ghana CIC				■						■				■	■	■				
Greencubator					■					■				■	■	■		■		
IKEA Green Entrepreneurship Accelerator Programme		■		■										■		■	■	■		
Impact Hub São Paulo						■								■						
Kenya CIC		■				■								■	■	■				
New Energy Nexus					■					■				■						
Pacific Green Entrepreneurs Network	■																			
Spring							■													
UM6P StartGate				■										■	■					
UNDP Youth Business Incubator							■									■				

Table 5
Financing models and TRL/BRL of reviewed I&As

Designation	Financing Model	TRL									BRL								
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
500 Global – Sustainable Innovation Program	Public, Private, Multilateral																		
AFCIA	Public, Multilateral																		
Agrifood Business Incubator (Moldova)	Public																		
Benibiz 2	Public																		
Berytech (Clyntech Accelerator)	Public, Private, Multilateral																		
Bloom Cluster	Public, Multilateral																		
Caribbean Climate-Smart Accelerator	Public, Private																		
CATAL1.5°T	Public, Multilateral																		
Catalyst Fund	Private, Multilateral																		
ClimAccelerator Africa	Public																		
ClimAccelerator Colombia	Public																		
MED ClimAccelerator	Public																		
ClimAccelerator Kazakhstan	Public, Private																		
ClimAccelerator Romania	Public, Private																		
CTCN YCI	Multilateral																		
Cubo Itaú	Private																		
Eastern Caribbean Green Entrepreneurship Initiative	Public																		
EnergyLab Asia	Private, Multilateral																		
GCIP Armenia	Public, Multilateral																		
GCIP Pakistan	Public, Multilateral																		
Ghana CIC	Public, Multilateral																		
Greencubator	Multilateral																		
IKEA Green Entrepreneurship Accelerator Programme	Private																		
Impact Hub São Paulo	Public, Private, Multilateral																		
Kenya CIC	Public, Multilateral																		
New Energy Nexus	Private, Multilateral																		
Pacific Green Entrepreneurs Network	Public																		
Spring	Public, Private																		
UM6P StartGate	Public, Private																		
UNDP Youth Business Incubator	Public, Multilateral																		

Table 6
Overview of support services delivered by the reviewed I&As

Designation	Training[7]	Mentoring / coaching[8]	Peer to peer learning[9]	Market Access[10]	Digital support[11]	Investment readiness[12]	Investor matching[13]	Networking[14]	Grants / I[15]	Equity funding[16]	Venture - building support[17]	Startup perks[18]	Media support[19]	Labs access[20]	Pilot & prototyping[21]
500 Global – Sustainable Innovation Program		■					■				■				
AFCIA	■	■							■						■
Agrifood Business Incubator (Moldova)	■			■											
Benibiz 2	■			■	■										
Berytech (Clyntech Accelerator)	■	■		■			■	■	■					■	■
Bloom Cluster		■		■				■	■					■	
Caribbean Climate-Smart Accelerator							■				■				
CATAL1.5°T							■			■	■				
Catalyst Fund							■			■	■	■	■		
ClimAccelerator Africa	■	■	■			■	■	■	■						
ClimAccelerator Colombia		■				■		■			■				
MED ClimAccelerator	■	■		■		■	■	■	■		■				
ClimAccelerator Kazakhstan	■	■				■		■							
ClimAccelerator Romania		■		■		■	■	■			■				
CTCN YCI	■	■	■		■	■	■	■	■			■			■
Cubo Itaú	■				■		■	■							
Eastern Caribbean Green Entrepreneurship Initiative	■	■					■	■	■						
EnergyLab Asia	■							■			■				
GCIP Armenia	■	■					■		■						
GCIP Pakistan	■	■					■		■						
Ghana CIC		■							■					■	■
Greencubator	■							■							
IKEA Green Entrepreneurship Accelerator Programme	■	■		■		■	■				■				
Impact Hub São Paulo	■	■						■							
Kenya CIC		■		■			■		■		■			■	
New Energy Nexus	■						■	■	■	■					
Pacific Green Entrepreneurs Network	■	■						■	■		■				
Spring	■					■		■			■				
UM6P StartGate	■			■		■	■		■		■			■	■
UNDP Youth Business Incubator	■	■				■		■							

[7] Training: Structured courses and workshops that build entrepreneurs' core business and climate-technology skills, such as business modelling, finance, go-to-market and sustainability.

[8] Mentoring / coaching: Individual or small-group guidance from experienced mentors, advisors or

C. Salient observations and insights from the mapping

52. The mapping suggests that climate technology I&As in developing countries are evolving in ways that resonate with the broader patterns highlighted in Chapter 2. Rather than sorting each initiative into a single category, this section reads a number of recurring features that appear repeatedly across the mapped I&As. These features are not mutually exclusive: they cut across the dimensions profiled in this chapter (e.g. host and anchoring, financing, service delivery, stage of support, and target group), and a given initiative frequently displays characteristics of more than one.

1. Capability-building programmes including youth-oriented programmes

53. These programmes adopt a lightweight, pipeline-oriented design intended to identify, inspire, and equip emerging innovators (e.g. youth) to set up and advance their climate-focused start-ups. They typically follow a staged progression – ideation → early incubation – and emphasise skills development, mentoring, technical guidance, and global exposure, preparing emerging innovators to progress toward more mature incubators, accelerators, or investment mechanisms.

54. Many youth-oriented programmes do provide direct support to start-ups and ventures, frequently in the form of grants rather than equity: the CTCN YCI (see Box 3), for example, award grants (USD 5,000 to accelerator-stage startups). Where they do not deploy in-house capital, they rely on linkages with external investors, partners, climate funds, and regional innovation events to encourage follow-on support through ecosystem connectivity. This makes them well suited to contexts where public or donor resources are limited but entrepreneurial talent is abundant.

55. By operating across multiple regions – Africa, MENA, Asia, and Latin America – these programmes leverage a network-based approach: international mentors, regional convenings, and cross-country peer learning. Their value lies in pipeline creation and empowerment: widening access for youth, improving the readiness of early-stage climate ventures, and strengthening the feeder system that supplies more advanced I&A structures.

entrepreneurs-in-residence who help founders work through specific business challenges over time.

[9] Peer-to-peer learning: Facilitated exchange among cohort members and alumni, enabling founders to learn directly from one another's experiences, problems and solutions.

[10] Market access: Support that links ventures to customers, distribution channels, corporate buyers and new market segments, including market linkages and access to larger contracts.

[11] Digital support: Provision of digital tools, platforms or online delivery (e-learning, community platforms, digital-marketing capability) that extend the programme's reach and the venture's online presence.

[12] Investment readiness: Targeted preparation to get ventures ready to raise external capital, including financial modelling, pitch development and due-diligence readiness.

[13] Investor matching: Curated introductions and matchmaking that connect ventures with relevant investors, funds and financing partners, through demo days, investor networks or 1:1 connections.

[14] Networking: Access to a wider community of peers, experts, partners and ecosystem actors via events, platforms and convenings that generate business and collaboration opportunities.

[15] Grants / loans: Direct non-equity finance provided to ventures, whether non-repayable or milestone/repayable grants or debt instruments such as concessional loans.

[16] Equity funding: Direct investment of risk capital in exchange for an ownership stake, typically at pre-seed or seed stage and sometimes with follow-on rounds.

[17] Venture-building support: Hands-on operational support from the programme team (often ex-founders and operators) working directly with founders on product, technology, talent, fundraising and growth.

[18] Startup perks: Free or discounted access to third-party startup tools and services (e.g. cloud/SaaS credits such as AWS, HubSpot, Notion; professional-services deals) negotiated by the programme for its cohort.

[19] Media support: Assistance that raises a venture's visibility and credibility through communications, branding, PR and exposure on the programme's channels and at conferences.

[20] Labs access: Access to physical facilities such as laboratories, testing equipment and specialised infrastructure for technology development and validation.

[21] Pilot & prototyping: Support for prototyping, piloting and real-world testing or demonstration of solutions, helping ventures validate and de-risk technologies before commercial deployment.

Box 3 - CTCN Youth Climate Innovation

The CTCN Youth Climate Innovation (YCI)[22] Pipeline exemplifies youth-dedicated climate-innovation programming in developing countries. Operating across Africa, MENA, Asia, and Latin America, the YCI model has trained more than 670 young innovators since 2020 through a structured Idea Lab → Incubator → Accelerator pathway. With over 50 mentors per cycle, the programme focuses on capability building, global exposure, and ecosystem connectivity, preparing youth entrepreneurs to engage with regional investors and more advanced acceleration structures.

2. Network-based and distributed accelerators

56. Several mapped accelerators operate as federated, multi-country systems that spread a common methodology, shared toolkits, and investor access across regions rather than anchoring activities in a single physical hub. They leverage regional or global networks – often spanning Africa, Asia, MENA, Latin America, and Small Island Developing States (SIDS) – to provide standardised training, mentoring, exposure, and connectivity, often focused on incubation → early acceleration stage. Their strength lies in diffusing capabilities across thin or fragmented national ecosystems.

57. Instead of relying on in-house infrastructure or grant capital, network-based vehicles focus on harmonising practices, expanding reach, and plugging innovators into a broader community. Examples include Climate Knowledge and Innovation Community (KIC) ClimAccelerators (see Box 4), the GCIP, infoDev-style Climate Innovation Centres, and multi-country SIDS initiatives, all operating as distributed ecosystems that enable cross-country learning.

Box 4 – Climate Knowledge and Innovation Community

The Climate Launchpad and ClimAccelerators model is based on a standardised international methodology, replicated locally through an operating license, contract, and centralised support. This model is similar to an impact franchise, where local operators apply a proven structure and tools while mobilizing their national ecosystem. As a largely donor-funded, regionally and globally integrated initiative, the Climate KIC[23] model is best understood as a distributed accelerator network enabling cross-country learning.

3. Corporate- and university-anchored entrepreneurship support modalities

58. Some accelerators mapped are corporate-[24] or university anchored, they represent a more asset intensive and infrastructure enabled model of climate innovation support, often focused on validation → deployment stage. Unlike lightweight or network-based accelerators, in this configuration, the anchoring entity provides R&D facilities, laboratories, testing grounds, faculty expertise, industrial assets, or pilot environments (e.g. UM6P StartGate) – all elements critically needed to advance climate technologies through mid-TRL stages (TRL 5–8).

59. Such modalities are often embedded within the university or corporate's innovation strategy – to foster intrapreneurship[25], generate spin-offs, or connect startups to its markets,

[22] More information available at: https://www.ctc-n.org/youth-climate-innovation-programme https://www.youthclimateinnovation.com.

[23] More information available at: https://climatekic.notion.site/Information-Package-for-ClimAccelerators-6d80d091e2bb4ea3ace6b27f759016ae.

[24] Definition of corporate-anchored: a corporate-anchored incubator or accelerator refers to a program directly supported, funded or managed by a company to foster innovation, start-ups or internal projects. These programs leverage the company's resources, industry expertise, market access, and sometimes capital to help startups or internal teams do develop new products, services or business models.

[25] Definition of intrapreneurship: entrepreneurial activity undertaken by employees or researchers within an established organisation, drawing on its resources, facilities and networks to develop new

brand and corporate network (see Box 5 and Box 6). This approach combines the agility of startups with the deep technical capabilities and deployment pathways of corporates or research universities, and has the potential to address one of the main bottlenecks in climate technology I&As in developing-country, which is the lack of mid-stage infrastructure required for validation, demonstration, and market-readiness.

60. Beyond technical assets, these anchoring institutions can act as deployment partners, offering integration into supply chains, joint testing with corporate business units, or university-led applied research partnerships. Their strategic potential lies in derisking climate technologies, supporting scale-up, and accelerating the journey from prototype to commercial adoption – especially in sectors like energy, transport, water, agri-tech, industrial decarbonization, and circular economy where physical testing environments are indispensable.

Box 5 - Cubo Itaù

Cubo Itaú[26] illustrates the strategic and ecosystem anchoring variant of the corporate-anchored hub model. A non-profit innovation ecosystem founded in São Paulo in 2015 by Itaú Unibanco together with the venture-capital firm Redpoint eVentures, Cubo deliberately sits outside the conventional programme format: by its own account it neither accelerates nor incubates but curates scale-ready start-ups, and is "driven by impact, not equity." Rather than supplying grant capital or taking ownership stakes, it anchors ventures in the founding bank's innovation strategy – brokering connections to corporations, investors, mentors and universities from a 22,000 m² headquarters and a complementary digital platform, with more than 1,000 start-ups hosted over its first decade. Its anchoring has increasingly turned to climate, through an ESG hub launched in 2022 around Net-Zero solutions and, more recently, a Deep-Tech industrial-decarbonisation programme and the São Paulo Climate Week. Cubo thus shows how a corporate hub can de-risk and connect ventures through network and brand assets rather than equity or donor grants – distinguishing strategic anchoring both from the physical/technical anchoring of university hubs (e.g. UM6P StartGate) and from the donor-backed models.

Box 6 - IKEA Green Entrepreneurship Accelerator Programme

The IKEA Green Entrepreneurship Accelerator Programme[27] in India illustrates the corporate-philanthropy / donor-backed variant rather than a corporate-anchored hub. The IKEA Foundation acts here as a philanthropic donor – providing a grant exceeding €3.4 million – while delivery is handled by an INGO implementer, TechnoServe; the host of the programme is therefore the implementing organisation, not a corporate parent contributing its own R&D assets. The programme also focuses less on building climate start-ups than on helping approximately 400 green small and growing businesses adopt clean technologies and become economically sustainable and environmentally impactful. It mobilises tailored business advisory services, market linkages, mentoring and capacity-building, connecting entrepreneurs with over 50 investor partners across waste management, textiles, agriculture, clean tech and renewable energy. As such, it is best read as a donor-backed, capability-focused green-SME programme delivered through an implementing partner – an example that sits closer to the grant-driven model than to the corporate- and university-anchored hubs of this section.

4. Public multilateral finance early-stage incubation

61. These programmes are typically funded by public agencies, multilateral organisations, or bilateral development partners, and implemented by global or domestic executing agencies focus on training, mentorship, and foundational business-development support for innovators at very early stages, often supporting the ideation → prototype stage (See Box 7).

62. They generally rely on grant financing, donor budgets, or voucher schemes rather than equity or loan instruments, reflecting both ecosystem constraints and a public-good logic.

ventures, products or services

[26] More information available at: https://cubo.itau/en/.

[27] More information available at: https://ikeafoundation.org/grants/green-entrepreneurship-accelerator-programme/ https://www.technoserve.org/fight-poverty/projects/greenr-sustainability-accelerator-program.

The mapping shows that purely private financing is rare, and that public–multilateral funding remains the prevailing modality for early-stage incubation in developing regions.

63. Although these programmes expand access, democratise participation, and strengthen early pipelines, they often lack the physical infrastructure, R&D assets, or blended-capital instruments required for mid-stage de-risking. They therefore tend to function as entry points within the broader NSIs, preparing start-ups and ventures to transition toward more specialised accelerators, network-based vehicles, or anchored hubs.

Box 7 - Pacific Green Entrepreneurs Network

The Pacific Green Entrepreneurs Network (PGEN[28]) exemplifies the public multilateral finance early-stage incubation model observed in multiple developing country ecosystems. Supported by development partners and structured around training, mentoring, and regional networking, PGEN focuses on strengthening the entrepreneurial capabilities of green startups across Pacific SIDS. With no inhouse testing infrastructure or embedded ticket financing, the programme reflects the grant driven, service heavy, infrastructure light design that dominates early-stage climate innovation support in resource constrained settings.

64. These approaches and features may be used in sequence or combination, depending on the context and availability of resources, capacities and partners; youth-oriented and public-multilateral programmes feed the pipeline that network-based vehicles widen and anchored hubs carry through to demonstration and deployment; thin but talent-rich ecosystems may gain most from youth-oriented and network-based delivery, which provides support a single country cannot sustain alone, whereas countries with strong universities or industrial corporates are better placed to develop anchored hubs that address the mid-stage validation bottleneck.

D. From observation to application

65. While the mapping of climate technology I&As in developing countries conducted as part of this analysis is not exhaustive, observations emerging from it offer insights into the landscape of needs and priorities of developing countries, as well highlights challenges and opportunities that climate technology I&As are facing. This includes aspects relating to enabling environments and financing modalities for their successful design, operation and sustainability. Findings from the mapping including the gaps and opportunities identified are used as evidence to inform the policy insights in the following chapters, complemented with semi-structured interviews, stakeholder consultations and desk research.

66. Policymakers, NDEs, programme designers and development partners in developing countries may take into consideration these insights and apply them in their own context, to inform policy development, programme design, and future support activities for promoting the use of climate technology I&As in climate action.

Chapter 4
Enabling policy and ecosystem conditions

67. An enabling environment for climate- and SDG-oriented technological change poses high demands on governance and policy coordination to provide strategic direction for innovation and technological transformation (IPCC, 2023). The effectiveness of climate technology I&As is closely linked to their integration within NSI, and the broader policy environments in which they operate. I&As may not fully realise their potential if they function in isolation from institutional, policy, and funding frameworks that govern climate and sustainable development action. Public trust and acceptance are also key elements for

[28] More information available at: https://gggi.org/wp-content/uploads/2024/08/Results-and-Learnings-from-Implementation-of-Green-Entrepreneurship-Support-in-the-Pacific.pdf.

promoting climate technology innovation, including regarding responsible development and deployment of existing and emerging technologies supported by I&As. Without being exhaustive, this chapter highlights a number of policy insights emerging from the review of climate technology I&As in developing countries, with a view to identifying conducive measures that support entrepreneurial ecosystems and start-ups in advancing the climate agenda.

A. Aligning the national innovation and climate agendas

68. Along with finance and institutional and technological capacity, STI policy is a key enabling condition to support technological change and system transformation, including related to STEM education and public research. Other policy and regulatory areas that influence the functioning of national and regional innovation systems, and by extension I&As, include:, public procurement and market transformation policies (see Box 8 on the experience of Kenya), business regulations for example relating to ease of starting a business and corporate social responsibility (see Box 17 on the experience of India) and intellectual property rights policies (Blanco, et. al, 2022).

69. Climate and innovation policy frameworks remain institutionally distinct in most developing countries. The International Development Innovation Alliance (IDIA) review identifies four recurring policy failures for innovation that are relevant to climate innovation: 1) insufficient clarity on the role of government; 2) the persistence of unsuitable or fragmented policies for research and innovation; 3) government processes that are operationally incompatible with the iterative nature of innovation; and 4) siloed approaches across ministerial portfolios (IDIA, 2021). Each of these is amplified in the climate domain, where mitigation and adaptation policy responsibilities are typically distributed across different ministries (e.g. environment, energy, finance, and planning), with limited coordination with ministries responsible for science, technology, or industrial policy. A consistent and supportive policy and regulatory environment is therefore essential to promote coherence and alignment across national, sectoral and local levels (UNDP, 2025).

70. Moreover, misalignment in timing of various policy and legislative processes related to innovation and climate action can lead to fragmentation and policy incoherence. Coordination mechanisms backed by institutional mandates (e.g. a clearly assigned coordinating role, whether statutory or established through inter-agency agreement) could help address these challenges. Innovation actors, including I&As, are not only influenced by policy directions but can also help shape them (see Box 8). UNCTAD (2025a), in the context of its work on strengthening STI parks, recommends that intermediary institutions that connect and coordinate different actors within an innovation system be given clear mandates as coordinators, be embedded in national innovation strategies and regional development plans to ensure policy coherence and continuity, and be governed through transparent structures - such as advisory boards or public–private steering groups - to strengthen legitimacy and reduce the risk of capture by narrow interests. These recommendations may be applied more broadly to ecosystem connectors, beyond the STI parks.

Box 8 - Kenya Climate Innovation Centre and supporting policy alignment[29]

Kenya Climate Innovation Centre (KCIC) is a leading climate innovation hub fostering sustainable development through technology, entrepreneurship, and strategic partnerships. In addition to services provided to I&As through cohort-support function (see Chapter 3), KCIC operates policy advocacy as an explicit service line, on the rationale that enterprise innovations frequently lack the regulatory framework, sector standards, or IP protection required to reach market.

KCIC has identified three operational modalities to foster the integration of climate technology projects into the local innovation system: 1) working with line ministries to develop new regulatory frameworks where none exist; 2) partnering with the national standards body to develop sector-specific standards; and 3) convening the broader I&A ecosystem to lobby for

[29] Source: KCIC interview, 29 May 2026.

legislative review where existing law penalises innovation. For example, KCIC together with UN agencies supported a policy reform in 2016-2017 which made ethanol biofuels competitive with kerosene and triggered a wave of entry by farmers and manufacturers into the domestic biofuel market.

B. Facilitating coordination among actors and leveraging partnerships

71. Strengthening entrepreneurial ecosystems involves coordinated efforts across government institutions, research bodies, private sector actors, and international partners. Such efforts are resource-intensive and complex, requiring sustained investment and institutional capacity, with public policy playing an anchoring role. Intentional policies and initiatives can also play a critical role in facilitating and endorsing large scale partnerships that match the scale and needs of climate technology startups (UNDP, 2025).

72. As underscored in previous chapters, there is a growing recognition of the role of 'ecosystems connectors' such as innovation hubs and STI parks, providing clustering, coordination and ecosystem orchestration functions (UNCTAD, 2025), with the capability to connect people, align support and bring resources together across institutional boundaries, so that entrepreneurs can navigate the gaps in an incomplete system. Where ecosystem connections are weak, even well-resourced I&A interventions struggle to translate cohort outputs into systemic outcomes, and to retain capabilities over time. This is framed by some as a "development chasm" (Srinivasan, S., 2021) and "A funder would not go where there is no talent, and talent would not go where there is no funding" (IDIA, 2021).

73. As such, well-functioning NSIs are pivotal to enable policies and regulations, accessibility of finance, equipped human capital, supportive research markets, energy, transport and communications infrastructure, a culture supportive of innovation and entrepreneurship, and networking assets, which together support productive relationships between different actors (Ibid.). Government-academic partnerships, public-private partnerships, and investor coordination platforms in support of climate action and innovation are among other approaches and modalities used by developing countries to strengthen and support climate innovation. International institutions and collaborations can help build local institutions and networks for example innovations hubs and centres of excellence (see Box 9) (UNFCCC TEC, 2023).

Box 9 - Strengthening Cleantech Ecosystems: The Evolution of the Global Cleantech Innovation Programme

A joint GEF-UNIDO initiative, the Global Cleantech Innovation Programme (GCIP) [30]was developed in 2010 with the primary objective of strengthening innovation and entrepreneurship ecosystems to help SMEs transform their cleantech innovations into viable, investment-ready businesses. It was initially designed as a set of independent national projects, but later transformed into a globally coordinated programme, in response to evolving needs of beneficiaries and learnings from the operation of the programme.

As a result, a formal, cross-country coordination mechanism was established to promote knowledge sharing and enable the aggregation of results. Other refinements in the delivery of support included a dedicated post-accelerator support for later-stage companies, which explicitly includes assistance with validating the technology, creating prototypes, advancing product development, and securing IPR.

Overall and across various funding cycles, the most appreciated intervention types by the beneficiaries and success stories under GCIP emerge from its role as an interconnector and convener. These include: convening national investor forums for securing capital, facilitating networking opportunities in the context of national and global innovation competitions, offering customised mentorship program and hands-on business training, and promoting national ownership by post-programme handovers to national technology and scientific institutions that were engaged in the programme (GEF IEO, 2025).

[30] More information available at: https://www.unido.org/GCIP.

C. Leveraging broader demand-pull and supply-push policy measures to foster climate entrepreneurship

74. Governments can foster climate entrepreneurship through a combination of demand-pull and supply-push policy instruments. For example, adopting market-shaping strategies can help overcome first-mover risks and encourage private investment through demand-pull instruments such as Advance Market Commitments, pooled procurement, subsidies to optimise pricing, and incentives to encourage take-up (IDIA, 2021). In countries with large youth populations, such policies can also steer entrepreneurial activity toward climate-focused ventures by signalling long-term market opportunities and lowering barriers to entry (see Box 8 for an example in utilising demand pull instruments in Kenya).

75. Supply-push instruments strengthen the capabilities needed to develop climate innovations, for example through R&D funding, skill development and capacity-building for technology development and transfer, all of which contribute to strengthening the NSI actors, institutional context or linkages. Many developing countries utilise bilateral, multilateral support and international cooperation (see Box 10) to introduce climate technologies (e.g. through technology piloting and demonstration facilities) and promote climate entrepreneurship (e.g. through training, R&D support, technical assistance, and education). Involving private actors in promoting supply push instruments is an effective complement to measures supported by public domestic and international resources (UNDP, 2025).

76. To help ventures move beyond field demonstration to operational deployment (TRL 7–9), the gap highlighted earlier in this paper, governments could strengthen climate technology accelerators and similar support programmes for example by providing late-stage deployment finance,[31] brokering partnerships with implementers for initial deployments, and sustaining support beyond programme graduation.

Box 10 - Role of international cooperation in fostering climate entrepreneurship

The technology framework under the Paris Agreement underscores the role of North–South, South–South, triangular and regional collaboration in advancing technology implementation. Examples below are extracted from the first transparency reports of Parties to the Paris Agreement:

- The United Kingdom of Great Britain and Northern Ireland (UK), under the umbrella of the UK-India Startup Launchpad, provides investment capital to under-funded job-creating technology-driven start-up enterprises as well as technical assistance, directed towards climate action, clean tech, agri tech, manufacturing tech, and health tech, among others. This initiative aims to foster deeper collaboration between two leading start-up ecosystems.[32]
- Spain has supported the Inno´VERT incubation programme to support the development of green entrepreneurship ecosystems for young people, women and migrants in Tanger, Morocco. The initiative aims to raise knowledge and environmental awareness about technological innovation on green and circular economy, and provide support to green ventures led by vulnerable population towards financing and consolidation.
- The Kenyan Green and Digital Innovation Hub, supported by the European Union and the government of Germany, is a one stop shop support facility for MSMEs, start-ups, and innovators that seek to develop and scale up their green and digital oriented business.[33]

[31] It may consist of time-bound concessional or public support that de-risks first commercial-scale deployment where market demand is still forming, and that is designed to complement, and ultimately give way to commercial finance.

[32] More information: https://www.startupindia.gov.in/content/sih/en/international/UK_India_Startup_Launchpad.html.

[33] More information: https://www.gdih.org/.

D. Ensuring inclusion in the operation and services of climate technology I&As

77. Inclusion as a policy objective has been acquiring increasing significance in STI policy agendas globally, referring to questions regarding, among others, who benefits, whose problems are being solved, who has access, and who gets to participate (Kalliomäki, H. et al., 2024). Youth, women, Indigenous Peoples and local communities are underrepresented in I&As and innovation systems at large. Broadening the participation of women and underrepresented minorities in STEM, improving science education, and developing a diverse STEM workforce could contribute to promoting inclusion in innovation ecosystems (Ibid.).

78. The International Labour Organisation (ILO) reports that women entrepreneurs face persistent structural gender inequalities that limit their ability to build resilience to climate-related risks, contribute to mitigation efforts, and take on leadership roles in a just transition (ILO, 2025). It also suggests that mentoring programmes, awareness campaigns and transparency policies are effective tools for tackling wider gender bias in the workforce (ILO, 2022). Involving representatives from the range of groups helps to diversify the solutions offered to climate challenges. Developing entrepreneurship support programmes that are more inclusive of under-represented groups is essential to fostering the growth and sustainability of start-ups and scale-ups and aligned it with NDCs and SDGs (see Box 11).

79. TEC also highlights the importance of locally grounded innovation approaches, including the use of indigenous knowledge and locally developed climate technologies. In many developing country contexts, such solutions are often more affordable, context-appropriate, and adaptable, and can therefore enhance the effectiveness and uptake of climate technologies supported through I&As.

Box 11 - Insights from NDCs: Ensuring inclusion and diversity in climate innovation

More than one-third of countries that submitted their NDCs in 2025 have included specific measures that ties the climate innovation agenda to the participation of youth, women and local communities, including in the context of job creation and just transition considerations. For example, to highlight a few: Eswatini aims to foster youth innovation in climate-smart technologies through technical and financial support for research and development, and to implement and scale up National Innovation Forums in support of the implementation of its NDC; Moldova prioritises policies that promote the participation of women in STEM and green industry; Cambodia includes in its climate plans training programmes for youth (especially women) in grid technology installation and maintenance, creating pathways to green jobs; and Lebanon states that digital technologies and innovation in support of its NDC must be implemented with a focus on inclusion, particularly for youth, women, internally displaced Lebanese communities, and informal workers.

E. Harnessing digital transformation in I&A services

80. Digital transformation, which goes hand-in-hand with the green transition for climate ventures, has had a significant impact on how start-up ecosystems are designed, operationalised and supported, including by I&As. Digitalization impacts the enabling support environment for entrepreneurship as well as the products and services developed by SMEs and start-ups (Elia, G. et al., 2020). Digital solutions can directly boost SMEs growth and employment creation, facilitate business's ability to reach new clients and markets at low cost, alleviate financial and talent constraints by offering more flexible working culture that allows remote work and reduces capital expenditure, and facilitate SMEs' access to funding, credit, and cross-border payments (Lukonga, I., 2020).

81. When it comes to I&As, digital technologies have enabled the delivery of virtual business incubation and acceleration services, as a stand-alone offer (all-digital) or combined with in-facility services and support. This offers a great opportunity for supporting a larger and more diverse set of climate technology start-ups in developing countries through online

and hybrid programmes who normally would have limited (if any) access to the necessary entrepreneurship support in a traditional business incubation and acceleration programme (OECD, 2021). However, virtual settings are not necessarily a replacement for traditional I&As, and may be utilised in combination with other modalities to maximise impact (see Box 12).

Box 12 - Enhancing the virtual delivery of business incubator services in Thailand

Business incubators in Thailand have had some experience in providing incubator services to remote (out-wall) clients. The shift to online virtual delivery of services was accelerated during the COVID-19 restrictions. Some of the measures used in Thailand to harness the use of digital technologies in the operation of I&As include establishing a virtual community platform for incubators and other business development entities, identifying packages of services to be delivered virtually by incubators, providing online training and learning tools and knowledge platforms, implementing virtual mentoring services for start-ups through an online mentor matching system, and providing knowledge services with an "open innovation" approach to match R&D resources with incubating start-ups (OECD, 2021).

F. Measuring the impact of I&As and sharing learnings

82. Climate technology I&As remain relatively few in number in many developing countries, yet they play an increasingly important role in supporting climate entrepreneurship and strengthening NSI. This makes it important not only to understand how well they perform, but also to identify which approaches are most effective under different national and institutional contexts. Monitoring, evaluation and learning (MEL) is therefore essential for assessing the performance of I&As, informing investment decisions and improving programme design over time. At the same time, MEL can be resource intensive and highly context dependent, requiring approaches that are pragmatic, proportionate to the capacity of I&As to collect and report data, and adaptable as programmes evolve.

83. While there is no universally agreed framework for measuring the performance of climate technology I&As, existing experience and practices from I&As and similar support modalities for start-up ecosystems, including the results-based frameworks used by projects/programmes in table 8, point to good practices that may be considered in this context (e.g. see Box 13). These include combining operational indicators (what programmes deliver), enterprise-level outcomes (how supported firms perform), and broader innovation and climate impacts (the longer-term changes they contribute to e.g. greenhouse gas emissions reduced or avoided or increased resilience of people, communities or assets). Other considerations include developing performance indicators in consultation with relevant stakeholders and collecting gender-disaggregated data where appropriate.

84. Beyond accountability, MEL systems can also generate valuable evidence, surface lessons, and identify opportunities for programming and policy making (UNDP, 2025). Learning and knowledge sharing are increasingly embedded as integral components of start-up support programmes, especially those operating across multiple countries such as ASIF under AFCIA (see Box 14), and GCIP (see Box 9).

Box 13 – Measuring the performance of STI parks

In advancing policy and institutional frameworks for STI Parks, UNCTAD (2026) outlines proposed guidelines for developing countries regarding key performance indicators (KPI) for monitoring and evaluation of STI parks, as well as principles for designing KPI frameworks for these innovation actors. Core KPI dimensions for STI park are:

a. **Input and capacity indicators to measure whether foundational capabilities are in place**, e.g. Public and private investment mobilized; R&D expenditure within the park; Quality and availability of infrastructure; Human capital (researchers, engineers, entrepreneurs).

b. **Innovation and knowledge indicators to capture the core innovation function**, e.g. Patents filed and licensed; Research publications with industry co-authorship; Joint R&D projects; Technology readiness-level progression; New products or processes developed.

c. **Entrepreneurship and firm-level indicators to assess enterprise development**, e.g. Number of start-ups created; Survival and growth rates; Scale-ups graduating from the park; Venture capital and private investment attracted; Revenue growth of tenant firms.

d. **Collaboration and ecosystem indicators to measure integration and spillovers**, e.g. University–industry collaborations; Corporate–start-up partnerships; Supplier linkages and upgrading; International partnerships.

e. **Economic and social impact indicators to reflect public value**, e.g. Jobs created (quality and skill level), particularly for youth and women; Contribution to the growth of national or regional priority sectors; Exports by tenant firms; Environmental and sustainability outcomes; Innovation and entrepreneurship nurturing.

G. Adopting a systemic approach to improve the effectiveness of climate technology I&As

85. Climate technology I&As can play an important role in advancing climate innovation, but their effectiveness depends on the strength of the wider enabling environment in which they operate. Coherent science, technology and innovation and climate policies, strong research and education systems, supportive legal and regulatory frameworks, effective coordination across institutions, and sustained public and private investment are all necessary to enable climate ventures to emerge, scale and contribute to sustainable development. Rather than operating as stand-alone programmes, or being supported as such, climate technology I&As should be embedded within NSI, aligned with broader climate and development priorities, and connected to complementary support mechanisms for start-up ecosystems. Maximizing contribution of I&As requires clear institutional mandates and linkages, predictable and diversified sources of finance, inclusive and digitally enabled approaches, and robust impact measurement. While the specific enabling conditions will vary across countries, strengthening climate technology I&As requires a systemic approach that considers the range of actors, institutions and relationships that shape innovation ecosystems.

Chapter 5
Financing modalities and sustainability

86. Financing is a central determinant of the effectiveness and long-term sustainability of climate technology I&As, as well as the success of the ventures they support. Climate start-ups and ventures in developing countries, particularly LDCs, often face significant financing gaps due to high upfront costs, technological risks and uncertain markets. Underrepresented entrepreneurs such as youth and women may face additional barriers to accessing capital and networks. Climate technology I&As therefore need to take into account these challenges and barriers, and devise strategies for addressing them, while also developing sustainable financing and operational models that enable them to maintain their support functions over time.

87. Global evidence, including observations from the mapping conducted in the context of this paper (see Chapter 3) indicates that the landscape of climate technology I&As in developing countries is highly grant-dependent, particularly for climate technology incubators. This makes their operation reliant on the lifecycle of funding projects, and may also limit their ability to develop longer-term strategies, retain institutional capacity and strengthen links with NSI and local innovation systems.

88. Both the availability of upstream fundings to support I&A operations and the existence of downstream, risk-tolerant capital to finance graduating ventures shape how I&As operate and the extent to which they can successfully support climate innovation. In

the remainder of this chapter, a number of considerations related to the operation and long-term sustainability of I&As are highlighted.

A. Addressing financing and infrastructure barriers for technology ventures

89. Supporting climate ventures from early stage to commercial viability requires, among other things, access to demonstration facilities, testing infrastructure and risk-tolerant capital i.e. to address the "valley of death" - a critical gap between proving a technology's feasibility and achieving its commercial viability. The mapping of climate technology I&As in developing countries undertaken for this analysis indicates that most programmes provide only limited access to laboratories or pilot environments, falling short of the robust mid-stage testing infrastructure required for accelerating the development and deployment of climate technologies, which may reflect constraints in the broader NSI. As such, the design and operation of I&As should place greater emphasis on overcoming financial and infrastructure barriers faced by climate ventures to progress from demonstration to deployment and early-stage commercialization (see Box 14).

Box 14 - Offering targeted support through the Adaptation SMEs Innovation Facility[34]

The Adaptation SMEs Innovation Facility (ASIF), a climate finance initiative designed to support the development deployment of innovative climate adaptation technologies and solutions by SMEs, takes a multi-pronged approach to the provision of support, categorizing its support modalities based on the TRL and BRL of the supported SMEs:

- The 'ignite' component offers general and specialized assistance to adaptation SMEs at TRLs 3-4 and BRL 2-4;
- The 'propel' component offers financial assistance to adaptation SMEs at TRLs 5-7 and BRL 5-7;
- The 'ecosystem and learning platform' component serves as a central hub for adaptation SMEs, investors and stakeholders.

This targeted approach allows ASIF to engage a diverse range of partners based on their comparative advantage (i.e. resources and expertise) in the provision of support to SMEs. It engages locally chosen incubators/accelerators, academic institutions, national, regional, and local associations, including those representing farmers and businesses in targeted sectors, and entities focused on empowering women and youth, among others.

B. Balancing support for technology innovation to address climate change mitigation, adaptation and enabling conditions

90. Global climate finance flows remain predominantly directed towards mitigation activities, while significant gaps persist in financing for adaptation, particularly in developing countries. For example, tracked adaptation finance reached an annual average of USD 63 billion in 2021-2022 – representing 11 per cent of the total tracked climate finance – primarily driven by the commitments of bilateral and multilateral development finance institutions (UNFCCC Standing Committee on Finance, 2024) and limited role of private and commercial capital in this area (Climate Policy Initiative, 2024). Development finance for climate-related technology transfer also remains concentrated in sectors such as energy and transport, and to a lesser extent agriculture and water sectors (UNEP-CCC, 2022). Support provided to climate technology I&As in developing countries should take these differences into account, recognising that the types of innovation systems, technologies and support functions required for mitigation and adaptation may differ. In particular, I&As supporting adaptation-focused innovations are likely to require more sustained public and concessional support, given the context-specific nature of these solutions and the limited availability of commercial financing models (Gautam, D. et al., 2024). Adaptation innovations may also

[34] Source: ASIF interview, 9 June 2026.

follow longer and less predictable time horizons than commercially deployable mitigation technologies. As such, dedicated funding mechanisms for supporting adaptation innovation through I&As and other innovation support programmes such as AFCIA (UNDP, 2025), can play an important role in addressing the specific challenges faced by adaptation-focused climate ventures.

C. Diversifying financial flows for I&As and their linkages with other actors

91. Concerning the funding of I&As, overreliance on external funding -particularly from a single donor- may limit the ability and agility of I&As to adapt their operations beyond donor priorities and threaten their long-term sustainability. Diversifying funding of I&As by blending public grants with private capital (e.g. blended finance models like the Green Climate Fund or public-private partnerships) and adopting revenue-generating strategies such as pay-as-you-go models, membership, and co-working fees are effective approaches to increase the scale of financing and diversify the sources of finance, including by developing and strengthening domestic financing ecosystems for climate innovation. For example, with the planned withdrawal of some of its key funders, the KCIC (see Box 8), has launched a commercial consulting arm, developed the Kenya Climate Venture investment vehicle, and explored revolving funds and cost-sharing with start-ups.

92. Strengthening operational linkages of I&As with the local actors, including youth, women, Indigenous Peoples and local communities, including social and solidarity economy entities, can enhance resilience and reduce dependence on external support, since I&As anchored in domestic institutions and aligned with national innovation and climate priorities are better placed to attract recurring public support and private investments and to outlast any single donor (see Box 15). Moreover, the role of bilateral and multilateral support providers could shift from that of a "solution provider" to "solution enabler" – away from funding individual cohorts and toward funding the facilitation, infrastructure and partnerships that allow I&As and the ecosystems they support to stand on their own.

Box 15 – National climate finance strategy in Uganda

Uganda created a climate finance unit in the Ministry of Finance, Planning and Economic Development in 2022, in order to build investment readiness, coordinate climate finance and ensure funding aligns with national development priorities. In 2023, with support from the NDC Partnership Action Fund, the government issued climate-mainstreaming guidelines for the financial sector to help banks, lenders, insurers and other financial players align their portfolios with the country's NDC. A series of high-profile matchmaking events and investor meetings were conducted to connect project proponents and investors.

In 2025, Uganda launched its national climate finance strategy to accelerate green growth and climate resilience. The strategy serves as a catalytic tool to accelerate low-carbon, climate-resilient investments in priority sectors such as agriculture, energy, transport, waste management, and industry. As part of the strategy, Uganda aims to scale up the Climate Finance Facility at the Uganda Development Bank to[35], among other things, facilitate private sector investments green innovations, technologies, and markets. The Facility has also introduced targeted special programmes such as Women Prosper Loans, and Youth Step-Up Loans, to provide SMEs, women, and youth with affordable financing and business support to strengthen their resilience to shocks.

[35] For more information, see: https://ndcpartnership.org/news/ugandas-climate-finance-unit-model-mobilizing-climate-finance; https://gggi.org/uganda-launches-national-climate-finance-strategy-to-accelerate-green-growth-and-climate-resilience/.

D. Blending I&A operation and services with venture investment

93. Some I&As are also experimenting with business models that combine incubation or acceleration services with investment activities. By taking equity stakes or success-linked fees, these models seek to align an accelerator's financial incentives with the long-term performance of its portfolio, although these approaches generate returns only over extended periods and depend on the existence of functioning exit markets (GALI, 2021). Other models combine incubation services with a dedicated blended investment vehicle. The Catalyst Fund, for example (see Box 16), operates as both an impact investment fund[36] and venture builder[37] for early-stage climate technology enterprises in Africa (Hans et al., 2025). Originally incubated within the Climate Policy Initiative's Global Innovation Lab for Climate Finance, it employs a layered capital structure in which concessional "junior" equity absorbs initial losses, thereby attracting commercial "senior" investors (CLIC & ISF Advisors, 2025) and expanding the pool of available capital for climate innovation.

Box 15 – Catalyst Fund

Catalyst Fund is an investment fund and accelerator focused on inclusive fintech and climate solutions in emerging markets. Backed by partners such as the Bill & Melinda Gates Foundation, it provides seed funding, technical support, and access to a global network of investors and mentors. Its goal is to bridge the gap between innovative startups and traditional capital, targeting sectors such as sustainable agriculture, clean energy, and climate resilience in developing countries. In 2025, Catalyst Fund strengthened its commitment to supporting African entrepreneurs developing technology solutions to address climate challenges in sectors such as agriculture, climate-smart insurance, clean energy, transport, waste management, and carbon capture. By 2025, its portfolio comprised 26 companies across nine African markets, delivering tangible results across 10 adaptation sectors (Catalyst Fund, 2025).

E. Taking innovative approaches to diversify revenue sources and financing models of I&As

94. The landscape of climate finance is dynamic and evolving, creating opportunities for climate technology I&As to explore innovative approaches to strengthen their financial sustainability. Performance-based (or results-based) financing has gained increasing attention in recent years by linking disbursements to verified performance. For I&As, milestone-linked grants or highly concessional finance can provide more flexible and outcome-oriented funding models, linking continued – and potentially more commercial – support to demonstrated performance and strengthening accountability for funders and investors. While these approaches enhance efficiency and accountability in the use of funds, their success and scalability depend on the availability of low-cost, standardised impact measurement tools and appropriate monitoring capacities.

95. Climate technology I&As are increasingly exploring diversified revenue models to reduce dependence on short-term external funding, for example, service-based revenues, membership models, corporate partnerships and equity participation, in line with their institutional set-up. Policymakers and innovation actors in developing countries should continually assess the feasibility of both conventional and innovative financing mechanisms to support climate technology I&As, using a combination of such instruments where appropriate.

[36] Impact investment fund: a fund that invests with the intention to generate positive, measurable social and environmental impact alongside a financial return, and specifically use that investment capital along with engagement or investment terms to positively influence targeted impact results. More information available at: https://thegiin.org/.

[37] Venture builder: also known as a company builder or venture studio, creates and launches ventures in-house rather than selecting external applicants (see Box 2).

F. Ensuring long-term sustainability of climate technology I&As

96. Financial and institutional sustainability are essential for climate technology I&As to deliver long-term impact. Stable, diversified funding, and supportive institutional arrangements are required to enable I&As to fulfill their role in supporting entrepreneurial experimentations within NSI, including by maintaining capabilities, partnerships and institutional linkages over time. A combination of domestic and international public support, philanthropic funding and private sector partnerships can help strengthen the resilience of climate technology I&As and reduce their dependence on short-term project-based financing. Ensuring complementarity and strategic sequencing of funding instruments is also critical, with grant and concessional finance remaining important for supporting the public-good functions of I&As, while revenue-generating activities and other sustainable financing mechanisms can contribute to their long-term viability. Moving beyond short-term funding cycles towards sustained support for effective I&As can help retain institutional capacities, strengthen innovation systems, cultivate lasting partnerships and ensure that these programmes evolve into durable ecosystem actors capable of advancing climate innovation.

Chapter 6
Designing funding proposals with climate technology incubators and accelerators

97. The Paris Agreement stipulates that accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development[38]. In line with this, the UNFCCC Technology Mechanism is to support developing country Parties in promoting the use of I&As, including by supporting the development of funding proposals for submission to the entities of the Financial Mechanism that incorporate their use[39], with the aim of stimulating technology RD&D, building effective ecosystems for start-ups, and strengthening NSIs towards achieving climate and sustainable development goals.

98. Beyond domestic and donor-supported initiatives, I&As can also be embedded within climate-related funding proposals submitted to international climate and development financing institutions, including as project components and delivery mechanisms to support the development, demonstration, deployment, and scaling of climate technologies in developing countries. This chapter focuses on the design of projects and programmes containing I&As and similar entrepreneurship support modalities for climate technology start-ups supported through public climate finance, and also touches upon the mobilisation of private finance that may complement support through public sources of finance.

99. The choice of financing pathway would depend on innovation maturity, project scale, and the associated level of risk (see table 7). Decision-makers in developing countries often combine different financing instruments and sources, leveraging their complementarities and comparative advantages to support climate entrepreneurship.

Table 7
Indicative characteristics of Multilateral Climate Funds and Multilateral Development Banks in supporting incubators and accelerators and start-up ecosystems

	Multilateral climate funds	**Multilateral development banks**
Objective	Support early-stage technology development, piloting, and demonstration activities for climate adaptation and mitigation and address market barriers in vulnerable regions.	Scale viable climate ventures, strengthen local financial ecosystems, and crowd-in private capital.

[38] The Paris Agreement, Article 10.5.
[39] Decision 18/CP.27, para. 10.

Risk appetite	High - designed to absorb early-stage and non-bankable risks.	Moderate to low – focused on bankable and de-risked projects.
Scale of intervention	Incubators/accelerators can be core or embedded components of projects.	Incubators/accelerators embedded within larger programmes or investment operations.
Type of innovation support	Grants, blended finance (e.g. first-loss capital), TA, capacity-building, piloting.	Equity investments, lending, investment platforms, financial intermediation, ecosystem support.

100. Mapping, case studies and portfolio analysis of various multilateral climate funds and multilateral development banks suggest that climate funds are generally better suited to higher-risk, early-stage innovation, including piloting and demonstration activities. These interventions are typically smaller in scale and designed to catalyse broader market transformation or future investment. On the other hand, multilateral development banks tend to support larger-scale investments and infrastructure projects, with lower tolerance for technological, market, and implementation risks

101. Accordingly, I&As may be well aligned with projects supported by climate funds focused on testing and validating innovative solutions start-ups, while more mature ventures and technologies are better suited for scaling through programmes financed by the multilateral development banks. It is also important to note that several multilateral development banks operate venture ecosystems beyond their sovereign lending portfolios, linking the public sector, the private sector and innovative entrepreneurs to support technological innovation in developing countries. These venture platforms can channel finance more directly and quickly to start-ups than large sovereign operations, which in turn shapes the financial instruments each is able to deploy. For example, the Asian Development Bank (ADB)'s ADB Ventures is a venture capital platform designed to support early-stage and growth-stage technology companies in Asia and the Pacific that advance climate and environmental sustainability.[40] Also, the IDB Lab is the innovation and venture arm of the Inter-American Development Bank Group, supporting high-impact startups and the innovation ecosystems they need to thrive through flexible financing, practical knowledge, and global connections to cocreate solutions for development challenges and spark new industries for growth in Latin America and the Caribbean, including in climate and clean-technology sectors[41]

A. Designing climate projects and programmes with incubators, accelerators and other support modalities for climate technology start-ups

102. The portfolios of the Green Climate Fund (GCF), Global Environment Facility (GEF) and the Adaptation Fund (AF), show that incubators, accelerators, and related innovation mechanisms are used across a wide range of project types, from small grants to large programmes, and at global, regional, national, and local levels. They may serve as either the central project focus or as integrated sub-components within broader interventions.

103. While non-exhaustive, table 8 provides an overview of practical approaches and key considerations for integrating technology incubators, accelerators, innovation hubs, and similar modalities into climate-related funding proposals, drawing on indicative examples from successful funding proposals supported by the AF, GCF and GEF. Each of the nine aspects discussed is accompanied by an example.

104. The insights presented are based on a desk review of project documentation from funds serving the UNFCCC and Paris Agreement, including those implemented by UNIDO, complemented by practitioner and financier experience. They are intended as illustrative

[40] More information available at: https://ventures.adb.org/
[41] More information available at: https://bidlab.org/en/about/about-us

considerations rather than prescriptive guidance and should be interpreted in light of the specific objectives and requirements of each funding institution.

Table 8
Integrating I&As in projects/programmes supported by multilateral climate funds

Strategic considerations for integrating I&As in projects/programmes	Project/programme example
I. Project/programme rationale and justification Anchoring climate innovation proposals that incorporate I&As in the priorities identified in national climate plans of developing countries – NDCs, NAPs, technology needs assessments (TNAs) and other relevant plans ensures policy alignments, can strengthens the rationale and justification for such projects. This alignment demonstrates the contribution of I&As to national climate and development objectives and strengthens the likelihood that they are recognized and supported as part of broader climate programmes, financing strategies, and investment portfolios aimed at addressing the technology priorities of developing countries.	The Programme for innovation in climate adaptation and resilience building solutions (PARS), supported by the GEF targeting LDCs, focused on key sectors of food and agriculture, water and energy, based on the partner country-specific needs and challenges and national priorities outlined in key policies and programmes, such as NAPs and NDCs, as well as baseline assessments of climate risks and existing projects.[42]
II. Financial structure and investment mechanisms Embedding I&As within a climate project/programme proposal can be an effective approach to create a continuum from innovation to investment, ensuring that early-stage solutions are systematically linked to climate finance instruments and broader climate policy priorities. Reviewed projects indicate the use of various complementary elements, such as involving private sector and domestic actors, providing pre-investment support and seed-funding for early-stage companies, using investment grant platforms often tied to clear milestones in the transition from idea to investable project, and putting in place de-risking mechanisms to crowd-in private capital.	In the project Building Eco-system for Accelerating Contribution to NDC through Climate Innovation Incubation for India ("BEACON INDIA"), supported by the GCF, dedicated green investment instruments, blended finance frameworks, co-investor mobilisation platforms and a step-up debt financing facility are utilised to leverage private sector participation and funding for selected climate ventures.[43]
III. Inclusion and access Creating dedicated support windows (e.g. first-time-founder pathways), targeted technical assistance, mentoring, skills-building, inclusive selection criteria, transparent, principles-based application processes, and relevant performance indicators are effective approaches for promoting diversity, equity, and inclusion in innovation support mechanisms such as I&As. These measures can help address barriers faced by women, youth, and other underrepresented or vulnerable groups, ensuring equitable access to innovation support, financing opportunities, mentorship, and networks.	The project Unlocking Investments in Gender and Youth-Inclusive Early-Growth Stage Adaptation Small and Medium-Sized Enterprises in Kenya and Uganda, supported by the AF, enforces a criteria by which 100% of the SMEs supported by this project would be women and/or youth-inclusive, meaning they aim for a 50% gender and youth balance in their work force and/or their primary customer base.[44]
IV. Components and activities The design of project/programmes components involving I&As shows a diverse range of activities, particularly depending on whether they operate at the national or regional level. Recurring examples include innovation centres and hubs, online peer networks and communities of practice, tailored technical assistance and advisory services, investment grant and investor matchmaking platforms, and capacity-building and networking activities. Global and regional projects/programmes may have a strong focus on community building and knowledge sharing while national projects/programmes may focus on integration with the existing policy frameworks and the ecosystem of innovation actors.	The Global Cleantech Innovation Programme (GCIP), supported by the GEF, was developed and implemented as nine separate, independent national-level projects, utilizing an array of interventions such as one-on-one mentorship support, national investor forums, networking opportunities, post-accelerator support, among others.[45]
V. Sustainable development co-benefits Technology I&As in developing countries can deliver benefits that extend beyond climate action. In addition to supporting mitigation and adaptation objectives, they can contribute to broader sustainable development outcomes and environmental goals. Offering innovative solutions to complex development	The project Agtech for inclusion and sustainability: SP Ventures 'Regional Fund (Agventures II), supported by the GEF, provides support to Agtech early-stage companies that will develop technologies to offer productivity, market, and environmental

[42] More information available at: https://www.thegef.org/projects-operations/projects/11566.
[43] More information available at: https://www.greenclimate.fund/document/building-eco-system-accelerating-contribution-ndc-through-climate-innovation-incubation.
[44] More information available at: https://www.adaptation-fund.org/project/pre-concept-note-unlocking-investments-in-female-and-youth-led-early-growth-stage-adaptation-micro-small-and-medium-sized-enterprises-in-kenya-and-uganda/.
[45] More information available at: https://www.unido.org/GCIP.

challenges. As such, they may be relevant instruments for inclusion in projects, initiatives and international cooperation aimed at advancing the sustainable development agenda and mobilizing sustainable development finance.	solutions for the agricultural sector in Latin America especially to the small and medium sized farmers to generate environmental benefits related to climate change, land degradation, and chemicals and waste.[46]
VI. Scale up potential Embedding I&As within climate projects/programmes with technology development and transfer objectives creates an opportunity to stimulate innovation and increase the likelihood of achieving impact at scale through promoting climate technology entrepreneurship, as the project finance could address early stage barriers for innovation (e.g. shortages of capital, technical expertise, and market connections) and involve stakeholders that will be essential to technology diffusion and uptake - investors, policymakers, industry actors, research institutions, and end users. Successful support modalities including I&As may also be replicated in other sectors and geographies.	The project Enhancing Hydromet Services through Regional Monitoring Innovation Hubs in Africa, supported by the AF, included, as one of its components, dedicated support to local start-ups in the Gambia and Tanzania (e.g. international twinning and mentoring, pump-priming grants, and innovation camps) to foster a culture of innovation and strengthen the participation of the private sector in hydromet services, beyond the lifetime of the project.[47]
VII. Implementation arrangements Engaging the right partners is critical to the success of projects/programmes involving I&As. Project/programme design should bring together institutions with the technical, financial, and entrepreneurial expertise needed to support innovation and technology deployment, including established I&As. It is equally important to anchor these initiatives within strong host institutions – such as universities, research centres, industry associations, financial institutions, or private sector organisations – to ensure long-term sustainability, access to expertise and networks, and alignment with local and national priorities.	The project Concerted Action To Accelerate Local I.5° Technologies (CATALI.5°T), supported by the GCF, is executed by 5 entities to deliver tailored support to West Africa and Latin America regions, based on their regional presence and unique expertise (e.g. programming, pre-acceleration, venture ideation, acceleration).[48]
VIII. Coordination, knowledge management and learning Knowledge management and coordination are generally important aspects in the operation of I&As, especially when projects/programmes operate in multi-country and multi-partner settings, where decentralised operations can create challenges for communication, consistency, learning, and results aggregation. Effective coordination mechanisms, including common reporting frameworks, regular exchanges, and shared governance arrangements, can help align activities across countries and partners while maintaining flexibility to respond to local contexts. Capacity-building activities, peer-learning networks, communities of practice, training the trainers, and knowledge-sharing platforms can facilitate the exchange of experiences among entrepreneurs, incubator managers, investors, and policymakers, helping to replicate successful approaches and strengthen innovation ecosystems. Including knowledge brokers in the design of these mechanisms is an important consideration, notably regarding climate issues.	In the second phase of the Adaptation Fund Climate Innovation Accelerator (AFCIA), the CTCN is coordinating the overall operation of the AFCIA II sub-programmes, including by establishing a monitoring and evaluation framework to enhance impact measurement and alignment across AFCIA implementing entities.[49] The Climate Adaptation Innovation Learning (CAIL) project, supported by the GEF, establish knowledge sharing platform which brings together insights from diverse adaptation projects and fosters collaboration and knowledge sharing across Communities of Practice. [50]
IX. Exit strategy and sustainability An exit strategy is essential to ensure that the entrepreneurship support functions offered by I&As continue beyond the lifetime of individual projects/programmes, whether through the continuation of the I&As themselves (e.g. by ensuring sustainable revenue sources) or transferred functions and capabilities to relevant actors in the innovation system. An exit strategy must be defined at an early stage to ensure the sustainability, ownership, and capacity retention at the local and national level. Leveraging existing institutions and initiatives to anchor I&As; building local capacity and transferring skills in areas such as project management, resource mobilization, and long-term planning; establishing networks and knowledge-sharing mechanisms; and strategic partnerships with governments, universities, private sector actors, investors, and other stakeholders that can provide the resources, expertise, and financing needed for long-term delivery of climate entrepreneurship support	ASIF, supported by the Adaptation Fund under the umbrella of the AFCIA, is designed with a comprehensive exit strategy, which includes capacity-building and policy harmonization at the national level to create an enabling environment for climate adaptation and SME development, e.g. through capacity-building for national institutions, involving Adaptation Fund Designated Authorities, adopting an innovative learning agenda, promoting stakeholder engagement and collaboration, and fostering policy alignment and integration.[51]

[46] More information available at: https://www.thegef.org/projects-operations/projects/10336.

[47] More information available at: https://www.adaptation-fund.org/project/enhancing-hydromet-services-through-regional-monitoring-innovation-hubs-in-africa-gambia-tanzania.

[48] More information available at: https://www.greenclimate.fund/portfolio/projects/fp198.

[49] More information available at: https://www.adaptation-fund.org/project/coordination-services-for-the-special-financing-window-in-support-of-innovation-for-adaptation-afcia-phase-ii.

[50] More information available at: https://www.unido.org/climate-adaptation-innovation-learning.

[51] More information available at: https://www.adaptation-fund.org/project/the-adaptation-smes-innovation-facility-asif.

services have been observed as common elements of a well-designed exit strategy.	

B. Strengthening support for climate technology entrepreneurship by mobilising private sources of finance

105. Beyond public finance – whether domestic or international – governments around the world are increasingly mobilising private sources of finance to support climate technology entrepreneurship, for example raising awareness of climate priorities and strengthening private sector engagement in national climate policy processes, using policy measures to incentivise and channel corporate social responsibility programmes and philanthropic funding towards climate innovation, and fostering public, private, and philanthropic partnerships to promote climate entrepreneurship (see Box 17). Examining these approaches alongside publicly financed interventions can help strengthen future project design and execution and improve the effectiveness of these modalities in supporting climate-related objectives.

Box 16 - Corporate social responsibility and corporate philanthropy for innovation in India

In India, corporate social responsibility (CSR) regulations established under the Companies Act 2013 specifies the categories of activities that companies may support through their CSR expenditure (Sattva Knowledge Institute and Atal Innovation Mission, 2024). Amendments to the Act have progressively broadened the scope for corporate investment in innovation, recognising it as an eligible area for CSR contributions (GIZ, 2017). In 2021, an amendment to the act allowed companies to establish their own Technology Business Incubator within educational institutions or approved by the central and state governments. In the context of this evolving policy framework, a 2024 study proposed a self-assessment checklist to help corporations evaluate their readiness to support innovation, in line with India's CSR regulations:

- **Policy Alignment**: Do our existing policies and practices encourage or hinder innovation? What areas need improvement, and what policy updates are necessary?
- **R&D Orientation**: Is our company inclined towards any form of research and development, technology, or scientific innovation?
- **Cultural Enablers**: Does the prevailing culture within our organisation foster innovation and entrepreneurship?
- **Leadership Engagement**: How can we educate our leadership on the potential benefits of funding innovation?
- **Beyond Financial Support**: Is our company open to engaging in CSR and corporate philanthropy initiatives beyond just granting funds?
- **Resource Leverage**: Are we open to leveraging non-financial resources, such as internal capacities through our employees and existing technology platforms, to amplify impact?
- **Ecosystem Connections**: Is our company open to forging new connections within the ecosystem and establishing cross-functional, cross-sectoral partnerships?
- **Long-Term Commitment**: Would our company be willing to support a long-term program for 3 to 5 years, considering that innovation funding often requires sustained support?
- **Ecosystem Knowledge**: Do I possess sufficient knowledge about the incubation, acceleration, and startup ecosystem, which is crucial for funding innovation programs?
- **Compliance Knowledge**: What are the initial compliance requirements with the latest CSR regulations?

Although this self-assessment questionnaire is indicative and designed for companies operating under India's CSR framework, many of the considerations it highlights may be relevant for governments and private sector actors seeking to mobilise private finance for climate technology entrepreneurship.

Chapter 7
Key messages and recommendations

106. Climate technology I&As, along with other support modalities for strengthening start-up ecosystems and entrepreneurship, play a pivotal role in strengthening NSI and accelerating

technological change in line with the climate and sustainable development goals in developing countries.

107. The analysis in this paper highlights a number of barriers and challenges that may constrain the establishment, performance and long-term operation of climate technology I&As in developing countries, for example:

(a) Many I&As in developing countries operate as standalone entrepreneurship support initiatives, with **limited institutional linkages with other innovation actors** at the local and national levels;

(b) Many I&As in developing countries do **not yet systematically align their activities and support portfolios with national climate priorities** (e.g. those identified in NDCs, NAPs and TNAs), limiting their contribution to national climate objectives;

(c) **Limited availability of testing and validation infrastructure for climate technologies at the mid-stage (TRL 5–8)** can hinder their commercialization and scale-up; At the same time, **insufficient domestic R&D investment and technical and institutional capacity can constrain the absorptive capacity** of domestic firms and innovation systems to capture and build on the knowledge and technological spillovers generated through I&As;

(d) **Over-reliance on public or donor funding,** particularly from a single source of support, **can limit the ability of I&As to provide sustained support to climate technology ventures and undermine their own long-term financial and institutional viability.** This may result in the loss of accumulated knowledge and capabilities and require subsequent initiatives to restart or duplicate efforts;

(e) **Locally-led climate solutions (**e.g. for adaptation to impacts of climate change**), and underrepresented entrepreneurs from vulnerable groups** (e.g. women and youth), **may face additional barriers to accessing support for climate-focused entrepreneurial activities** (e.g. finance, business networks, technical expertise) provided through I&As.

108. The analysis in this paper underscores the following salient points and key messages:

(a) **Climate technology I&As are diverse, evolving and context-dependent, and no single I&A model is universally applicable**. The design of climate technology I&As should reflect climate and sustainable development goals, technology priorities and national circumstances, existing gaps and challenges, and available capacities and support options in developing countries. The mapping of climate technology I&As conducted as part of this analysis could provide inspirations and insights for the design of I&As and similar support mechanisms, which may be combined as part of a portfolio of solutions tailored to specific contexts;

(b) **Supportive policy and regulatory frameworks are essential for the effective performance of I&As within NSI**. Aligning public policy and regulatory frameworks across climate (e.g. NDCs), economic (e.g. business and corporate regulations, public procurement) and innovation (e.g. STEM education and research) domains can enhance coherence and coordination for climate action and sustainable development, across sectors and levels of governance, at the national level, and in the context of multilateral support and international cooperation;

(c) **Leveraging partnerships and adopting an ecosystem approach to innovation systems is essential for effective design and operation of climate technology I&As**. Complementary support including from universities, research institutions, corporates, investors, and international actors is essential to address commercialization gaps. University- and corporate-anchored start-up support vehicles, enabled by supportive public policies and institutional mandates, can play a particularly important role by providing the infrastructure, technical expertise and market linkages needed to advance climate technologies from validation to deployment;

(d) **Strong, place-based local innovation ecosystems are essential. Digital technologies can help expand the reach, accessibility and inclusiveness of climate technology I&As and similar entrepreneurship support mechanisms. However, virtual**

services and support modalities complement rather than replace local innovation ecosystems. Countries are increasingly leveraging STI parks, innovation hubs, centres of excellence and similar platforms to strengthen these ecosystems by clustering support for start-ups, providing access to physical infrastructure, laboratories, testing facilities, expertise and collaborative networks that are essential for climate technology validation, commercialization and scale-up;

(e) **Adaptation-focused climate technology I&As require sustained public and concessional support,** given the context-specific nature of adaptation solutions and limited availability of commercial financing models for them**.** Taking into account the different types of actors, technologies and support functions required, decision makers and support providers could differentiate and balance the support for technology innovation to address climate change mitigation, adaptation and the enabling conditions.

109. In addition to the key messages and findings from this work, the following recommendations could be highlighted, for consideration by a range of actors across the NSI in developing countries in their actions, particularly policy makers and country teams that are in charge of designing and implementing projects to support climate technology start-up ecosystems, in particular through I&As:

(a) With regard to enabling environment, policymakers and development partners could strengthen the role of I&As within NSI by:

(i) **Aligning support mobilized for and operations of I&As with climate and development priorities** by using instruments such as NDCs, NAPs, TNAs, and relevant national, sectoral and local policies (e.g. STEM education and research policies) and regulatory measures (e.g. corporate social responsibility frameworks and twin transformation);

(ii) **Strengthening coordination and clustering functions within local innovation systems** (e.g. through innovation hubs), and promoting institutional linkages with NSI actors (e.g. universities, research institutions and the private sector);

(iii) **Promoting the inclusion of youth, women, Indigenous Peoples and local communities** in the operation of climate technology I&As and the ventures they support;

(iv) **Applying effective MEL approaches** to enhance the design, delivery and long-term contribution of I&As to NSI and climate action in developing countries.

(b) With regard to mid-stage infrastructure and the deployment and scale-up gap, policymakers and development partners could consider:

(i) **Investing in shared mid-stage infrastructure**, including through public-private partnerships (e.g. laboratories and testing facilities);

(ii) **Providing policy signals and financial incentives to companies** that open their R&D facilities and industrial assets to start-ups;

(iii) **Utilizing corporate- and university-anchored I&As as institutional hosts for such infrastructure**, drawing on their capacity to de-risk technologies and connect ventures to deployment pathways;

(iv) **Prioritizing sectors where physical testing environments are critical** – such as energy, transport, water, and agriculture.

(c) With regard to financing of climate technology I&As, policymakers and development partners could consider the following to strengthen their long-term viability:

(i) **Diversifying sources of finance to support the operation of I&A and the ventures they support** by combining public, concessional, philanthropic and private finance, with effectiveness, complementarity and accountability in mind;

(ii) **Diversifying revenue streams to reduce donor dependence, enable financial viability of I&As, and increase the scale of financing for climate technology innovation** (e.g. service-based revenues, membership models, corporate partnerships and equity participation);

(iii) **Leveraging strategic partnerships to strengthen local and national climate innovation systems** (e.g. establishing innovation labs and centres of excellence through public-private partnerships) **and address financing and infrastructure gaps for climate technology innovation** (e.g. though international cooperation).

(d) With regard to embedding I&As into climate projects and programmes supported by multilateral climate funds, policymakers, project developers and development partners should consider:

(i) **Positioning I&As as delivery mechanisms to advance the development, demonstration and deployment of prioritized climate technologies** (e.g. those identified in NDCs, NAPs and TNAs), rather than as standalone entrepreneurship activities;

(ii) **Incorporating considerations related to inclusion** (e.g. for youth and women), **sustainable development co-benefits**, and **opportunities for scaling impact** in the design of projects and programmes;

(iii) **Tailoring support modalities of climate technology I&As to the local needs and circumstances of the ventures they support** (e.g. performance of NSI, technology maturity and business readiness, and financing and infrastructure gaps for climate technology implementation);

(iv) **Building on existing institutions and partnerships for implementation of climate technology I&As** (e.g. by anchoring I&As within national institutions); and

(v) **Including measures to promote local ownership, ensure capacity retention, and enable effective exit strategies for donor-backed climate technology I&As**, in order to sustain results beyond project lifecycles.

(e) With regard to the sustainability and effectiveness of I&As, policymakers and development partners should consider, among other things:

(i) **Institutional sustainability** (e.g. strengthening linkages and coordination within NSI);

(ii) **Financial sustainability** (e.g. diversifying sources of finance and exploring complementary financing approaches that reduce reliance on short-term project-based funding);

(iii) **Operational sustainability** (e.g. strengthening connections with other innovation support mechanisms and actors);

(iv) **Functional sustainability** (e.g. maintaining services offered by I&As to start-up ecosystems, which may, where appropriate, be transferred to or continued through other actors);

(v) **Inclusivity and diversity** (e.g. ensuring that I&As remain accessible and responsive to the needs of diverse groups of entrepreneurs and beneficiaries); and

(vi) **Integrating learning, knowledge management** and exchange mechanisms (i.e. to capture lessons, strengthen implementation practices, and facilitate knowledge spillovers among climate technology I&As and across broader innovation systems in developing countries).

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