November 2023

THE INDIA CLIMATE FINANCE REPORT

Climate Capital Network

Contents

Introduction

There are many ways to describe what must happen – Mainstreaming, Institutionalisation, Normalisation of Innovation, Scaling, and of course, Adoption. As we hurtle towards 2030 and experience all varieties of climate impact and volatility, one thing is crystal clear to everyone – we must move from "The Age of Innovation" to "The Age of Adoption".

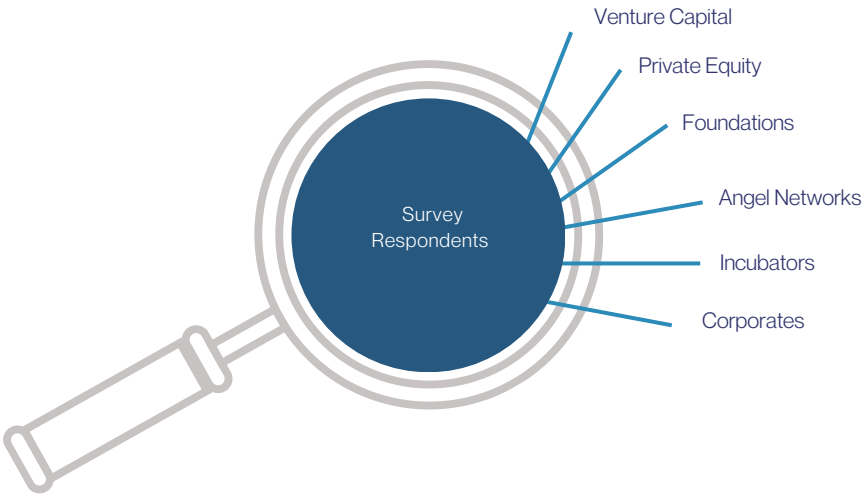
To be clear, innovation will continue to be the lever that propels transformation. Business as usual won't work anymore and we will need foundational shifts in how we live and transact with each other and the planet. That said, we are at a critical inflection point of innovation adoption.

The scientists at Project Drawdown called it out best, "At present, global efforts come nowhere near the scale, speed, or scope required. Yet many of the means to achieve the necessary transformation **already exist** (our emphasis)**.** Almost daily, there is promising evolution and acceleration of climate solutions, alongside growing efforts to sunset fossil fuel infrastructure and prevent expansion of these antiquated and dangerous energy sources." In other words, these climate technologies already exist, are proven and the key is to adopt them at speed and scale.

While many pieces need to be brought together, climate finance and the capital allocators can play a particularly pivotal role in facilitating this adoption – both through the funding made available, as well as the approaches employed (or the funding instruments deployed) to make capital accessible, available and affordable.

In this, the second annual Climate Finance Report by the Climate Capital Network, we asked members of the network and a number of other experts, "What will it take to deploy innovations at scale?"

Like last time, survey inputs are used to provide context, and uncover opportunities to catalyse specific financial approaches and climate asset classes. This is complemented by guest articles and OpEds to provide a diverse set of perspectives as well as unpack specific areas of interest. Our survey respondents were:



As always, we are grateful for the time and insights of our various contributors and very cognizant that there are likely experts, funders, and perspectives we have overlooked in putting this report together. Our apologies for these oversights; we would be keen to get additional viewpoints, so please do connect with us separately.

Finally, we leave you with the clarion call of "Deploy, Deploy, Deploy". It's time.

About Us

The Climate Finance Report by the Climate Capital Network (CCN) is an annual landscaping of the opportunities and white spaces in climate finance in India. While many others in the ecosystem do an excellent job of summarising the flow of climate finance (primarily equity investments) to innovation in India, the focus of this report is to provide a nuanced understanding of areas of emergence and showcase insights from organisations who are using innovative approaches.

GREEN ARTHA

Green Artha invests to accelerate the market adoption of the innovations and business models that will be the backbone of the Green Economy. GA was the founding Fund Manager for ACT for Environment and the seeding member of the Climate Capital Network (CCN).

www.green-artha.com

Contact us at maya@green-artha.com/ starlene@green-artha.com

Climate Capital Network

The Climate Capital Network was seeded in October 2021 with a view to creating a platform for capital allocators across the climate ecosystem in India to connect, exchange ideas, discover areas of mandate alignment, share pipelines, and build the continuum of capital. Given the nascency of the climate innovation (and climate finance) ecosystem in India, we were very intentional in our coverage across the capital spectrum – from philanthropic grant funding, through debt and equity – the returns spectrum – impact-first through to fully commercial – and across the breadth of climate sectors – far beyond energy and mobility.

To date, this is the only Network in India for and by climate capital allocators. Network activities are broad and include investment showcases, thesis deep dives, sector deep dives, panel discussions on topics of emerging interest and member offline connects.

Section 1

Capital Flows

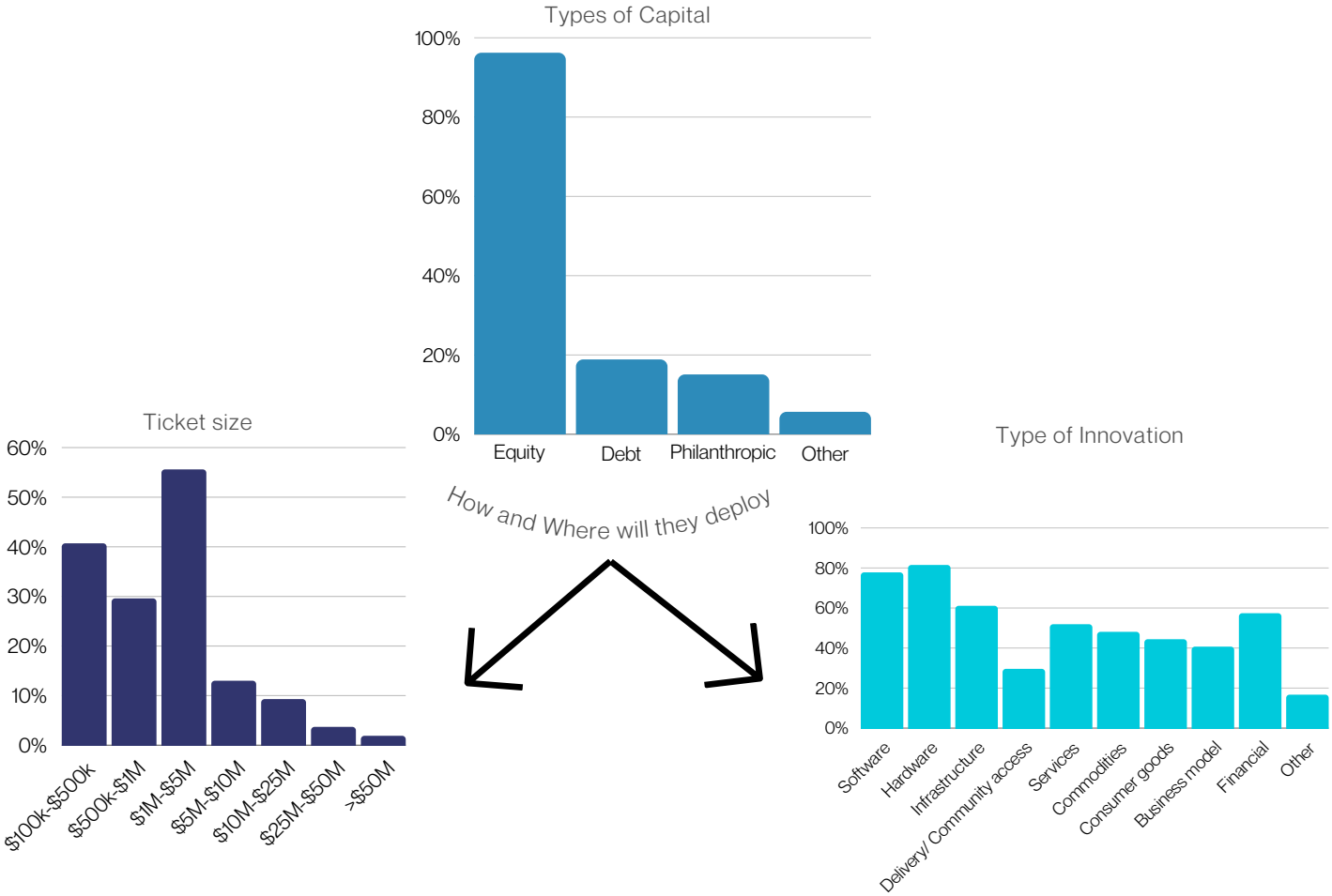
Where, What & How?

Many of our peers and partners already do a great and comprehensive job of summarising the historical flow of capital to various areas of climate technology and innovation (Unitus Capital and Climake's The State of Climate Finance in India 2023, and Impact Investors Council's (IIC) Climate Tech Investment Trends in India: A 2022 Retrospective); in this section we want to quickly set the context of where and how capital is **projected** to flow in the coming 12 months and what's changed (if anything) from last year.

2022 was a clear indicator that climate was a rising focal point for investors in India. 1/3rd of all equity impact deals involved a climate-tech startup, while 1/5th of the entire impact capital invested was in climate. In our survey this year, we found that 47% of investors identify climate as an important and existing part of their funding mandate as compared to the 33% recorded in our survey last year. Climate is presenting front and center of investor mandates.

Out of the surveyed investors, equity investors are the majority presence, clocking in at an overwhelming 94%. On the other hand, debt and philanthropic investors remain a comparatively small constituent of funders, about 18%, and 14% respectively.

The majority of funders – irrespective of debt, equity, or philanthropy – are concentrated around the Pre-Seed to Series A stage of funding. While we observe that investors are gradually moving towards bigger check sizes within this early stage, there still is a dearth of funding for Series A / B onwards. In other words, no significant shifts from last year, and there is **still a clear continuum of capital gap.**



Series B+ funders Edhina Capital, talk here about the important role played by Growth Capital in refining business models and supporting market adoption.

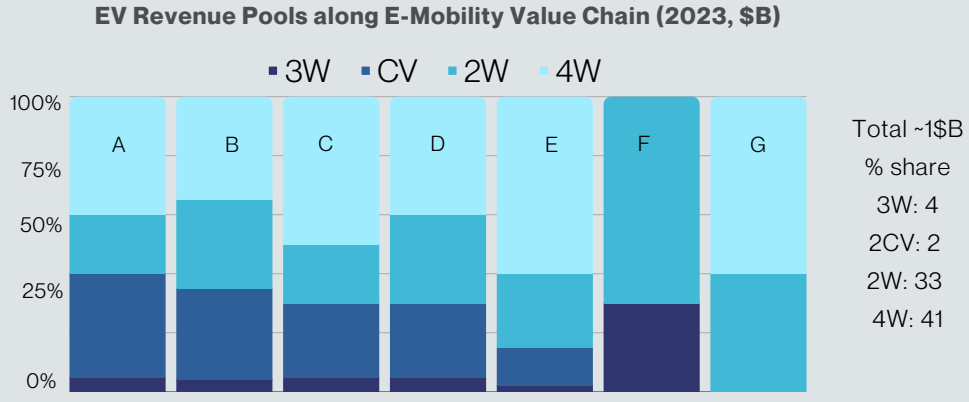
Guest Article

Closing The Market Adoption Gap: The Role of Growth Stage Funders

Hariprasad Hegde, Garima Sehra, & Priyanshu Gupta - Edhina Capital

Climate finance conventionally refers to a narrow set of areas needing patient/ blended finance with a passive tone to market returns. Recently, it has matured into a competitive, Returns-Focused Thematic Investment Sector. VC firms spent over $25 billion funding cleantech start-ups from 2006-2011 and lost over half their money. Cleantech companies developing new materials, hardware, chemicals, or processes were poorly suited for VC investment in the past due to their significant capital needs, long development timelines, uncompetitive nature in commodity markets, and inability to attract corporate acquirers. They were thus more likely to fail, and even those who did not fail returned limited capital. Key market failures include knowledge spillovers, high-risk perceptions due to uncertain climate policies, technological costs, economic effects of climate impacts, and high upfront costs and risks associated with mitigation and adaptation investment projects.

Cut to the present, the industry is seeing the application of demonstrated technology to sectors as they are transitioning and climate resilient action by businesses, cut across segments and value chains. For example, in the changeover from ICE to EV, EV growth will generate $76 -100 billion of new cumulative revenue opportunity and $8 -11 billion of new profit pool across the value chain: At least six new segments are emerging as promising EV-specific opportunities.



A - Battery, B - EV Auto Components, Software, & Telematics, C - Other Components (chassis, motors, plastic parts, etc.) D- Auto OEM, Sales, & Services, E - Charging, F- Battery Swapping, G - Mobility

(Source: Figure 3, Page 6, Bain & Company)

The modeled growth effect in this category will be driven by a combination of investment in climate-resilient infrastructure, a supplementary fiscal initiative to fund climate-consistent infrastructure, pro-growth reform policies to improve resource allocation, technology deployment, and green innovation.

Climate startups are capital intensive, making them more sensitive to funding cycles, and face hurdles in accessing capital. To successfully demonstrate first-of-a-kind products and increase production at scale, further capital is required. However, in India, the challenge is not a lack of capital but rather an orientation of available funding. The bulk of funding is consumed by technology, retail, etc. sectors.

Within the climate sector, EVs and renewables receive the majority of early-stage funding, while other sectors such as energy efficiency, clean manufacturing, agriculture, waste management, etc., remain underfunded.

Given long gestation periods, startups need funding to refine their prototypes and achieve market adoption. Lack of funds, misaligned PMF, and pivot failures are causes for 45-50% of startups to cease to exist before year 5. Besides capital, startups must comply with government regulations and certifications while building business models. They face the unique risks of changing procurement and facilities costs and, supply chain unreliability. These challenges further blur the path to market and profitability.

Growth investors must not only enable capital-led but also gauge business model superiority, extend execution prowess, impart insights on market adoption barriers, and product-level differentiation, understand market competition, and accelerate market adoption which determines who will capture the largest market share in the portfolio.

Commercialising early-stage climate tech is very challenging but can be achieved via the ripeness of the financing subsystem; however, extensive deployment requires a mature ecosystem and value chain. The Indian market lacks deep comprehension compared to the US and Europe, which have advanced climate tech ecosystems. Building networks is vital to underpin economic growth as part of a collaborative transition towards climate-resilient pathways. As one straddles from incubation to early-stage to scale, ecosystem development can help build interconnected plays. For example, interest groups and policy think tanks intersect knowledge pools with investing acumen.

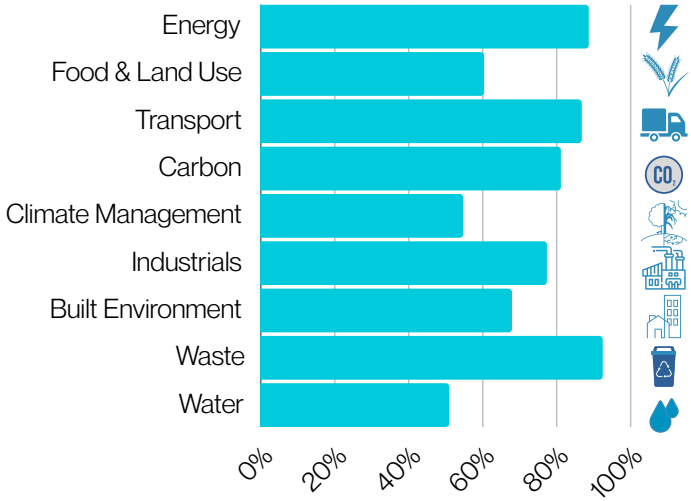
A suite of developments that will help the world in its climate transition has gathered steam in recent years from lithium batteries to green hydrogen to carbon capture technologies, virtual utilities, and remaking of the grid are beginning to show signs of potentially becoming mainstream.

Climate tech funds still have $37 billion of investable dry powder ready to deploy. Combined with, demand signals from the energy crisis, increased policy support, and a decline in green premiums, climate tech investing is well positioned in 2023 to continue its breakout growth trajectory. In conclusion, compounding pro-growth reforms with climate policy: policies that favour an incremental transition, and well-aligned investment conditions will address the risk of falling short from both a climate and an economic point of view.

Projected Flows - What will be funded in the immediate future?

Our analysis does highlight major shifts over the last year in the **type** of investments made. **Hardware-based, infrastructure, and commodities-based** innovations are experiencing a jump in investor interest. Similarly, the heavy industry sectors of **metal and mining, point-of-source capture, alternate industrial materials, and waste management** are seeing a significant uptake in investor interest. These are reflective of several market factors – the maturation of domestic manufacturing capabilities, geopolitical instabilities, and a need to be resource self-sufficient, India emerging as the manufacturing base of choice for many countries, a maturing deep-tech ecosystem, and evolving business models that enable organisational scale.

On the flip side, nature restoration, environmental analytics, micro-mobility, and urban logistics, will likely see a fall in investor interest. While mobility and logistics have been a well-funded sector in the recent past, this change in investor focus will be an interesting forward-looking trend.



Section 2

Underfunded but Promising

The question “What areas of climate innovation are underinvested but promising?” literally opened the floodgates of comments and suggestions. Like last time, everything **other than** Renewable Energy and Electric Mobility was considered seriously undercapitalised.

> “Electric Mobility is the only theme here that has attracted large capital, which has also been skewed towards two companies”

At the core, funders coalesced around a few common areas/sub-sectors, demonstrating that although these areas have increasing investment or interest, **an inflection point still has to be reached**.

As a separate track, several funders commented on the need to align climate with inclusion.

> “Most climate adaptation barring alternate proteins is underinvested.”

Nature Based Solutions (NBS) and agriculture are showcase examples:

> "We believe that not enough emphasis has been placed on strategies that help address both climate mitigation and adaptation issues. Nature restoration/ nature-based solutions (NBS) form a key opportunity to address these issues while forming an opportunity for outsized financial returns while creating high climate impact. Across the NBS landscape, we believe forestry/ agroforestry, wetland/ mangrove restoration, and regenerative agriculture/ soil carbon represent critical yet underinvested environmental domains. These domains combine having a direct positive impact on the biodiversity and local communities while providing an additional monetisation mechanism through the generation of carbon credits."

We find examining what **isn't** getting funded as informative as what is.

A repeated theme with the underfunded sectors is the fact they are generally IP-led, asset-heavy technologies, and often creating/ integrating with core infrastructure. In the transition to a green economy, it will increasingly be what we call the "boring businesses" in hard-to-abate sectors that lead the charge in making climate impact. Integral to these businesses are plant and equipment, machinery, hardware, infrastructure, and capex. Their growth trajectories, timelines, funding needs, and return profiles are, for obvious reasons, quite distinct from software-led business models.

The **critical unlock for these areas of impact will come with funders who have the ability to unpack the business models, and levers for growth, build new risk-reward frameworks, and align funding.** This is where we see the largest opportunity and the potential for a multiplier effect on financial and environmental RoI.

On the other hand, the relative underfocus of NBS and climate-smart agriculture as an area of mandate derives from a more historical and primary funding focus on mitigation.

> "Protecting the natural world has traditionally been left to ecologists and nature-lovers rather than VCs looking for profitable, fast-growing businesses"*

Funding that looks to **address both emissions and the ways people interact with the green economy will lead with this more holistic and inclusive approach**; particularly as mandates in the Global South broaden to acknowledge **the strong interlinkages between mitigation and adaptation,** we expect to see this change.

Another interesting trend we see is the move in Europe towards legislation that tries to attribute a financial value to protecting nature.

> "Investors are waking up to the fact that solving the climate crisis may require long-term investment in things that have typically fallen outside the VC-realm."

This has had a real impact on the flow of funds in Europe to biodiversity tracking, restoration, and regenerative agriculture startups and will likely be reflected over a period of time in India as well.

In this article, our partners at Dalberg discuss the collaborations needed to support adaptation and resilience funding in India

Guest Article

Forging Climate-Resilient Sectoral Connections: Advancing Just Transitions in India

Jagjeet Sareen, Anahitaa Bakshi, and Anirudh Kishore - Dalberg

As the global spotlight shines on climate action and inclusive development, India is at a pivotal juncture. Traditionally, Just Transitions involved shielding workers in carbon-intensive industries from the repercussions of transitioning to a low-carbon future, ensuring that no one was left behind on the path to Net Zero. As the world faces the far-reaching impacts of climate change across sectors, a more systemic perspective is warranted. This is particularly relevant in the Indian context, with heightened vulnerabilities to climate impacts that are intertwined with livelihoods. While this recognition is evident in the energy sector, as seen in India's G20 Presidency Energy Transitions Working Group's recommendations, it's vital to extend these principles across all economic sectors. To truly be a 'just' transition we need to think about how it can impact other sectors such as agriculture, health, and technology, the essential role of social sectors in supporting low-carbon, climate-resilient economies, and creating socio-economic opportunities for low-income, climate-vulnerable populations.

Scaling Cross-sectoral Climate Solutions: Embracing Three Key Pivotal Shifts

The effects of climate change reach far across sectors. It impacts vital issues such as access to nutritious food and climate-resilient housing among others. For India's marginalized communities, their vulnerability to these impacts is often magnified, posing a dual threat to their livelihood security and overall well-being. However, we are yet to understand the climate risks associated with the most vulnerable, such as small-scale farmers and urban marginalized communities, given their crucial role in building climate adaptation and resilience.

It is crucial to cultivate markets in Bottom of the Pyramid (BOP) sectors to support grassroots organisations, women entrepreneurs, and micro-enterprises. Communities have the ability to employ their own distinctive skills and knowledge to strengthen their climate resilience.

Given this intersectionality, ignoring linkages between climate and social sectors can lead to disjointed policies that fail to address the root causes of vulnerability, and in extreme cases, further perpetuate them. Thus, climate solutions need to employ a multi-sectoral lens

First, we must articulate climate risks across diverse sectors, emphasizing their consequences for the socio-economic determinants of decent living for vulnerable populations. For instance, consider the agricultural sector where climate risks, like irregular rainfall and prolonged droughts, directly affect crop yields, posing food security challenges for communities reliant on agriculture.

Second, harnessing innovative climate technology is essential for rapidly scaling climate solutions to serve these vulnerable communities. Transitioning from traditional 'clean tech' to holistic 'climate tech' is key. Imagine the use of mobile-based healthcare technology that connects remote and underserved regions with healthcare professionals. This innovation not only enhances healthcare accessibility but also strengthens the resilience of communities facing climate-induced health challenges.

The potential of technology as a tool for climate mitigation and adaptation is evident in the fourfold increase in venture capital investments in climate technologies since 2019. These investments span critical domains like energy, electric vehicle transport, resilient infrastructure, climate-smart agriculture, and carbon accounting and removal, highlighting their commercial viability and scalability.

Third, a supportive policy environment must be cultivated, accompanied by increased private-sector investment. Policymakers and experts from various sectors must consider how they connect climate impacts and sectoral risks with development policies, blending sectoral growth pathways with the country's climate ambitions. Seeding such initiatives would require innovative financing methods, such as outcomes-based blended finance approaches, to play a pivotal role. Additionally, such actions emerge as engines of employment generation, reinforcing the foundations of inclusive just transitions. For example, consider a blended finance initiative that combines public and private resources to bolster climate-resilient infrastructure in flood-prone urban areas. This approach not only secures investments by de-risking private investments but also aligns public and private interests in building climate-resilient cities, benefiting vulnerable urban populations.

Unlocking Opportunities in Multisectoral Collaborations

The good news is that multi-sectoral collaborations are not new for India. The National Rural Livelihoods Mission (NRLM), for example, is a central government scheme, implemented in coordination with various in-line state ministries, with the aim of alleviating poverty by providing secure livelihood opportunities to rural households. By integrating NRLM with climate resilience objectives, we can facilitate just transitions for rural communities, enabling them to thrive in a changing climate. This broader perspective widens the scope of just transitions, making it applicable across diverse economic activities.

A Call to Action

As we navigate climate change and just transitions in India, we must embrace a holistic approach. This entails recognising that climate impacts transcend sectoral boundaries and fostering innovation in finance and technology adoption. The just transition extends far beyond preserving jobs; it must unlock a wide range of opportunities to reduce emissions intensity by 35% by 2030 while ensuring improvements to our overall well-being. It's about envisioning a future where marginalized communities are not just protected but also emerge as climate-resilient.

Section 3

Tools of the Trade

Given the nascency of the climate funding ecosystem in India, survey respondents highlighted the fact that our **entire toolkit of funding instruments needs to be expanded**. Literally all of the following were identified as necessary and missing/ inadequate.

Survey respondents provided additional nuance in many of these areas:

> "Advanced research capital – The most significant gap between India and the US/ Israel in this field is the capital available to do advanced research in this field. At early stages, an equivalent of BIRAC focused on climate-smart solutions can lead to creation of solutions for the global south."

> "Carbon Credits – provide a valuable mechanism for funding emissions reduction and removal projects, they are just one part of a larger strategy to combat climate change. Effective carbon credit programs require proper monitoring, verification, and regulation to ensure that the claimed emissions reductions are accurate and meaningful."

Capital Innovations for Climate Innovations

At the same time, our conversations with funders have highlighted several **interesting and emerging approaches**, currently being deployed in other markets or geographies, but all relevant to India in different ways.

Public Capital

Green Debt Swaps/ Debt-for-Nature Swaps

Debt for Nature Swaps enable developing countries with high levels of debt to reprioritize investments in climate. This mode of financing significantly cuts countries' debt in exchange for commitments towards climate action. Most recently, Ecuador received the largest debt swap of $1.6 billion, swapped for a $12 million commitment to protect the endangered Galapagos island. Through these swaps, countries are relieved of their external debt burden, receive much-needed climate capital, and financial institutions benefit by selling debt at a profit.

Match Funding Facility

Match Funding, as a collaborative public-private funding instrument that de-risks investment in nascent technologies, is not only attractive to startups who gain multiple types of investors but also to funding parties by diversifying the risks. Scottish Enterprise, NEDO, and NY Ventures, through their match funds, support early-stage startups by typically matching co-investors up to 50% of the total funding sought and provide tools and connections to de-risk technologies and advance toward market adoption.

Private Equity/ Venture Capital

SAFER Notes

SAFE notes were first introduced to support new, pre-revenue startups that were struggling to raise the first rounds of funding. While popular in 2022, investors went back to using convertible notes in the following year owing to confusion around conversion. To tackle this, SAFER ("Simple Agreement for Future Equity with Repurchase") was introduced. Investors can buy equity and startups have the option to repurchase a part of that equity based on a percentage of future revenues. These notes are both a flexible source of capital for climate startups and a great tool for investors to get access to early-stage companies, get compensated for taking larger risks, and participate in the upside while having clear exit opportunities.

Distressed Venture Capital

Often startups with proven technology and strong business models are unable to hit growth milestones and raise further capital. Distressed Venture Capital (DVC) steps in here to acquire a majority stake and takes startups out of the venture lane into a private equity path. While restructuring and cost-cutting remain the focus, they still aim for growth and profitability at a steady scale. This modification of the venture capital to the private equity model could be very powerful for climate innovations with varied growth trajectories; many companies have strong business fundamentals, revenue generation, and potential for profitability, while not being appropriate for the VC path.

Private Debt Capital

Project-Based Debt: Pooling & Securitisation

Project-based debt for smaller tickets that can be pooled effectively to spread risk. Pooling and securitisation are well-accepted tools in mainstream finance that can have contextual and positive applications for climate tech as well.

Servitization

The servitization model has been long used in the market and is increasingly popular amongst climate tech startups. In this model, the customer pays a service fee, while the ownership and cost of the system remain with the startup along with operational costs. This model has enabled widespread adoption of solar by allowing customers to purchase energy units, while the company owns the panels themselves. This is now being adopted across various climate sub-sectors with high set-up costs and performance risks amongst others, including the cooling sector.

Royalty-linked Financing

While royalty-based financing has been employed widely in other industries like music and mining, it is becoming a common instrument for the climate sector. In exchange for an investment, investors receive a percentage of revenue over a set period of time. The instrument allows founders to prevent dilution while receiving the cash inflow, irrespective of their sales cycle. This type of financing can offer significant opportunities to support the longer gestation periods and development cycles of deep tech innovations.

Philanthropic & Catalytic Capital

Milestone-Based Grants

Offering grant investments in a milestone-based structure can be beneficial to startups as they graduate through various stages of growth. Both startups and investors establish a transparent, pre-agreed set of milestones based on which funding is disbursed. This not only presents an incentive for startups to hit their targets but also provides a steady flow of incoming funds as they scale up without diluting ownership. For the investors, the structure de-risks their investments – funding is distributed over time as milestones are achieved. This is an established model in the automotive and biomedical sectors and can be expanded to the climate space as well.

Repayable/Recoverable Grants

Repayable/Recoverable grants are flexible, short-term, zero-interest grants with a condition to return the principal. These grants are ideal for climate tech startups with unforeseen expenses or to build up their manufacturing capacity in the early days. This catalytic source of funding can be used by startups to build credit history. Returnable grants are cyclic in nature. Once returned to the investors, they can further be reinvested into other businesses, thereby maximising the impact. The structuring and regulations for this form of financing remain to be developed though, in many markets.

First-of-a-Kind (FoaK) Funding

Philanthropic funding for FoaK innovations and products is untapped at this point but offers tremendous potential. Funding models such as the kind the Prime Coalition is developing fulfill a critical need in the sector. *For a deep dive into Prime's model, see below on page 22*.

Risk Backstop

Philanthropic support in the form of a risk backstop can provide a safety net, as startups begin or advance their nascent innovations that typically cannot be supported by other capital providers. Philanthropic investors can provide a backstop by agreeing to pay the principal in case of failure to produce results or a percentage of costs with respect to outcomes achieved. This in turn can be used by startups to finance their other costs and bring aboard risk investors.

At the end of the day, it is clear that climate innovation will need a variety of "different dollars" to scale and thrive. Many of the funding tools mentioned above are either: **completely new, new to climate, or new to India, and therefore will have to go through their own adoption journeys and learning curves**.

Several of the solutions described also, interestingly, straddle different capital instruments and pools of funding. This will require funders to have a **more creative and constructive approach to climate finance**, and a comfort potentially working with different instruments to support their climate innovations.

On the one hand, there is a strong need for capital allocators to test, demonstrate, and ultimately roll out these more innovative and fit-for-purpose funding structures to progress climate technologies; equally, there is a clear **opportunity for large philanthropic funders, foundations, and DFIs** to enable and facilitate the testing and development of these innovative climate finance instruments.

Guest Article

The Infrastructure for Pay-as-you-Go is Ready

Avishek Gupta and Sanjoy Sanyal - Caspian Debt

Companies and Impact Investors should create the market.

Organisations selling renewable energy-powered products for agricultural use have the ability to prove their significant value to their farmer-customers. Solar pumps increase productivity in fields that are rain-fed or replace costly diesel pumps, while renewable energy-powered cold storage prevents wastage. They help farmers optimally time the selling of their produce (or catch). At the same time, solar drying enables farmers to earn better margins from value-added products without having to make distress sales of perishables at the local mandi. These all have clear livelihoods, and therefore payback, implications.

Studies by the Department of Science and Technology and CRIDA, a constituent organisation of the Indian Council of Agricultural Research have identified specific districts that are vulnerable to climate change. With India facing significant climate change risks and threats to food security, it becomes more imperative than ever that the sales and penetration of these products increase rapidly. These renewable energy products have the potential to strengthen the resilience of vulnerable smallholder farmers and withstand the challenges of climate change, while reducing the use of fossil fuels, helping the country meet its mitigation goals.

There is, however, one significant roadblock to them being purchased and owned at scale -- they cost often in the range of INR 300,000 to INR 700,000, making them beyond the reach of not only smallholder farmers but also most Farmer Producer Organisations. This cost needs to be contextualised -- a tractor costs INR 500,000 and more than 90,000 units are sold every month. Buying a tractor from a well-known company is one thing, however, buying a new technology from an unknown start-up is quite another.

Pay-as-you-Go Allows Customers to Test New Technology

"Pay-as-you-Go" (PAYG) allows companies to make renewable energy systems available to skeptical customers on rent. The model originated in East Africa in the early 2010s where mobile money allowed customers to send small amounts of money every day or every week to companies selling small solar household systems. Companies collected rent from remote rural areas and switched on the systems remotely. There were no collection agents and yet, chances of default were minimised. A clutch of companies, including Azuri, Bboxx, Mobisol, M-Kopa, and Off-grid Electric started growing rapidly. As mobile money spread across the continent and companies expanded, investment poured in. A Wood Mackenzie study estimated that in 2018, USD 500 million was invested in the sector up five times from USD 100 million in 2014.

One problem with the PAYG model in Africa is the lack of debt available from African banks. Companies had to raise hard currency debt to finance the installation of solar systems across Africa. A WRI report explains how companies have had to set up expensive overseas structures which made effective interest rates to rural customers usuriously high (as much as 125% for small systems). This of course exposed companies to risk. Not all the companies that started off survive today: Mobisol filed for insolvency in 2019. Even without the support of banks, companies in Africa have graduated from selling solar home systems to selling larger systems. Bboxx, for example, sells solar pumps on a PAYG basis.

India as the ideal place for the PAYG model

Unlike Africa, Indian public sector banks reach the remotest corners of Bharat and Indian farm credit doesn't depend upon complex offshore structures or foreign currency loans. If renewable energy companies did implement the PAYG model, they need not worry about the lack of debt finance once the models are proven. With universal electrification already achieved, PAYG can directly power agriculture equipment. The country's digital infrastructure and mobile network provide the foundation to build scalable businesses.

Consider a thought experiment in what the PAYG industry could look like in 2027. Village entrepreneurs and farmer associations rent all sorts of equipment from pumps, drying and processing units, cold storage, and electric vehicles from equipment manufacturers, who collect digital money from farmers and in turn, make their payments to the product supplier. The companies get the debt financed from the priority sector lending units in banks. Bank officers have access to a website that shows how much is collected from each location every day. The digital moneys flow into an escrow account, from which loan payments are deducted. Credit rating agencies rate the pools of underlying cash flows to enable banks to take exposure. Bank CEOs get real-time information on climate benefits in addition to the actual cashflows. Finally, there is an alternative for agri-priority sector exposure seeking Indian banks beyond the microfinance or commercial vehicle agri loan securitisation transactions. This vision and impact is compelling.

Impact lenders can help companies develop these models with the initial transactions by taking on the additional risk with the prospect of creating this outsize impact. At Caspian Debt we seek partnerships to make this future possible.

Section 4
Catalytic Capital & Commercialisation

The traditional view of philanthropy in climate and environment has been project/ program funding for social enterprises/ not-for-profit organisations with strong climate impact, or very early-stage grant funding to support R&D and testing.

This view has evolved in recent years, with a **significantly larger opportunity set for philanthropic funders** across the climate innovation stages, particularly around the **commercialisation of innovations**.

Some of the more commonly called out use cases of catalytic funding for later-stage innovations include:

- Access to low-rate wholesale financing, with guarantee mechanisms/ backing from philanthropy
- Technical assistance and handholding, supported by philanthropic funding, and
- High-risk, philanthropic funding to support climate innovations progressing through the TRLs

We showcase 4 case studies from CCN partners, detailing the diverse approaches that philanthropic capital can take to move the commercialisation/ market adoption needle – funding FoaK; using flexible funding instruments, collaborative funding for critical landscape restoration, and using a philanthropic platform approach.

Guest Article

Visionary Climate Leadership in India and a New Model of Philanthropy

Shloka Nath - India Climate Collaborative

As climate risks intensify in India and hinder development progress, India's climate story can seem daunting. Yet, the India Climate Collaborative (ICC) has found immense hope within the ecosystem. In addition to supporting extraordinary solutions on-ground, co-created by civil society and communities, the ICC is enabling visionary philanthropists to anchor India's climate progress, in line with the country's sustainable economic development and net-zero goals.

While awaiting the promised USD 100 billion and technology transfer from developed countries for our mitigation ambition, and without a proven template for low-carbon development, India needs resilient, flexible leaders willing to make bold bets on path-breaking solutions. Working in partnership, and inspired by the Climate Leadership Initiative, we have built the India Climate Leaders programme. Through this, we will platform this next generation of Climate Leaders who believe in the catalytic power of philanthropy and have the resources and stubborn optimism to rewrite our climate story as one of opportunity.

Based on a leader's theory of change, we guide their journey in a variety of ways to amplify impact. We partner with them to evolve their climate lens, connect them to experts in the ecosystem, and identify credible solutions that align with their interests and need critical support.

To make this more tangible, we want to share the journey of Climate Leader X (names withheld for privacy), a sustainability investor with a strong scientific background, and a history of giving to sectors like education and health. Having directed more than INR 120 crores towards climate action till date, and with a sizeable amount in the pipeline, we started working with them a year ago to expand their climate portfolio.

While generally sector-agnostic, they wish to mirror India's emissions map, by focusing on technology and innovation. This is crucial for India's climate ecosystem. Adaptation has traditionally attracted more domestic philanthropic attention over mitigation, despite there being an urgent need to avoid future emissions as well as channel risk-free capital towards early-stage innovations and take them to market.

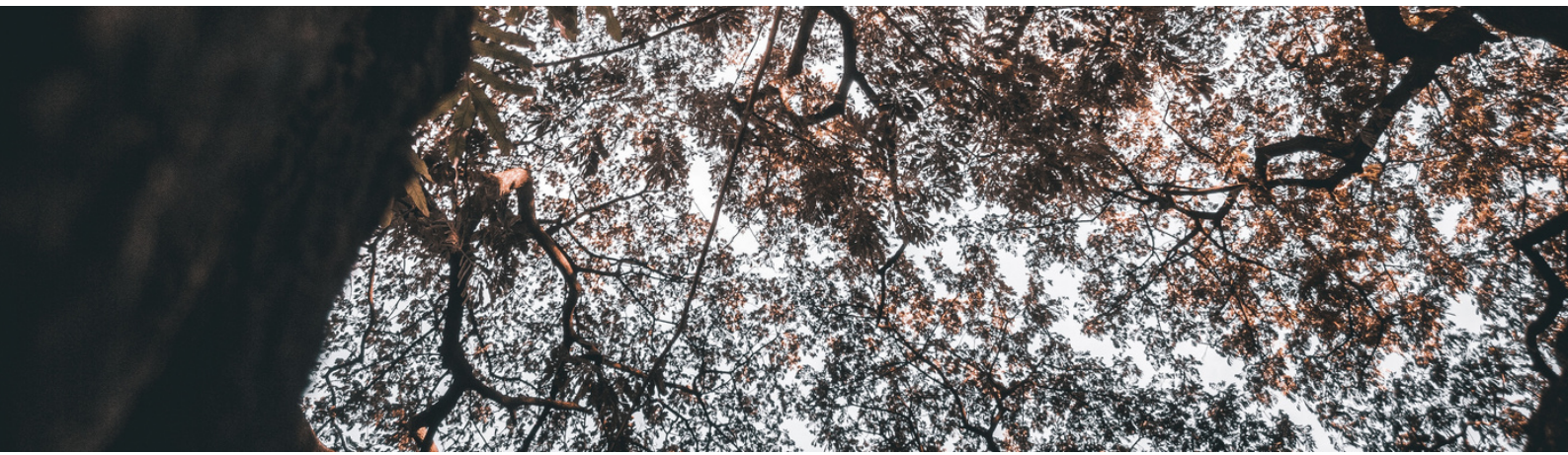
X's flexible investment philosophy reflects this urgency. Instead of focusing on returns, they have adopted an experimental problem-solving approach – using different financing instruments to influence promising climate solutions. They are willing to embrace high-risk opportunities with potentially negligible returns, whether grant-making in the non-profit sector or high-risk equity investments in commercial enterprises, with a long-term theory of change. Their toolkit is expansive, moving beyond debt, equity, or grant capital. For example, another tool in X's arsenal is their willingness to support capital expenditure that traditional venture capitalists hesitate to, like manufacturing units for sustainable enterprises.

Driven by curiosity and this problem-solving approach, they look for emerging startups that offer the potential to reduce GHG emissions and need growth capital to scale in India and across the globe. They have successfully funded innovations across energy efficiency and biofuels, among others. They are also keen to pre-empt challenges that technological innovations may face when they hit critical bottlenecks and explore the use of philanthropic capital for such tipping points.

Through research advisory on impactful solutions, networking opportunities, and access to industry experts, we have helped diversify X's climate journey – increasing flexibility with levers of impact and capital. This aligns with their impact-first lens, to explore how different financing instruments can be leveraged, and how to apply relevant capital all while breaking the silos of philanthropic and returnable capital. For example, X came to us a year ago seeking levers of impact beyond technology, and has since given substantial grants to policy, research, and communications organisations. X also recently provided debt to a climate-related fund to test new business models, help scale environmentally responsible projects and startups, and unlock other forms of capital.

Apart from mobilising climate capital, this has opened several new doors for X – through direct and indirect relationships in the sector that lead to actionable results for their investments. These relationships also build new pathways for knowledge-sharing, blended finance, and potential public-private-philanthropic partnerships across sectors, facilitating multi-disciplinary approaches to climate funding.

Learnings from X's journey reinforce our dual goals with the India Climate Leaders programme. In addition to accelerating climate action, we hope to bring Indian philanthropic perspectives on innovation and equity and their learnings to global platforms like the World Economic Forum, UNFCCC's COP28, and the Global Stocktake later this year. As India emerges as a leading voice in the Global South, the significance of such leadership cannot be understated. India's success in addressing the intertwined challenges of developing while decarbonising will likely determine the fate of other emerging economies in the Global South.



Guest Article

Building a Restoration Economy in India by Catalysing Finance for Locally Led Restoration

Dr Ruchika Singh - WRI India

Climate change is everyone's problem, and while humanity faces its biggest challenge and its impact - the risks are disproportionately faced, by the poor, farmers, vulnerable and marginalized groups, and women.

Recent Intergovernmental Panel on Climate Change Reports have indicated that different land-based mitigation and adaptation measures, like landscape restoration, sustainable agriculture, reducing food loss and waste, and protection of open natural ecosystems, can mitigate one-third of climate impacts.

Investment in nature is a must! It's great for business, enhancing jobs and livelihoods for local communities while protecting and rejuvenating landscapes - farms, forests, and common lands. Strengthening economic activities that promote sustainable land use, ecological restoration, regenerative practices, and bridging capacity and finance gaps for restoration champions to build robust business models is critical to spur a land-based restoration economy.

An ambitious collaboration of donors and partners has now come together, with an aim to catalyse systems change to unlock the potential of a restoration economy to improve rural jobs and livelihoods, build regenerative agricultural systems, enhance food and nutrition security, and mitigate climate change impacts by protecting and restoring natural ecosystems and biodiversity. This is a growing collaborative, with six partners currently bringing in diverse expertise – India Climate Collaborative, Pune Knowledge Cluster, Sangam, Spectrum Impact, Transforming Rural India Foundation, WRI India, and WRI with support from the Principal Scientific Advisor's office, Government of India.

As part of this collaborative initiative, Harit Bharat Fund *(Hindi for 'Green India Fund')* was launched in September 2023 to accelerate a land restoration-based economy in the central Indian states of Chhattisgarh, Madhya Pradesh, and Maharashtra. Harit Bharat Fund finances and capacitates locally led start-ups, farmer-producer companies, and non-governmental organizations that restore India's landscapes and build robust business models.

With a clear focus on equitable, inclusive development, the Harit Bharat Fund envisions a resilient land restoration-based economy for local communities, where they embrace viable business models that protect and restore their forests, farms, and common lands. Through a blend of financial support, capacity-building, and policy improvements, this initiative aims to inspire broader support from national, state, and district governments in Central India that can be replicated in other regions. The initiative intends to equip key actors, especially restoration champions and decision-makers, with the knowledge, capacity, capital, and connections they need to translate ideas and commitments into successful implementation, monitor progress, and share learnings.

Locally led restoration initiatives need different types of finance for new business models to grow and successfully demonstrate impact. Philanthropy and patient capital can provide catalytic capital to locally-led restoration business models to grow and unlock public finance for spurring a restoration economy. Climate funding and ecosystem building for these locally led initiatives is key, and the Harit Bharat Fund is a step in that direction to catalyse more finance for locally-led restoration to innovate, with the right incentives and business models.

Guest Article

Emerging Climate Philanthropy Trends

Sucharita Kamath - ANDE South Asia

2022 ended on a distressing note, with the Intergovernmental Panel on Climate Change (IPCC) publishing dire warnings about the climate crisis. However, a recently launched update to the International Energy Agency (IEA) Net Zero Roadmap displays grounds for continuing optimism that developing countries can still help limit the temperature increase to the target of 1.5 degrees Celsius (above pre-industrial levels), but will need additional support to be able to deliver on the clean energy transition.

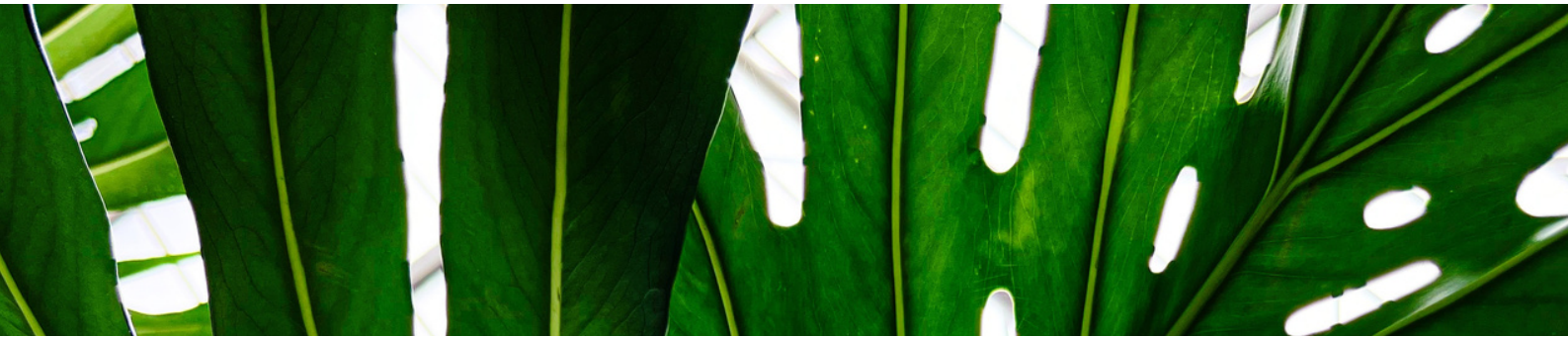
India has set ambitious climate targets, including aiming to have 50% of its energy requirements met by renewable energy to reduce the carbon intensity of its economy by at least 45% by 2030 (in comparison to 2005 levels). Rather than seeing this as a burden, however, ANDE's recent research on green economic opportunity areas for entrepreneurship has uncovered many areas of opportunity in the Indian economy to achieve this including major growth sectors such as green buildings, waste management, and renewable energy.

Delivering on this promise, and accelerating efforts towards the clean transition with an equity lens will require mobilising funds at all levels, from both philanthropy and the private sector. At present, estimates state that only 0.5% of domestic philanthropic funding in India is allotted to climate action. Given that India is highly susceptible to the effects of climate change, more work needs to be done towards exploring avenues to build climate resilience and adaptation in our systems and societies, in addition to funding ongoing climate mitigation efforts.

Indian philanthropy has played a key role in bringing to light successful models of climate action, by funding pilot project implementations and helping build evidence of 'what works'. There has also been an encouraging trend of large companies making climate-related investments in 2022 and setting climate targets for their supply chains.

Given the scale at which action is required, philanthropic funding has now also begun to look at creating collective pathways towards market deployment of innovative solutions. An example of this is the Global Energy Alliance for People and Planet (GEAPP) platform, where over 20 philanthropies have come together to complement governments' mission of enabling clean energy transitions. Activities that are a focus for GEAPP in India include facilitating India's startup network to address clean energy barriers and developing a resource center to enable a global scale-up and increase cross-border market access, among other pursuits that will create an enabling ecosystem.

A movement towards enabling innovation while also nudging philanthropy to move the needle on supporting the deployment of those solutions at scale is definitely welcome. India is a very large market with contextual needs, even when it comes to climate innovations, and philanthropic funding can play a big role in ensuring that climate solutions are addressing national carbon inequality which is at the core of meeting justice goals.



Guest Article

What will it Take To Get Climate Solutions Adopted and Scaled?

Lara Pierpoint, Emily Lewis O'Brien, & Lee Scott - Prime Coalition

Bringing climate tech into the world can be a risk-prone and challenging process that faces multiple breaks in the tech pipeline, "valleys of death". The invention and commercialization process is often far from linear or easy. Fortunately, at least in the U.S., we've made some hard-won gains at the earliest stages of climate technology development – thanks to ARPA-E, patient venture capital, entrepreneurial fellowship models, and hardtech incubators, among other early-stage support systems.

Over the last decade, capital for the earliest stages has grown. But what happens to those earliest-stage solutions when they're entering their growth, commercialization, and deployment? The reality is the market has not caught up to their capital needs, nor their risk profile, as they advance. This valley looks more like a million-mile-wide abyss. Specifically, these companies entering growth, commercialization, and deployment phases are discovering they need significant amounts of late-stage venture or early-stage growth funding to build first-of-a-kind commercial projects. As they begin implementation, their capital stack can become more complicated- as do some engineering risks, supply chain dependencies, and business model implementations. The funding they require is also too expensive or nonexistent.

Climate tech projects at these phases are often costly and incredibly risky – they involve engineering scaleup risks if not core technical risks, market risks, execution risks, and many others. In addition, even if these projects are built successfully, their products often compete with incumbent, cheap, high-emitting alternatives. A lucky few climate tech companies are finding big venture capital supporters willing to take on the risks but still fewer are successfully garnering big slugs of U.S. government funding, and we're all hoping more state and federal funding will follow.

Unfortunately, many companies are struggling, especially if they are not unicorn venture fundraisers or don't have a project timeline in line with government grant cycles. If we don't get this right, many great companies with game-changing, high-impact ideas could die on the vine.

At Early Climate Infrastructure (ECI), a program at Prime Coalition, we're in the early and experimental phases of bringing philanthropic dollars to help. Our plan is to catalytically and additionally invest in opportunities alongside market-rate financiers. In addition, we plan to supply impact-first capital in a wrap-around capacity to support important systemic goals around projects, such as community engagement and environmental impact assessment. In the process, we're hoping to uncover the highest leverage points for philanthropy toward building a longer-term, focused program around the most effective mechanism for philanthropic support.

If we're wildly successful, philanthropy can catalyze a number of projects, and potentially solve some of the systems challenges in communities, policies, and markets preventing climate technology scaling. However, current levels of climate philanthropy won't solve these challenges alone. Catalytic capital can expand capital available for future FOAK projects. Catalytic investments into FOAKs support data creation on cash flows, technology risk, and market risk. These data enable more accurate assessment by market-rate investors into risk-return potential for that company's future projects and the wider sector. Catalytic funding for FOAKs thereby de-risks the next round of project financing.

With time, we hope more government funding will enter the space. Finally, more philanthropy at very high levels – specifically, funds willing to support demonstration and early commercialization projects at billion-dollar levels – could be game-changing. This government and philanthropic funding should go way beyond catalytic investment: big portions could be focused on taking systemic risks off the table for whole classes of GHG reduction solutions. For example, this could include creating clear government procurement markets for clean cement or carbon dioxide removal credits.

The great news is that the group of us focused on these challenges is growing. Globally, we're running out of time on emissions, but if we work together, we can deploy new climate solutions. This is our obsession at Early Climate Infrastructure at Prime.

Section 5

Blended Capital

A promising solution, with some course corrections

In our survey and conversations last year, blended capital was discussed as an emerging tool or approach, but with no tangible models for application in India. So much has changed in 1 year.

While one respondent considered blended capital as "promising but not the climate finance solution", almost universally this time, **capital allocators across the spectrum of funding instruments highlighted the opportunity for an approach that blends public and private capital in a manner that catalyses both innovations and ecosystems to attract follow-on commercial funding.**

And this is also the reason we've devoted an entire section this time around to exploring this approach.

At its simplest, blended capital uses small amounts of concessional capital to mitigate investments, re-balancing the risk-reward trade off for pioneering technologies or innovations. This approach is especially powerful to mitigate risks in developing economies or the introduction of new technologies in mature economies, where private investors are unable to understand, manage or price the risk appropriately and shy away from funding. "The ultimate goal of blended finance is to transform markets or – as is often the case in developing economies – create markets...The intervention should build confidence, capacities and a track record so that eventually public or philanthropic contributions are no longer necessary." Alicia Seiger, MD Sustainable Finance Initiatives, Stanford. Especially in developing economies, Blended Finance can help avoid "carbon lock-in" and develop climate-friendly economic pathways.

At its most expansive, the opportunity is seen as serving different needs: grant/philanthropy at the riskiest end for support and innovation; equity for growth/innovation; and working capital/debt for more business needs. More specifically, two very clear use cases emerge for the use of blended funds:

- Commercialisation and technology adoption – Navigating some of the key challenges such as hardware risk underwriting, commercialisation and achieving product market fit, providing a risk absorption layer and financing for longer gestation tech development and GTM iterations, and in short, providing different types of capital to further narrow the Valley of Death for startups. Almost without exception, blended capital has been recognised as **"critical to technology adoption and commercialization"**.
- Catalysing Impact – Filling the funding gap where monetary value to impact has yet not been assigned or is currently accounted as cost. Eg: Viability Gap Funding (VGF) for trash collected and provided to industrial plants or mobilising finance towards smallholder farms in India and other developing regions.

At the same time, some funders recommended important course corrections in how Blended Finance is deployed. Historically blended capital has gone to complex social enterprises that have long gestation periods; there was an expressed **need to direct equal amounts of funding to "risky and hard technologies" or "innovations not projects", as another appropriate use of blended capital.**

There were also some concerns about the likelihood of success of this model, given the fact that funding organisations and capital instruments generally work independently and in silos.

The Why and What of Blended Capital are clear, comprehensive, and established now; it's the How that remains less defined.

> "While blended finance holds important promise to unlock capital at scale, it plays a minimal role in the current ecosystem. We need to solve for awareness among capital allocators and entrepreneurs. There's a need for a strong intermediary that is able to bring together a variety of capital providers and organise blended finance structures where incentives for everyone involved are fully aligned. Since this process of intermediation is time and resource-intensive, the way forward to scale up blended finance still remains an open question."

There are significant complexities and nuances in aligning multiple instruments (and organisations) cohesively. But given how compelling the potential is, we will continue to seek and showcase models that are successful (or unsuccessful) in establishing this approach.

Guest Article

Approaches and Models for Blended Capital and Climate Innovation

Impact Investors Council (IIC) - Divya Pinge

India's presidency at the G20 Summit in 2023 has The Leader's Declaration formally recognising climate finance needs for developing countries and the world economy in general. This requirement is pegged at an approximate of USD 4 trillion per year for clean energy technologies by 2030 to reach net zero by 2050.

Achieving a financial commitment of this nature requires private capital and public finance to be equally participative. Private capital which has conventionally been viewed through the dual paradigm of commercial investments and philanthropy now sees an emerging opportunity - **Blending of Finance for climate action.**

The strategic use of catalytic capital from public or philanthropic sources to mobilise more private capital, while not recent, stands more relevant than ever before for climate-linked projects in India. In May 2023, the Impact Investors Council (IIC) and the Asha Impact Trust co-authored a report - **'The Blended Finance India Narrative'** overviewing the nature and insights of blended finance transactions in India. From 2010 to 2022, projects that focussed on clean energy or climate action accounted for more than 30% of the total blended finance investments made during this period; a close second to the 'financial services' sector.

Clearly, there is immense untapped potential and a key role for blended finance structures in addressing the unique requirements of the climate finance conundrum.

Propelling Innovation

While climate-focused innovation has been on the rise, such new-age solutions require assistance to build scale and effectiveness in deployment. By providing early-stage technical assistance and low-cost funding, blended finance plays a critical role in making them ready for debt and equity at scale.

A case in point is that of Caspian Debt, which joined hands with Villgro, to create a guarantee-backed loan product aimed to unlock credit for early-stage enterprises engaged in impact sectors.

A Case for Adaptation Financing

While projects linked to climate mitigation see private finance, climate adaptation has largely remained an area for public finance. Such projects have few to no established business models that are economically viable – building climate-resilient housing for low-income communities, engaging in climate-resilient agriculture practices as well as building city infrastructure keeping the imminent risk of climate change in mind.

An alternate approach demonstrated by the Rabo Foundation in partnership with the U.S. Agency for International Development (USAID) encourages financing to businesses operating in the forestry sector. Through a portfolio guarantee structure, they partnered with Indian financial institutions to support loans geared toward SMEs, cooperatives, and microfinance institutions that are directly or indirectly engaged in sustainable landscapes through agriculture, forestry, and other land uses. Through a combination of first and second loss guarantees, the structure mobilized finance to a high climate impact space that otherwise receives little understanding or attention from conventional lenders.

Intersecting Social and Climate Impact

Climate-focused solutions have the ability to not just build a case to mitigate and adapt to climate change but also build livelihoods and social inclusivity. Such solutions naturally align themselves with the objectives of catalytic capital - conventionally geared towards creating social impact, thus helping create a high financial leverage (i.e. the ratio of return-seeking (commercial) capital mobilised by the catalytic capital invested and expended) for the project.

The Green Climate Fund (GCF) extended a line of credit of USD 100 million to the National Bank for Agriculture and Rural Development (NABARD), for the development of rooftop solar power in India's commercial, industrial, and residential sectors. NABARD on-lent to Tata Cleantech an NBFC lending to rooftop solar projects. This program, apart from furthering the cause and market of climate-smart solar rooftop solutions, also paved the way for social inclusivity and upliftment by providing clean energy access to vulnerable communities.

Such structures also can help create better accountability and transparency by measuring the social impact of solutions, and thereby encouraging increased capital towards climate financing.

Blended Finance: An Agent for Change

The market and understanding of blended finance solutions in India is still at a nascent stage. The perceived complexity of blended finance structures and challenges in identifying the appropriate capital and technical partners have made it challenging to build scale for blended finance. However, the narrative around the implementation of blended finance stands stronger with an increasing interest from both public and private capital providers for leveraging such solutions for driving capital towards 'green projects'.

The increasing climate finance gap in India, the imperative to create an impact for communities most vulnerable to climate change, and the necessity to build and nurture a financial ecosystem well poised to finance climate action, have made it clear that blended finance can go a long way towards building a sustainable climate finance strategy.

Section 6

What else is needed?

Beyond finance, the key to taking climate innovations to market lies in synergies with two major stakeholders: **the government and corporates.** In the words of Mridula Ramesh of the Sundaram Climate Institute (SCI):

> "" Finance follows the presence of commercial opportunity and/or exit, these are driven by market conditions which are in turn shaped by policy events. Finance typically drives innovation once an opportunity is spotted to make it commercially viable quickly....we need policy to lead at the beginning - not necessarily in a Big Bang way but in an enabling, catalytic way especially in the realm of climate resilience."

Robust government support in the form of policy drafting and implementation is vital to create a nurturing environment for finance to subsequently step in and enable growth. Our respondents called out policy pushes such as mandates and standards, emission reduction targets, subsidies, tax incentives, etc. to incentivise stakeholders like the general public, and corporates to adopt new innovations faster. Beyond conducive policy, government support could include establishing R&D facilities, growing a talent pool, providing access to low-cost capital by mandating banks to issue low-interest loans in the sector and creating sandboxes for climate tech innovations.

Guest Article

Greening India's Future

Shubhangi Prasad - Invest India

India announced its goal to reach net zero by 2070 at COP 26 in November 2021 and in recent years, India has backed this up with significant advancements in the promotion of climate technology and renewable energy.

India's dynamic climate tech scene sees startups capitalising on the green product and service demand while attracting substantial investments from major industrial players. In 2021, Indian climate tech startups raised USD 7 Bn in private and venture funding, with a focus on energy management and electric vehicles.

Husk Power Systems, Gram Power, and Onergy are some examples of exceptional Indian cleantech startups specialising in biomass-to-power, innovative microgrids, and solar energy solutions, respectively. Emerging sub-sectors gaining traction include green hydrogen, biofuels, low-carbon biotech in agriculture, material science, energy efficiency, recycling, carbon management, water tech, and property tech. In 2022, agri-tech funding increased by 20%, and waste management by 5X, totalling around USD 22.5 bn in climate tech investments. Despite this growth, the climate tech startup ecosystem in India is still relatively fledgling compared to other sectors.

Renewable Energy as a Case Study of Policy Support and Success

While the market for climate technology is still expanding, India has succeeded in establishing itself as a pre-eminent player in the renewable energy sector, ranking 3rd globally in attractiveness for investments and deployments. The Government of India has taken some key measures to support its ambitious net zero goals.

The International Solar Alliance's success served as a catalyst for the formation of the Global Biofuel Alliance, which further solidified India's position as a significant global participant. With several member countries, including Singapore, Bangladesh, Italy, USA, Brazil, Argentina, Mauritius, and UAE.

This alliance, led by India as the G20 Chair, aims to speed up the adoption of biofuels globally through technological improvements, sustainable use, strong standards, and knowledge-sharing. It catalyses international cooperation and the wide-scale use of biofuels. The Government of India is proactively driving its renewable energy agenda through a series of strategic initiatives. Notably, it permits 100% Foreign Direct Investment (FDI) under the Automatic Route, encouraging international investment. The Government has allotted 39,600 MW of domestic Solar PV module manufacturing capacity to 11 companies under the Production Linked Incentive Scheme, with an estimated investment of USD 930.41 Bn and the creation of 1,01,487 jobs by April 2026. Additionally, the National Portal for Rooftop Solar simplifies the application process for residential consumers to install rooftop solar systems under the Rooftop Solar Programme Ph-II with central financial assistance.

Policy Support for Other Emerging Technologies

By encouraging investment and promoting research in green hydrogen technology, the National Green Hydrogen Mission aims to position India as a leader in green hydrogen production and export. Additional Mission components will also receive USD 47 Mn, including the creation of Green Hydrogen Hubs, storage bunkers close to ports, and priority grid connectivity. By increasing India's solar capacity by 30.8 GW, PM-KUSUM, backed by USD 340 Bn of central financial support, intends to ensure energy and water security, lessen the reliance on fuel in the agricultural sector, and increase farmer income. India also aims to have 40 GW of solar park capacity by 2024, enabling the transportation of renewable energy through Green Energy Corridors, and improving accessibility through the Green Energy Open Access Rules 2022. Additionally, the National Bio-Energy Programme intends to recover energy from the vast amounts of excess biomass, cow dung, industrial, and urban biowaste that are available in the nation.

Climate technology offers intriguing new possibilities to handle the challenge of addressing climate change, including carbon capture, enhanced biofuels, nanomaterials, green hydrogen, and geoengineering solutions.

The Indian government has already demonstrated its clear commitment to climate action through various schemes and enabling policy support. The impact of climate change permeates national boundaries and hence investing in climate tech and creating financial incentives for investments in climate technology is essential to ensuring sustained advancement. Additionally, creating a network of opportunities for networking, investment, and mentorship for climate tech entrepreneurs will help to further accelerate innovation and promote environmental resilience. These measures will improve India's position in the fight against climate change and the development of a greener future.

Corporates, on the other hand, are the gateway to techno-commercial validation. Corporates can play a multitude of roles in engaging climate innovations, all the way from providing them with paid pilot opportunities, corporate sandboxes for techno-commercial testing, decarbonising their own processes and supply chains through startups, providing strategic corporate capital without additional obligations, and partnering with IP-led solutions to give them distribution heft.

Of course, these types of Corporate-Startup partnerships are complex to create, and awareness of the distinct technical and financial risks is imperative. That said, by partnering with innovation early, Corporates have the ability to guide the direction of the innovations, while developing real business and operational competitive advantage. The technical and financial risks, meanwhile, can be mitigated by properly understanding the underlying business models. If developed thoughtfully, these Industry-Innovation partnerships have tremendous power to move the needle.

Overall, awareness of climate innovations is needed across the board to move the needle toward commercial climate success. Only educated stakeholders can fruitfully engage in cross-collaboration: be it between the government and corporates to set up sandboxes, or between public and private capital providers to make low-cost, non-dilutive capital accessible to startups across growth stages.

Corporates & Innovation

Many companies are already well-positioned from this perspective and have clear strategic plans to align climate innovations with business operations.

"At Aarti, we are always eager to look for cleantech solutions relevant to our operations. We actively engage with early-stage start-ups to pilot the solutions at our relevant locations. We also provide the start-ups with tacit knowledge, network connections, and mentoring wherever possible. We believe holistic engagement with companies is more beneficial for both partners than a vendor-buyer relationship."

Mirik Gogri, Aarti Enterprises

"Mahindra is working to integrate sustainability into its core business strategy and working to build "Planet Positive" businesses across its portfolio. This relies on three key tenets that are:

a) Greening Ourselves, by being net zero on emissions, waste, water and bringing in material circularity,
b) Decarbonising our Industries by offering green products & services, and helping decarbonise the value chain &
c) by Rejuvenating Nature, that is supporting sustainable agriculture, afforestation, and biodiversity conservation.

There is enormous in-principle willingness and intent to support the huge developing cleantech. ecosystem and develop win-win situations. We see our role as being catalytic to the adoption and scaling of innovation, as there are others in the ecosystem who are already focused on the funding and investing role. We have worked with climate innovations across stages and sectors, to align with our operations and business. At the very early stage of innovation this manifests as providing companies with demonstration and testing ground for their technologies; for later stage, more proven startups, we provide an opportunity for growth at scale; and for established companies with climate or sustainable solutions, we see our role as providing a platform. Overall, our engagement revolves around partnering and procuring to enable the adoption and scaling of climate technologies."

Ankit Todi, Mahindra

"Corporates play a pivotal role in mainstreaming climate innovation. At ABB, climate innovation is core to our sustainability framework. ABB partners with technology giants, collaborates with key infrastructure providers, and invests in start-ups to bring innovative solutions to market and at scale. Through ABB's global knowledge-sharing network The Energy Efficient Movement, like-minded stakeholders work together to accelerate change toward a more energy-efficient world. We also implement our own and third-party innovative technologies at ABB sites through Mission to Zero, a company program focused on improving energy efficiency, reducing Scope 1 and 2 carbon emissions, and using on-site or locally sourced renewable energy."

Suhas Laxmeshwar, ABB

Conclusion

No Silver Bullets Here

The time to scale climate innovations is now, and climate finance will play a critical role in making this happen at the scale and speed needed to keep our planet liveable. Whether you call it the climate capital stack or the climate capital continuum, the message is the same – **there are large gaping holes**.

As this report showcases, there are many fit-for-purpose financial innovations possible; what is interesting is how **many of these innovations straddle multiple stakeholders and capital instruments**, often combining grant, equity, and debt in powerful and contextualised ways. **Specialised climate finance is what is needed to get climate innovations to the market.**

More than ever, this will require **capital allocators across the spectrum to work together** to develop creative and collaborative climate finance. This is the reason for being for the Climate Capital Network.

Guest Contributors

The Aspen Network of Development Entrepreneurs (ANDE) is a global network of organizations that propel entrepreneurship in developing economies. ANDE members provide critical financial, educational, and business support services to small and growing businesses (SGBs) based on the conviction that SGBs will create jobs, stimulate long-term economic growth, and produce environmental and social benefits. Ultimately, we believe that SGBs can help lift countries out of poverty. With a U.S. team based in Washington, DC, and eight chapters across Asia, Africa, and Latin America, ANDE staff work hard to support members globally and locally while building strong ecosystems for entrepreneurial growth. ANDE develops unique initiatives to address systemic challenges and seize opportunities that can only be approached through collective action. ANDE was founded in 2009 and is a program of the Aspen Institute, a global nonprofit organization committed to realizing a free, just, and equitable society.

Caspian Debt is a catalytic debt provider to startups, social enterprises, and financial institutions working towards positive social and environmental impact and has disbursed over USD 400 Mn across more than 250 companies in India. It is the first Indian financial institution to be a signatory to the Partnership for Carbon Accounting Financials (PCAF) and has been recognised as a 2X Flagship Fund for its track record in gender lens investing. Caspian Debt is a part of the Caspian Group which is a Certified B Corporation that has a 19-year track record of investing equity and debt into impact-creating businesses.

Dalberg is an impact advisory group that brings together strategy consulting, design thinking, big data analytics, and research to address complex social and environmental challenges. We work collaboratively with communities, institutions, governments, and corporations to develop solutions that create impact at scale. With more than 29 locations worldwide and a diverse footprint, Dalberg is driven by a mission to build a world where all people, everywhere, can reach their full potential.

Edhina is a growth stage Sustainability fund focused on Energy Transition, Mobility, Circular Economy, and Built Environment, started by ex-Wipro, Siemens AG, IFC, World Bank, and Caisse de Dépôt et Placement du Québec (CDPQ) executives.

The Impact Investors Council (IIC) is India's preeminent member-based, not-for-profit industry body set up to strengthen impact investing in the country. IIC's key areas of activity and effort include advocacy and policy support, research, and publications in addition to a strong focus on impact measurement and management. IIC is supported by 60 investors and ecosystem partners.

Guest Contributors

India Climate Collaborative (ICC) is a first-of-its-kind organisation working to accelerate climate action in India. The ICC identifies critical sectors that need investment, drives funding towards climate solutions, and enables private and corporate philanthropy to engage more effectively with climate action.

Invest India is the National Investment Facilitation and Promotion Agency (IPA) of the Government of India, working under the aegis of the Ministry of Commerce and Industry. The core mandate of the agency is to promote and facilitate investment through the entire investment cycle on a pro-bono basis. Closely working with both the Central and the State Governments of India and with Businesses, Invest India is the one-stop solution provider ranging from policy inputs, enhancing the investment ecosystem to enhancing ease of doing and running businesses for businesses in India. Invest India is also the execution agency for the Government of India's Start-up initiative.

Prime Coalition is a nonprofit organization that works with philanthropists and other mission-driven organizations and individuals to support sustainable, effective, and scalable solutions to climate change. Prime's new Early Climate Infrastructure (ECI) Program aims to remove systemic barriers for climate solutions that are ready for initial commercialization activity (i.e., have passed through rigorous proof-of-concept phases), or that are fully commercial but need additional support to move to a massive scale. We aim to support ECI interventions that include catalytic investment capital in combination with curated, grant-funded contract work to create structural shifts that accelerate climate solutions and galvanize co- and/or follow-on investment that wouldn't have otherwise been possible.

WRI India, an independent charity legally registered as the India Resources Trust, provides objective information and practical proposals to foster environmentally sound and socially equitable development. WRI India's mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations. Through research, analysis, and recommendations, WRI India puts ideas into action to build transformative solutions to protect the earth, promote livelihoods, and enhance human well-being. We are inspired by and associated with World Resources Institute (WRI), a global research organization.