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LEVERAGING BLENDED FINANCE FOR CLIMATE AND HEALTHCARE IN INDIA:

**BOLD EQUITABLE BETS TO
CATALYZE CLIMATE-HEALTH
OPPORTUNITIES**

June 2024



In collaboration with **The Bridgespan Group**

SAMRIDH HEALTHCARE BLENDED FINANCE FACILITY

SUPPORTED BY:



Office of the Principal Scientific Adviser
to the Government of India



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Message from the Executive Director, NHSRC



Maj Gen (Prof) Atul Kotwal, SM, VSM

MBBS, MD (PSM), PDF (Epidemiology),
FRCP Edin, FAMS, FIPHA, FIAPSM
Executive Director



National Health Systems Resource Centre
राष्ट्रीय स्वास्थ्य प्रणाली संसाधन केंद्र
Ministry of Health and Family Welfare
Government of India

MESSAGE

Transitioning to a low-carbon and sustainable economy has emerged as a vital imperative. We witnessed several nations, including India, pledging to combat climate change at the UN Climate Change Conference in Glasgow (COP26). Moreover, it is projected that between 2030 and 2050, climate change will cause approximately 2,50,000 additional deaths per year from malnutrition, malaria, diarrhea, and heat stress. According to a September 2019 report, "Health Care Without Harm", the health sector alone contributes 4.4% to global greenhouse gas (GHG) emissions. Therefore, hospitals must take action to reduce their climate footprints and strive toward achieving net-zero emissions. As we navigate through this multifaceted issue, it is imperative that we explore innovative solutions that include harnessing blended finance to address both environmental and health-related concerns. Our efforts in this direction have led to the development of the concept of incorporating environmentally sustainable and climate-resilient infrastructure in public healthcare facilities, aligning with the objectives outlined in the National Action Plan for Climate Change and Human Health by the National Program on Climate Change and Human Health. Additionally, within the Kayakalp initiative, the integration of the Eco-Friendly Facilities theme underscores our commitment to promoting sustainability within the healthcare sector.

However, considering the vast and crucial role of the private sector, focusing solely on public healthcare facilities will not suffice to meet India's net zero target. It is imperative to provide incentives to encourage the private sector to adopt green and climate-resilient infrastructure swiftly.

This report provides pathways for differentiated capital flow and explores how blended finance can be a helpful tool to drive more public, private, and philanthropic investments to mobilize the private health sector towards net zero. In doing so, it not only diminishes the dependency of start-ups on government debt but also expedites the building of commercially viable social impact projects. The report recommends the establishment of three major funds, including the Climate Smart Health Infrastructure Fund to achieve social objectives. It also highlights opportunities on initiatives promising significant social and financial returns and demands immediate attention viz cost-effective solutions for heat resilience, pioneering point-of-care diagnostic devices, resilient food and vaccine supply chains, and climate-adaptive healthcare infrastructure, technologies for monitoring vector borne diseases and digital augmented healthcare and capacity building of health workforce as urgent priorities.

I congratulate NHSRC, IPE Global, and other collaborators for bringing out this publication on "Leveraging Blended Finance for Climate and Healthcare in India." The report offers a timely and insightful exploration into how opportunities can be aligned across social return, financial return, and blended finance investments. I am sanguine that this effort will be a significant contribution in the armamentarium of strategies to address the effects of climate change on health and well-being.

Maj Gen (Prof) Atul Kotwal

Date: 7th June 2024
Place: New Delhi



Message from Director, Health Office, USAID/India

Four years ago, as the COVID-19 pandemic began, the U.S. Agency for International Development (USAID) and our partners sought to leverage the expertise and innovation of India's dynamic private sector to develop and scale responsive healthcare solutions. In 2020, USAID worked through our implementing partner IPE Global to collaborate with stakeholders from the Indian government, academia, and the private sector to develop an innovative blended finance facility to combine public and philanthropic funds with commercial capital to create and scale market-based health solutions. Thus, the Sustainable Access to Markets and Resources for Innovative Delivery of Healthcare (SAMRIDH) initiative was created.

SAMRIDH has since expanded its scope to address the broader issues of health systems resiliency, including climate change and human health. This is aligned with USAID's goal to support health systems in India to mitigate and respond to the health impacts of climate change through private sector engagement, locally-led development, and innovation.

USAID recognizes the world faces a profound climate crisis, and in India, we are working hand in hand with the government and private sector to address the root causes and effects of climate change.

USAID is grateful to work in partnership with the National Health Systems Resource Center for its leadership in this crucial effort. We aim for this report to serve as a valuable resource for a wide range of stakeholders, including development partners, government agencies, academia, civil society, financial institutions, and the private sector.

Michelle Lang-Alli

Director, Health Office, USAID/India



Message from the Managing Director, IPE Global

I am delighted to unveil the white paper on ‘Leveraging Blended Finance for Climate and Healthcare in India’ developed under SAMRIDH Healthcare Blended Finance Facility, an initiative supported by U.S. Agency for International Development (USAID) and managed by IPE Global. Since its inception in 2020, SAMRIDH has played a significant role in accelerating India’s response to the COVID-19 pandemic and strengthening the resilience of health systems in the post-pandemic recovery phase.

At SAMRIDH we leverage innovative financing mechanisms to provide affordable capital and technical support to small and medium-scale impact enterprises. This enables them to scale high-impact, lifesaving interventions, ensuring last-mile access of affordable and quality healthcare services for underserved communities. Through this approach, to date, SAMRIDH has supported 90+ high-impact solutions, across infrastructure, diagnostics, medical devices, vaccine delivery and capacity building. Through our portfolio of solutions, we have achieved an extensive pan-India footprint with over 43+ million beneficiary contacts.

Climate change is the biggest emerging threat, set to place tremendous pressure on global health systems. It is predicted to cause over 250,000 additional deaths per year between 2030 to 2050. India is highly susceptible to climate-related health threats, with three out of four districts vulnerable to extreme climate events such as floods and droughts. The country has experienced a significant rise in the frequency, duration, and intensity of heatwaves in recent years.

Against this background, SAMRIDH partnered with The Bridgespan Group to explore and document gaps in climate health financing, stakeholders’ potential to bridge the financing gaps, and financing mechanisms including blended finance to fill those gaps. This white paper is an outcome of that partnership and was developed after extensive secondary and primary research with over 30 cross-sectoral experts. The report identifies bold equitable bets for blended finance investments to improve the climate resilience of India’s healthcare systems.

The report gives a roadmap for SAMRIDH to diversify into climate-centric healthcare needs and climate-adjacent healthcare needs based on its experience by setting up three different thematic-focused funds. The report illustrates how initiatives like SAMRIDH can support innovations and social enterprises addressing health challenges emerging from climate change.

I invite all stakeholders, investors, and partners to join us in this endeavour as we collectively try to address the climate crisis.

Ashwajit Singh

Founder & Managing Director,
IPE Global

Acknowledgments

We are deeply grateful to Dr Neeta Rao, Senior Health Lead, USAID/India and Maj Gen (Prof) Atul Kotwal, SM, VSM, Executive Director, National Health Systems Resource Centre (NHSRC), Government of India (GOI) and Dr. K Madan Gopal, Advisor -Public Health Administration, NHSRC, Government of India, and all other NHSRC team members for providing valuable inputs and guidance that significantly enriched the depth and quality of our research findings. We thank USAID for their unwavering support and for commissioning this study.

We are thankful to the several sector experts have also provided invaluable insight, guidance, and support to our project and we would like to acknowledge and thank the many experts who took to share overall inputs. These include experts from organizations such as Michael and Susan Dell Foundation, AVPN, Samyak, Artha Impact, OECD, NCDC, Rockefeller Foundation, Leapfrog Investments, Dasra Climate Rise Alliance, Waterfield Advisors, BAT, RainMatter Foundation, India Climate Collaborative, Gates Foundation, Quadria Capital and others.

This report would not have been possible without the leadership of Himanshu Sikka, Dr. Manjunath Shankar, and Dr. Vijender Jeph, from SAMRIDH Healthcare Blended Finance Facility. Their expertise and commitment played a crucial role in shaping the research and final recommendations.

A special acknowledgment goes to the Bridgespan India advisory team, including Anant Bhagwati, Kanika Gupta, Gunjan Saini, and Nandika Chaubey, for their dedicated efforts in conducting both primary and secondary research. Their collective expertise and tireless commitment have been integral to the thoroughness of our study. We would also like to thank Amit Garg for his contributions and guidance, in an individual capacity.

About SAMRIDH

SAMRIDH (Sustainable Access to Markets and Resources for Innovative Delivery of Healthcare), supported by the United States Agency for International Development (USAID) and implemented by IPE Global, works in technical collaboration with the Atal Innovation Mission (AIM), Women Entrepreneurship Platform, NITI Aayog, Principal Scientific Advisor to the Government of India, National Health Authority, Indian Institute of Technology Delhi, The Rockefeller Foundation, Axis Bank, IndusInd Bank, HDFC Bank, Caspian Debt, and NATHEALTH.

SAMRIDH Healthcare Blended Finance Facility combines commercial capital with public and philanthropic funds to mitigate barriers to private investment in market-based health solutions that can improve access to affordable and quality health services for vulnerable population. This initiative has mobilized a capital pool of **USD 300 million** to offer grant and debt financing provisions to healthcare enterprises and innovators to augment the production and supply of high-impact health solutions, focusing on strengthening the healthcare system. SAMRIDH, under the newly launched Recoverable Grants, has created a reserve of funds to lend/grant to the recipients to build sustainability of interventions and help create credit history to support social enterprises, making them more investment-ready for the future. Over a given period, the funded entity is expected to repay the original sum that restocks the fund. This approach results in a fund that is used repeatedly and replenished with repayments, allowing it to continue providing financial support to a specific set of activities or projects until it gets depleted while achieving the intended social outcomes. This is complemented by a strong technical assistance and business advisory component to enable enterprises to make process and product improvements, navigate policy regimes and build sustainability strategies for a long-term impact.

SAMRIDH has been recognized among 'India's top 50 COVID-19 last mile responders' by the World Economic Forum. SAMRIDH was awarded the P3 Impact Award 2022, led by the Office of Global Partnerships in the U.S. Department of State, Concordia, and the University of Virginia Darden School of Business Institute for Business in Society. SAMRIDH became one of the founding members of the G7's Triple I (Impact Investing Initiative) for Global Health, which aims to promote global health investment. The initiative is led by the Government of Japan and was launched at an event held on the sidelines of the United Nations General Assembly in September 2023.

100+

Partnerships with Public, Private
and Philanthropic partners

82+

Health Solutions Supported and
Counting

10-12x

Leverage Achieved on
Philanthropic Funding

27,000+

Medical Staff, Nurses, Community
Health Workers Trained

4200+

Health Facilities
Reached

43 Million+

People
Contacts

List of Abbreviations

ADB	Asian Development Bank
AI	Artificial Intelligence
AIM	Atal Innovation Mission
AQI	Air Quality Index
ASHA	Accredited Social Health Activist
AVPN	Asian Venture Philanthropy Network
BAT	British Asian Trust
BF	Blended Finance
CAGR	Compound Annual Growth Rate
CIDF	Climate Innovation and Development Fund
COP	Conference of Parties (Climate Change Conference)
CO2	Carbon Dioxide
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DFI	Development Finance Institute
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EBRD	European Bank for Reconstruction and Development
FDI	Foreign Direct Investment
FMCG	Fast-moving Consumer Goods
GDP	Gross Domestic Product
GHG	Green House Gas
GoI	Government of India
IFC	International Finance Corporation
IIX	Impact Investment Exchange
IRR	Internal Rate of Return
ITC	Imperial Tobacco Company of India
M&E	Monitoring and Evaluation
MFI	Microfinance Institutions
MIGA	Multilateral Investment Guarantee Agency
MSME	Micro, Small and Medium Enterprises
NAPCCHH	National Action Plan on Climate Change and Human Health
NBFC	Non-Banking Financial Company
NCDC	National Centre for Disease Control
NGO	Non-Governmental Organization
NHSRC	National Health System Resource Centre
OECD	Organization for Economic Cooperation and Development
PE	Private Equity
PHI	Public Health Institute
PoC	Point of Care
PPP	Public Private Partnership
PSW	Private Sector Window
ROI	Return on Investment
R&D	Research & Development
RPM	Remote Patient Monitoring
SAMRIDH	Sustainable Access to Markets and Resources for Innovative Delivery of Healthcare
SD	Skill Development
SDG	Sustainable Development Goals

SDOH	Social Determinants of Health
SE	Social Enterprise
TDS	Total Dissolved Solids
US EPA	USA Environmental Protection Agency
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar
USDFC	United States International Development Finance Corporation
US EPA	United States Environmental Protection Agency
VBD	Vector-borne diseases
VC	Venture Capital
WASH	Water, sanitation, and hygiene
WHO	World Health Organization

Executive Summary

Background

Climate change is expected to put tremendous pressure on health systems across the world, with over 250,000 additional deaths per year predicted between 2030 to 2050 due to climate threats¹. It is estimated that the world would lose USD two to four billion as direct damage costs of climate change to health by 2030¹.

India is highly susceptible to climate threats to human health, with three in four districts in India being vulnerable to extreme climate events such as floods and droughts². To tackle this complex challenge, significant financing resources would be required. As per latest estimates, India needs to scale up its capital investments to USD 170 billion annually until 2030 to achieve its net-zero targets³.

At this level of annual investment, private capital must play an essential role in alleviating the damages expected to be brought by climate change. Blended finance (BF) can be a helpful tool to drive more public, private, and philanthropic investments to address this critical challenge. Blended finance involves the strategic use of concessional funds from public and philanthropic sources to mobilize private capital from commercial investors, to support projects with high development impact potential but limited commercial viability.

Against this background, the **USAID and IPE-Global supported SAMRIDH Healthcare Blended Financing Facility partnered with the Bridgespan Group to produce this white paper on ‘Leveraging Blended Finance for Climate and Healthcare in India’**. The objective of this paper is to identify bold equitable bets⁴ for BF investments to improve the climate resilience of India’s healthcare systems. That is, with a special focus on protecting vulnerable population segments like low-income groups and marginalized communities.

For this purpose, a rigorous mixed-methods approach, which include secondary research on climate risks to health systems, data analysis of past BF transactions in India, and consultations with 30+ sector experts, has been used. Based on this approach, the paper identifies key needs that require urgent action, prioritizes them to highlight bold bet opportunities⁴ for BF, and concludes with a set of recommendations to enable these bold bets as well as to develop the ecosystem at large.

Key Findings

A review of key global and local frameworks such as the Government of India’s National Action Plan on Climate Change and Human Health (NAPCCHH) highlighted that climate and healthcare needs can be described as a continuum ranging from solely climate focused needs, followed by intersectional

¹ World Health Organization (2023). Available at <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>

² Mohanty, Abinash and Shreya Wadhawan (2021). Mapping India’s Climate Vulnerability: A District-Level Assessment. New Delhi: Council on Energy, Environment and Water. Available at <https://www.ceew.in/sites/default/files/ceew-study-on-climate-change-vulnerability-index-and-district-level-risk-assessment.pdf> (Accessed December 2023)

³ International Finance Corporation (2023). Blended Finance for Climate Investments in India. The World Bank Group, Washington, DC. Available at <https://www.ifc.org/content/dam/ifc/doc/2023/Report-Blended-Finance-for-Climate-Investments-in-India.pdf> (Accessed December 2023)

⁴ Bold equitable bets are defined as investment opportunities which are expected to have a minimum ticket size of INR 100Cr of catalytic capital and have the potential to create multiplier impact at climate-health intersection, especially for vulnerable populace

needs, to solely healthcare focused needs. Due to cross-sectoral impact of climate change, over half of the intersectional needs such as air quality management, nutrition security, vector control, heat related action and green healthcare infrastructure, were found to lie outside the traditional healthcare systems. An analysis of funding trends showed that blended finance is gaining momentum in India, with over USD 4 billion in investments in the past decade, accounting for ~3 percent of global investments⁵. With a CAGR of 18 percent, Indian blended finance market is also growing at a faster pace as compared to global market growing at about 11 percent⁵. However, there is a significant need to sensitize funders about health effects of climate change, with less than 3 percent of total giving directed to the intersection in India⁶.

Basis secondary research and expert consultations, sixteen bold bet opportunities were identified across seven major themes at the climate-health intersection in India. These opportunities were evaluated across parameters of potential social return, financial return and fit for blended finance investments. Four bold equitable bet opportunities viz., a) **affordable heat resilience solutions**, b) **innovative point-of-care diagnostic devices**, c) **climate resilient food and vaccine supply chains** and d) **climate smart healthcare infrastructure**, with high social returns, financial returns, and blended finance fit, were prioritized for urgent action. Two more opportunities viz., a) **technologies for monitoring vector borne diseases** and b) **digital augmented healthcare and capacity building of health workforce**, were identified as medium priority actions.

Recommendations

Three major initiatives would be required to catalyze markets for the six prioritized bold bets in India:

1. **Innovation Fund for Climate and Health Resilience Solutions:** Given the nascent stage of the sector, a fund needs to be structured to pool innovation capital from both concessional and commercial investors. The fund can be used to combine grants and concessional debt to support nascent innovators to test product-market fit and build markets for growing innovations.
2. **Climate Smart Health Infrastructure Fund:** Stakeholders can structure a BF based concessional debt fund with catalytic funding from development partners for low-cost lending by financial intermediaries. This fund can be used to reduce the cost of capital and unlock scale transactions for building climate smart health infrastructure and capacity building of health workers.
3. **Heat Resilience Collaborative and Climate Resilient Health Supply Chains Collaborative:** Climate change can have multidimensional health impacts, especially via aggravating heat stress and threatening access to medicines and food. Multiple actors can hence come together to form these two collaboratives. Using alliances like this would help create compelling narratives around the need and engage governments in creating supporting

⁵ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

⁶ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

policies. It can also help produce relevant research to further innovation and pool capital to provide affordable finance to emerging innovations.

These interventions must be supported by ecosystem building efforts. These would include sensitizing funders regarding the urgency of the situation, creating and dissemination knowledge around the use of blended finance, developing standardized frameworks to simplify blended finance instruments, and creating networking platforms for funders and solution providers to enhance collaborative action.

It is hoped that this study and its recommendations would be useful for governments, philanthropies, impact investors and other stakeholders in activating cross-sector collaboration and advancing high-impact investments to build climate resilient healthcare systems in India.

Section 1: Introduction

Climate change is likely to be an urgent health threat across the world

According to the World Health Organization (WHO), climate change would be the single biggest health threat facing humanity and needs urgent attention. Estimates show that over 3.6 billion people are highly susceptible to the impact of climate change⁷. The burden of these risks is also disproportionately experienced by low-income countries and vulnerable groups like women, children, elderly, poor communities, and ethnic minorities.

Climate change poses new health challenges in the form of death and illness from heatwaves, storms, and floods and increased risk of zoonotic, food-, water- and vector-borne diseases. By threatening socio-environmental determinants of health such as clean air, safe drinking water, nutritious food supply and safe shelter, it also multiplies the burden of respiratory illness, malnutrition, mental health issues and other non-communicable diseases.

Figure 1: Impact of climate change on human health in India⁷



Several global frameworks such as the WHO Framework on Climate Change and Health, Public Health Institute (PHI) Climate Change and Health Framework for Action and the USA Environmental Protection Agency (US EPA) Climate Change and Health Pathways have also highlighted that climate change impacts human health via direct pathways, that is, by triggering extreme weather events as well as indirectly by degrading essential determinants of health such as access to clean air, water and food security outside health systems⁸.

Climate change makes it crucial to focus on both preventative actions as well as resilience actions. Preventative action would avoid aggravation of climate-health risks (e.g.: air quality management, nutrition security, climate smart housing). While resilience actions would prepare healthcare systems for upcoming climate risks (e.g.: climate resilient healthcare infrastructure, surge preparedness, management of infectious and non-communicable diseases). The frameworks also underscore prioritizing the

protection of vulnerable segments who are usually the worst hit.

⁷ World Health Organization (2023). Available at <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>

⁸ Statistics sourced from: [University of Cambridge](#); [Council on Energy, Environment and Water](#); [McKinsey & Company](#); [World Bank](#)

Climate change related health impacts would pressurize an overburdened healthcare system in India

India's healthcare system is already severely stressed with persistent challenges: a lack of access in remote and rural areas, a lack of quality infrastructure and inadequate service delivery to vulnerable segments (Figure 1). The combined total government expenditure in India is 1.29 percent of its GDP⁹ and the system places the cost burden largely on patients, with high out-of-pocket financing.

With a rise in infectious diseases, heat-related illnesses, and other climate-induced health issues, climate change is likely to place overwhelming pressure on an already overburdened healthcare system in India. A disproportionate impact is expected on rural areas housing 65 percent of the population but only having access to 30 percent of the available health infrastructure in the country¹⁰.

This is echoed in the National Action Plan on Climate Change and Human Health (NAPCCHH) developed by the Government of India with the objective of reducing morbidity, mortality, injury and health vulnerability to climate variability and extreme weather conditions. The NAPCCHH also lays emphasis on health adjacent sectors and community driven change by synergizing efforts with other national missions on climate change in allied sectors such as National Water Mission, National Mission for Sustainable Agriculture, National Solar Mission, and others (Figure 2).

Figure 2: Key need areas at the climate-health intersection based on assessment of key frameworks and expert consultations

Climate centric healthcare needs	Climate adjacent healthcare needs
Climate mitigation & adaptation needs in health sector	Climate mitigation & adaptation needs in sectors allied to social determinants of health
Climate smart healthcare infra	Air quality management
Surge preparedness	Safe water, sanitation & hygiene
Capacity building of health workers	Controlling growth of vector borne diseases
• Management of non communicable diseases	Food & nutrition security
Virtual healthcare delivery	Waste management
	Climate smart / safe housing
Cross cutting needs across sectors	
Community engagement	
Partnerships & Advocacy	
Monitoring & alerts systems	
Vulnerable communities	
Climate-Health Financing	

Key: ■ Covered in NAPCCHH ■ Not covered / Partially covered in NAPCCHH

⁹ NITI Aayog and SAMRIDH Healthcare Blended Finance Facility (2022). Reimagining Healthcare in India through Blended Finance. Available at <https://www.niti.gov.in/sites/default/files/2022-02/AIM-NITI-IPE-whitepaper-on-Blended-Financing.pdf> (Accessed December 2023)

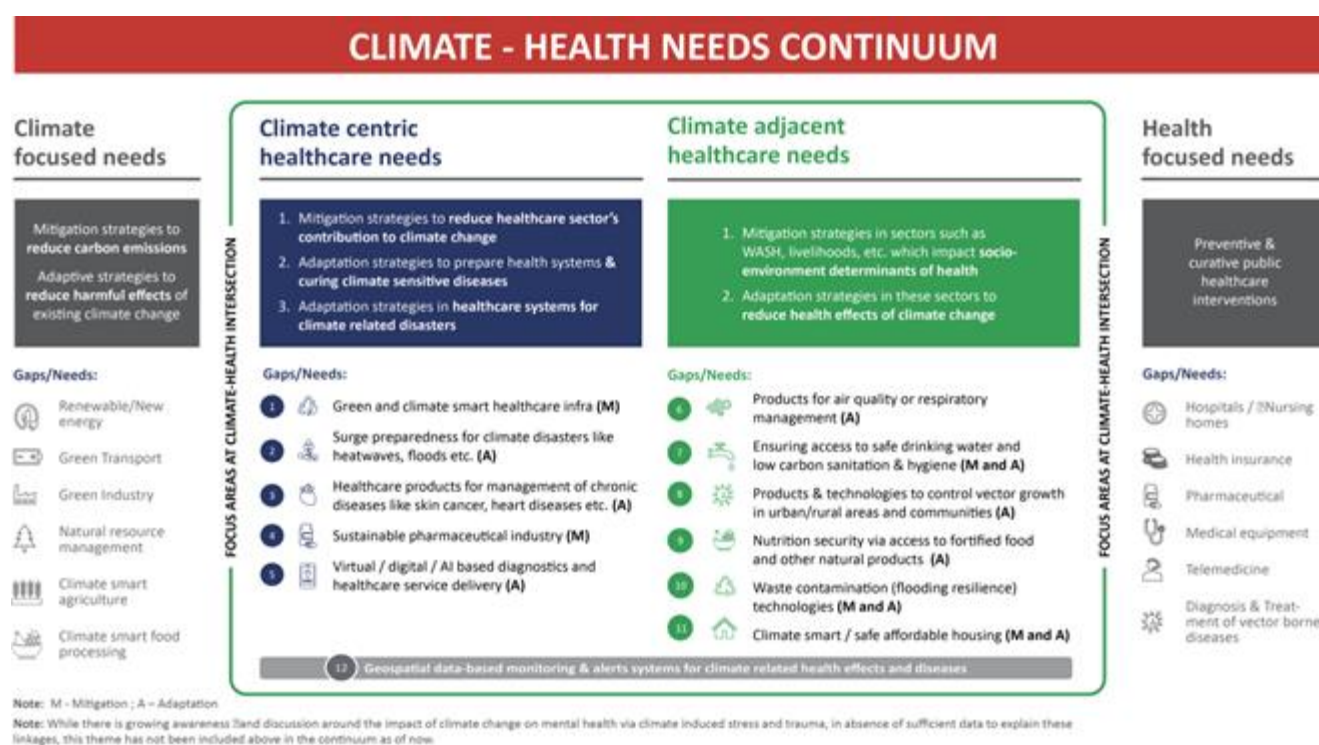
¹⁰ India Blended Finance Collaborative (2023). Leveraging Blended Finance to maximise the Impact of India's Healthcare Spending. Available at <https://blendedfinanceindia.org/wp-content/uploads/2023/05/IBFC-1.4.pdf> (Accessed December 2023)

Over half of the high priority areas at the climate-health intersection lie outside traditional healthcare systems

Based on this review of global and local frameworks followed by conversations with sector experts, India's needs at the climate-health intersection can be represented via the 'Climate-Health Needs Continuum' (Figure 3). The continuum categorizes the entire spectrum of needs at the intersection into the following types:

1. The extreme ends of the continuum correspond to **climate and health focused needs** respectively. Traditional health systems are geared to only solve for health focused needs.
2. **Climate centric healthcare needs** include the requirement for mitigation strategies to reduce the healthcare sector's contribution to climate change and adaptation strategies to prepare health systems for climate change effects.
3. **Climate adjacent healthcare needs** include mitigation and adaptation strategies in sectors that correspond to socio-environmental determinants of health such as air, water and housing that will either prevent climate change or protect humans from its harmful health effects.

Figure 3: Climate – Health Needs Continuum mapping key need areas at the climate-health intersection



A mapping of **12 high priority gap areas** to the climate-health continuum has suggested that over half of these needs are driven by impact of mitigation strategies on the social determinants of health and lie outside the traditional healthcare systems and climate focused needs. This underscores the necessity of focusing on intersectional areas such as green health infrastructure, air, water, food, and housing to prevent and protect against upcoming climate-health risks.

It is noteworthy, that experts consider adaptation strategies to be critical across these need areas. Since most climate financing efforts have focused on mitigation approaches in recent years, this

indicates a clear need to direct more resources towards adaptation measures. Stakeholders have also reiterated that cross-cutting efforts, for example: focus on vulnerable communities and the establishment of geospatial data-based monitoring and early warning systems would continue to play an important role.

Existing funding may not be sufficient, necessitating the use of blended finance to crowd in commercial capital towards the climate-health intersection in India

Though there is a clear consensus among stakeholders about the importance of the climate-health intersection, it is observed that existing funding from public and philanthropic sources is not sufficient to meet India's growing healthcare needs. Add to that, the onslaught of climate change. Estimates suggest that India would need **USD 256 billion by 2034 to achieve health related SDG goals**¹¹ (Figure 4). Similarly, public funds alone can't meet India's ambitious climate goals. Exogenous shocks such as inflationary factors after COVID-19 have raised borrowing costs and reduced access to foreign capital for developing countries like India. All of which, necessitates an even more judicious use of public and international philanthropic capital.

Figure 4: Need to attract private capital to India's climate and health sectors¹¹



While it is pivotal to leverage private capital to fill this funding gap, most of it is invested in mature spaces with demonstrated profitability. While these segments have high potential for development impact,

its unproven commercial viability makes it crucial to use public and philanthropic capital to catalyze private capital here. In the long term, it will be essential to ensure long term sustainability of investments to mobilize private capital at the nexus of climate and health.

Against this backdrop, the use of innovative financing instruments such as blended finance can help in mitigating investments risks and pooling capital. This will help in addressing critical health challenges that are aggravated by climate change. Blended finance is an approach where catalytic funding (e.g., grants and concessional capital) from public and philanthropic sources is used to mobilize additional private sector investment to achieve social goals and outcomes. It is a structuring approach that allows enterprises to invest alongside each other while achieving their different objectives: financial return, environmental/social impact, or a blend of both. Blended finance is therefore not a single instrument, but a financial structure in which different investors with different investment priorities can participate¹¹.

¹¹ NITI Aayog and SAMRIDH Healthcare Blended Finance Facility (2022). Reimagining Healthcare in India through Blended Finance. Available at <https://www.niti.gov.in/sites/default/files/2022-02/AIM-NITI-IPE-whitepaper-on-Blended-Financing.pdf> (Accessed December 2023)

Via adequate risk mitigation and creation of incentive structures, blended finance can be an effective way of mobilizing public and private capital. However, it has not yet fully scaled in India and there is significant potential that remains to be unlocked by advocating for it among funders, structuring simple blended finance instruments and establishing intermediaries to facilitate scaled blended finance investments.

Summary

- Climate change is likely to have multidimensional impacts on human health in India via heat stress, increased risk of infectious diseases, threats to safe drinking water and nutrition security, and disruptions with extreme weather events.
- Existing funding may not be sufficient to overcome these complex challenges, necessitating the use of innovative finance models such as blended finance to mobilize additional private, philanthropic, and public capital to climate proof health systems in India.

Section 2: Funding Trends in Climate and Healthcare

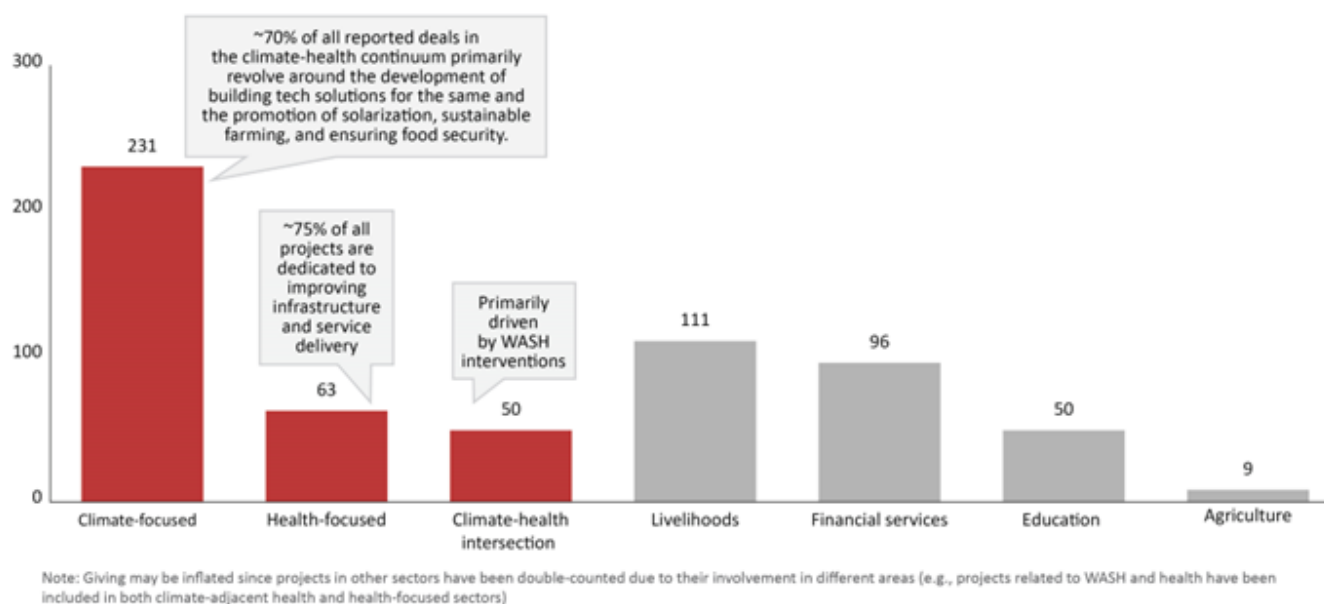
Global Trends

Global funders are increasingly using blended finance instruments to drive action at the climate-health intersection

Blended finance has driven significant change globally, especially in the climate-health continuum. Over the past decade, it has channeled USD 160 billion¹² into the social sector, with over half dedicated to climate-health initiatives¹³. It reflects an increasing focus on innovative financial models like blended finance to address complex issues, including climate change and community health. The European Bank for Reconstruction and Development's Sustainable Energy Financing Facilities is a prime example. These facilities have provided about 2.8 billion Euros in credit lines to more than 100 local financial institutions. This funding has, in turn, supported over 75,000 small businesses and residential clean energy users in 22 countries, showcasing the global reach and impact of blended finance.

Figure 5: Giving to the social sector globally via blended finance models (2010-2022; USD B)¹³

Giving to the social sector **Globally** via blended finance models from 2010-2022 (in\$B)



¹² Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

¹³ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

Global funders are rapidly intensifying their focus on the intersection of climate and health sectors (Figure 5). Notably, 10 percent of all social sector funding through blended finance is directed specifically to the climate-health intersection. This is, in turn, centered around WASH initiatives.¹⁴

The Climate Innovation Fund by the British Asian Trust and Sajida Foundation is a prime example of increased global funding towards the climate sector and its intersections. This USD 1M fund provides grant funding and technical support to establish and scale-tested solutions in climate resilience that can impact over 13 million people at risk due to climate change¹⁵. Innovative financial models, especially blended finance, are gaining traction as strategic tools to tackle complex issues. Over the past decade, the global blended finance market has grown by 11 percent CAGR¹⁶ and is projected to expand by three percent next year¹⁴. This momentum signals a promising shift towards targeted initiatives that address climate change and improve community health worldwide.

Summary

- Within the climate-health continuum, funders prioritize solutions for greening, sustainable farming, and renewable energy globally
- Health initiatives come second in priority within the continuum, with a focus on infrastructure development and capacity building for service delivery
- Global funders are increasingly emphasizing the intersection of climate and health sectors, with 10 percent¹⁴ of all social sector funding through blended finance specifically directed to this area. This emphasis is primarily centered around WASH initiatives

¹⁴ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

¹⁵ The Daily Star (2023). Available at: <https://www.thedailystar.net/environment/climate-crisis/climate-action/news/sajida-foundation-british-asian-trust-launch-climate-fund-3360071>

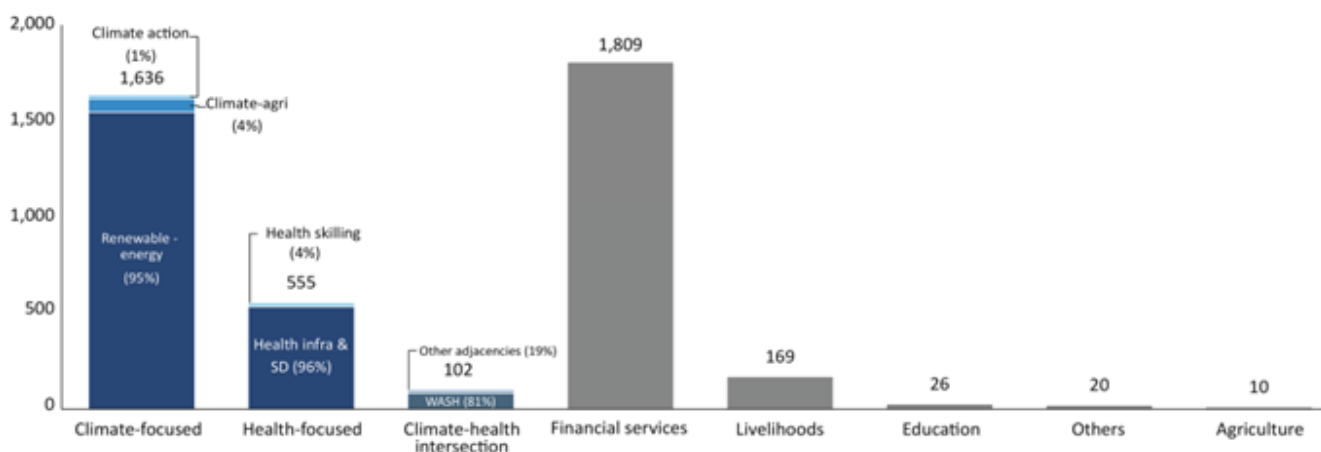
¹⁶ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

National Trends

Blended finance is gaining traction within the climate-health nexus in India

Figure 6: Giving to the social sector in India via blended finance models (2010-2022; USD B)¹⁶

Giving to the social sector IN INDIA via blended finance models from 2010-2022 (in\$B)



Note: Giving may be inflated since projects in other sectors have been double-counted due to their involvement in different areas (e.g., projects related to WASH and health have been included in both climate-adjacent health and health-focused sectors)

From 2010 to 2022, India's blended finance market expanded eightfold, achieving a ~18 percent compound¹⁷ annual growth rate (CAGR), surpassing the global average (Figure 6). This growth reflects a surge in innovative financing, with a substantial portion dedicated to the climate health sector, particularly climate mitigation initiatives. A standout example is the International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA) of the World Bank Group's Private Sector Window (PSW). The PSW, boasting a USD 2.5 billion budget, has earmarked USD 1000 million for the Risk Mitigation Facility. This facility offers project-based guarantees to over 70 borrowers, supporting large-scale infrastructure and public-private partnership (PPP) projects in over

¹⁷ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pingre (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

100 countries¹⁸. This initiative underscores the efficacy of blended finance in attracting private investments for critical developmental objectives.

In the past decade, blended finance transactions have accounted for ~ USD 5B of funding in India¹⁷. Notably, more than half of this funding goes to the continuum, especially climate-mitigation spaces¹⁹.

The climate-focused sector comprises 40 percent of all blended funding, ranking second only to financial services²⁰. Notably, 95 percent of transactions in this sector are exclusive to advancing renewable energy solutions, reflecting a distinct pattern from global trends⁵. The health-focused sector secures around 15 percent of blended funding, making it the third most prioritized area for funders within the social sector²⁰.

Figure 7: Blended finance transaction size⁵

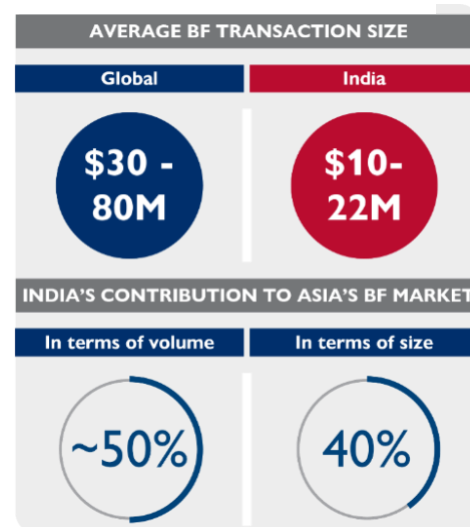


Figure 8: Big bets in the climate-health intersection in India²⁰

Big bets in the climate-health intersection

USAID-USDFC WASH Partial Credit Guarantee, \$82 mn

- **Need:** unlock credit for enterprises operating in water provision, water purification, toilet manufacturing, and fecal sludge management
- **Funders:** USAID, USDFC, Unnamed private bank, Unnamed NBFC
- **Instrument:** USD 82 Mn with 50% pari-passu portfolio guarantee provided by USAID and USDFC
- **Year:** 2019

Impact Investment Exchange (IIX) ACTS, \$19 mn

- **Need:** Scaling existing enterprises focused on health, WASH, etc.
- **Funders:** Bank of America, Charitable Foundation, JP Morgan Chase Foundation, The Rockefeller Foundation, USAID
- **Instrument:** Total facility of USD 19 Mn, with 10% for TA;
- **Year:** 2014

Mirroring global trends, the emphasis is on infrastructure and service delivery solutions. Notably, upskilling healthcare workers for emergency response has rapidly risen to approximately five percent of health projects within three years, indicating a post-pandemic focus on bolstering surge capacity services and enhancing preparedness in healthcare. The climate-health intersection is slowly becoming visible among funders in India, currently constituting around 3 percent of deals (Figure 8)²⁰. Echoing global patterns, the intersection

¹⁸ World Bank (2024). Available at <https://www.worldbank.org/en/news/factsheet/2024/03/06/10-things-to-know-about-the-private-sector-window>

¹⁹ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

²⁰ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

is predominantly characterized by deals focused on WASH solutions .

While funders are increasingly investing in the climate-health intersection, there is an opportunity to further engage them about the size of transactions.

Summary

- Climate-focused funding constitutes 40% of total funding, ranking second after financial services. Notably, 95% of transactions in this sector exclusively focus on renewable energy solutions²⁰.
- Health-focused initiatives secure around 15 percent²⁰, standing as the third most prioritized area. Historical focus includes improving health infrastructure, with recent attention on upskilling the healthcare workforce.
- The climate-health intersection is slowly gaining visibility, comprising about 3 percent of deals²⁰, with predominant focus on WASH

Development agencies and global funds are key concessional scale providers in India, dedicating over 10 percent of funds to the climate-health intersection²¹

Development agencies and global funds play a pivotal role as significant concessional scale providers in India, allocating more than 10 percent of their contributions in India to the climate-health intersection²². Their primary motivation for giving stems from enhancing health outcomes for vulnerable populations in middle and low-income countries. Consequently, they strategically focus on initiatives related to WASH, as well as infectious disease control²¹. Giving from development agencies and global funds serves as a catalyst, inspiring additional capital from other scale providers, with a notable emphasis on government participation.

GoI and corporate entities are the prominent funders of the scale capital

Demonstrating a profound commitment to advancing public health outcomes in harmony with both global commitments and national priorities, active engagement of government²³ and corporate entities²⁴ within the intersection is also notably focused on WASH. Experts recommend enhancing GoI contributions by demonstrating robust business models with extensive impact, fostering both capital and potential adoption. Corporate funding, on the other hand, can be streamlined through innovative financial instruments like bonds²¹.

²¹ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

²² OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023); Bridgespan analysis

²³ GoI India budget. Available at: <https://www.indiabudget.gov.in/> (Accessed October 2023); Bridgespan analysis

²⁴ Sheth, A., Batabyal, J., Nundy, N., Misra, A., & Pal, P. (2023, March 1). India Philanthropy Report 2023. Bain & Company. <https://www.bain.com/insights/india-philanthropy-report-2023/>; Bridgespan analysis

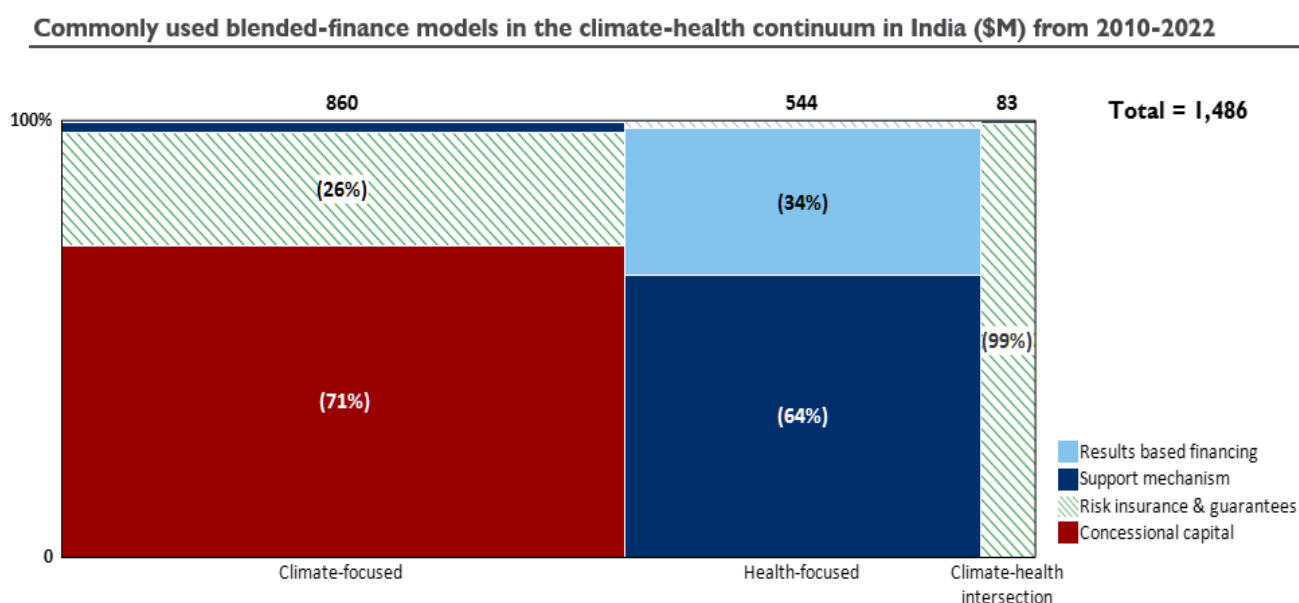
While financial institutions²⁵ and venture capital/private equity funders²⁶ play a crucial role as scale capital providers in the climate-focused sector, their involvement at the intersection is presently constrained, possibly due to their risk-averse nature and singular focus on financial returns. Nevertheless, there is potential for catalyzing investments through risk mitigation or provision of equity-based options²¹.

"Scaling climate-healthcare solutions can only happen through collaboration between the private, public and philanthropic sectors." - Nelson Amaya Durán, OECD

A strategic and stakeholder focused approach to blended finance is necessary to drive impactful interventions in the climate-health intersection in India.

Around 60 percent of funding²⁷ for climate-health comes from concessional debt, risk insurance and guarantees

Figure 9: Commonly used blended-finance models in the climate-health continuum in India (2010-2022; USD M)²⁷



Blended finance instruments are being utilized in the climate and health sectors individually, with noticeable growth at the climate-health intersection. Concessional debt and support mechanisms are rare but drive big bets in well-established sectors (e.g., climate energy, health infra) because they offer risk-return and scalability benefits in well-understood sectors. Risk insurance and guarantees is the most frequently used model in emerging sectors (climate agri, climate action) as funders are allowed to customize the model to address specific risks (Figure 9). However, the flow of investments

²⁵ Atre, G., Asapur, S., & Fernandes, A. (2023). Still Unprepared: India's Big Banks Move Slowly in the Face of Climate Crisis. Climate Risk Horizons. <https://climateriskhorizons.com/research/Still-Unprepared.pdf>; Bridgespan analysis

²⁶ Database on VC/ PE giving. Available at: <https://www.crunchbase.com/>. (Accessed October 2023); Bridgespan analysis

²⁷ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

via this model is limited as funders are wary of placing big bets in nascent, not-well-understood sectors²⁸. Experts suggest that as the climate-health intersection matures, there would be a shift from results-based financing and risk insurance & guarantees to concessional debt as the preferred model of blended finance²⁹.

Summary

- Development agencies and global funds are the major contributors of concessional capital in India, dedicating over 10% of their overall giving²⁸
- The GoI is the primary source of scale capital, followed by corporate entities. However, there is significant potential for increased corporate contributions
- The most common focus areas are WASH initiatives and infectious disease control
- Risk insurance and guarantees are frequently employed based on transaction volume, while concessional debt is utilized for making big bets

²⁸ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

²⁹ Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>

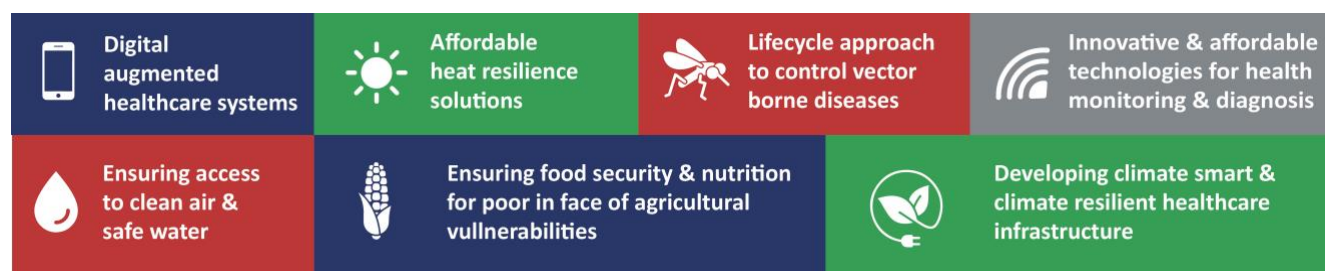
Section 3: Bold equitable bets at climate-health intersection in India

Based on secondary research and expert consultations, 16 bold equitable bet opportunities were identified for the climate-health intersection

As advancements take place in the blended finance segment at the climate-health intersection, it is equally important to identify suitable investment opportunities for concessional and commercial capital providers.

Seven broad themes have been identified at the climate-health intersection based on secondary research on key priority areas for the Government of India, global and local blended financing trends, and expert consultations (Figure 10).

Figure 10: Seven bold bet themes for investments at climate-health intersection in India



Within each theme, specific solutions are delineated to identify investment opportunities for funders. The list of 16 bold equitable bets across seven broad themes are provided below in Table 1. More details on the same can be viewed in Appendix 1.

Table 1: List of sixteen bold equitable bet investment opportunities at climate-health intersection in India

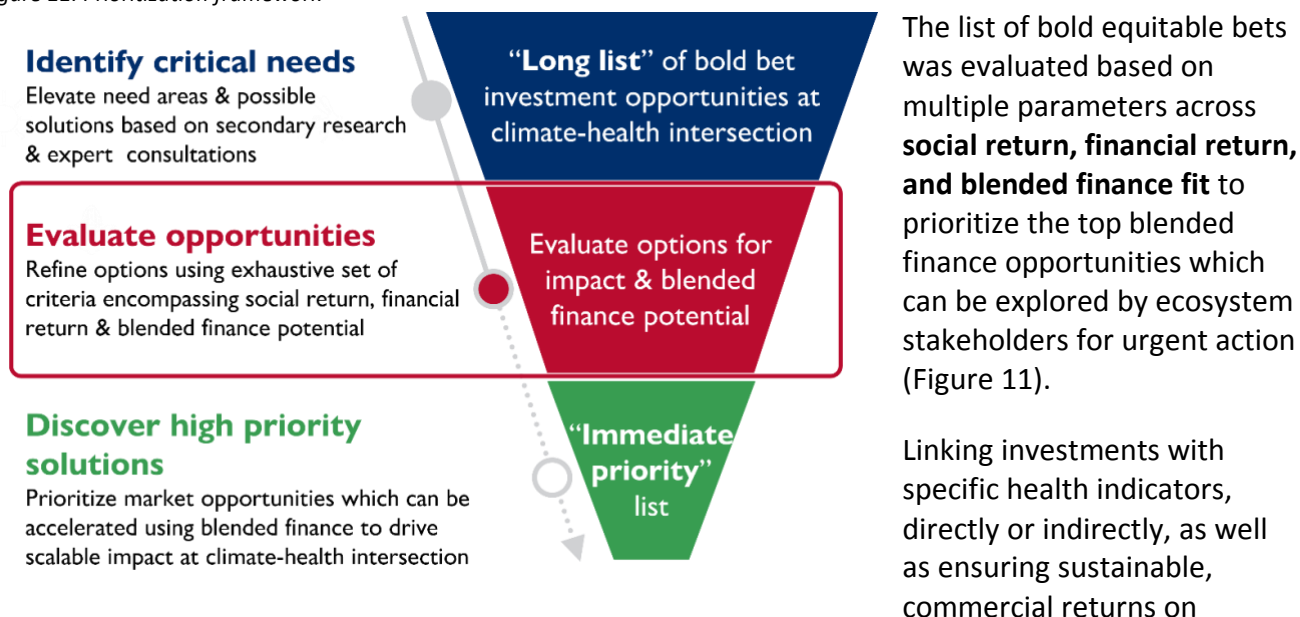
Bold Equitable Bet Themes	Potential Bold Equitable Bet Opportunities
Theme 1 Digital augmented healthcare systems for climate resilience <i>To establish digital physical and human infrastructure to protect against frequent outbreaks of infectious diseases and extreme weather events</i>	• Upgradation and certification program for low-cost privately-run hospitals to be digitally hybrid and offer teleconsultation solutions • Digital platform for capacity building of frontline health workers like doctors, nurses, ASHA workers to prepare them for climate sensitive diseases and related surges • Affordable remote patient monitoring (RPM) solutions for patients with chronic conditions like cardiovascular diseases and cancer in remote locations
Theme 2 Affordable heat resilience and clean cooling solutions for people <i>To catalyze innovations in heat resilience solutions to protect over 90 percent of India at extremely high heat stress risk impacting health via disruptions to health, livelihoods, and food production</i>	• Rooftop whitening solutions for all types of buildings • Phase change material solutions in walls for all types of buildings • Affordable cooling design solutions for housing

Bold Equitable Bet Themes	Potential Bold Equitable Bet Opportunities
Theme 3 Integrated approach to control vector borne diseases <i>To promote integrated vector management with climate change increasing risk which accelerates spread of infectious diseases owing to higher temperatures, humidity and changing precipitation patterns</i>	• Digital monitoring technologies for prediction, detection, triage, and rapid action for controlling epidemics of malaria, dengue, chikungunya, and other diseases. • Innovation for ensuring sustainable vaccine cold chains (especially for vector borne diseases)
Theme 4 Innovative and affordable technologies for health monitoring and early diagnosis <i>To promote research and development of new game changing information technologies that will map vulnerabilities and ensure better delivery of health interventions, amidst growing climate risks</i>	• AI-based self-health assessment applications for climate sensitive health risks for self-monitoring of physical and mental health • Innovative point-of-care diagnostic devices for quicker diagnosis of climate-health risks like cardiovascular diseases, respiratory diseases, and vector-borne diseases • Geospatial data-based surveillance platform for climate sensitive health risks for risk mapping of geographies / populations and early warning systems for heatwaves and floods.
Theme 5 Ensuring access to clean air and safe water especially in face of climate related deterioration <i>To jointly address air and water pollution along with climate change and increase access of affordable solutions to the bottom of the pyramid</i>	• Affordable water and air purifiers for poor and vulnerable segments to ensure access to clean air and water
Theme 6 Ensuring food security and nutrition for poor in face of agricultural vulnerabilities and supply chain disruptions <i>To upscale solutions to safeguard vulnerable segments from climate change's adverse effects on nutrition security, via its impact on food production and transport</i>	• Affordable fortified food products to avoid nutrition deficiencies during climate risks with special emphasis on child malnutrition • Building climate resilient food supply chains to ensure food security
Theme 7 Developing climate friendly and resilient healthcare infrastructure <i>To scale private interest in green infrastructure to reduce the health sector's carbon footprint and prepare health infrastructure to withstand climate risks</i>	• Decarbonizing and climate proofing existing healthcare infrastructure to reduce health sector's greenhouse gas emissions • Building climate resilient healthcare infrastructure to withstand climate disasters like floods and landslides and cope with demand surges

The bold equitable bets were evaluated across parameters of social return and equity, financial return, and blended finance fit to prioritize them

Considering limited financial resources and the fact that all opportunities may not be urgent or may not be amenable for private capital flows, it was imperative that the bold equitable bets are prioritized for suitable intervention.

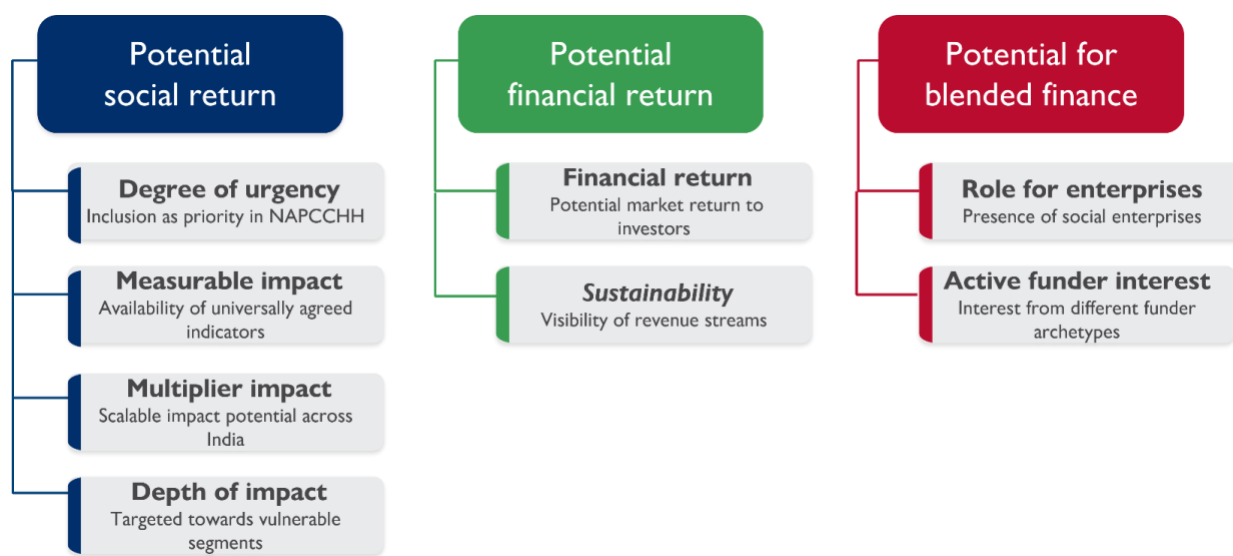
Figure 11: Prioritization framework



investments, will be crucial for identifying opportunities that are fit for leveraging blended finance models.

Descriptions of each parameter along with corresponding metrics are provided in Appendix 2. A summary snapshot is below for quick reference (Figure 12).

Figure 12: Prioritization framework criteria



A summary of evaluation of bold equitable bet opportunities is provided in Figure 13.

Figure 13: Summary of evaluation of 16 bold equitable bet opportunities using the prioritization framework³⁰

Theme	#	List of bold bets	Potential social return				Potential financial return		Potential for blended finance		
			Degree of urgency	Measurable impact	Multiplier impact	Depth of impact	Financial return	Sustainability	Role for enterprises	Funder interest	
			Priority in NAPCCHH	Universally agreed indicators	Potential reach or scale	Targets vulnerable people	IRR / ROI	Final payer or revenue streams	No. of startups / SEs	Attractive to funders (Catalytic)	Attractive to funders (Commercial)
Digital augmented healthcare	1	Certification program for hospitals to be digitally hybrid	Yes	✓ No. of teleconsultations	17,000+ private hospitals	Yes	High	↑	10+	●	●
	2	Digital platform for capacity building of health workers	Yes	✓ % of workers equipped	7 mn+ healthcare professionals	Yes	High	↓	10+	●	●
	3	Affordable remote patient monitoring solutions	No	✓ No. of timely transfers	100 mn+ diabetic & elderly patients	Yes	High	↑	10+	●	●
Affordable heat resilience solutions	4	Rooftop whitening solutions	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	High	↑	1-5	●	●
	5	Phase change material solutions in walls	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	Medium	↑	1-5	●	●
	6	Affordable cooling design solutions for housing	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	Medium	↑	1-5	●	●
Lifecycle approach to control vector borne diseases	7	Digital monitoring technologies for vector-borne diseases	Yes	✓ Incidence rate of VBDs	180 mn+ people at risk	Yes	Medium	↓	1-5	●	●
	8	Innovation for ensuring sustainable vaccine cold chains	Yes	✓ % of vaccine wastage	7 mn+ cold chain equipment	No	High	↑	1-5	●	●
Innovative & affordable tech	9	AI-based self-health assessment applications	No	✗ Not attributable	110 mn+ potential users	No	Medium	↑	10+	●	●
	10	Innovative point-of-care diagnostic devices	Yes	✓ No. of diseases with PoC diagnostics, Hours saved	140,000+ Pvt labs & hospitals	Yes	High	↑	10+	●	●
	11	Geospatial data-based surveillance platform	Yes	✓ No. of diseases with surveillance	Widespread Use by govt, researchers etc.	Yes	Low to Medium	↓	10+	●	●
Safe Water & Air	12	Affordable water and air purifiers	No	✓ Indoor AQI, Water TDS	30 mn+ households	No	High	↑	1-5	●	●
Food security & nutrition	13	Affordable fortified food products	No	✗ Not attributable	180 mn+ potential consumers	Yes	High	↑	1-5	●	●
	14	Building climate resilient food supply chains	Yes	✓ % of food wasted	17,000+ cold chain equipment	No	High	↑	10+	●	●
Climate smart & resilient health infra	15	Decarbonizing & climate proofing existing healthcare infra	Yes	✓ Total energy consumption, GHG emissions	250,000+ hospitals and health centres	Yes	High	↑	10+	●	●
	16	Building climate resilient healthcare infrastructure	Yes	✓ Total energy consumption, GHG emissions	250,000+ hospitals and health centres	Yes	High	↑	10+	●	●

To ensure accountability on the appropriate use of blended finance, the **same high-level framework can also be used for monitoring and evaluation (M&E)** of the above mentioned bold equitable bet

³⁰ Degree of urgency: Yes/No categorization done based on whether the opportunity has been included as a prospective solution in the NAPCCHH ; Measurable impact: Flags if there are clear and measurable indicators which can be measure the impact attributed to the solution; Multiplier impact: Broad estimates based on secondary research available on the number of people who are at risk of the respective challenge or the number of potential users of the service ; Depth of impact: Yes/No categorization done if the solution targets and can be used by any one of the high risk segments; Financial return: High/Medium/Low categorization based on broad estimates for industry and allied sector performance or potential returns for similar solution providers; Sustainability: High/Low categorization based on expert views on potential for multiple users and associated revenue streams; Role for enterprises: Broad estimates of the prominently visible solution providers based on desk research; Funder interest: High/Medium/Low categorization done based on interest from funders during expert consultations

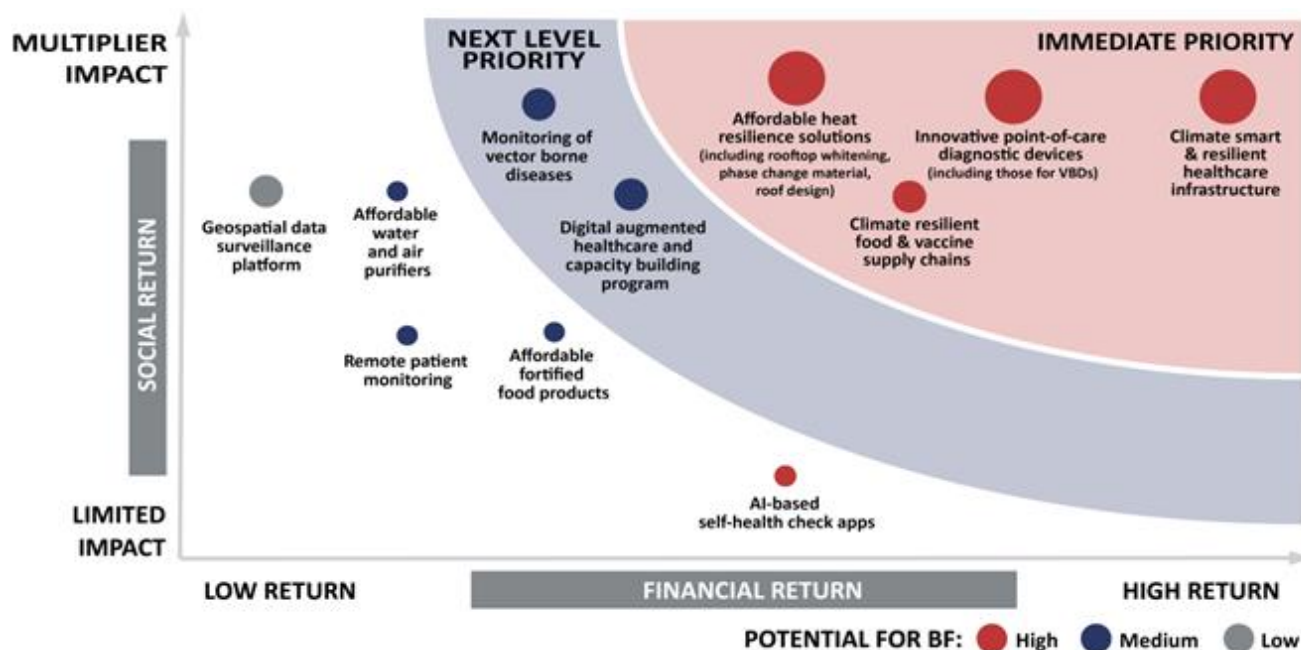
opportunities after necessary contextualization for each solution. The framework can be used to evaluate the social impact across the above four parameters. In addition, it must also regularly monitor and report the financial flows and commercial performance of the solution to assess if it is fit of blended finance investments. Adequate systems must be put in place to allow the M&E of interventions supported through blended finance. This information must be easily accessible to all stakeholders to ensure transparency and allow for mid-course corrections.

Based on this analysis (details in Appendix 3), a prioritization emerges (Figure 14).

Four bold equitable bets were found to be high on both social and financial return and were identified as immediate priority areas (Figure 14). The opportunities demonstrated high potential for BF with sufficient evidence of a considerable number of social enterprises operating in these fields and attractiveness to both catalytic and commercial investors:

1. **Affordable heat resilience solutions:** Heat stress is an urgent government priority with over 40 million urban and rural households being exposed to heat waves in India³¹. Blended finance can play a crucial role in catalyzing the use of modern sustainable technologies such as rooftop whitening, use of phase change material and insulating material into developing affordable housing and roofing solutions. Such solutions can be easily used by informal settlements to protect their lives and livelihoods from extreme heat stress.

Figure 14: Prioritized bold equitable bet opportunities for blended finance³²



2. **Innovative point-of-care diagnostic devices:** Integrating technologies with medical devices to optimize scarce health resources and ensure access to remote care is of importance to many

³¹ Madan, P. & Kwatra, S. (July 2022). Natural Resources Defense Council. Discussing Climate Friendly Cooling in India. Available at <https://www.nrdc.org/bio/prima-madan/discussing-climate-friendly-cooling-india>. (Accessed December 2023)

³² The X-axis represents the potential financial return from low to high. The Y-axis represents the potential social return from low to high. The bold equitable bet opportunities have been plotted as circular points on this X-Y plane based on their evaluation against social and financial return

investors with multiple players and over 15 percent margins reported in Indian diagnostics sector³³. However, given that these technologies are at a nascent stage of development, stakeholders agreed that blending philanthropic capital was required to balance the risk-return profile and attract commercial capital to such solutions.

3. **Climate smart and resilient healthcare infrastructure:** Green infrastructure to mitigate health sector's climate impact and make it resilient in the face of upcoming calamities was elevated as an urgent priority by over 70 percent of stakeholders³⁴. With over seven percent year-on-year growth being registered in private capital finance over last few years³⁵, infrastructure can be considered as a safe investment avenue for investors. However, given the scale of the problem, it is recognized that there is a strong role for BF to create scaled investment opportunities by pooling capital from various sources, especially in the healthcare sector.
4. **Climate resilient food and vaccine supply chains:** With 40 percent of food getting wasted in Indian supply chains³⁶ and India's requirement for 11 million cold chain equipment for vaccines³⁷, stakeholders unequivocally raised focus on climate resilient food and health supply chains. This is to hedge against aggravated risks to nutrition security and vaccine equity due to climate change. While market solutions have been developed to tackle this issue, BF is required to scale these efforts to make them affordable for adoption by poor and vulnerable segments like small farmers and low-cost clinics in rural areas.

Apart from these, two opportunities emerged as **second level priority areas**:

1. **Technologies for monitoring of vector borne diseases:** With 180 million people at risk of infectious diseases like malaria in India³⁸, integrated vector management solutions to predict outbreaks, detect community spread and undertake immediate action to prevent epidemics can have huge impact. However, these solutions involve the use of complex technologies like the use of drones and city sewage surveillance systems. Hence, they have only been piloted and need to demonstrate financial potential to attract private capital. Blended finance can help innovators gain access to low-cost innovation capital to test product-market fit to enable this transition.
2. **Digital augmented healthcare and capacity building program:** With 50 percent of the country's population having access to only 35 percent of hospital beds³⁹, there is a role for digital healthcare in ensuring affordable access to healthcare amid climate risks. However, this cannot be achieved without capacity building of over seven million health workers, where private markets have limited role to play. Catalytic capital from development partners can be

parameters. The size of the circle represents the potential impact or market size of the opportunity, evaluated based on secondary research and expert consultations. The color of the circle represents whether the opportunity is fit for blended finance investments.

³³ Axis Capital (March 2023). India Diagnostics. Available at <https://www.axiscapital.co.in/wp-content/uploads/India-Diagnostics-Sector-01-Mar-2023.pdf>. (Accessed December 2023)

³⁴ Bridgespan analysis

³⁵ Saha, S. (21 Apr 2023). Business Insider. Green finance — need of the hour for net-zero transition — is gaining momentum in Indian economy. Available at <https://www.businessinsider.in/sustainability/article/opinion-green-finance-need-of-the-hour-for-net-zero-transition-is-gaining-momentum-in-indian-economy/articleshow/99657828.cms>.

³⁶ Paulo, D., Smalley, A. & Yip, C. (15 Apr 2021). DBS. Why our food supply chain is flawed, and these champions' efforts to stop the waste. Available at <https://www.dbs.com/livemore/food/why-our-food-supply-chain-is-flawed-and-these-champions-efforts-to-stop-the-waste.html>.

³⁷ Kumar, C. (16 Dec 2022). Times of India. Vaccine: India projects need for 5.2 million to 11 million cold chain equipment. Available at <https://timesofindia.indiatimes.com/india/india-needs-5-2m-11m-cold-chain-equipment-to-handle-vaccine-govt-projects/articleshow/79748757.cms>.)

³⁸ John, E. (7 Jan 2016). Times of India. 1 in 7 Indians at risk of malaria, says WHO report. Available at <https://timesofindia.indiatimes.com/india/1-in-7-indians-at-risk-of-malaria-says-who-report/articleshow/50475094.cms>.

³⁹ Sarwal R; Prasad U; Madangopal K; Kalal S; Kaur D; Kumar A; Regy P; Sharma J. (2021). Investment Opportunities in India's Healthcare Sector. NITI Aayog. Accessed at https://www.niti.gov.in/sites/default/files/2021-03/InvestmentOpportunities_HealthcareSector_0.pdf

used to crowd in private capital to offer joint solutions for building both digital and human infrastructure, especially in rural areas.

Voices from the community elevate the importance of capacity building to build climate resilience for the long term⁴⁰.

Voices from the community: Ambojwadi, Maharashtra

A collective of residents in Ambojwadi — an informal settlement near the sea in northwestern Mumbai — with the help of a local NGO, have mapped out areas prone to flooding in the settlement and devised the first-response strategy in case of an extreme climate event. They are also sensitizing their community about the climate crisis, which is the first step towards enhancing climate resilience.

Summary

- Bold equitable bets can be prioritized for blended finance investments based on their potential social return, financial return and fit for blended finance
- Affordable heat resilience solutions, innovative point-of-care diagnostic devices, climate smart and resilient healthcare infrastructure, and climate resilient food and vaccine supply chains are solutions with potential for multiplier impact and can gain active funder interest. They can be prioritized for urgent action via blended finance route at climate-health intersection in India.
- Technologies for monitoring vector-borne diseases, digital augmented healthcare, and capacity building of workforce emerge as medium priority actions for blended finance

⁴⁰ Building India's Climate Resilience Through Community Action. (27 February 2024). Council On Energy, Environment and Water. Available at <https://www.ceew.in/blogs/building-climate-resilience-through-community-action-in-india>

Section 4: Pathways for ecosystem building and scaling blended finance deals in India

Many challenges hamper blended finance scaling in India, underscoring the need for diverse stakeholders to unite and take bold action

A lack of funder awareness regarding climate-health and limited data on the intersection limits funder activity. Insufficient comprehension of blended finance mechanisms, limited avenues for participation, and the resource-intensive process of structuring deals collectively impede the effective utilization of blended finance. There are multiple steps that different stakeholders in the ecosystem can take to address these challenges⁴¹:

1. Bring funders together on a unified platform to raise awareness about the pressing need for concerted action at this intersection.
2. Form a climate-health "knowledge hub" by consolidating pertinent resources to aid stakeholders in identifying areas of critical need and determining which activities to engage in.
3. Socialize frameworks and "how-to-guides" to standardize and streamline the application of blended finance instruments
4. Facilitate larger deals through a matchmaking platform, fostering collaboration between funders and investees

"Educating funders like us on how blended finance can drive solutions, which philanthropy alone cannot achieve, and commercial capital won't enter independently, will be beneficial." – **Prabhir Correa, Waterfield Advisors**

"Creating spaces for learnings of best practices and insights of civil society organizations working on ground is critical – allows to leverage the existing data, evidence and knowledge that already exists and can be part of a data platform" – **Parnasha Banerjee, Dasra**

"Funders are staying away due to complexities. We need to standardize and simplify instruments to create an opportunity for people to participate" – **Aravind Srinivasan, AVPN**

"Way forward to catalyze capital is to create and nurture collaboratives – with 5-6 corporates with intent, experience, & synergies in the domain, philanthropies, and an orchestrator of the collaborative among others." – **Prabhakar Lingareddy, ITC Limited**

⁴¹ Analysis of data from (i) Asha Impact, Asha Impact Trust, Aparna Dua, Shivika Chauhan, Maitreyi Menon, Swati Shah Gupta, Ramraj Pai, Divya Pinge (2023). The Blended Finance India Narrative A Decade of Blended Finance in India and What Lies Ahead. May 2023. Commissioned By Societe Generale. <https://ashaventures.in/wp-content/uploads/2023/05/The-India-Blended-Finance-Narrative-Report-1.pdf>; (ii) Convergence data. Available at: <https://www.convergence.finance/> (Accessed October 2023); and (iii) OECD database. Available at: <https://stats.oecd.org/> (Accessed October 2023)

Summary

- A multifaceted strategy is essential to strengthen the blended finance ecosystem in India. This strategy should focus on creating standardized frameworks and easy-to-understand guides to ease the entry process for newcomers in the blended finance ecosystem
- Furthermore, establishing a matchmaking platform that links funders with potential investors will enable larger, more effective deals. Such a platform will play a pivotal role in uniting various stakeholders, promoting collaboration

Section 5: Potential risks and mitigation strategies to scale blended finance solutions in India

Effective risk mitigation and diversification measures would be critical to create an enabling ecosystem for blended finance transactions to scale in India

There exist certain overarching risks with blended finance models, apart from specific risks that may be associated with the solutions or pathways that have been outlined above. These include:

Operational risks: While blended finance transactions can be a strong medium to attract scale capital to the development sector, complex deals can increase the potential for operational risks such as structuring errors or unintended delays.

Sustainability risks: Finding an agreement amongst multitude of stakeholders present in a blended finance transaction with different expectations on returns and impact can be difficult. Misalignment in objectives can again pose risks in the form of inefficient use of funds and/or compromised project sustainability. Furthermore, there is a need for deep analytics to identify areas that require concessional finance, and the instruments that may be used in varied contexts. Neglecting these aspects can lead to inappropriate application of blended finance and again result in financially unsustainable models.

Market risks: Complexities, combined with lack of awareness about blended finance among investors, can make them hesitant to participate in future blended finance ventures, hindering the overall growth of the market. Lack of impact assessment and measurement mechanisms to showcase the impact of blended finance solutions also pose such risks as investors are only willing to fund what can be measured.

Reputational risks: When projects are not able to achieve intended outcomes due to any of the above risk factors, stakeholders can also suffer reputational damage, impacting future pipeline of solutions and fund availability for blended finance solutions.

Regulatory risks: The absence of a regulatory framework and lack of clarity on taxation for blended finance structures pose further challenges to the Indian blended finance ecosystem⁴². It is hence critical to undertake necessary policy initiatives and adopt adequate risk mitigation strategies to harness the complete potential of blended finance solutions⁴³:

1. Mitigation strategies:

- a. **Ensure clear alignment and transparency:** All blended finance transactions must be anchored to a development rationale while ensuring that it can unlock commercial

⁴² Blended Finance for Climate Investments in India. IFC. Available at <https://www.ifc.org/content/dam/ifc/doc/2023/Report-Blended-Finance-for-Climate-Investments-in-India.pdf>

⁴³ Blended Finance Guidance and Principles. OECD. Available at <https://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/guidance-and-principles/>

finance. It must be ensured that all stakeholders have a shared understanding of project goals, risk tolerance, and expected financial and social returns. Open communication channels and transparent reporting mechanisms may be established for this purpose.

- b. **Effective partnerships and risk allocation in blended finance transactions:** Mobilising commercial finance in a sustainable manner requires addressing the risk-return profile of transactions via balanced risk allocation between development and commercial partners. The ability to effectively and efficiently allocate and manage risks is central to success of blended finance.
- c. **Due diligence and impact assessment:** To ensure accountability on the appropriate use and value for money of development finance, blended finance operations must be monitored on the basis of clear results frameworks which measure and report on financial flows, commercial returns as well as development results.

2. Policy initiatives:

- a. Regulatory amendments and clarifications would be needed to allow easier blending of commercial capital with concessional sources in order to de-risk investments.
- b. Creation of standardized blended finance frameworks and reporting frameworks within the blended finance sector would go a long way in streamlining processes, reducing transaction costs, and increasing transparency.

Section 6: Recommendations to enable climate-health bold equitable bets

As the paper articulates, there is a need for sector shaping actions to build awareness, enable visibility and activate investments. There is a need to structure scalable blended finance solutions around the prioritized bold equitable bet themes to be able to drive impact at the climate-health intersection in India. Based on globally successful examples of scaled blended finance models and expert consultations to attune these models to local needs, three critical sector imperatives emerge (Figure 15).

Figure 15: Recommendations to enable climate-health bold equitable bets

	Innovation Fund for Climate and Health Resilience Solutions	Climate Smart Health Infrastructure Concessional Debt Fund	Heat Resilience Coalition & Climate Resilient Health Supply Chains Coalition
Description	A fund to provide innovation capital for well-tested solutions for heat, diagnostics & VBDs requiring support for financial sustainability	Concessional debt fund with catalytic funding from philanthropies & DFIs for low-cost lending by financial intermediaries for physical & human infrastructure needs in health sector	Alliances with key stakeholders to mobilize affordable capital, advocate for policy frameworks & promote research and knowledge creation to build ecosystem
Big bet themes	- Affordable heat resilience solutions - Innovative point-of-care diagnostic devices - Monitoring of vector borne diseases	- Climate smart & resilient healthcare infrastructure - Climate resilient food & vaccine supply chains - Digital healthcare & capacity building	- Affordable heat resilience solutions - Climate resilient food & vaccine supply chains
Stage of supported solutions	Early & Growth stage solutions	Mature stage solutions	Growth & mature stage
Source of giving	- Philanthropic Grants - Concessional debt by scale capital providers - Technical assistance	- Concessional debt and/or risk guarantees by lending institutions - Technical Assistance (TA)	- Philanthropic Grants - Concessional debt/risk guarantees by funders' coalition - Technical assistance
Avg ticket size	~\$ 1 mn (caters to small capital needs)	~\$ 5-10 mn (caters to large capital needs)	

Recommendation 1: Innovation Fund for Climate and Health Resilience Solutions

Heat, vector borne diseases and extreme weather events are critical need areas requiring urgent action

Various stakeholders have iterated that heat stress, vector borne diseases and climatic disasters like floods and droughts are the most critical climate change induced health risks

“Disaster events in the form of floods or heat waves will hugely affect South Asia. Systems need to be equipped for such disasters” - Aravindan Srinivasan, AVPN

facing India for next few years⁴⁴. Estimates suggest that over 100 crore people have faced very strong heat stress for more than 300 hours across a span of 80 days in North and Central India⁴⁵. This burden is only expected to get aggravated over time.

Figure 16: Critical climate induced health risks faced by India⁴⁴



Over **380M people** depend on heat exposed labour in India



180M people at high risk of contracting malaria in India



Two-fold surge in extreme floods across top 10 states in last 5 decades

“Climate change is likely to have a huge impact on the onset of vector borne diseases, due to changing weather and habitat patterns. Healthcare facilities might not be well equipped to handle this change.” - Sameer Shishodia, Rainmatter Foundation

WHO has suggested that India accounts for three-quarters of all malaria cases in Southeast Asia⁴⁶. With climate change causing changes in temperature and precipitation, vegetation patterns and human migration, incidence and severity of such diseases is only bound to increase in India.

India is the seventh most climate vulnerable country globally⁴⁷. There has been a rapid increase in extreme weather events, such as heat waves, droughts, floods, and cyclones, becoming more frequent and intense, causing widespread damage and loss of life in the country (Figure 16). August 2023 was reported to be the driest and warmest time for India in over hundred years⁴⁸.

Promising innovations however face numerous financing challenges

Though multiple innovative solutions are designed to overcome these evolving challenges, several roadblocks hinder their market growth. The innovators often struggle with high startup costs owing to limited precedence of inventions in such spaces and limited commercialization strategies to develop business models around the innovations. They also have limited access to networks of investors, advisors, and partners who can help them gain access to affordable finance and markets. These issues are compounded by unattractive risk-reward profile, given the nascent state of these segments presently characterized by high uncertainty. Greater financial support is therefore required to accelerate growth of market-ready innovations targeting the bottom of the income pyramid and facing the “critical valley of commercialization death”.

⁴⁴ Statistics sourced from: [WRI India](#) (2022), [World Health Organization](#) (2014), [Council on Energy, Environment & Water](#) (2022)

⁴⁵ Palanichamy, R. (22 July 2022). WRI India. Measuring and Mapping a Heatwave. Available at <https://wri-india.org/blog/measuring-and-mapping-heatwave>.

⁴⁶ World Health Organization (2014). Small Bite: Big Threat. Fact sheets on vector-borne diseases in India. Available at https://www.who.int/docs/default-source/searo/india/health-topic-pdf/vbd-fact-sheets.pdf?sfvrsn=c1908b04_2

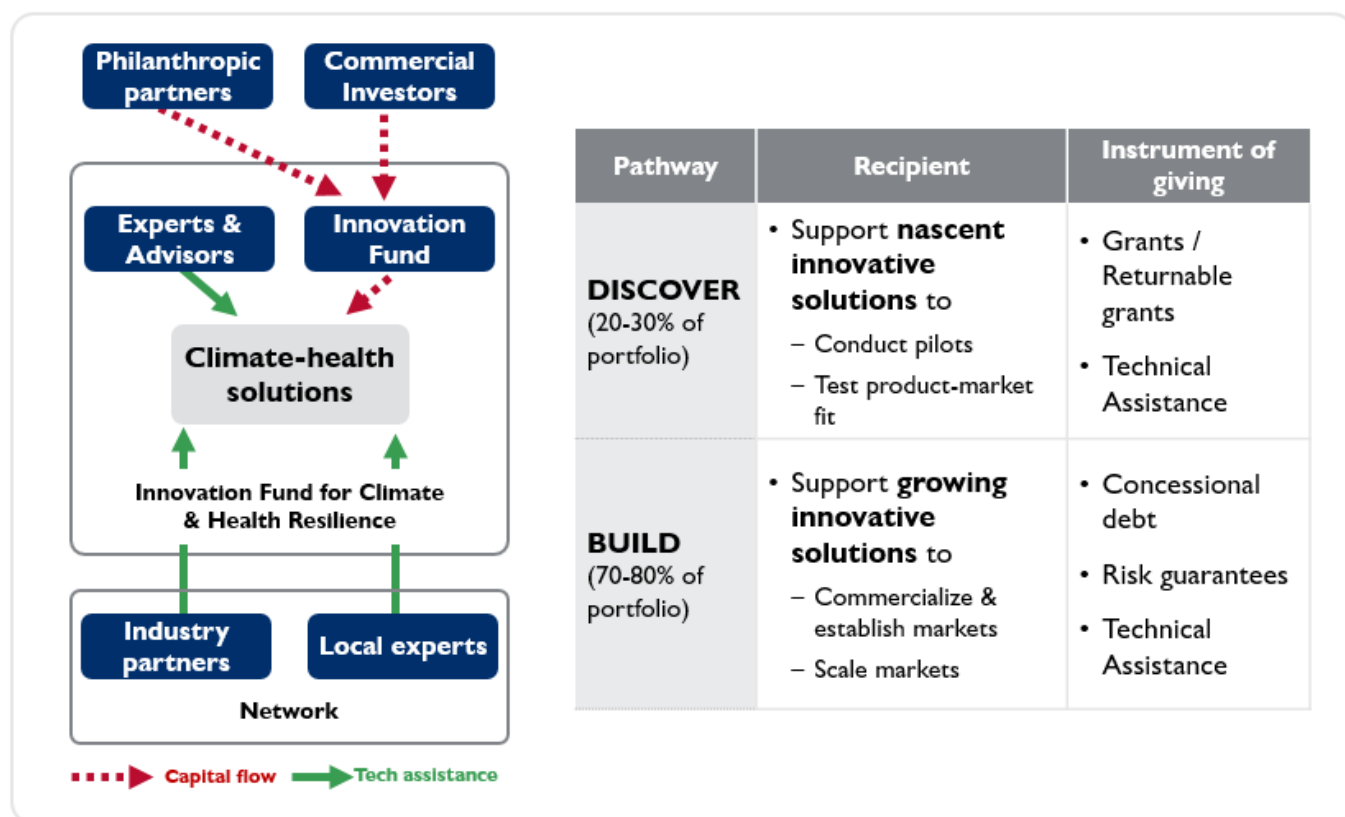
⁴⁷ Mohanty, A., & Wadhawan, S. 2022. The State of Extreme Events in India. Under exclusive licence to Springer Nature Switzerland AG 2022 R. Brears (ed.), The Palgrave Encyclopedia of Urban and Regional Futures. Available at https://doi.org/10.1007/978-3-030-51812-7_314-1

⁴⁸ Gupta, A. (8 Sept 2023). Weather News. Explained: What Factors Led to India Witnessing Its Hottest and Driest August in 122 Years. Available at: <https://weather.com/en-IN/india/news/news/2023-09-08-why-did-india-witness-its-hottest-and-driest-august-in-122-years>

Blended finance can be used to structure an innovation fund to ‘discover’ and ‘build’ innovators in climate-health intersection

To overcome these financing challenges, blended finance can be used to structure an innovation fund for solutions promoting climate resilience for improved health outcomes in India. The ‘Innovation Fund for Climate and Health Resilience’ can be used for aggregating concessional capital from philanthropic partners and scale capital from commercial investors to create a pooled fund of over 100 million dollars. This capital can be then used to support innovative solutions across the following themes: a) affordable heat resilience solutions (including rooftop whitening), b) technologies for early prediction, detection and monitoring of vector borne diseases, and c) innovative point-of-care diagnostic devices (including those for VBDs), which can help India tackle emerging health risks and extreme weather events.

Figure 17: Structure of ‘Innovation Fund for Climate and Health Resilience Solutions’



It is envisaged that the fund would support such solutions via two major pathways (Figure 17):

- **‘Discover’ pathway:** Comprising 20-30 percent of the portfolio, returnable grants can be used to support nascent solutions that still need to demonstrate market potential.
- **‘Build’ pathway:** Comprising 70-80 percent of the portfolio, concessional debt and risk guarantees can be used to support growing solutions that are well-tested but need financial assistance to commercialize and scale.

Across the two pathways, the fund should also aim to provide customized technical assistance to both nascent and growing innovators, by onboarding an in-house panel of experts and industry advisors as well as partnering with a network of local experts and industry leaders.

This way, this innovation fund can engage with investors to pool innovation capital and help generate a pipeline of robust solutions via grant challenges and partner networks. It can provide customized technical assistance across business, operational and M&E functions during the initial stages for startups to be able to grow, commercialize and attract private capital from PE/VC investors at a later stage.

Voices from the community elevate the importance of embracing innovations to build climate resilience for the long term, especially vis-à-vis supporting nature-based solutions⁴⁹.

Voices from the community: Tandahara village, Odisha

10 self-help groups in Tandahara village, in the Puri district of Odisha, are regrowing Casuarina forests along the coast to reduce the impact of cyclones and seawater intrusion. The super cyclone of 1999 uprooted the vast stretch of Casuarina forest along the coast. However, the villagers believe they would not have survived the cyclone if not for the forest acting as a buffer. Communities, with support from local authorities, are thus looking to prioritize restoring natural ecosystems to better prepare against climate shocks, and innovation fund such as this could help catalyze the same.

⁴⁹ Building India's Climate Resilience Through Community Action. (27 February 2024). Council On Energy, Environment and Water. Available at <https://www.ceew.in/blogs/building-climate-resilience-through-community-action-in-india>

Global evidence suggests that leading actors in climate space are using such funds to create catalytic leverage and multiplier impact (Figure 18)

Case Study: Catalytic Climate Finance Facility by Convergence and Climate Policy Initiative⁵⁰

The Catalytic Climate Finance Facility serves as a prominent example demonstrating the power of blended finance for innovation. It is an innovation fund with an initial size of USD 12 million, designed by Convergence and Climate Policy Initiative, to support the implementation of climate adaptation solutions for agriculture in Sub-Saharan Africa and South Asia. With funding from three anchor donors, Bill & Melinda Gates Foundation, Global Affairs Canada, and Australia's Department of Foreign Affairs and Trade, the facility would target the acceleration stage when solutions face commercialization issues. With an ambitious plan to increase its funding up to USD 100 million, it is designed to support and launch promising solutions through grant funding and technical assistance.

India can learn from and build upon several climate innovation funds that are being used across the globe to accelerate innovations and create investible pipeline of solutions for mainstream investors⁵⁰.

Another useful example would be the Climate Innovation and Development Fund (CIDF) managed by the Asian Development Bank. The CIDF is a USD 25 million concessional financing fund established with grant commitments from Bloomberg Philanthropies and Goldman Sachs. The purpose of the fund is to support innovative and high impact climate mitigation and adaptation projects in India and Vietnam⁵¹. By de-risking projects via concessional finance mainly in the form of grants, the fund aims to leverage up to USD 500 million in additional financing for private sector innovation in clean energy solutions. In India, the fund is expected to mobilize 14 times its investment capital to support the purchase of 255 electric buses operating on 56 high traffic intercity routes to reduce 15,000 tons of CO2 emissions per year. In Vietnam, the fund aims to mobilize 44 times its investment capital to build 140 e-buses and 15,000 charging ports throughout the country⁵².

Figure 18: Leading examples of Climate Innovation Funds^{50,51}



With the global rise of innovation funds, there is a unique opportunity for Indian philanthropists and investors to spearhead such advancements in India and support groundbreaking initiatives at the intersection of climate and health sectors, to confront the dual threat of climate change and health risks.

An indicative list of some leading Indian innovators in the space who could be

⁵⁰ Climate Policy Initiative. (9 May 2023). Press release. Available at <https://www.climatepolicyinitiative.org/press-release/cc-facility-launches/>

⁵¹ Asian Development Bank. Available at <https://www.adb.org/what-we-do/funds/climate-innovation-development-fund>

⁵² Goldman Sachs. Available at <https://www.goldmansachs.com/media-relations/press-releases/2022/announcement-11-07-2022.html>

considered for potential investments is provided below in Figure 19⁵³.

Figure 19: Examples of innovative solutions at climate-health intersection that can be supported by Innovation Fund

Innovative point-of-care diagnostic devices	Affordable heat resilience solutions	Monitoring of vector borne diseases
 AI driven chest X-ray solution  AI powered cough analysis  Affordable & portable ECG device  AI based PoC screening	 Rooftop white paint  Cooling design solutions	 Drones for identifying vector hotspots  Sewage sensors for detecting vector borne diseases

Recommendation 2: Climate Smart Health Infrastructure Fund

There is an emerging need to build climate smart healthcare infrastructure and undertake capacity building of health workforce to adapt to climate change

On one hand, healthcare sector contributes to approximately 4.4 percent of global greenhouse gas emissions. Estimates suggest that if health sector were a country, it would be the fifth largest emitter on the planet⁵⁴. To reduce health sector's own carbon footprint, stakeholders have recognized there is an urgent need for concerted efforts to mitigate healthcare sector's own contribution to climate change.

On the other hand, climate change is likely to heighten disruptions and place overwhelming pressure on existing healthcare infrastructure with frequent cases of extreme weather events and outbreaks of infectious diseases resulting in considerable surge in demand for healthcare. It would be critical to build climate resilient healthcare infrastructure to prepare Indian health systems for these challenges.

Building climate smart healthcare infrastructure would therefore be a critical element in healthcare sector's climate mitigation and adaptation strategies. This can include measures like low carbon building design, adoption of renewable energy, switch to digital healthcare infrastructure, use of sustainable waste management infrastructure, use of sustainable transport, low carbon procurement and other climate resilience strategies.

"Whilst significant CSR spends goes to healthcare, it is necessary to ensure that the same is channelized in a way that it also addresses the existing and potential challenges of climate change on healthcare by integrating requisite solutions in the design and delivery" - L Prabhakar, ITC

⁵³ This is a not an attempt at due diligence of these solutions and this is non-exhaustive list curated using public sources.

⁵⁴ Karliner, J., Slotterback, S. Boyd, R., Ashby, B. & Steele, K. (September 2019). Health Care without Harm & ARUP. Health care's climate footprint. Available at https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf

"Capacity building of workforce like doctors, nurses and ASHA workers is crucial to enable use of all digital healthcare solutions such as telemedicine, digital therapeutics, AI based diagnosis etc. Capacity building needs to be the foundation of blended finance models to support such solutions." – Sunil Thakur, Quadria Capital

As echoed by the NAPCCHH by the Government of India, infrastructure development would have to be supported by capacity development of health workforce to create sustainable impact. The current demand of allied health professionals is already six times of the current supply⁵⁵. As climate change may further aggravate stress, it would be critical to build their capacities to understand climate-health linkages, manage surges and adopt remote

healthcare solutions. Special focus would be required on less- equipped local doctors in rural areas and healthcare workers like ASHAs.

While availability of scaled private finance seems to limit growth of green infrastructure, there is also a need to attract private capital to support scalable capacity building solutions

Estimates suggest that India needs over USD 10 trillion to achieve net zero emissions by 2070. With public and private sector efforts, green finance has gained momentum in India with steady growth in green loans, climate bonds and sustainable equity investments.

"Currently, health infrastructure is remote & spread out. Blended finance can give it economies of scale" – Ragini Chaudhary, Caspian Debt

However, given the scale of the problem, there is a need to attract more private capital to green infrastructure. Assessments show that global climate finance grew at a CAGR of 7 percent per annum between 2011-2020, but it must increase by 20 percent every year to avoid the worst impacts of global warming scenario⁵⁶. Blended finance can help fix this gap, but it is again noted that global climate focused blended finance flows from private sector investors decreased by 45 percent in 2020-2022 as compared to 2017-2019⁵⁷. Private capital growth has been limited due to high credit risk associated with such projects and lack of a robust pipeline of solutions. It would be critical to design simple blended finance instruments to unlock scale for affordable infrastructure solutions especially in the healthcare sector.

"We presently conduct physical trainings but aspire to build e-modules; finding appropriate agencies with good skills and affordable costs will be a prerequisite to make this change to e-learnings." – Anonymous

With regards to capacity building, though the need is well recognized, scalable capacity building models have been limited. It is expensive to build digital infrastructure for low-cost facilities and there are limited players in market offering such solutions. There is a need to attract private capital to build and support digital capacity building solutions to make them affordable for healthcare workers at the last mile.

⁵⁵ Sattva.(29 July 2022). Addressing the Gap in Supply and Demand for Allied Health Professionals. Available at <https://www.sattva.co.in/ski/addressing-the-gap-in-supply-and-demand-for-allied-health-professionals/>.

⁵⁶ Climate Policy Initiative (2022). Global Landscape of Climate Finance. Available at <https://www.climatepolicyinitiative.org/wp-content/uploads/2022/10/Global-Landscape-of-Climate-Finance-A-Decade-of-Data.pdf>

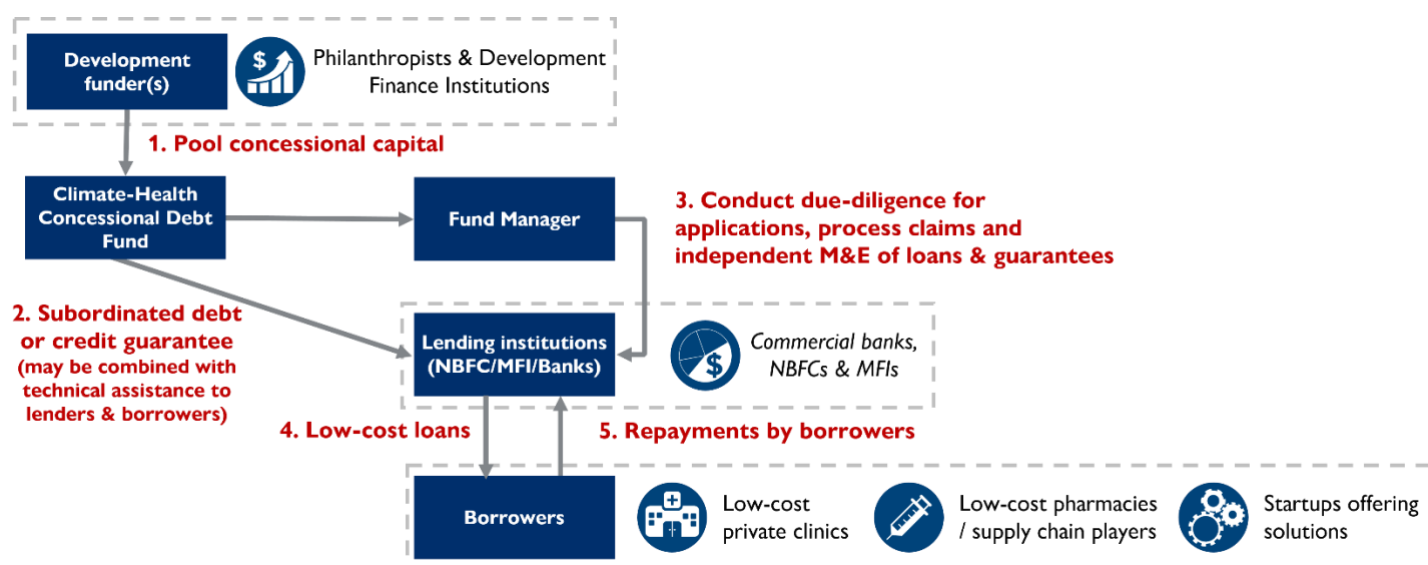
⁵⁷ Convergence (2023). State of Blended Finance. Available at <https://www.convergence.finance/api/file/3b1add1098b28f4b74fbf3e6432a1edb:e05444f6392b78b62aaf1fd55e8d00b3cd6f8e3626aa36f50953fb7f862cb499ea5435e4e94808053ab54ac7deaa9dedb3289f295ff31c5118f16dedc9b07ac682f132f56918164bd1b20871cd0856e24737de9a4d25ef38e34a61f13ae32720976260f8973c68fee7841cf133b7fa3a94b293f47590ca0a1c4d976c75f5029130762e73279e92b10b4ada3ff42c8a11>

Indian stakeholders can structure a concessional debt fund for low-cost lending by financial intermediaries to scale climate smart health infrastructure solutions

Blended finance can be used to solve for these dual challenges with physical and human health infrastructure. Blended capital can be used to structure the Climate Smart Health Infrastructure Fund, which is envisaged to be a concessional debt fund to reduce cost of capital for end users of infrastructure solutions.

It is envisaged that development funders such as philanthropists and development finance institutions can pool concessional capital to create this concessional debt fund, which can then be used to provide subordinated debt at below market rate of returns or risk guarantees to market lending institutions such as non-banking financial corporations (NBFCs), microfinance institutions (MFIs) and commercial banks (Figure 20). It is also recommended that financial assistance is combined with technical assistance for lending institutions to structure and manage such financial instruments as well as for borrowing entities to be able to adopt and use emerging green infrastructure solutions. This can aid in creating a robust pipeline of solutions and borrowers.

Figure 20: Structure of 'Climate Smart Health Infrastructure Fund'



Financial intermediaries can blend concessional capital with their own high-cost capital, in 20:80 ratio, to provide low-cost debt to following types of borrowing entities in India:

- **Low-cost private clinics and nursing homes**, especially in remote areas, in need of financial assistance to install renewable energy infrastructure, develop digital healthcare infrastructure and build capacities of their healthcare workers to adapt to climate change.
- **Low-cost pharmacies and smaller supply chain players**, who need support to switch to sustainable cooling infrastructure solutions.
- **Social enterprises offering climate smart healthcare and capacity development solutions** to remote and rural areas and require affordable capital to scale up markets.

The fund can be managed by a fund manager who can conduct due-diligence throughout the process to ensure that loan applications are duly scrutinized, claims are timely processed and to also

undertake conduct monitoring and evaluation assessments to assess on-ground impact of the loans and/or guarantees issued by the fund.

Voices from the community elevate the importance of supporting development of climate- resilient infrastructure⁵⁸.

Voices from the community: Idukki district, Kerala

49-year-old Jayachandran house was swept away in the 2018 floods in Kerala's Idukki district. When he rebuilt his house, he ensured that a thorough risk zonation mapping was undertaken, and the piece of land was certified 'not landslide-prone'. Additionally, the new house is climate-resilient and can withstand the impacts of present and future extreme floods. This example highlights the urgent need to support the development of climate-resilient infrastructure, especially in ecologically fragile regions such as hill stations and coastal regions.

Global evidence demonstrates the success of such models with 3X leverage reported for each dollar of donor capital in blended finance infrastructure projects⁵⁹

Multiple global efforts (Figure 21) illustrate the success of similar lending models using blended finance⁶⁰.

Figure 21: Leading examples of debt funds and risk guarantees for infrastructure projects^{60,61}



The International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA) of the World Bank Group run Private Sector Window (PSW) to expand private investment towards SDG goals. As part of USD 2.5 billion PSW, they have allocated USD 1,000 million to the Risk Mitigation Facility to provide project-based guarantees to 70+ borrowers for large infrastructure and public-private partnership (PPP) projects across 100+ countries⁶¹.

⁵⁸ Building India's Climate Resilience Through Community Action. (27 February 2024). Council On Energy, Environment and Water. Available at <https://www.ceew.in/blogs/building-climate-resilience-through-community-action-in-india>

⁵⁹ USAID. Unleashing Private Capital for Global Health Innovation: Innovator and Investor Support Opportunities. Available at https://www.usaid.gov/sites/default/files/2022-05/USAID_Private_Capital_508.pdf.

⁶⁰ European Bank for Reconstruction and Development. Sustainable Energy Initiative. Available at <https://www.ebrd.com/what-we-do/sectors-and-topics/sustainable-resources/seffs.html>.

⁶¹ The World Bank Group. (21 April 2017). De-Risking Private Sector Operations in Frontier Markets. Available at <https://thedocs.worldbank.org/en/doc/df88737b43e3b084fb9186a0b100e483-0410012017/original/psw-updated-may-2017.pdf>.

An indicative list of some leading Indian solution providers who could be considered for potential infrastructure investments is provided below in Figure 22.

Figure 22: Examples of growing solutions at climate-health intersection that can be supported by the Infrastructure Fund

Climate friendly and resilient health infrastructure	Climate resilient food and vaccine supply chains	Digital augmented healthcare and capacity building of health workforce
 COVID-19 plastic waste management  Drone-based delivery network for healthcare  Waterless Products For Critical Care And ICU Patients	 Sustainable vaccine cold chain technology  TECHNOLOGY FOR A BETTER WORLD Pharmaceutical cold containers using phase change materials	 Critical Care Hopes Hub & Spoke Tele ICU Model  Skill development of healthcare workers  Hyper local digital health platform  Capacity Building of Health Workers

Case Study: Sustainable Energy Financing Facilities by the European Bank for Reconstruction and Development⁶¹

The European Bank for Reconstruction and Development (EBRD) showcases the global effectiveness of blended finance through its Sustainable Energy Financing Facilities. These facilities have actively provided about 2.8 billion Euros in credit lines to over 100 local financial institutions. This capital has been pivotal in lending to over 75,000 small businesses and residential clean energy users, including small-scale renewable energy project developers across 22 countries. Beyond financial support, the EBRD's role extends to technical assistance in project assessment and due diligence. This approach underlines how blended finance goes beyond mere funding, significantly contributing to the enhancement of project design and execution.

Recommendation 3: Heat Resilience Collaborative and Climate Resilient Health Supply Chains Collaborative

Given the multidimensionality of heat stress and multiple issues in climate proofing health and food supply chains in India, there is a need for collaborative action

Figure 23: Pathways to develop climate-health intersection field in India



As elaborated upon in previous sections, various segments of climate-health intersection are still at a nascent stage in India. Consequently, blended finance alone cannot help until it is elevated as a key priority by stakeholders, favorable policy and regulatory frameworks are created and research is undertaken to develop impactful solutions at the intersection. This creates a need for varied field building initiatives, as highlighted in Figure 23.

Specifically, stakeholders elevated the need to adapt to heat stress and climate proof health and food supply chain ecosystem as two major areas where a wide network of partners would need to bring together diverse capabilities to enable systemic change. This would not only help in creating a compelling narrative around

these critical gap areas, but also support in channelizing larger funding pools to conduct research, produce knowledge, and develop solutions to resolve these complex challenges. Collaboratives among philanthropists, CSR institutions, other funding institutions, research institutions, community-based organizations and solution providers can take integrated action to protect Indian communities from heat stress, ensure nutrition security and safeguard healthcare supply chains.

Global evidence also suggests that coalitions are quite successful in engaging governments, private sector and development partners around a common impact mission, especially when it comes to cross-functional climate initiatives. Examples include the 'Extreme Heat Resilience Alliance' hosted by the Adrienne Arsht-Rockefeller Foundation Resilience Center for multi-sectoral heat resilience efforts in urban cities across USA, Greece, and Sierra Leone⁶². The alliance focuses on educating decision makers, co-developing heat risk reduction policies and providing affordable capital, among other activities. Another notable example in local context is 'India Cooling Coalition' formed with the support of Shakti Sustainable Energy Foundation⁶³. It is a multi-stakeholder group with

⁶² Adrienne Arsht-Rockefeller Foundation Resilience Center. Extreme Heat Resilience Alliance. Available at <https://onebillionresilient.org/project/extreme-heat-resilience-alliance/>

⁶³ India Cooling Coalition. Available at <https://indiacoalition.org/>

representation from non-profits, research institutes and industry associations to endorse policy changes, create and share knowledge to improve access to sustainable cooling solutions in India.

In this context, two collaboratives to build heat resilience and decarbonize healthcare and food supply chains were recognized to be crucial pathways to prepare India’s healthcare systems for climate change.

3a. Heat Resilience Collaborative

Indians are vulnerable to heat stress from multiple angles, necessitating well-coordinated and multi-sectoral actions to build heat resilience solutions in India

Over 90 percent of India is at extremely high risk of heat stress, which can have catastrophic impact on health by disrupting education, livelihoods, food security, housing, power, and many other allied pathways (Figure 24).

“Women spend a significant amount of time carrying water and water transits become more difficult with heat stress. Women often face the most visible brunt of heatwaves with a high number of heat related deaths observed among women.” – Prabhir Correa, Waterfield Advisors

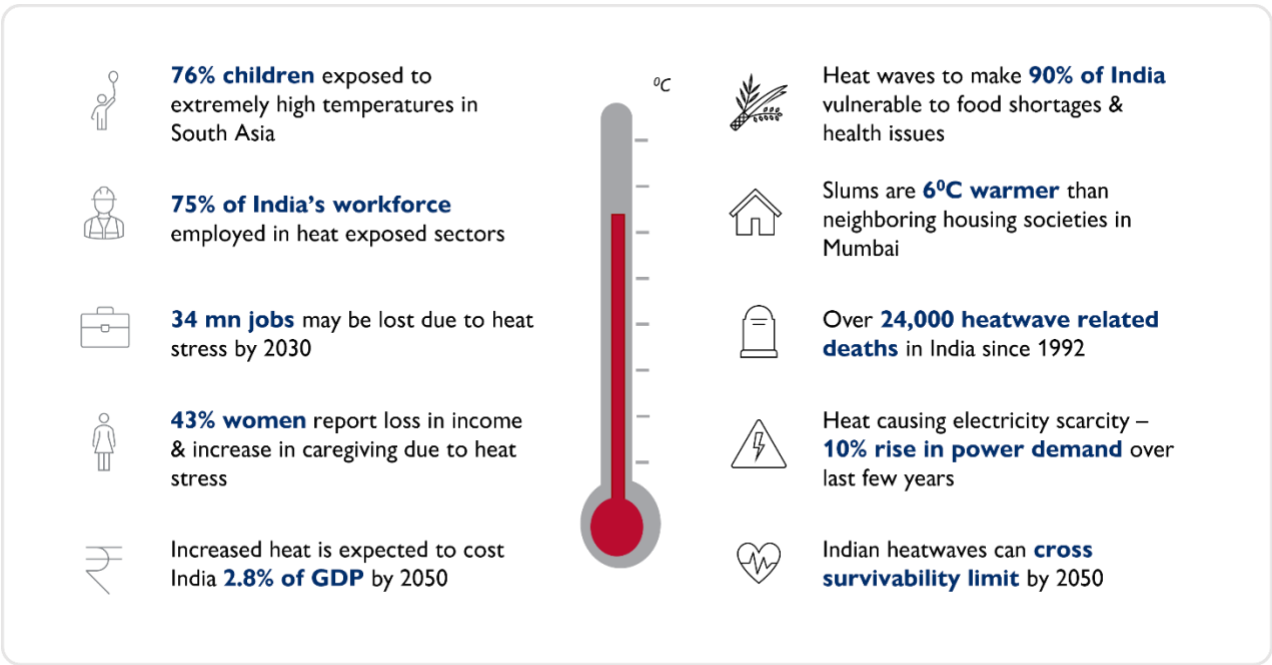
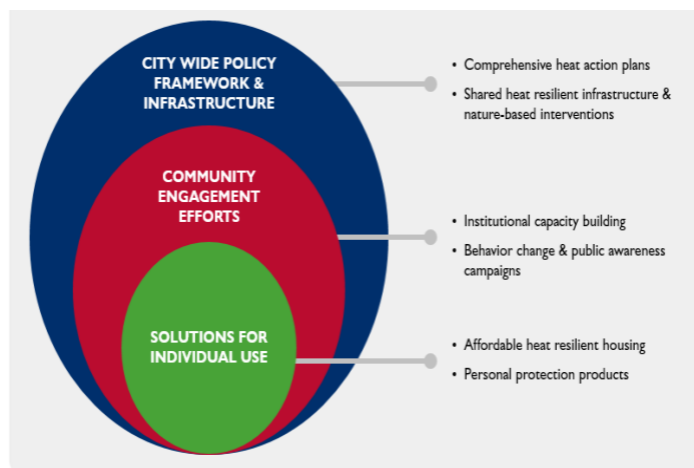


Figure 24: Impact of heat stress on India⁶⁴

⁶⁴ Statistics sourced from: [Deccan Herald](#), [Mongabay](#), [UNICEF](#), [TIME](#), [Hindustan Times](#)

This multi-dimensional effect of heat stress on human health in India makes it impossible for funders and private sector solutions to solve this problem all alone. It creates an imperative for well-coordinated actions by private sector along with government, communities, local bodies, and research institutions to effectively combat heat stress in India. As Figure 25 illustrates, varied stakeholders would have to take multi-pronged efforts at three broad levels of the ecosystem:

Figure 25: Multi-stage efforts required for heat resilience in India



- Private sector and philanthropic partners would play a crucial role in developing and supporting sustainable heat resilience solutions for household use, especially those targeted at low-income individuals
- Community-based organizations would be required for undertaking local initiatives such as capacity building of health workforce and allied professionals like ASHA workers and public awareness campaigns to promote these solutions
- Government players and local bodies would have to create heat action plans and develop shared infrastructure for heat resilient cities like water dispensers and green shades.

Voices from the community elevate the importance of government action to support solutions to mitigate impact of climate change⁶⁵.

Voices from the community: Rudraprayag district, Uttarakhand

In Uttarakhand's Rudraprayag district, Mandakini ki Awaaz — a community radio station — has become an invaluable link between the government and the communities in improving the effectiveness of early warning systems. They regularly correspond with the State Disaster Management Authority and the India Meteorological Department, Dehradun, to relay accurate and up-to-date weather information and early warnings. Scaling up such initiatives via government support could help fortify climate-resilient solutions.

⁶⁵ Building India's Climate Resilience Through Community Action. (27 February 2024). Council On Energy, Environment and Water. Available at <https://www.ceew.in/blogs/building-climate-resilience-through-community-action-in-india>

Indian stakeholders can partner with each other to form ‘Heat Resilience Collaborative’ to undertake multi-pronged efforts for heat resilience in India

Against this backdrop, it is recommended for key actors in climate and health space in India to join hands to create India’s first Heat Resilience Collaborative. The alliance can intervene via multiple pathways to fast-track the journey of creating heat resilience cities and villages in India (Figure 26):

- **Policy advocacy and capacity building:** The coalition can partner with think tanks and government stakeholders to educate decision makers about adverse heat impact and key mitigation and adaptation measures under the NAPCCHH. They can also associate with local bodies to co-create heat action plans and early warning systems in vulnerable areas.

- **Knowledge creation and dissemination:** Research institutions can develop knowledge series and toolkits on heat resilience solutions in India and facilitate dialogues among promising researchers and innovators, industry associations, and key funders to promote growth of sustainable heat resilience solutions in India. NGOs and civil society organizations (CSOs) can also be onboarded to conduct awareness and outreach activities to generate demand at the last mile.

- **Affordable finance:** Concessional and commercial investors can partner to structure simple blended finance instruments, as detailed in previous sections, to support affordable heat resilience solutions. It would also be crucial to disseminate this knowledge for its widespread adoption by other actors.
- **On-ground implementation support:** Given certain heat resilience innovations such as use of phase change material for housing are still not well commercialized, the collaborative can play a key role in conducting pilots in partnerships with decision makers and community-based organizations to test promising solutions. Learnings can be documented for wider dissemination among stakeholders.

Figure 26: Suggested focus areas of the Heat Resilience Collaborative



3b. Climate Resilient Health Supply Chains Collaborative

There is an urgent need to decarbonize healthcare, pharmaceutical and food supply chains, necessitating partnerships among industry players and solution providers^{66,67}

"Ensuring agile and climate resilient supply chains and delivery mechanisms for food, preventive and curative healthcare, potable and drinking water, etc. is most important in the context of managing and responding to extreme weather events and consequent disasters. These supply chains need to reach the affected communities and people with speed and basis specific and localized requirements." - L Prabhakar, ITC

However, most players across healthcare and food supply chains continue to rely on fossil-fuel based cold storage and transportation solutions due to multiple challenges. First, there is a lack of aggregated demand for green supply chain services from major pharmaceutical companies and food retailers, which can create a demand-driven pull for sustainable products. Second, some smaller segments who can use these solutions at the last mile, being allied health workers and farmers, often don't have adequate awareness or capacities to adopt sustainable cold chain solutions. Third, transition to greener cold chain alternatives would require overhaul of infrastructure which involves high financial costs. Finally, there is also need for policies supporting cold chain development and promoting R&D in this field to create a more robust pipeline of cold chain solutions using alternative technologies.

"Cooling technologies are very important not just for buildings but also for agricultural and vaccine supply chains. Currently, logistics of sustainable supply chains is very expensive. There is a need to make it affordable and scale it up, especially with low costs technologies for farmers. This can have a multiplier impact if we get it right." – Shivangi Bubna, Mumbai Angels

The 'Climate Resilient Health Supply Chains Collaborative' can be designed by industry allies to build the field for sustainable cold chain solutions in India

The issue requires integrated action by several stakeholders to aggregate demand and provide financial incentives to users. This can be supported by advocating for necessary policies to support innovation and create sustainable cold chain solution to decarbonize India's healthcare and food supply chains.

Accordingly, it is recommended that industry leaders can partner with solution providers and other supporting actors such as key funding institutions, think tanks, academic and research institutions to form the Climate Resilient Health Supply Chains Collaborative. The collaborative can prioritize demand mobilization, innovative financing, policy advocacy, capacity building and promoting research and development activities in the space.

⁶⁶ Health Care without Harm. (2019). Health Care's Climate Footprint. Available at https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf ;

⁶⁷ The CSR Journal. (2023). Food Wastage In India, Its Implications on Nutrition and Sustainability. Available at <https://theCSRjournal.in/food-wastage-in-india-a-serious-concern/>

Figure 27: Focus areas of Climate Resilient Health Supply Chains Collaborative

 Demand mobilization	 Affordable finance	 Policy advocacy, capacity building and R&D
• Mobilize collective demand for sustainable cold chain solutions via large scale agreements • Involve leading pharma & health giants & FMCGs via sustainability commitments • Connect suppliers with buyers for better outreach & to share market opportunities	Use blended finance to scale up promising solutions – Via concessional debt & risk guarantees – Technical assistance to help solutions commercialize • Disseminate knowledge on role of blended finance in supporting cold chain solutions in India	• Support creation of policy incentives to enable private sector's transition • Raise awareness & develop capacities of farmers & healthcare workers to adopt new solutions • Support researchers to innovate & test alternative technologies with potential for scaled adoption

On the demand side, it would be crucial for the collaborative partners to build networks with leading pharmaceuticals and food industry giants to mobilize scaled demand in the form of sustainability commitments and large-scale agreements. This would also help in sending clear demand signals to solution providers and boosting the market for such products. On the supply side, provision of affordable finance to promising innovators can help in de-risking of innovations and scaling them for commercialization. (Figure 27)

The collaborative can also undertake other crucial steps to develop a thriving ecosystem for sustainable cold chains for pharmaceuticals, vaccines, and food products. The coalition can advocate for the creation of policy frameworks to provide financial assistance to players switching to sustainable alternatives. Support to researchers testing new technologies and capacity building of smaller users like low-cost clinics and farming units to be able to use these technologies would also require continuous coordination among philanthropists, think tanks and community-based organizations as part of the coalition.

Section 7: Implementation plan for suggested recommendations

Over the short-medium term, various ecosystem stakeholders can work collaboratively to undertake the following measures, ensuring the effective implementation of the report's recommendations:

- 1. Disseminate learnings about climate health and generate awareness among stakeholders:**
 - a. Curate thematic convenings on key issue areas at the climate-health crossroads, emphasizing the role of blended finance in driving action
 - b. Leverage events or platforms by other stakeholders for socialization of report, field building, and funder engagement
- 2. Ensure consistent monitoring and knowledge sharing:**
 - a. Collaborate on creating evidence regarding the efficacy of climate-health models, support documentation of best practices of narrative implementation, and contribute to specialized insights
 - b. Regularly share insights and lessons learned with the broader ecosystem regarding program implementation and structuring blended finance deals
- 3. Build the field for innovative financing in India:**
 - a. Engage in dialogue with various stakeholders and funder archetypes to standardize norms
 - b. Advocate for policies that encourage easy and scalable blended finance transaction
 - c. Establish a task force to streamline communication between funders, intermediaries, government entities, and other stakeholders
- 4. Capacity Building of government officials:**
 - a. Build capacity of government officials regarding the function and running of the blended financing framework
- 5. Sensitize the private partners to the government's public health goals**

In the medium to long term, a robust regulatory framework is imperative for blended finance models in climate and healthcare to succeed. Such a framework should encompass clear guidelines for safeguarding interests of various stakeholders, ensure strong linkages to health indicators and promote an ecosystem that enables risk taking and innovation. Striking the right balance between private sector incentives and social outcomes will be important to enhance adoption and propagation of such models.

Section 8: In Conclusion

The potential impact of climate change on healthcare presents a significant and growing challenge, particularly for vulnerable communities in India. Blended finance has emerged as a promising approach to address this challenge as it combines both public and private capital. This combination helps spur innovation and scale climate resilient and adaptive healthcare solutions.

Based on secondary research and expert insights, it is evident that several big-bet opportunities exist across seven key climate-health-centric themes. This presents significant potential for funders to drive action and make strategic investments at this crucial intersection. These big bets are centered around –

- (i) Digitally augmenting healthcare systems for climate resilience
- (ii) Promoting affordable heat resilience solutions
- (iii) Preventing surge of vector-borne diseases
- (iv) Supporting innovative and affordable technologies for health monitoring and diagnosis
- (v) Ensuring access to clean air and safe water
- (vi) Assuring food security and nutrition for poor in face of agricultural vulnerabilities
- (vii) Developing climate-smart and climate resilient healthcare infrastructure

To formulate simple and scalable blended finance solutions centered on the identified priority themes, three overarching recommendations have surfaced. These recommendations will bolster emerging social enterprises through blended finance in India's evolving climate-health intersection. These narratives encompass promoting the following funds and coalitions:

1. **Innovation fund for climate and health resilience solutions** to support innovative solutions across the following themes:
 - a. affordable heat resilience solutions (including rooftop whitening)
 - b. technologies for early prediction, detection, and monitoring of vector-borne diseases
 - c. innovative point-of-care diagnostic devices (including those for VBDs), which can help India tackle emerging health risks and extreme weather events.
2. **Climate smart health infrastructure concessional debt fund**, funded by catalytic funding from philanthropies and DFIs for low-cost lending by financial to scale mature-stage climate-smart health infrastructure solutions.
3. **Heat resilience coalition and climate resilient health supply chains coalition:** Alliance with key stakeholders to mobilize affordable capital, advocate for policy frameworks, and promote research and knowledge creation to build the ecosystem.

Besides specific interventions, there is a need to build the ecosystem for BF transactions in India. To drive BF transactions, tackling challenges in funder awareness, data scarcity⁶⁸ and deal-structuring complexities is imperative. Stakeholders must act with urgency to create a centralized knowledge hub and standardize BF processes through shared frameworks. Encouraging collaboration via matchmaking platforms is essential to enable substantial deals. This will unlock the potential of BF for addressing India's pressing climate-health challenges.

⁶⁸ The lack of evidence on the climate's impact on health, diligence of organizations engaged in impactful work, investment methodologies and opportunities.

Appendices

Appendix 1: Overview of sixteen bold equitable bet opportunities across seven themes

The sixteen bold equitable bet opportunities across the seven themes have been detailed below:

Bold Bet Theme 1: Digital augmented healthcare systems for climate resilience

Frequent outbreaks of infectious diseases and extreme weather events can increasingly cause disruptions to on-ground health facilities. Consequently, there is a strong role for digital healthcare in optimizing energy use to mitigate climate change as well as in ensuring affordable access to high-quality healthcare services amid climate risks. Blended finance can play a role in making digital healthcare accessible to rural areas by equipping low-cost health facilities with necessary digital infrastructure, scaling digital solutions for capacity building of health workers and catalyzing innovation in remote patient monitoring solutions to optimize the use of scarce human resources in the face of climate risks. Accordingly, stakeholders elevated the following solutions for blended finance applications:

Bold Bet Theme 1: Digital augmented healthcare systems for climate resilience

Potential bold equitable bet solutions

- **Upgradation and certification program for low-cost privately-run hospitals to be digitally hybrid to offer teleconsultation solutions**
 - *Certifying hospitals to build digital infrastructure and undergo training for teleconsultation solutions*
 - *Improving access to quality healthcare by linking rural areas to specialized care providers in urban areas*
- **Digital platform for capacity building of frontline health workers like doctors, nurses, ASHA workers to prepare them for climate sensitive diseases and related surges**
 - *Using digital training platforms to upskill healthcare personnel and frontline workers to be able to address climate change and related health effects, appropriate to their role and function*
- **Affordable remote patient monitoring (RPM) solutions for patients with chronic conditions like cardiovascular diseases, cancer and other diseases in remote locations**
 - *Developing remote patient monitoring solutions to allow continuous monitoring of patient vitals via sensors and share this data with physicians to raise alarms.*

Bold Bet Theme 2: Affordable heat resilience and clean cooling solutions for people

More than 90 percent of the India population is at an extremely high risk of heat stress impacting health via disruptions in livelihoods and food production as well as increased risk of vector borne diseases⁶⁹. However, most heat resilience solutions are not well developed and are still at early growth stages of their business lifecycle. Blended finance has a crucial role in catalyzing the use of new technologies to develop affordable solutions to protect lives and livelihoods of vulnerable populations from extreme heat stress. Sustainable heat resilience solutions which can be customized to local contexts and have significant investment potential were identified and have been elaborated below.

Bold Bet Theme 2: Affordable heat resilience and clean cooling solutions for people *Potential bold equitable bet solutions*

- **Rooftop whitening solutions for all types of buildings**
 - *Developing a market for rooftop whitening for commercial, official, and high-end residential buildings*
 - *Supporting startups to make these solutions accessible to poor communities*
- **Phase change material solutions in walls for all types of buildings**
 - *Using phase change materials for commercial, official, and high-end residential buildings*
 - *Supporting startups to make these solutions accessible to poor communities*
- **Affordable cooling design solutions for housing of all types of buildings**
 - *Supporting startups who provide cooling design solutions based on local conditions such as rooftop gardening, using recycled materials for insulation in roofs, evaporative cooling, and radiant cooling*

⁶⁹ Pailoor, A. (30 April 2023). Deccan Herald. Silent scorchers: Karnataka's rising heat. Available at <https://www.deccanherald.com/india/silent-scorchers-karnataka-s-rising-heat-1214266.html>.

Bold Bet Theme 3: Integrated approach to control vector borne diseases

One in seven Indians are currently at the risk of malaria⁷⁰. Climate change is likely to further increase the risk and accelerate the spread of infectious diseases with higher temperatures and humidity and changing precipitation patterns. The situation calls for integrated vector management solutions to predict outbreaks, detect community spread and undertake immediate action to prevent outbreaks. While there are multiple latest technologies that could be used for early detection and vector control, e.g., drones and city sewage surveillance systems, these solutions have only been piloted and have not yet scaled up. Blended finance can help these innovators gain access to low-cost innovation capital to test product-market fit and demonstrate market potential. Additionally, ensuring sustainable access to vaccines would also be equally important to protect lives from infectious diseases. Accordingly, two major types of impactful innovations were identified as promising investment opportunities in this segment.

Bold Bet Theme 3: Integrated approach to control vector borne diseases

Potential bold equitable bet solutions

- **Digital monitoring technologies for prediction, detection, triage, and rapid action for controlling epidemics of malaria, dengue, chikungunya, and other vector borne diseases**
 - *Use of new technologies like sewage sensors for quick and automated prediction of occurrence of vector-borne diseases in communities*
 - *Use of social tracing apps for automated information on transmission of vector-borne diseases*
- **Innovation for ensuring sustainable vaccine cold chains (especially for vector borne diseases such as malaria, dengue, chikungunya etc.)**
 - *Use of climate friendly technologies for stationary and mobile vaccine cold rooms at regional level*
 - *Use of climate friendly technologies for vaccine refrigeration in health facilities and pharmacies*

⁷⁰ John, E. (7 Jan 2016). Times of India. 1 in 7 Indians at risk of malaria, says WHO report. Available at <https://timesofindia.indiatimes.com/india/1-in-7-indians-is-at-risk-of-malaria-says-who-report/articleshow/50475094.cms>.

Bold Bet Theme 4: Innovative and affordable technologies for health monitoring and early diagnosis

Use of new information technologies can be a game changer in ensuring better delivery of health interventions, especially amidst growing climate risks. Satellite based remote sensing technologies have proven effective in surveillance of climatic conditions like heatwaves, floods, and related health threats. Artificial intelligence algorithms are being widely used to monitor personal health threats and can be contextualized for climate related threats. Integrating technologies with medical products can help make the health system more climate resilient in a cost-effective manner. However, given these technologies are at a nascent stage of development, blending philanthropic capital is required to balance the risk-return profile and attract commercial capital to such solutions. Promising investment opportunities in this segment have been highlighted below.

Bold Bet Theme 4: Innovative and affordable technologies for health monitoring and early diagnosis

Potential bold equitable bet solutions

- **AI-based self-health assessment applications for climate sensitive health risks for self-monitoring of physical and mental health**
 - *Developing AI-powered health and wellness applications for determining personal exposure to climate change related health threats*
 - *Using AI in apps to offer customized healthcare advice based on personal exposure and symptoms*
- **Innovative point-of-care diagnostic devices for quick diagnostics of climate-health risks like cardiovascular diseases, respiratory diseases and vector-borne diseases**
 - *Embedding AI in PoC diagnostic devices for healthcare professionals for improving patient outcomes*
 - *Enables quicker and more accurate detection of vector borne diseases and aids in reducing carbon emissions by limiting travel*
- **Geospatial data-based surveillance platform for climate sensitive health risks for risk mapping of geographies / populations and early warning systems for heatwaves, and floods**
 - *Developing climate-health information systems providing continuous evidence*
 - *Assessing which populations/areas are most vulnerable to which health effects and early warnings*

Bold Bet Theme 5: Ensuring access to clean air and safe water especially in face of climate related deterioration

Air pollution has caused over 1.1 million premature deaths in 2017 in India, of which ~50 percent was due to exposure to outdoor particulate matter pollution⁷¹. Given that sources for air pollution and climate warming are similar, air pollution and climate change need to be addressed. Similarly, climate change, via disrupting weather patterns and triggering extreme events, is exacerbating water scarcity, and contaminating water sources. By 2040, almost one in four children across the world would live in areas of extremely high water stress due to climate change effects⁷². To protect marginalized sections of the society from such emergent health threats, it is crucial to make low-energy air and water purifying solutions accessible to them. While such solutions exist for affluent sections, it would require significant catalytic capital to decrease the cost of borrowing and make these products affordable for vulnerable segments.

Bold Bet Theme 5: Ensuring access to clean air and safe water especially in face of climate related deterioration

Potential bold equitable bet solutions

- **Affordable water and air purifiers for poor and vulnerable segments to ensure access to clean air and water**
 - *Deepening the market for air and water purifiers to reach the bottom of the pyramid*
 - *Supporting innovative startups ensuring access to clean air and water to rural areas*
-

⁷¹ Gurjar, B. (5 Apr 2021). TERI. Air Pollution in India: Major Issues and Challenges. Available at <https://www.teriin.org/article/air-pollution-india-major-issues-and-challenges>

⁷² UNICEF. (2 Mar 2023). Water and the global climate crisis: 10 things you should know. Available at <https://www.unicef.org/stories/water-and-climate-change-10-things-you-should-know#:~:text=Climate%20change%20is%20disrupting%20weather,that%20children%20need%20to%20survive.>

Bold Bet Theme 6: Ensuring food security and nutrition for poor in face of agricultural vulnerabilities and supply chain disruptions

India already faces elevated levels of malnutrition. Climate change is likely to have a further adverse effect on nutrition security, via its impact on food production such as reduced crop yields, soil degradation and increased risk of pests and diseases. To safeguard India from this looming health hazard, large-scale food fortification can be a cost-effective and well-proven way to tackle nutrition deficiencies. Moreover, with 40 percent of food produced getting spoilt in supply chains in India⁷³, it is critical to build climate resilient supply chains. That is, with climate vulnerabilities such as higher temperatures, extreme weather events and pandemics aggravating stressful conditions. While some market solutions have been developed to tackle these problems, blended finance would be required to scale these efforts to make them reasonably priced for adoption by poor and vulnerable segments like rural women, children, and small farmers.

Bold Bet Theme 6: Ensuring food security and nutrition for poor in face of agricultural vulnerabilities and supply chain disruptions

Potential bold equitable bet solutions

- **Affordable fortified food products to avoid nutrition deficiencies during climate risks with special emphasis on child malnutrition**
 - *Developing a market for affordable fortified food products like edible oil, wheat, rice, and milk*
 - *Supporting capital requirements for large-scale food fortification by MSMEs*
- **Building climate resilient food supply chains to ensure food security**
 - *Adopting climate resilient practices in food storage and processing such as desiccant dehumidification*
 - *Investment in energy efficient cold storages and transportation*

⁷³ Paulo, D., Smalley, A. & Yip, C. (15 Apr 2021). DBS. Why our food supply chain is flawed, and these champions' efforts to stop the waste. Available at <https://www.dbs.com/livemore/food/why-our-food-supply-chain-is-flawed-and-these-champions-efforts-to-stop-the-waste.html>.

Bold Bet Theme 7: Developing climate friendly and resilient healthcare infrastructure

With healthcare sector contributes to over five percent of global greenhouse gas emissions⁷⁴, it is vital to adopt climate mitigation strategies in Indian healthcare sector to reduce its own carbon footprint. Shifting to renewable energy and building low carbon infrastructure across the health value chain would be fundamental in meeting these climate goals. Furthermore, with climate change heightening the risk of health system disruptions, climate resilient healthcare infrastructure is necessary to protect against these uncertainties. While green infrastructure is already attractive to private finance, funding gaps do exist and there is a strong role for blended finance to create scaled investment opportunities by pooling capital from various sources, especially in the healthcare sector.

Bold Bet Theme 7: Developing climate friendly and resilient healthcare infrastructure *Potential bold equitable bet solutions*

- **Decarbonizing and climate proofing existing healthcare infrastructure to reduce health sector's greenhouse gas emissions**
 - *Use of renewable energy and energy efficient products at low-cost private healthcare facilities*
 - *Developing locally sourced, well distributed and energy efficient pharmaceutical supply chains for medical devices, generic drugs, and disposable items*
- **Building climate resilient healthcare infrastructure to withstand climate disasters like floods, landslides and coping with demand surges**
 - *Developing climate resilient building infrastructure for last-mile low-cost private healthcare facilities*
 - *Using new technologies such as drone deliveries to ensure access to healthcare during emergencies*

⁷⁴ Saha, S. (21 Apr 2023). Business Insider. Green finance — need of the hour for net-zero transition — is gaining momentum in Indian economy. Available at <https://www.businessinsider.in/sustainability/article/opinion-green-finance-need-of-the-hour-for-net-zero-transition-is-gaining-momentum-in-indian-economy/articleshow/99657828.cms>.

Appendix 2: Prioritization framework criteria for evaluation of bold equitable bets

The bold bet opportunities were assessed across criteria on social return, financial return and fit for blended finance.

To assess the opportunities on social return, four main criteria were considered:

Potential social return criteria	Description	Metric
<i>Degree of urgency</i>	Whether the opportunity caters to an urgent climate and health challenge according to the priorities of the Government of India?	Priority in NAPCCHH
<i>Measurable impact</i>	Whether there are clear, measurable, and universally agreed indicators that can be regularly used to monitor the social impact created by the opportunity?	Existing universally agreed indicators
<i>Multiplier impact</i>	If the investment opportunity is easily replicable and has the potential to be adopted at scale creating widespread and multiplied social impact?	Potential scale of impact
<i>Depth of impact</i>	If it is easily accessible for populations specifically vulnerable to climate change and has the potential to create significant deep impact for such segments like women, children, economically weaker sections, elderly tribals and Dalits among others?	Target group includes vulnerable populace

Financial return across the opportunities was evaluated based on two main criteria:

Potential financial return criteria	Description	Metric
<i>Financial return</i>	If there is a potential market role for the opportunity offering decent financial returns to commercial capital?	Potential market return
<i>Sustainability</i>	Whether there is a strong business proposition for it to be able to sustain operations and generate revenues beyond initial funding by capital providers?	Potential revenue streams

Finally, all opportunities were also gauged based on their potential for blended finance using the following two criteria:

Blended finance potentiality criteria	Description	Metric
<i>Role for enterprises</i>	Is the market prospect attractive for entrepreneurial ecosystem with multiple social enterprises or startups existing in or aspiring to enter the sector?	Presence of social enterprises
<i>Active funder interest</i>	Is it an attractive funding opportunity to both concessional and commercial capital providers like philanthropists, CSR organizations, development agencies, financial institutions, and PE/VC firms?	Interest from funder archetypes

Appendix 3: Detailed evaluation of sixteen bold equitable bets using the prioritization framework

Theme	#	List of bold bets	Potential social return				Potential financial return		Potential for blended finance		
			Degree of urgency	Measurable impact	Multiplier impact	Depth of impact	Financial return	Sustainability	Role for enterprises	Funder interest	
			Priority in NAPCCHH	Universally agreed indicators	Potential reach or scale	Targets vulnerable people	IRR / ROI	Final payer or revenue streams	No. of startups / SEs	Attractive to funders (Catalytic)	Attractive to funders (Commercial)
Digital augmented healthcare	1	Certification program for hospitals to be digitally hybrid	Yes	✓ No. of teleconsultations	17,000+ private hospitals	Yes	High	↑	10+	●	●
	2	Digital platform for capacity building of health workers	Yes	✓ % of workers equipped	7 mn+ healthcare professionals	Yes	High	↓	10+	●	●
	3	Affordable remote patient monitoring solutions	No	✓ No. of timely transfers	100 mn+ diabetic & elderly patients	Yes	High	↑	10+	●	●
Affordable heat resilience solutions	4	Rooftop whitening solutions	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	High	↑	1-5	●	●
	5	Phase change material solutions in walls	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	Medium	↑	1-5	●	●
	6	Affordable cooling design solutions for housing	Yes	✓ Difference in indoor temperature	40 mn+ households	Yes	Medium	↑	1-5	●	●
Lifecycle approach to control vector borne diseases	7	Digital monitoring technologies for vector-borne diseases	Yes	✓ Incidence rate of VBDs	180 mn+ people at risk	Yes	Medium	↓	1-5	●	●
	8	Innovation for ensuring sustainable vaccine cold chains	Yes	✓ % of vaccine wastage	7 mn+ cold chain equipment	No	High	↑	1-5	●	●
Innovative & affordable tech	9	AI-based self-health assessment applications	No	✗ Not attributable	110 mn+ potential users	No	Medium	↑	10+	●	●
	10	Innovative point-of-care diagnostic devices	Yes	✓ No. of diseases with PoC diagnostics, Hours saved	140,000+ Pvt labs & hospitals	Yes	High	↑	10+	●	●
	11	Geospatial data-based surveillance platform	Yes	✓ No. of diseases with surveillance	Widespread Use by govt, researchers etc.	Yes	Low to Medium	↓	10+	●	●
Safe Water & Air	12	Affordable water and air purifiers	No	✓ Indoor AQI, Water TDS	30 mn+ households	No	High	↑	1-5	●	●
Food security & nutrition	13	Affordable fortified food products	No	✗ Not attributable	180 mn+ potential consumers	Yes	High	↑	1-5	●	●
	14	Building climate resilient food supply chains	Yes	✓ % of food wasted	17,000+ cold chain equipment	No	High	↑	10+	●	●
Climate smart & resilient health infra	15	Decarbonizing & climate proofing existing healthcare infra	Yes	✓ Total energy consumption, GHG emissions	250,000+ hospitals and health centres	Yes	High	↑	10+	●	●
	16	Building climate resilient healthcare infrastructure	Yes	✓ Total energy consumption, GHG emissions	250,000+ hospitals and health centres	Yes	High	↑	10+	●	●



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