

Policy pointers

Digital technology can help develop new governance, collaboration and business models for climate finance that emphasise including people, particularly vulnerable and marginalised groups, at all stages.

Developers should approach new technology as an ecosystem, not as a service, putting people — rather than the technology itself — at the centre of their work.

To understand local socioeconomic and cultural conditions — including decision making and gender dynamics — as well as the regulatory context, data rules and technological starting points, developers must engage local stakeholders from the outset.

Where possible, developers should focus on technologies and solutions that are flexible enough to build on, grow and adapt to existing systems, data, services and trusted institutions.

Digital technologies for an inclusive, low-carbon future that puts people first

Many of the same long-standing issues that underpin the climate and development finance space impede the use of technology in climate finance. Solutions and pilots show promise but are built out in parallel rather than forming an integrated, human-centric approach that can effectively reach the local level. In this briefing, we consider how digital technology can facilitate climate finance in a way that delivers more human-centric and better-targeted funds, empowering local communities to mitigate and adapt to the impacts of climate change and protect their environment through their actions. We give an overview of the pattern of technology development to date and explore potential pathways to change, closing with recommendations for developing a bottom-up, integrated approach to digital technologies to help bring about an inclusive, low-carbon future.

In recent decades, the technology landscape has evolved to support the achievement of the Sustainable Development Goals (SDGs) and global climate goals as established in the Paris Agreement. Successful initiatives have used technology for humanitarian applications in identity verification and aid distribution,¹ renewable energy and financial inclusion,² and supply chain transparency.³

Innovations in digital technology can also help channel more climate finance directly to the people and places that need it most and best understand its potential impact. If designed and governed effectively, these technologies can disrupt prevailing power dynamics for fairer resource governance, reducing costs and increasing the efficiency of climate and development finance. However, without careful consideration, they can entrench existing

inequalities and inadvertently drive unjust and ineffective development outcomes.

To date, most overall patterns of technology development have followed a business-as-usual, technology-centric approach. But despite a proliferation of digital start-ups offering applications that appear to address climate objectives, many projects have failed to reach scale or fallen short of or undermined their envisioned impact. Instead, they have reinforced the dominant paradigms and assumptions that underlie existing institutional climate finance structures, incentives and power imbalances. Fragmented efforts take place in silos, leading to duplication and credibility issues and reducing cost effectiveness, returns on investment, time efficiency and additionality (Figure 1). This has created important gaps — in investment and infrastructure, information, access, understanding and ultimately, intended impact.

Technology pitches are rarely designed for or informed by local socioeconomic and cultural factors

Business-as-usual technology

When estimating the investment required to achieve global climate and development goals, the business-as-usual approach to technology portrays it as a market opportunity,⁴ indicating the 'size of the prize' to be won by the firms or organisations that develop and roll out successful initiatives.

Although this interpretation helps motivate public and private efforts to address different global goals, these are often based on incorrect assumptions about the local socioeconomic, cultural, technical and regulatory context.

Local decision making and gender dynamics, accurate and consistent data, local technical capacity, reliable access to mobile networks and electricity, and interoperability between and across new and old technology and systems all affect the successful implementation and adoption of technologies. But the people developing and building technology applications to support global sustainability and climate goals often work far away — and in completely different contexts — from the places where the technologies will be deployed and used. To a large extent, the roots of emerging technology solutions, the processes by which they emerge, and the sources of their financial support reflect a 'Silicon Valley' approach. Characterised by a venture capital mindset and competitive evaluation processes, they value vision, 'plug

and play' solutions and entrepreneurial zeal more than a deep appreciation of on-the-ground realities. As a result, they miss important considerations for success in developing countries, where incorrect assumptions can have adverse, unintended results.

Technology pitches often focus on vision. Although they may cite developing country case studies, they are rarely designed for or informed by local socioeconomic and cultural factors; nor do they build on local initiatives. Many aim to overthrow, bypass or leapfrog 'inefficient' frameworks, policies and projects, including those that are already having a positive, if sub-scale, impact under local conditions.

Business-as-usual technology development can also conflate technological wizardry pitching skills with impact and value. Few attempts to develop digital approaches to facilitate the flow of climate finance or improve efficiency in existing systems have been based on an understanding of the overarching needs and specific vulnerabilities of local communities. Instead, initiatives are built around the technology at specific points in a value chain or system, leading to vertical integration. They do not consider local people and culture, infrastructure constraints or the geopolitical, geographic and physical aspects that will limit uptake and impact. Nor do they engage in serious gender analysis, so developers remain unaware of the technology's potential gendered impacts.

Even key international institutions and development banks initially adopted the 'Silicon Valley' approach, hosting hackathons, pitching events and calls for innovation.⁵ They have also retained long-standing procurement processes, assuming that technology solutions were plug-and-play ready. Rather than fund pilots to build out more impactful distributed ledger technology applications, they have held up technology gurus as thought leaders, bolstering funding for solutions that harness institutional power and reputation in marketing. And although initiatives have matured — with a focus on lab approaches for longer-term support and scaling impact — too often, they lack integration and collaboration across local institutions and ecosystems.⁶

Many technology efforts to date have used a 'sticking plaster' approach, fixing specific symptoms or inefficiencies without addressing larger problems across a value chain, underlying assumptions about capacity, data readiness and ethics, or the lack of collaboration with stakeholders. When initiatives stay small or stall out, they may remain viable in theory. But they also perpetuate the key issues of credibility,

Figure 1. The barriers to integrated, locally relevant technology developments

Barriers	Examples
Silos and replication	<ul style="list-style-type: none"> ▪ Building technology and project silos ▪ Not connecting initiatives, systems and frameworks
Credibility issues	<ul style="list-style-type: none"> ▪ Adopting 'Silicon Valley' culture, process and market-based approaches
Efficiency challenges	<ul style="list-style-type: none"> ▪ Digital, physical and institutional divides ▪ Data gaps and readiness assumptions
Misaligned incentives	<ul style="list-style-type: none"> ▪ Innovation focused on competitive procurement ▪ Assuming 'plug-and-play' solutions
Infrastructure gap	<ul style="list-style-type: none"> ▪ Lack of integration with problem holders ▪ Technical builds isolated from ecosystems, stakeholders and infrastructure

efficiency and misaligned incentives. By introducing technology with limited input from local actors, these approaches or 'solutions' risk perpetuating the climate infrastructure and investment gap they aim to resolve. They can also create new risks and barriers.

Locally led technology development

We need a bottom-up, contextualised approach to defining problems and building solutions with stakeholders, technology partners and communities. Adopting an approach that is centred on local people, needs and conditions, and collaborative implementation with partners will be more efficient, more effective and less likely to reinforce existing barriers to climate finance.

For digital technology to facilitate climate finance so it delivers more and better-targeted funds and empowers communities, it must be centred on the people and the problems to be addressed, not on the technology or financial flows. Every stage of a project or investment that fosters climate investment — particularly those that focus on adaptation and resilience — must engage local people. This means hiring local developers where possible, enabling local stakeholders to define the problem, the barriers and the starting context for any emerging technology, and ensuring they participate in designing and implementing key investments.

Technology development can serve as the rationale for convening stakeholders to determine the minimal viable technology design. At this stage, communities identify several short and long-term challenges and form an initial view on priorities, considering and addressing a range of relevant issues. New digital technologies can also help improve information flow, access and

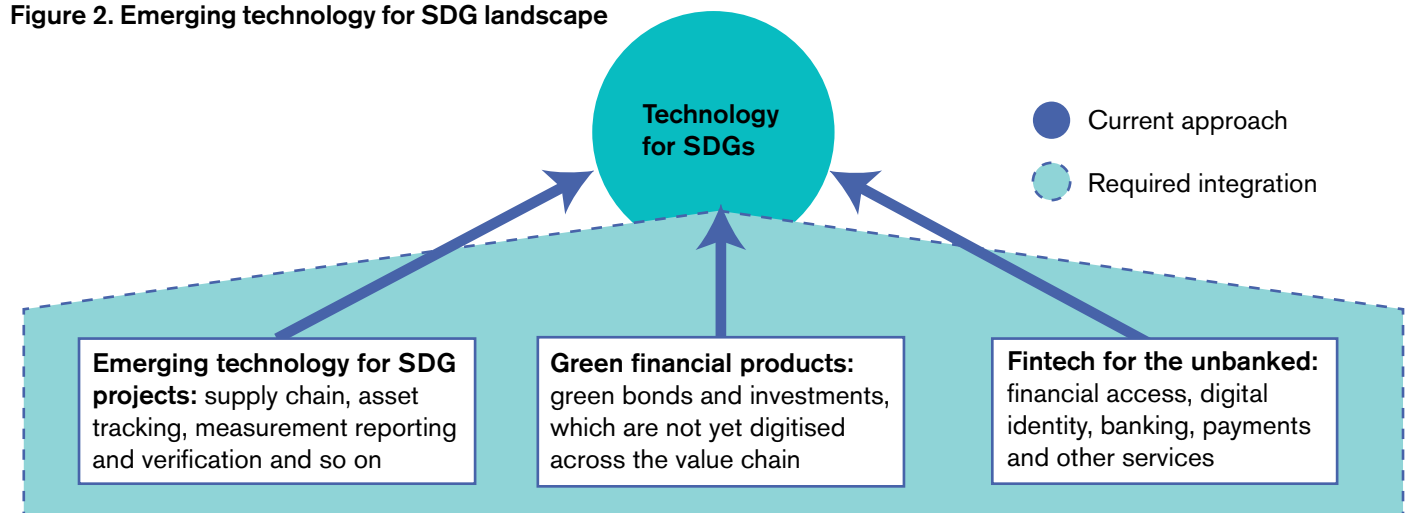
connectivity. And with this, comes the potential for improved knowledge, capacity and skills. It is important, for example, to understand which types of climate infrastructure are necessary, how they can be financed in a way that ensures equitable access, and how they can be designed inclusively and sustainably. Without this information, it is hard to prioritise investments and mobilise capital with the assurance of alignment with agreed global goals.

Building scaled-up, integrated systems

Overall, climate finance innovation is taking place on three parallel and distinct tracks, addressing some of the information gaps and other issues (Figure 2). But while digitalisation or emerging technology apply **within** each of these tracks, there is little integration **across** them. The new technology built through these business-as-usual paradigms has limited (if any) scaling of practical application or integration to local level. This has created a patchwork of IT systems, data siloes and infrastructure systems that fall short of the need to advance development and climate goals.

Despite showing significant potential for impact, there is a lack of real financial innovation or new sources of funding and no real access from the local level. Aside from the theoretical potential of new climate and SDG funding sources such as capital markets, pension funds, and infrastructure investment, climate finance continues to flow from the top down. Public flows remain structured for large bureaucratic systems. And with local sociopolitical context, economic dynamics, gender dimensions, energy requirements, stakeholder involvement and digital access rarely — if ever — considered at the start of projects, local-level access to climate finance remains limited.

Figure 2. Emerging technology for SDG landscape



A bottom-up approach that puts people first

To design a better approach, we must recognise that the reality on the ground does not always lend itself to linear solutions or a single technology input. Rather than a technology-centric approach that replicates and extends structural impediments to reaching global goals, projects must start with a broad view of the context and its dynamics.

To successfully implement and scale emerging technical solutions, developers need a thorough understanding of local energy, network and cloud access, smartphone use and access, and political, cultural and gender considerations. For this, they should consider local communities — and the vulnerable and marginalised groups within them — as experts in the problem definition stage and as stakeholders in solution building.

Many projects do not focus on learning until the pilot and scale-up phases, but learning must begin from a project's earliest stage and continue throughout its implementation. Allocating enough resources to stakeholder engagement, training and community education will help ensure efficient measurement, evaluation and learning takes place. It is important to dedicate resources to learning from all stakeholders, as no single group will foresee all the consequences of a technology. As climate impacts often have disproportionate impacts on women and girls, projects must also incorporate and continuously monitor indicators for gender considerations. This will ensure they can improve the prospects for the project's success and for future technology deployment at the local level.

To bridge the divergent tracks of innovation (see Figure 2) and resolve the persistent issues facing emerging technology in the sphere of the SDGs, the design and delivery of digital technology must be geared to address the needs of local actors. For this, we recommend the following actions for all technology project designs.

1. Be locally led, wherever possible, working with local populations as project leaders or stakeholder experts from problem definition through to the build and delivery stages.
2. Build on actionable elements from the local level up and across the whole value chain while strengthening mechanisms that have strong track records of empowering communities.
3. Have flexible definitions of climate finance scope sources and an understanding of cross-sectoral initiatives and frameworks.
4. Understand readiness first — in terms of technology, data, cultural dynamics, socioeconomic conditions, regulatory environment, and other relevant considerations.
5. Emphasise approaches to governance, and encourage local civil society, public and private actors to do the same.
6. Allocate resources for continuous learning and improvement processes that incorporate perspectives of the people affected directly or indirectly by the technology, particularly the most vulnerable.
7. Identify and vet technology builders that understand the SDG landscape and ethical considerations, looking carefully at their team, governance and structure, using local experts where available and integrating and building local knowledge and capacity.
8. Repurpose or layer on existing programme initiatives, such as SMS mobile platforms or conservation funds where possible.
9. Link initiatives and technology interventions in a more systemic, lean and agile manner, partnering and collaborating with emerging platforms where possible.
10. Harness the convening capacity of technology and connecting initiatives, while ensuring that the overall design and implementation guarantees that the technology roll-out puts people first.

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Notes

¹ For examples of technology use in humanitarian settings, see: PMNCH (2019) Digital Opportunities for Displaced Women, Children and Adolescents. <https://tinyurl.com/yxrplb88> / ² For example, BitLumens, www.bitlumens.com / ³ Early examples that have evolved into broader applications include Provenance (supply chain traceability) and Everledger (beginning in 2015 with Diamond lifecycle traceability and certification, now expanding into other supply chain and ESG applications). / ⁴ See, for example, World Economic Forum (2020) Unlocking Technology for the Global Goals. www3.weforum.org/docs/Unlocking_Technology_for_the_Global_Goals.pdf / ⁵ Two early examples of many include the 2017–2019 Hack4Climate and the inaugural UN ID2020 Summit. See <https://hack4climate.org> and www.id2020.org / ⁶ For example, although Innovate4Climate and the UNDP Accelerator Labs focus on supporting local solutions, they still replicate tools, processes and efforts rather than integrate them across institutional lines. See www.innovate4climate.com and <https://acceleratorlabs.undp.org> / ⁷ Bayat-Renoux, F, Svensson, U and Chebly, J (2018) Digital Technologies for Mobilizing Sustainable Finance. Green Digital Finance Alliance. <https://greendigitalfinancealliance.org/wp-content/uploads/2019/11/Digital-Technologies-for-Mobilizing.pdf>

