Reliance Foundation

ORF OBSERVER RESEARCH FOUNDATION

UNITED NATIONS INDIA

THE NEXT FRONTIER

Charting the Contours of the Post-2030 Development Agenda

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Attribution: Nilanjan Ghosh and Vanita Sharma, Eds., *The Next Frontier: Charting the Contours of the Post-2030 Development Agenda,* September 2024, Reliance Foundation and Observer Research Foundation.

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Editors: Nilanjan Ghosh and Vanita Sharma
Production: Antara Sengupta, Debosmita Sarkar, Sharon Sarah Thawaney, and Válter Gouveia
Design & Layout: Rahil Miya Shaikh

ISBN: 978-81-19656-05-9
ISBN Digital: 978-81-19656-45-5

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Editors' Note

Crossing the Rubicon: Framing the Development Agenda Beyond 2030

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The United Nations Sustainable Development Goals (SDGs) sit at the heart of the 2030 Agenda for Sustainable Development and are the pillars of global developmental governance. In September 2015, when the United Nations Sustainable Development Summit adopted the SDGs, the international community made an advance from the Millennium Declaration of the year 2000 that embodied the Millennium Development Goals (MDGs). The eight quantifiable targets under the MDGs found a more holistic embodiment in the 17 SDGs targeted to be achieved by 2030. Just as the SDGs replaced the MDGs in 2015, we need a new set of goals in a post-2030 era—targets that will be guided by the progress so far, the persisting challenges, and evolving human aspirations.

As the 2030 deadline fast approaches, the world finds itself at a critical crossroads. The quest for the apparently irreconcilable trinity of sustainability, efficiency, and equity—represented by the SDGs' environmental, economic, and social goals, respectively—remains the hallmark of the dominant global development governance paradigm. The 2023 mid-term SDGs review was a clarion call for urgent, accelerated action to meet the 2030 deadline, given that only a small percentage of the targets are on track to being fulfilled.[1] This massive shortfall in progress is being attributed to cascading global challenges, including the COVID-19 pandemic, climate change, and geopolitical conflicts. Yet, within these challenges lies an unprecedented opportunity—not just to fulfil the SDGs but to set our sights even higher in how we will approach global development after 2030.

It is in recognition of this pivotal moment that Reliance Foundation and Observer Research Foundation, in collaboration with UN India, conceived *The Next Frontier: Charting the Contours of the Post-2030 Development Agenda.* After the MDGs and the SDGs, the world will require new objectives beyond 2030 for a suitable global development governance framework. This volume builds on the momentum generated by our previous publication, *Ideas, Innovation, Implementation: India's Journey Towards the SDGs*[2]—highlighting lighthouse lessons from India's pioneering development efforts—and expands the conversation to confront what lies ahead.

The Next Frontier: Charting the Contours of the Post-2030 Development Agenda explores the strategies, innovations, and leadership required to forge a new global development agenda beyond 2030. The task calls for renewed ambition and innovative thinking from India and around the world. This publication comprises twenty-seven essays authored by a range of authors from the development, philanthropy, and think tank sectors, as well as policymakers and other thought leaders, carrying voices from both the Global North and the Global South.

This volume not only underlines the challenges that confront us but illuminates the pathways that can lead to a more resilient, inclusive, and sustainable world. To this end, the essays selected for this publication are organised around three themes: Inclusive Transformations, Resilient Progress, and Sustainable Evolutions. In these crucial endeavours, India stands as a beacon of leadership and innovation. With its advancements in domains such as digital transformation, health services, and inclusive growth, India is setting new benchmarks that could be replicated across the Global South, even as it also learns from the experiences of these other countries. Knowledge-sharing will be a valuable pathway for accelerating development, and this publication seeks to serve as a platform for such conversations.

About this Compendium

This volume is presented in six sections, and is concluded by a Postscript.

I. Bridging the Global North-South Divide

The north-south divergence in various development parameters is stark. Three essays highlight these gaps and explore plausible ways to bridge them. *Pamla Gopaul* calls for a collective effort by all nations—in both Global North and Global South—to work for the rebalancing of globalisation and create a just and more equitable world. *Anita Prakash,* in her piece, champions India as a voice of the Global South; she observes that the country is in an ideal position to initiate the call for global cooperation for aligning development programmes that need to include the climate goals. *Richard Hawkes* then introduces the readers to Outcomes-Based Finance (OBF), an innovative development financial instrument that links development funding to achieving verified outcomes.

II. Fostering Social Inclusion

The articles in this section address the equity or distributive justice pillar of the development discourse. *Abhishek Gupta, Priya Naik, and Irfan Nooruddin* highlight the case of an integrated framework of a multi-intervention micro-services model to provide market linkages, credit access, and social protection schemes along with entrepreneurship development; the aim is to unleash market forces and help alleviate poverty in India and other countries of the Global South. In the next essay, *Naina Batra* delves into the importance of turning to "transformational" and "humanised" financing as against the typical transactional relationship between funders, grantees, and beneficiaries of development assistance. Rural India has historically been projected as a prototype of underdevelopment, though policy initiatives over the last two decades have claimed to create perceptible impacts. *Atul Satija and John Paul* call for the last-mile reach of the developmental forces in order to include those communities in rural India who have been historically left behind. In their piece, *Pritha Venkatachalam and Shashank Rastogi* highlight the 'Pay What It Takes' approach to funding non-profit organisations at the forefront of delivering development initiatives at the grassroots.

III. Building Human Capital

This section of the compendium tackles the human capital challenge to the global development goals. *Brigid Freeman* emphasises the need for embedding resilience in higher education through diverse talent retention during emergencies and faculty development with AI proficiency. *Gloria Langat,* for her part, underlines the need to move the challenges of ageing populations to the centre stage of the development agenda, recommending a holistic and long-term approach to mobilising opportunities.

Next, *Sonam Yangchen and Oommen Kurian* argue that the post-2030 health agenda will be shaped by an interplay of various forces emanating from both the challenges of climate change and socio-economic inequalities, and the promise of technological advancements. They advocate for leveraging the strength of the community in making health systems climate-resilient. *Mitali Nikore,* in her essay, makes a call for the Global South to take leadership in building care economies for gender-inclusive global development. She outlines crucial recommendations for mainstreaming the care economy and promoting it to emerge as a force of inclusive growth. *Shruti Kapoor's* chapter then calls attention to the importance of addressing 'tokenism' in the pursuit of equity—to ensure representation of a minority or a historically marginalised group not only in the form of numbers, but by providing them concrete decision-making or leadership roles.

IV. Nurturing Food Security

Alice Ruhweza opens this section with a piece that focuses on the need to promote food security in Africa without compromising on conservation goals. She recommends a landscape approach to promote food and environmental security as a post-2030 development agenda. *Madhu Verma, Charu Tiwari, and Mahima Sharma* then describe the case of organic farming in the Indian state of Sikkim, and discuss the opportunities associated with adopting such a model as well as the challenges to implementation. *Ananya Awasthi and Shoba Suri* follow with their essay on inclusive governance, making a case for the creation of sustainable value chains and nurturing shock-resilient food systems towards food and nutritional security in the post-2030 world. *Sudarshan Thakur, Sumendera Punia, and Saroj Kumar Mahapatra's* contribution then offers compelling arguments for aligning sustainable agricultural practices with carbon markets and thereby helping the cause of farmers through Farmer Producer Organisations (FPOs).

V. Crafting Climate and Environmental Governance

This section of the compendium begins with an essay by *Madhurima Sarkar-Swaisgood and Aparna Roy* that outlines the opportunities associated with AI-driven urban and climate resilience, even as they underscore the challenges to widespread adoption. For her part, *Lakshmi Menon* explains how environmental sustainability can be integrated with social and economic development by involving fisherfolk and local communities, building zero-waste school campuses, and creating necessary infrastructure. *Senthilkumaran Krishnan* delves into ocean governance in the Indian context, bringing the debate to the question of reconciling growth and conservation imperatives and disproving the hypothesised trade-off between the two.

VI. Leveraging Technology and Innovation

The last section of this volume consists of six essays that expound on the imperative of leveraging technology and innovation to unleash the world's post-2030 development forces. *Alexandria Huerta and Vanita Sharma* build a compelling argument for expeditiously bridging the gender digital divide through equitable digital access that will improve women's livelihoods, economic security, and resilience. *Andrea Cabello* weighs the performance of multilateral forums on inclusivity and finds them wanting. She argues for the inclusion of developing nations in the space of digital development dialogues, calling for the creation of platforms that are more open and democratic, and not self-serving. *Astha Kapoor* reiterates the case for democratising data and making it a public good.

In the fourth essay in this section, *Gouri Gupta* walks us through the idea of embracing remote learning, expanding access to digital tools,

and ensuring that education is inclusive and adaptable—which will all allow the creation of systems that not only survive but thrive in the face of uncertainty. *Raja Chakraborty* then highlights the critical role of a GIS-Based Multi-Hazard Information System for building community resilience amid heightening extreme weather events and disasters brought about by climate change. Rounding up the compendium is an essay authored by *Rikin Gandhi, Namita Singh, and Ankita Singh,* which describes the promise of AI in building inclusive growth in the agriculture sector.

In his Postscript, Shombi Sharp postulates that a prosperous post-2030 world can emerge by strengthening the multilateral system and enabling it to keep pace with the needs of changing times. The multilateral system must be fair, equitable, and representative. He makes a case for a Pact for the Future that will embrace a new global development governance paradigm that places the Global South at its centre, and confronts challenges with amplified youth voices, digital innovation, and accelerated financing for development.

Post-2030 Development Agenda: Takeaways from the Volume

The essays in this volume are threaded by the notion that the traditional development frameworks and narratives are no longer sufficient to address the cascading and complex challenges that confront the world today, and those yet to unfold. Seven overarching messages emerge from the essays in this volume, each encapsulating the critical areas where innovative approaches can have the greatest impact to the development agenda as we look beyond 2030.

a. Moving from transactional to transformational relationships

At the heart of this transformation is the imperative to rethink the relationships that underpin our efforts to create social change. For example, experience has shown that the traditional transactional dynamics between funders and grantees, while instrumental in driving specific outcomes, can often fall short of fostering deep and genuine reform. Systemic change is thus needed to achieve long-term impact.

It is not only the governments and the multilateral institutions that should be the stakeholders in the quest for sustainable development. The private sector and philanthropy, whose roles have been undervalued so far, can play more prominent roles. Taking a humanised approach to philanthropy, rooted in trust and mutual respect, can enhance the capacity of non-profits thereby making them better equipped to navigate the challenges of a rapidly changing world.

This shift in relationships will have a key role in setting the stage for systemic changes essential for fostering resilience in our educational and social systems.

b. Building resilience in education and social systems

Building resilience is not limited to relationships; it extends into our educational and social systems. In particular, the disruptions caused by global crises such as the COVID-19 pandemic have underscored the fragility of education systems, particularly in low-income communities. Essays in this volume discuss the urgent need to adopt flexible and technology-driven models that can withstand future shocks. Continued investment in these areas is also critical to building a more resilient future for children in underserved communities, therefore achieving

social impact. As we explore resilience, we naturally progress to the broader theme of sustainability and economic inclusion, where innovative approaches are required to address intertwined challenges.

c. Embracing innovative approaches to sustainability and economic inclusion

The essays in this volume explore various approaches to promoting sustainability, from reducing plastic waste in our oceans to leveraging geospatial technology for building climate-resilient communities. Indeed, environmental sustainability and economic inclusion are interrelated challenges that require innovative solutions. Such initiatives demonstrate the potential of novel approaches to create a virtuous cycle of sustainability and inclusion. As we delve into the intersection of sustainability and economic inclusion, it becomes clear that empowering marginalised communities is crucial for achieving equitable progress. This helps in reversing the hypothesised, internalised notion that there is a natural trade-off between conservation and development.

d. Building climate-resilient livelihoods for marginalised communities

Central to the discourse on development is the question of equity and inclusion. The systemic barriers that prevent marginalised communities from accessing opportunities must be dismantled if we are to achieve true progress. The essays in this collection address the critical need for strategies that empower these communities, through economic models that are inclusive by design, but also emphasise the importance of having a strong focus on building climate-resilient livelihoods. The disproportionate impacts of climate change on the poor and marginalised in the Global South need particular attention. If we are to regard communities as stewards of development, creating climate-resilient livelihoods for the marginalised becomes extremely important.

e. Empowering women and youth: Unleashing the untapped potential of human capital

This volume highlights the need to unlock the untapped potential of the world's women and youth. Increasing women's participation in the labour force and equipping the youth with the skill sets to face future challenges can unleash two critical growth drivers of the post-2030 world. This addresses three concerns simultaneously. First, it tackles the efficiency parameter of development by utilising the untapped human capital and making them forces of next-generation growth. Second, it addresses the equity and distributive justice parameters through women and youth employment and empowerment. Third, this helps in involving the next generation in the decision-making process by giving them more agency to make sound choices.

f. Leveraging technology as a driver for inclusive growth

As global development continues to evolve, technology emerges as a catalyst for fostering inclusive growth and resilience. India's leadership in this domain is evident through initiatives like the Aadhaar programme, which has revolutionised access to public services and social security, particularly for marginalised communities. This publication highlights the potential of Geographic Information Systems (GIS) in not only mitigating risks associated with climate change but also empowering local communities to actively participate in safeguarding their environments. Additionally, AI can be harnessed to enhance climate resilience and optimise resource allocation. The essays, therefore, reflect the transformative potential of technology in addressing complex global challenges.

These insights build upon the foundations laid down in Reliance Foundation, United Nations India, and ORF's earlier publication, *Ideas, Innovation, Implementation: India's Journey Towards the SDGs,* where India's strategic use of digital technology was underscored as a key driver of progress. The continued exploration of development goals in these essays demonstrates how technology, when applied thoughtfully, can bridge gaps, enhance resilience, and drive sustainable growth, setting a model for other nations to follow.

g. Catalysing leadership development and innovation to build the future

Leadership and innovation play pivotal roles in shaping the future of global development. The essays in this volume, authored by thought leaders and practitioners in the Global South, demonstrate that the solutions to our most pressing challenges often emerge from those who are closest to the ground. Whether it is innovative financing mechanisms or new forms of governance, leadership provides a roadmap and a replicable framework for others. Visionary leadership, coupled with a willingness to embrace genuine change, is essential for navigating the complexities of the post-2030 world. While reflecting on the necessity of strong leadership, it becomes clear that the journey towards a more just and sustainable future requires steadfast dedication, deliberation, and collaboration.

To end the beginning…

This compendium emphasises that the journey toward a resilient, inclusive, and sustainable future will extend far beyond 2030. It is a continuous quest that requires innovative thinking, shared knowledge, and collective action. The global threats to this process are many

and daunting—they can emerge as systemic shocks, or even as imperceptible slow stressors. Yet, the opportunities for transformative change towards a prosperous future are equally vast.

As the world intensifies its focus on meeting the 2030 goals, it is important to initiate envisioning and crafting the agenda for the decades ahead—an agenda crucial for fostering sustainable and inclusive development by addressing the pillars of equity, efficiency, and sustainability—postulated as 'Sustainomics' by Mohan Munasinghe.[3] By accelerating collective efforts and drawing on the lessons from across the Global South, humanity stands at a pivotal moment for driving this change.

Following our conclusions in *Ideas, Innovation, Implementation: India's Journey Towards the SDGs,* it is our hope that the present volume, *The Next Frontier: Charting the Contours of the Post-2030 Development Agenda,* will similarly inspire readers to not only rethink the future shape of global development but also to actively engage in making it happen, guided by objectives of inclusive transformations, resilient progress, and sustainable evolutions. These concepts are deeply interconnected with critical issues such as gender disparities, youth participation, and the integration of technology, accelerated through South-South learning, where shared experiences and innovations across the Global South contribute to a more resilient and inclusive global development landscape. The time for action is now, and the responsibility to lead this change lies with each of us.

Endnotes

1 United Nations, *The Sustainable Development Goals Report: Special Edition,* July 10, 2023, https://unstats.un.org/sdgs/report/2023/.

2 Jayashree B, Anirban Sarma, Vanita Sharma and Shoba Suri, Eds., *Ideas, Innovation, Implementation: India's Journey Towards the SDGs,* September 2023, Reliance Foundation and Observer Research Foundation, https://www.orfonline.org/research/ideas-innovation-implementation-india-s-journey-towards-the-sdgs

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I.

Bridging the North-South Divide

Rebalancing Globalisation: Perspectives from the Global South

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Globalisation has shaped the modern world in profound ways. However, dominant narratives often overlook the perspectives of the Global South, perpetuating a skewed understanding of globalisation's impact. In the contemporary discourse on globalisation, voices from the Global South have often been marginalised, with the traditional narratives and frameworks of development being primarily shaped by the dominant powers of the Global North. This essay seeks to rectify this oversight by delving into the nuances of globalisation from the standpoint of countries and regions that have historically borne the brunt of inequitable global power dynamics.

The Global South, representing a combination of nations with varied cultural and economic landscapes, challenges the traditional paradigms of development

and globalisation. This essay critically examines globalisation from this perspective, advocating for a paradigm shift that recognises the diverse and dynamic nature of these regions. Simon During argues for a similar shift, emphasising the need to move beyond geographical divisions and consider the impact of global capitalism on local communities.[1] This essay further critiques the existing geopolitical hierarchies and calls for a reimagined international economy that is more equitable and sustainable. Echoing the sentiments of Geoffrey Pleyers, this article emphasises the need for alternative discourses and policy models that prioritise the environmental, social, and cultural factors crucial to the development of the Global South.[2]

Historically, the colonial legacy continues to resonate in the Global South. Exploitative practices, resource extraction, and cultural imperialism have left lasting imprints. Acknowledging this history is crucial to understanding present-day challenges.

Navigating Opportunities and Challenges in a Globalised World

The Global South faces a dual reality in an increasingly interconnected world. While globalisation presents opportunities for economic growth, technological advancement, and cultural exchange, it also exacerbates existing inequalities, fuels environmental degradation, and leads to social disruption. Navigating these complexities requires a multifaceted approach that leverages opportunities while mitigating risks. This section examines key challenges and potential solutions for the Global South, drawing on examples from Africa, Asia, and Latin America.

Economic Diversification: Moving Beyond Commodity Dependence

A central challenge for many Global South countries is their reliance on commodity exports, leaving them vulnerable to price fluctuations and external shocks. Diversifying economies is crucial to building resilience and achieving sustainable growth.

In Africa, countries like Nigeria are taking steps to move beyond oil dependence. Investing in infrastructure, promoting transparency, and fostering regional cooperation is essential to attract foreign investment and stimulate growth in sectors such as agriculture, manufacturing, and services.

Kenya, for its part, is leveraging its potential as a technology and innovation hub. By strengthening its digital infrastructure, investing in education and skills development, and fostering entrepreneurship, Kenya aims to become a key player in the global digital economy.

Meanwhile, South Africa, with its history of resilience and democratic transition, can leverage its position to advocate for fair trade practices, promote sustainable development, and address income inequality. Regional integration efforts within the African continent are also crucial to amplify the collective influence of African nations on the global stage.

Asian economies face a similar imperative to diversify beyond low-cost manufacturing. The exploitation of cheap labour in global supply chains necessitates a strong focus on ensuring fair wages, labour rights, and safe working conditions.

There are also encouraging examples of Asian countries moving up the value chain. Vietnam, for instance, has become a hub for electronics manufacturing, hosting Samsung's largest production base globally and attracting increasing investment from companies like Apple. Thailand has seen growth in aerospace exports, demonstrating its capacity for high-tech manufacturing.[3]

Latin America is grappling with the need to diversify beyond its traditional reliance on commodity exports. Chile offers a compelling case study, having implemented policies to promote growth in non-resource sectors. Investments in education, infrastructure, and technology have facilitated the expansion of industries like fruit and seafood exports, wine production, and processed foods. Chile has also emerged as a regional hub for services such as finance, tourism, and logistics. Active participation in regional trade agreements has further strengthened economic ties and facilitated technology transfer.

Addressing Systemic Challenges: Trade, Debt, and Inequality

Beyond economic diversification, addressing systemic challenges within the global system is crucial to rebalance globalisation. Unfair trade practices, unsustainable debt burdens, and persistent inequality hinder the ability of Global South countries to achieve equitable and sustainable development.

Dominant global powers often shape trade rules, financial systems, and development agendas in ways that disadvantage developing countries. Smaller nations typically face unequal power dynamics, limiting their ability to negotiate favourable terms and access global markets on a level playing field.

Furthermore, historical and ongoing debt accumulation from powerful lenders can devastate developing economies. Debt servicing often diverts resources from critical investments in education, healthcare, and infrastructure, perpetuating a cycle of underdevelopment.

Addressing income inequality within Global South countries is also paramount. High levels of inequality undermine social cohesion, hinder economic growth, and limit opportunities for marginalised communities. Investing in education, healthcare, and social safety nets is essential to create a more just and equitable society.

Harnessing Technology and Innovation

Technology transfers and innovation are crucial to driving economic transformation and social progress in the Global South. However, access to technology and knowledge is often unequal, and developing countries may face challenges related to adaptation, implementation, and potential dependency.

Regional cooperation and South-South collaboration play a vital role in bridging these gaps. Sharing knowledge, expertise, and best practices can empower countries to develop homegrown solutions tailored to their specific contexts.

The rise of tech startups in Africa exemplifies the potential of innovation to drive development. These startups are introducing innovative digital services in sectors such as finance, agriculture, and healthcare, attracting both international and local investment, which has grown in recent years.[4] Realising the full potential of technology transfers requires addressing issues related to intellectual property rights, capacity building, and infrastructure development.

Role of Regional Cooperation in Rebalancing Globalisation: Policy Recommendations

In an interconnected world, regional cooperation is crucial to rebalancing globalisation. By collaborating with neighbouring countries, Global South nations can collectively negotiate better global trade and investment terms, share knowledge and resources, and amplify their voices in global forums. This section outlines key policy recommendations to leverage regional cooperation to navigate the complexities of globalisation and achieve more equitable and sustainable development outcomes.

Promoting Fair Trade Practices

Unfair trade practices often disadvantage developing countries, hindering their ability to fully benefit from global trade. Regional cooperation can help address this challenge by the Global South collectively advocating for fair trade agreements that prioritise fairness, ensuring developing countries have equal access to markets and that trade benefits are distributed equitably. Regional blocs can work together to reduce or eliminate trade barriers and subsidies that disproportionately disadvantage developing countries.

Fostering Technology Transfers and Innovation

Bridging the technological gap between developed and developing countries is essential to fostering inclusive globalisation. Initiatives that promote and encourage collaborative research and development between developed and developing nations can facilitate technology transfers and allow Global South countries to overcome technological gaps. Regional partnerships can support initiatives that build capacity

in science, technology, engineering, and mathematics fields within developing countries, fostering homegrown innovation. Advocating for intellectual property rights regimes that balance incentivising innovation with facilitating technology transfer to the Global South is crucial.

Investing in Human Capital and Infrastructure

A skilled workforce and robust infrastructure are pillars of economic growth and competitiveness in a globalised world. Collaborative efforts to strengthen education systems, particularly in relevant technical and vocational fields, can empower citizens with the skills needed to thrive in the global market. Facilitating investments in critical infrastructure, including transport, energy, and digital infrastructure, can enhance connectivity, attract foreign investment, and promote economic growth.

Strengthening Regional Integration and Cooperation

Deepening regional integration is essential to amplify the collective influence of the Global South nations. Continued support for the work of regional institutions such as the African Union, and regional blocs such as the Economic Community of West African States (ECOWAS) and the Southern African Development Community (SADC) is key to promoting economic cooperation, political stability, and collective bargaining power. Encouraging the establishment of regional innovation hubs, modelled after initiatives like Chile's 'Chilecon Valley,' can foster entrepreneurship, provide resources and mentorship, and create ecosystems for diverse industries.

Aligning National Policies with Sustainable Development Goals

Sustainable development is paramount to ensuring that globalisation benefits both present and future generations. Global South nations

should prioritise Agenda 2030 and Agenda 2063 by aligning national policies with the Sustainable Development Goals. This requires focusing on poverty eradication, environmental conservation, and social equity.

Conclusion

Rebalancing globalisation requires a collective effort from the Global South and the Global North. While countries in the Global South must pursue economic diversification, invest in human capital, and promote sustainable development, developed countries have a responsibility to foster a more just and equitable global system. This includes promoting fair trade practices, addressing the issue of unsustainable debt, and supporting technology transfer and capacity-building initiatives.

Regional cooperation emerges as a powerful tool for the Global South to navigate the complexities of globalisation. By advocating for fair trade agreements, investing in human capital and infrastructure, and fostering technological innovation, nations can collectively leverage their strengths and amplify their voices in the global arena. Strengthening regional blocs like the African Union, ECOWAS, and SADC is crucial to promote economic cooperation, political stability, and collective bargaining power.

When envisioning the future, societies must consider sustainable development, equitable trade, and social justice. The Global South's resilience and innovation offer valuable lessons for shaping a more just and interconnected world. By foregrounding the voices and experiences of the Global South, humankind can transcend conventional narratives and forge a more holistic understanding of globalisation. This essay invites scholars, policymakers, and practitioners to engage in dialogue that transcends borders and fosters meaningful change. Rebalancing

globalisation is not merely a moral imperative but a strategic necessity for a more just, sustainable, and prosperous future for all. By embracing the perspectives and priorities of the Global South, the world can move towards a model of globalisation that prioritises economic equity, cultural diversity, political stability, and environmental sustainability. This requires a fundamental shift in mindset, away from extractive development models towards a system that empowers all nations and peoples to thrive.

Endnotes

1 Simon During, "The Global South and Internationalism: The Geographies of Post-Subjectivity," *Postcolonial Studies* 23, no. 4 (April 8, 2020): 457-467, https://www.tandfonline.com/doi/full/10.1080/13688790.2020.1745995

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Global Partnerships for Realising the 2030 Agenda for Sustainable Development

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At the 70th session of the United Nations (UN) General Assembly on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, also known as the '2030 Agenda', which were centred around the Sustainable Development Goals (SDGs). The same year, the Paris Climate Agreement (COP 21),[1] the Addis Ababa Action Agenda as an integral part of the 2030 Agenda,[2] and the Sendai Framework for Disaster Risk Reduction[3] were also adopted.

In adopting the 2030 SDGs, leaders agreed to work together to implement the agenda within their countries and at the regional and global levels. The agenda recognises different realities, capacities, and levels of development among countries. The agenda prioritises policies for sustained, inclusive, and

sustainable economic growth, particularly in developing states, while remaining consistent with relevant international rules and commitments. The adoption of the 2030 Agenda also underlined the importance of regional and sub-regional dimensions, regional economic integration, and interconnectivity in sustainable development.[4]

The timeframes of programmes such as the Sendai Framework and the SDGs have provided an opportunity for greater coherence and integration in planning, implementation, and monitoring.[5] This coherence and convergence needs to be adopted by other developmental programmes. In this context, this article proposes an initiative from India and like-minded countries in the Asia-Pacific to establish a partnership for converging the goals of global development programmes to better manage the achievements in targeted and timely manner.

Aligning Global Development Programmes with Global Community, Multilateralism, and Global Governance

The 79th session of the UN General Assembly (UNGA 79) will open on 10 September 2024. Against this backdrop, it is important to note that the global community's efforts for building an inclusive and sustainable future have been facing headwinds: slow economic recovery from the COVID-19 pandemic; uncertainties about the real benefits of globalisation; the unequal distribution of global wealth; rising support for restrictions on trade; and the hardening of borders against the movement of people. These uncertainties have also shifted the focus to people and regions that have been "left behind" in both the developed and developing worlds.[6]

In this context, India must lead a global partnership programme in the Asia-Pacific region to synergise different plans for sustainable

development and disaster risk reduction in Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs), and the Small Island Developing States (SIDS), specifically towards realising the 2030 Agenda.[a] This programme will aim for the convergence of the principles, goals, and targets of the 2030 Agenda with other global development programmes of action for the Global South, especially the Sendai Framework for Disaster Risk Reduction[b] and the Paris Agreement.

Further, to foster connectivity, inclusiveness, and sustainability, programmes of action for LDCs, LLDCs, and SIDS are also vital.[7] Accordingly, the partnership must draw from the objectives and results of the following programmes:

- Istanbul Programme of Action (for Least Developed Countries)
- Vienna Programme of Action (for Landlocked Least Developed Countries)
- Samoa Pathway (for Small Island Developing States)

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a The proposal and recommendations in this article are based on and expanded from the study *"Brussels Report on Strengthening Asia-Europe Connectivity: Drawing Synergy from Global Development and Governance Programmes"* edited by this author in 2018. See: https://www.eria.org/uploads/media/Brussels-Report-on-Strengthening-ASEM-Connectivity_ERIA_2018.pdf

b Adopted at the Third United Nations Conference on Disaster Risk Reduction in 2015 in Sendai, Japan, the Sendai Framework for Disaster Risk Reduction 2015–2030 aligns with the principles of the 2030 Agenda, including its promise to reduce inequalities and ensure the objective of "leaving no one behind". (Zen and Prakash, 2018). A set of 38 indicators are used to track progress in implementing the seven targets of the Sendai Framework as well as its related dimensions reflected in the Sustainable Development Goals 1, 11 and 13. UN Member States report their progress through the Sendai Framework Monitor (SFM).

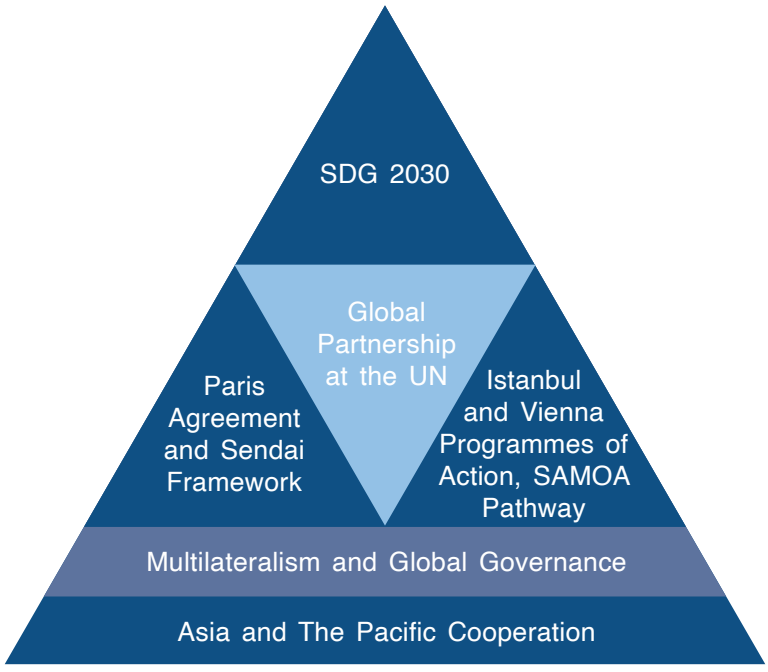
Analysis by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has found that, at the midpoint to the target year of 2030, when the Asia-Pacific region should have made 50 percent of the progress required to achieve the goals, the overall progress was only 14.4 percent.[8] The UNESCAP's *Asia and The Pacific SDG Progress Report 2023* has reported that the greatest progress in the region has been made on affordable and clean energy (Goal 7) and industry, innovation, and infrastructure (Goal 9). The UNESCAP report also noted that the world continues to regress in climate change (Goal 13). The least progress since 2015 has been on decent work and economic growth (Goal 8) and partnerships for the goals (Goal 17), along with clean water and sanitation (Goal 6), responsible consumption and production (Goal 12), and life below water (Goal 14). The findings of the report indicate that inclusive growth in the Asia-Pacific region in the post-Covid-19 months continues to lag as healthy progress in rich Asian countries have been depressed by results from poor and developing countries.[9] The Asia-Pacific is also prone to natural disasters, which further disrupt any progress towards achieving the SDGs, especially among the LDCs and the SIDS.

Multilateralism and Global Governance

India has established several activities in Southeast Asia towards enhancing climate action, blue economy, disaster resilience, and other development programmes. The ASEAN-India Green Fund, established in 2007 with US$5 million, is funding pilot projects to promote adaptation and mitigation technologies to address climate change.[10] India, Brazil, and South Africa, in collaboration with the United Nations Office for South-South Cooperation (UNOSSC), are supporting resilience in SIDS through a partnership established at the 4th International Conference on Small Island Developing States (SIDS4).[11] The Forum on India-Pacific

Island Cooperation (FIPIC), which comprises India and 14 Pacific Island nations, has several development programmes, including major assistance projects, setting up a US$1-million fund for adapting to climate change and clean energy, and cooperation in space technology applications for improving the quality of life in the Islands.[12] The global agenda for sustainable development stands reinforced and strengthened by such partnerships in the context of Asia-Pacific through effective multilateralism and the rules-based international order. A partnership among countries in Asia-Pacific would therefore help realise common goals in the development programmes. (Figure 1).

Figure 1: Partnership Pyramid for Sustainable Development Programmes



Source: Author's own, reconstructed from the Brussels Report on Strengthening Asia-Europe Connectivity (2018)[13]

Global Cooperation for Converging Development Programmes

At the 79th UNGA, leaders will assess the drivers that will deliver results for global development programmes. Some of the notable progress towards realising the SDGs and the objectives of the Paris Agreement and the Sendai Framework have emerged from the Asia-Pacific. However, the region is equally prone to challenges in achieving these goals. India's support for the initiatives of less developed member states and the SIDS has enhanced the capacities of these countries. The mid-point to the target year of 2030 is an appropriate time for India to enhance its support for multilateralism and global governance mechanisms through a new set of interlinkages among the sustainable development programmes to address global challenges, especially in Asia-Pacific.

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Innovation in Development Finance: Meeting Global Goals Beyond 2030

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"If we are to rescue the SDGs, we need much greater urgency, and much higher ambition."

- UN Deputy Secretary-General Amina Mohammed, July 2024[1]

The Sustainable Development Goals (SDGs) of 2015 set clear, specific, and measurable targets to be achieved by 2030, spurring public, private, and philanthropic action. While there have been notable investments in development, most countries are lagging in achieving the SDGs by 2030.[2] However, the race to achieve the SDGs has demonstrated that the challenge

at hand is not just about filling the US$4-trillion SDG financing gap;[3] equally important is examining how current funding can be better used and optimised to make the system more effective and efficient. As we look beyond 2030, we must reflect on what has worked, particularly within development finance, and examine how promising interventions and innovations can help meet greater ambitions.

Outcomes-based finance (OBF) is one such innovation. It is a transformative approach to development finance that links development funding to the achievement of verified outcomes.[4] OBF falls under the umbrella of "social finance", "blended finance", and "innovative finance" by bringing together complementary streams of private and philanthropic capital. However, OBF is specific to models that clearly tie fund flows to measurable outcomes, thereby improving the efficiency and effectiveness of available funding. Examples of OBF instruments include Development Impact Bonds (DIBs), Social Impact Bonds (SIBs), Social Impact Guarantees, Social Success Notes, and Pay-For-Results Grants.

The British Asian Trust[a] has played a central role in pioneering OBF in South Asia and has launched several first-of-their-kind DIBs in the region, working with a range of other innovators and funders who are supporting the growth of OBF approaches by bringing catalytic capital, capabilities, and competencies to these projects. This includes OBF initiatives in:

[a] The author is Chief Executive of the British Asian Trust.

- India, where the British Asian Trust has conceptualised and executed three of the country's five impact bonds:
  - **Quality Education India Development Impact Bond (QEI DIB):**[5] Launched in 2018 and supported by social impact investors and philanthropic funders, this US$11-million programme transformed the lives of 200,000 students and improved their learning by 2.5x compared to non-DIB students.
  - **Skill Impact Bond:**[6] Launched in 2021, together with India's national central body on skilling, international philanthropic funders, and domestic CSR donors, this US$14.4-million programme is India's first impact bond for employment outcomes and is on its way to achieving its goal of supporting 50,000 young Indians, 60 percent of whom will be women.
  - **LiftEd:**[7] Launched in 2024 and supported by founding partners including Reliance Foundation, Michael & Susan Dell Foundation, Bridges Outcomes Partnerships, Maitri Trust, Atlassian, Standard Chartered, USAID, and UBS Optimus Foundation, this US$17-million programme is aimed at strengthening foundational literacy and numeracy in India for four million children, working with the Government of India's NIPUN Bharat Mission.

- Pakistan, where the British Asian Trust has conducted feasibility studies[8] to explore the potential for impact bonds in partnership with multilateral development banks and is now designing and launching the country's first impact bond, the Pakistan Employment Impact Bond, in partnership with the Punjab Skills Development Corporation (PSDF).

The growing body of evidence generated by the British Asian Trust illustrates how OBF shifts the focus and incentives of funding from inputs to outcomes, thereby improving flexibility, boosting innovation, increasing transparency, and strengthening data-driven decision-making. Leading research bodies such as the Government Outcomes Lab at the University of Oxford and the Brookings Institution have documented and disseminated evidence around this, predominantly from the more than 290 impact bonds launched in 40 different countries over the last decade.[9]

In South Asia, India—which is a sandbox for development sector innovations—is an early adopter of OBF and at the forefront of demonstrating how OBF can propel emerging economies towards their development goals. The following key learnings and insights have been derived regarding the adoption of OBF to improve the efficiency and effectiveness of development spending:

- **OBF is most effective when an issue is approached with an 'impact first, tool second' mindset.** OBF, rather than being viewed as a singular solution, can be considered as a basket of different tools that are driven by a set of core principles: linking funds to outcome achievement, managing risks, robust performance management, and rigorous outcomes evaluation. The tool is not as important as the underlying principles. Keeping this in mind ensures that the problem is critically evaluated and that the best route to impact is identified.

- **OBF solutions can be designed for, and in, imperfect realities.** To design an OBF instrument and reach consensus on payment terms, outcomes, and targets, a significant amount of high-quality, relevant, and timely data is required on successful models, price

points, and development benchmarks. These may not always exist, particularly in data-dark sectors or in countries where data systems are still evolving or marked by a lack of trust. However, the British Asian Trust's experience in South Asia has shown that OBF tools can be launched even when ideal preconditions are lacking. For example, at the beginning of the QEI DIB, the lack of benchmarks resulted in an inability to agree on the target level of learning outcomes improvement. To ensure that this did not become a roadblock, the QEI DIB partners built consensus by following an incremental target-setting approach, where the learning improvement achieved in Year 1 became the baseline for Year 2, and so on. At the end of the four-year DIB, the data indicated that DIB students experienced a 2.5x increase in learning outcomes[10] compared to non-DIB students—which is a valuable benchmark for future projects, such as the recent LiftEd DIB.

- **OBF works best when diverse forms of capital come together for improved collaboration.** Along with exploring how commercial and philanthropic funding can be blended through OBF, it is important to explore how global and domestic capital can be best combined for impact. This blend brings the added benefit of diverse perspectives, expertise, capabilities, and non-financial competencies to OBF projects. The collaborative nature of OBF also fosters trust between international and domestic partners, especially with on-ground implementation partners who understand local contexts best. For example, a non-profit partner shared how the QEI DIB's international funders empowered them to choose their own course of action and trusted them to do what it took to meet the outcomes in a manner never seen before—a level of acknowledgement and trust not always extended to local changemakers.

When it comes to domestic capital, which is increasingly important for countries like India, Bangladesh, and Pakistan where domestic Corporate Social Responsibility (CSR) policies are maturing and evolving rapidly, OBF can help unlock these streams of capital for greater outcomes. Since CSR is often constrained by regulations and legalities, OBF offers the flexibility to design fund flows such that it can participate, along with most other forms of capital. For example, in India, domestic corporate funds need to comply with CSR regulations. When creating the LiftEd DIB, the British Asian Trust was able to design the cashflows such that domestic CSR could act as outcome funders and still comply with factors such as rules around annual utilisation and funds not leaving the country and use other types of funding more flexibly to fill the gaps.

- **OBF needs government partnership to achieve scale and sustainability.** Given the size of South Asia's population and the development challenges confronting these countries, OBF cannot be sustainable or deliver impact at scale without meaningful participation from governments. In low- and middle-income countries, resources are often constrained and thus it is impractical to view the government as the sole funder for an instrument. This is compounded by a lack of awareness around OBF within governments and the elaborate processes that restructuring entails in terms of legal, financial, and procurement systems. However, there are creative ways to build governments' familiarity and ability to engage with OBF. For example, in the Skill Impact Bond, the British Asian Trust collaborated with National Skill Development Corporation (NSDC), a quasi-government body responsible for implementing skilling schemes in India, as an investor. Additional support was brought in from the private sector to work with NSDC on performance management and data-driven decision-making.

NSDC is now internalising the performance management framework to inform its wider work and has socialised the approach with the Ministry of Skill Development and Entrepreneurship, which is considering scaling up the OBF by playing a variety of roles.

- **Fundamental barriers need to be overcome for OBF to scale.** There are significant and systemic challenges in scaling OBF approaches, including lack of awareness and dialogue around OBF, lack of preparedness among implementing partners to utilise OBF, the time and complexity in designing OBF tools, and the transaction costs associated with developing and running them. Through several OBF projects in South Asia, the British Asian Trust has tried to evolve how these challenges are addressed. For example, through a feasibility study on applying OBF in Pakistan, the Trust worked with the Government of Sindh to build its understanding and capacities to commission impact bonds for improved educational outcomes. Similarly, in India, the Trust has run a capacity-building programme to make non-profits 'outcomes-ready' so they can participate in OBF structures and deliver results. In both countries, iterative and innovative processes (such as introducing a grant-funded learning year ahead of launching a DIB) have been employed to streamline the design period. Through these projects, templates for financial models, legal agreements, and other standard documents to reduce transactions costs have also been created.

A lot more investment and collaboration are required to create the 'building blocks' for OBF to scale up beyond 2030, but the evidence shows that these tools hold significant promise.

By engaging with OBF and bringing enhanced efficiency and effectiveness to development finance, countries in South Asia are primed to become a lighthouse for other nations seeking to innovate and optimise their development spending to achieve ambitious results. This has the power to move efforts from box-ticking development activities to life-changing development outcomes, making every rupee, dollar, peso, dirham, and dinar count towards building better lives for communities and citizens across the world.

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II.

Fostering Social Inclusion

Multi-Pronged Approach to Inclusive Transformation

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The World Bank estimates that around 700 million people worldwide live below the poverty line.[1] But poverty is a temporary phenomenon, not a permanent condition. Various research, such as the seminal work, *Portfolios of the Poor: How the World's Poor Live on USD 2 a Day,* show how poor people keep moving in and out of poverty, depending on peak/lean seasons (or months) or exogenous shocks, such as unexpected weather events or a health crisis.[2] A large segment of the world's population resides marginally above the extreme poverty line, but keeps getting pulled below it, into conditions of financial stress and indebtedness.

In the past, many social innovation models have focused on establishing livelihood security, which was believed to lead to income stability.[3] This included enabling skill development, providing microfinance,

and generating health awareness, which would improve the economic resilience of low-income households and enable them to invest in factors of production, thereby achieving higher growth and incomes. Such a focus, however, does not account for the fact that such households do not need either skilling or access to finance; they need both simultaneously.

Poverty is a multi-dimensional problem, and escaping it requires the puzzle pieces to fall into place together. Unsurprisingly, various efforts across the globe focusing on a single intervention—be it imparting enterprise skills, providing microfinance, or teaching agricultural best practices—have shown modest success.[4] The same holds for most large-scale innovations and partnerships forged for inclusive growth and equitable development but which are uni-dimensional in their objective and scope. It is the mutually reinforcing nature of multi-interventions that allows individuals to break free from the stranglehold of poverty. Development experts need to reimagine the way livelihood security is approached by governments, development finance institutions, philanthropic and aid agencies, and civil society organisations. This is especially true in India, home to the world's largest population, which aims to transition over the next 25 years from a lower-middle-income country to an upper-middle-income one. It will require an increase in incomes for the population below the 50th percentile group, who eke out a precarious living at present in the informal sector. This essay describes a multi-dimensional livelihood accelerator from India, which has shown promising results and can feasibly be replicated at scale throughout the Global South.

Livelihood Accelerator with Blended Finance Continuum

A livelihood accelerator is one that propels low-income households forward with multi-pronged support being offered simultaneously (see Figure 1). It provides a composite set of services to low-income households to support them with lifecycle needs and growth opportunities.

Figure 1: Multi-intervention Livelihood Accelerator

Source: REVIVE Learning Report, 2024[5]

Samhita,[a] founded in 2009, aims to positively impact 25 million lives and double the incomes of 10 million workers and entrepreneurs by 2030. It is pioneering a blended finance alliance that brings together public, private, and philanthropic institutions to mobilise catalytic, concessional capital. The partnerships collectively create a composite livelihood accelerator with a multi-intervention micro-services model that provides access to markets, credit, entrepreneurship development, business formalisation, and social protection schemes to low-income families.

The accelerator offers various services that improve overall livelihoods and well-being of poor households, summarised in Table 1.

Table 1: Samhita's Initiatives

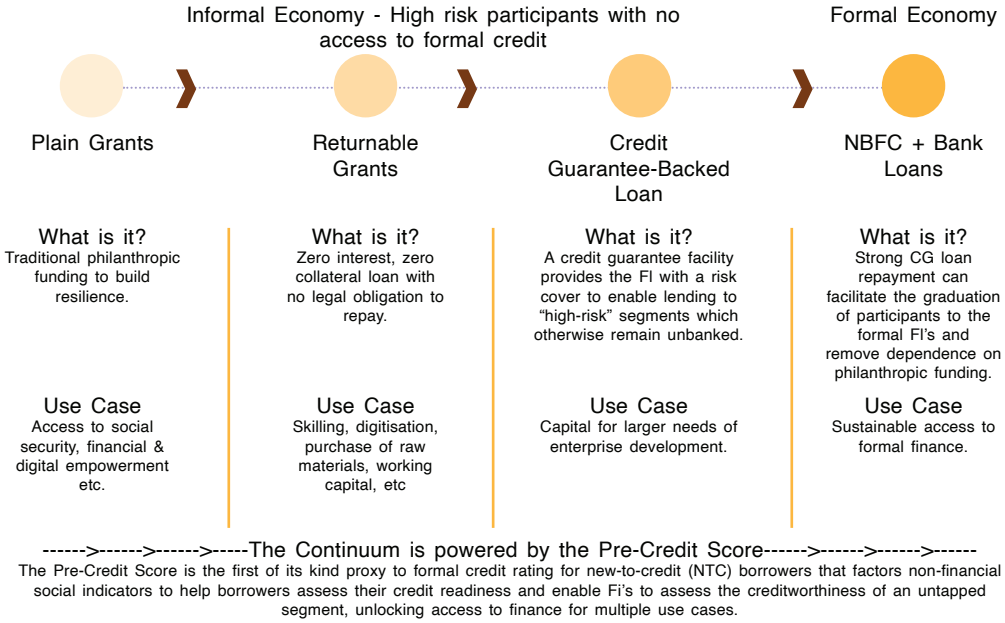
Awareness of government schemes and subsidies	Enables access to social security schemes to enhance resilience against economic shocks.
Financial and digital empowerment	Inculcates responsible financial and digital practices into the daily personal and professional lives of low income families, and assists them with micro-investments to grow wealth.
Access to credit	Enables access through blended finance instruments to support business investment and help build a credit repayment history for higher ticket-size loans later.

[a] The authors of this article are affiliated with Samhita, an impact catalyst, alliance builder and India's largest blended finance facility that collaborates with companies, government, financial institutions, philanthropic organisations, NGOs and social enterprises to deliver national-scale impact.

Skilling, jobs, and career progression	Enables access to training in trade-specific skills to enable skilling, re-skilling or up-skilling of participants for increased employability and income earning potential.
Entrepreneurship development	Enables access to entrepreneurship development training, consisting of modules on customer management, negotiation skills, business planning, and digital marketing.
Market linkages	Enables access to digital markets, including through digital cataloguing, e-commerce training, logistics, and support in generating demand.
Healthcare awareness, products and services	For women, provides training in effective healthcare practices, enabling savings for healthcare and supporting linkages to healthcare and wellness products and service providers

Successful execution requires building a continuum that enables the transition from one phase to the next. Doing so makes it possible for relevant partners and funders to step in – and exit – at different stages as catalysts. It thus evolves as a blended finance continuum (see Figure 2) providing capital support to the low-income households as per their needs and absorption capacity to improve their livelihoods.

Figure 2: The Blended Finance Continuum



Source: REVIVE Learning Report, 2024[6]

Such a blended finance continuum is undergirded by a pre-credit score (PCS) for each household, developed on the basis of data provided by the participants themselves (such as highest educational qualification, household well-being, access to electronic goods, among others), given the lack of reliable audited financial statements of their informal businesses. PCS is akin to a scorecard that looks at alternative metrics to predict good repayment behaviour—indicators such as financial literacy, durable assets ownership, and monthly line-item expenses.

Thus, a blended finance continuum would enable a low-income woman entrepreneur running an apparel shop in a small town of India to obtain additional online sales through a returnable grant[7] for packaging/ logistics, before moving on to a credit guarantee-backed loan to increase and improve her inventory. With further growth in her business alongside the maturity of India's e-commerce ecosystem, she can, at some point, use her digital transaction history to avail cash-flow lending from formal lenders.

Design Principles

The multi-pronged livelihood accelerator described briefly above can be replicated in other countries. Its overarching design principles should include:

1. User-centricity: It should provide participants with a bundle of services from which to choose, depending on context and need. They should have the option to decide the pace and type of interventions. This allows for agency, empowerment, and dignity.
2. Gender-intentionality: Addressing the specific needs of women requires customised and patient hand-holding to dismantle the barriers posed by social norms against women's economic participation. It also requires helping women overcome the digital divide and resolving last-mile mobility challenges. To do so, there has to be a dedicated focus on enabling women-led collective action by identifying and strengthening the institutional capacities of local non-government organisations working with women.
3. Innovative public goods: The accelerator should spawn various public goods that will be useful for all the ecosystem actors. The PCS is an example—a model that can bring millions into the net of the formal economy using the data they themselves generate. This, in turn, can help to extricate them from the frictions and inefficiencies of an information asymmetric market, through lowered search and transaction costs.
4. Technology-enabled backbone: Open technology architecture seamlessly allows the accelerator to offer customised services to participants, helping the latter move from one micro-service to another, including integrations across service providers. This allows for interoperability—the market participants on the supply-side and the demand-side do not have to be on the same platform

to undertake exchanges. The data generated will be available to all participants—in anonymous form—as a public good with useful aggregated insights as well, which will help improve future programmes and interventions.

5. Long-term sustainability: A key learning from the decades of social innovations has been the importance of creating inclusive markets in which the poor can participate. From its inception, the accelerator must have sustainability built into it, so that participants can graduate from being recipients to becoming active customers and entrepreneurs. This will enable the network to grow and flourish organically.

Conclusion

The liberalisation of the Indian economy in the 1990s opened pathways to prosperity for the Indian middle class. However, the vast majority of the population has witnessed a slower rate of growth, resulting in widening inequality. A livelihood accelerator approach can help the poor majority escape systemic poverty. Catalytic blended finance capital can provide the necessary scaffolding, enabling sections of the low-income informal sector to gradually get formalised and become part of the mainstream commercial arena. The multi-pronged approach discussed above makes possible scalable transformations that can be adapted to fit different national contexts.

Making markets work for the poor requires overcoming myriad market failures and inherent handicaps. Low-income households do not have the information, access, choice and economic strength to participate in markets while the supply-side players (both financial institutions and non-financial service providers) have a high cost of acquisition and lack

products fit for this section of the market. The mismatch is exacerbated by the absence of high-quality data about low-income individuals.

However, an open network approach allows such markets to form and grow. It provides an opportunity for participants to graduate into customers through targeted services that help them participate better. Supporting small and marginal farmers in adopting climate-smart practices in an affordable manner, for example, also helps the supply-side start-ups and institutions—such as farmer producer organisations which cater to them—to flourish as businesses. With rising income from higher sales to premium customers through e-commerce, they can graduate from catalytic blended finance for climate adaptation to actual buyers of such services. This virtuous spiral will widen and deepen the net of inclusive markets.

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From Transactional to Transformational: A Humanised Approach to Lasting Social Change

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Philanthropy in Asia has evolved from a model rooted in addressing immediate needs to a more outcome-oriented approach focused on the efficiency and effectiveness of interventions. With Asia becoming the fastest growing region in the world in 2024,[1] and its younger generation expected to hold 35 percent of global wealth by 2025,[2] there is an emerging pool of Asian philanthropists engaging in new and innovative approaches to giving, shifting the region towards more formalised philanthropy practices.[3] This has inadvertently led to the prioritisation of predetermined targets over long-term, inclusive transformation of communities.

There is a need to transition towards a more holistic approach grounded on humanised relationships to differentiate it from transactional engagements between

funders, grantees, and beneficiaries in the pursuit of social impact and maximising the potential of the growing capital in the region. This is especially salient in Asia where, according to Bridgespan, 75 percent of the foundations associated with Southeast Asia's wealthiest families are operating foundations.[4] These foundations provide direct interventions to the community that they serve, as opposed to giving out grants to non-profits that take on the work on the ground.[5] This grassroots, community-level approach to philanthropy presents the perfect opportunity to humanise relationships between funder and beneficiary for greater impact.

As an ecosystem builder for social investment in Asia, AVPN[a] is at the intersection of funders, intermediaries, and impact leaders. From this vantage point, it is clear that progress towards the Sustainable Development Goals (SDGs) will be inhibited if there is no active learning, and even *unlearning*, that will drive the transformative change in the social impact sector.

"Humanised" relationships are framed by empathy, trust, and understanding, prioritising genuine connections and emphasising the importance of understanding and addressing root causes alongside empowering communities to drive equitable outcomes.[6] Transactional relationships, in contrast, prioritise the delivery of outputs and activities, with little opportunity for the parties to interact as individuals. For example, in the day-to-day grant-management process, non-profit or impact leaders become vehicles for programme implementation and

[a] The author is CEO of AVPN, an ecosystem builder that is increasing the flow of financial, human, and intellectual capital from around the world into the social sector in Asia.

means to achieve prescribed outputs. The essence of humanising grant-making is to undo this process by creating spaces where funders consider impact leaders as equals in an environment of trust and mutual respect, and impact leaders do the same with the communities they serve.

As the interest in leveraging artificial intelligence (AI) and other forms of technology in achieving impact grows, fostering humanised relationships becomes even more critical. This is especially so in Asia, where diversity in cultures, rapid urbanisation, and persistent inequalities create a complex context in which top-down solutions often fall short. Prioritising human relationships ensures that digital tools are used to enhance rather than replace human interactions. This requires a delicate balance between leveraging the potential of technology with a deep understanding of the human context.

Initiatives like SG Enable,[7] a Singapore-based agency for disability and inclusion, exemplify this approach. Through the Enabling Lives Initiative (ELI),[8] launched in partnership with Singapore's Tote Board, SG Enable provides grant funding for solutions aimed at improving the well-being of persons with disabilities, including solutions that showcase how technology can empower marginalised communities when combined with a deep understanding of their needs and aspirations. The grants are designed with the beneficiary in mind, leveraging research that has meaningfully incorporated the perspectives of persons with disabilities. ELI also brings together a diverse community of non-profit organisations, social enterprises, and innovators to create and identify scalable and impactful innovations, fostering collaboration to drive social impact. This ground-up approach is an extension of SG Enable's ongoing communities of practice that aim to build a supportive disability ecosystem in Singapore.

Another key area of impact where humanised approaches are important is inclusive digital transformation. This is the purpose of the US$15-million AI Opportunity Fund: Asia-Pacific,[9] a partnership between AVPN, Google.org, and Asian Development Bank (ADB). The Fund aims to empower workers in the Asia-Pacific region with essential AI knowledge and tools necessary for the evolving work landscape, thereby ensuring that jobs and roles presented by AI are accessible to more people in the region, specifically those from underserved communities, such as school-leavers and women re-entering the workforce. The Fund will identify and select non-profit organisations, social enterprises, and workforce associations in the Asia-Pacific that meaningfully reach the workers who will bear the greatest impact from the workforce transitions caused by AI. Selected organisations will receive comprehensive support, including guidance, financial support, and tailored AI training based on foundational AI courses designed by Google and its external partners. A key element of the Fund is a preliminary effort to understand the current awareness and perception of AI by beneficiaries, so that activities developed meaningfully incorporate these sentiments in their design.

AVPN has always focused on building community and connecting people across geographies, approaches, and impact areas. While the primary mandate has always been to support funders and resource providers, the organisation recognises the importance of centring impact leaders in these conversations and decisions to ensure that collective efforts effectively translate to tangible change on the ground. This is the objective of AVPN's Global Leadership Academy (GLA),[10] launched in 2023 to enable a process of co-creation with grassroots impact leaders across emerging countries in Asia, Africa, and Latin America. This initiative leverages locally rooted insights and the wisdom of impact leaders and funders with a goal to facilitate the

shift to localised solutions. These GLA leaders have suggested that a humanised approach could include:

- An openness and flexibility to embrace the unknown, as deeply entrenched issues have no quick fixes. The best solutions emerge over time. In safe learning spaces, where funders and impact leaders interact equally, the leaders can define learning agendas and see what emerges naturally based on their interaction, rather than following a rigid lesson plan with a risk of discussing materials that are disconnected with the reality of their community. In grant-making, more humanised relationships could lead to greater alignment and trust with how funding is used, as the grants would focus on the evolving needs of the community rather than strict programme-implementation metrics.
- A commitment to prioritising "human" elements over pre-existing systems. The focus on personal rather than professional attributes would allow individuals to connect on a deeper level rather than solely as representatives of an organisation. This fosters deeper trust and reduces the likelihood of immediately assessing the potential for transactions.
- Embracing complexity and diversity to be truly inclusive in the present interconnected impact ecosystem. The question of which "unheard" voices should be included in order to be inclusive—and what constitutes "underrepresented"—is complex and contextual. In a group of funders, the grassroots voice often remains unheard, and in a group of grassroots organisations, the voice of the funders is often unheard. Sensitivity to this notion and bringing together diverse individuals with unique perspectives allows each stakeholder to be exposed to multiple views that are different from their own. In the context of establishing potential partnerships, it involves developing sensitivity to unexpected encounters and reaching out to people beyond the usual networks.

Humanised relationships and the collaborative partnerships they initiate could be the missing link to unlocking the true transformative potential of social investment towards a more inclusive future. While the impact ecosystem has targets to achieve, with the SDGs as well as beyond 2030, all actors have the responsibility to contribute. Asia presents a distinct opportunity to drive this transformational approach to impact. In no other region of the world is there such a stark juxtaposition between prosperity and social and environmental challenges.

The explosion of wealth in Asia alongside the demand for solutions creates unparalleled opportunities for the social investment ecosystem to leapfrog the rest of the world. It has given rise to a new wave of social investors, many of whom began as philanthropists and are becoming increasingly more strategic, intentional, and inclusive in their approach to giving. A new breed of Asian social investor is emerging—one who is keen to align personal values, business goals, and philanthropic aims. They appear to be more hands-on and attuned to innovative social investment instruments than previous generations.

The unique characteristics of Asian giving, which is driven by cultural heritage and personal values, present this group of philanthropists with the opportunity to be more open, prioritise human elements over systems, and embrace humanised relationships seamlessly as they work towards addressing social and environmental issues in their own backyards. Beyond the post-2030 SDG agenda, humanised relationships founded on empathy, trust, and knowledge exchange present the next step towards truly empowering communities and driving positive change in Asia and beyond.

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Reimagining Economic Inclusion for the Poorest Rural Communities in India

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India and the world need a moonshot goal that may seem audacious but is achievable through collective effort. Imagine an India where, by 2047, every citizen not only has access to dignified work but also the opportunity to thrive in a rapidly evolving global economy. One of the ways by which this can be achieved is reimagining our approach to livelihoods.

The government and civil society have made strides in reaching the most vulnerable populations and ensuring their economic inclusion. However, with the scale and complexity of poverty in India, there is still much ground to cover. Government programmes and schemes are targeting greater penetration, along with grassroots organisations that are striving for innovation, scale, and sustainable impact.

A critical aspect of extreme poverty and deprivation is captured in the concept of 'scarcity mindset'.[1] This highlights that the lack of money, time, calories, or even companionship can create cognitive deficits and reinforce self-defeating actions in people in a state of deprivation. From The/Nudge Institute's[a] experience in rural India, most excluded communities demonstrate low confidence and risk-averse behaviour as well as an inability to handle shocks and recover from them. Unpredictable income sources, capital constraints, lack of access to markets, and multiple deprivations working in tandem with enduring socio-economic exclusion to become both a cause of and trap for poverty. The Socio Economic Caste Census (SECC) designates particular attention for deprivation categories, highlighting the need for additional strategies and investments for such households.

In India, rural financial delivery for poverty alleviation received a boost in 1980-81, with the government-sponsored Integrated Rural Development Programme (IRDP), under which loans of less than INR 15,000 (US$330) were given to the poor. Cumulatively, INR 250 billion (US$5.6 billion) were provided to roughly 55 million families over the 20 years of its implementation. Around the same time, civil society organisations also worked on executing microfinance models more attuned to the needs of poor households, with the Self Employed Women's Association (SEWA) being a pioneer in this front.

The self-help group (SHG) movement in India was incubated out of these schemes and models in an attempt to collectivise groups of rural poor for ease of outreach, organisation, and delivery. The National

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[a] The authors are affiliated with The/Nudge Institute.

Bank for Agriculture and Rural Development (NABARD) funded INR 1 million to MYRADA for the promotion of 300 SHGs as early as 1987. As of 2024, under the National Rural Livelihoods Mission, rural credit and financial delivery has reached more than 10 crore rural poor households through more than 91 lakh SHGs and their federations.

Despite the high level of saturation and uptake through these collectives across states, rural exclusion and poverty persist. In excluded households, members are hesitant to enter mainstream institutions like SHGs, owing to routine norms of meeting, saving, repayment, and loan uptake that seem difficult to fulfill. These households may not be abundantly found in a village and may be too remotely located for integration into existing structures and services.

Reimagining Economic Inclusion for the Poorest Rural Households

Cash+care approaches like poverty graduation, which is a multifaceted and sequenced intervention, are tested and evidence-driven approaches to lift the poorest of the poor out of extreme poverty. The poverty graduation model, particularly, rests on four pillars: social protection, livelihood generation, financial inclusion, and social development/ empowerment.[3] The model is centred on the intense handholding of women from the poorest of the poor households through motivated and trained field cadres. It includes a consumption or business stipend to provide a 'breathing space' for the household to learn livelihood activities, a 'big push' livelihood grant (either for agriculture, livestock, a small enterprise, or a combination thereof), household-level enterprise planning and development support, access to rights and entitlements, access to food and nutritional security, access to health and education services, and support through special institutions to address the unique

challenges of the most excluded. Since 2002, the Graduation Approach has been replicated in several countries and has come to be regarded as an important social policy instrument and a mechanism to make progress towards achieving the Sustainable Development Goal (SDG) 1 (End poverty in all its forms everywhere). The approach has been evaluated extensively and has demonstrated durability. A study of a six-country pilot[4] by 2019 Nobel Laureates Abhijit Banerjee and Esther Duflo revealed long-term durability of the programme, with statistically significant improvements in consumption, household asset value, and food security. Income and revenues were significantly higher in every country.[5] The model has now been adopted in more than 40 countries by NGOs and governments, with active investment of more than US$1 billion by the World Bank.

In 2019, The/Nudge Institute piloted the Poverty Graduation Cash+Care model with 1,200 households in the Lohardaga, Latehar, and Gumla districts in Jharkhand and was able to target and achieve outcomes across food and nutrition security, at least two diversified livelihoods, higher income and savings, higher productive asset value, access to SHG credit and financial services, and access to social entitlements with a strong focus on building the agency and resilience of women. The model was also implemented during the uncertainty of the COVID-19 period, which is testimony to the robustness of the programme design in ensuring economic inclusion.

Kanti Devi's story exemplifies this. Along with her husband and children, she would migrate to Benaras for work and live there for six months every year. In the kilns, they worked for ten hours a day making up to 400 bricks a day for INR 240, amounting to INR 7,200 for 30 days. Often, they would have to give away part of their earnings to the contractors who got them the job. Following the Poverty Graduation

Cash+Care programme, Kanti Devi earned INR 16,200 from selling three goats and over INR 15,000 each year from selling crops. Today she owns 13 goats and is optimistic that even though the programme has ended and the *dadas* (community workers) no longer visit regularly, her family will continue to flourish.

Drawing confidence from the experience in Jharkhand, The/Nudge is now scaling the programme, in partnership with Central and State governments, with a goal of one million households (five million people) over the next five years and five million households (25 million people) in the next ten years. The/Nudge is doing this by enabling select relevant government agencies to allocate resources and supporting State Rural Livelihood Missions to implement the Poverty Graduation model through close support from internal design, research, product, data, monitoring, and impact assessment teams. Technology has been an enabler in these efforts. The SARATHI tech solution, launched in early 2024 by the Ministry of Rural Development, aims to solve for the end-to-end planning, implementation, and monitoring of the economic inclusion programme across states.

Elsewhere in India, Bihar's implementation of the Satat Jeevikoparjan Yojana has successfully adopted the Graduation Approach at a scale of over one lakh households by integrating the approach into community institutions and by converging social security programmes to targeted households. State Rural Livelihood Missions in other states, including Rajasthan and Odisha, have also adopted the model on a smaller scale. In Jharkhand, the Social Welfare Department's Targeting the Hardcore Poor (THP) programme reached out to 5,000 Particularly Vulnerable Tribal Group (PVTG) households with the intent of graduating them out of poverty within 24 months. Learnings from these programmes, targeting the most excluded, indicate the benefits of contextualisation, convergence, and communitisation.

What Does the Post-2030 Development Agenda Look Like?

The post-2030 agenda for economic inclusion for the most excluded will need to closely examine how such poverty graduation and cash+care approaches can be scaled in a durable manner across diverse contexts of marginality. Complexities and challenges abound, particularly around aspects of the flexibility of programme design, administrative agility, and an enabling ecosystem, including but not limited to the government. Multiple experiments are testing how the design interacts with complementary layers of gender intentionality, psychosocial programming, and climate resilience.

3ie's impact evaluation[6] study of NRLM's work in nine of the poorest states in India using a sample of over 27,000 households revealed that, while economic indicators of income, savings, and formal lending have improved, there is considerable variation in the two indices of women empowerment. There is scope of improvement across both the decision-making index (within the household) and the confidence index (on interactions with government officials and community leaders) for women participants. Psychosocial interventions have been found to be a critical component in such cash+care models. A randomised evaluation of a national cash transfer scheme in Niger[7] indicates the cost effectiveness of prioritising this within the full stack of the graduation programme.

Precedence for successfully integrating climate resilience in cash+care programmes may be found in the USAID-funded programme GRAD (Graduation with Resilience to Achieve Sustainable Development), aimed at chronically and transitory food-insecure households in rural Ethiopia. In the effort to build household and community resilience, GRAD focused

on addressing climate change challenges through spreading awareness, introducing improved technologies, and supporting community-based climate-change strategies.[8] The awareness of households on climate change and adaptation improved, and 64 percent of those surveyed had adopted at least one climate change adaptation mechanism by 2016.

Lastly, the role of a dynamic ecosystem to support these economic inclusion efforts remains critical. Key stakeholders in the pathway to scale include the government, philanthropists, and multilateral and private-sector players. Civil society organisations as well as research institutions are required to maintain a focus on quality, with a close ear to the ground to enable deep scaling across the diverse and shifting contexts of exclusion. Academics and practitioners need to keep asking key questions related to the relevance, efficacy, and efficiency of these approaches and advocating for the agility and iteration of a strong post-2030 development agenda to drive economic inclusion for all.

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Building Resilient Non-Profits: The Role of Organisational Development Financing

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The Society for Nutrition, Education, and Health Action (SNEHA) was founded in 1991 by Armida Fernandez, one of India's foremost neonatologists. As she was implementing life-saving measures in Mumbai's largest public hospitals, she realised that when newborns with complicated care requirements were brought home, many of them would soon fall ill and eventually die. Low-income families who often lived in slums struggled to appropriately care for the babies, who developed serious illnesses due to their living conditions. This drove the understanding that, in order to save these infants, there is a need to shift them out of intensive care areas and into the community.[1]

Today, SNEHA's focus has expanded to create evidence-based urban health models enabling greater awareness about health and safety, improving health-seeking behaviour, strengthening public health systems, and building the capacity of healthcare providers to serve vulnerable communities. In the past year alone, its work in settlements has reduced maternal anaemia by 35 percent, improved access of pregnant women to antenatal care clinics by 26 percent, and reduced stunting among children under five years by 6 percent.[2] SNEHA's women and children protection programme grew from handling 292 cases in 2008-09 to 5,036 cases in 2023-24. In the same period, direct beneficiaries numbered 141,000, with indirect beneficiaries reaching more than 1 million in 2023-24. Between 2008 and 2024, its annual budget increased from INR 6.3 million (~US$75,000) to INR 390 million (~US$4.7 million).[3]

A key factor in SNEHA's success has been its ability to invest in organisational development (OD) and cover 'true costs.' True costs are essential for a non-profit to grow and sustain operations. They include core costs (administration/overheads), OD investments, and reserve funding,[a] along with programme costs.

Covering True Costs Improves Social Outcomes

There is growing evidence in India and globally to suggest that SNEHA is not an exception, but an instance of what could be possible when funders work with non-profits to form a purpose-driven partnership.[4]

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[a] SNEHA has been supported through unrestricted funding and OD support from Wellcome Trust UK, Epic Foundation, Dasra, Manan Trust, Azim Premji Foundation, Silicon Valley Community Foundation, and the Harish and Bina Shah Foundation.

Pay-What-It-Takes (PWIT) India—an ecosystem-building initiative by The Bridgespan Group[b] and six anchor partners—aims to build a stronger, more resilient non-profit sector by systematically addressing the issue of underfunding. Findings from PWIT India's 2021 research[5] revealed that, over a five-year period, organisations that invested in OD grew their annual budgets twice as fast compared to organisations that did not make similar investments.

Other organisations have also studied the impact of covering true costs. The final evaluation report for Ford Foundation's BUILD initiative found that multi-year operating and OD support resulted in 85 percent of NGOs being more financially resilient by the end of the initiative,[6] which further contributed to improved strategic clarity, leadership and governance, and core capabilities.

Analysis by the A.T.E. Chandra Foundation indicated that partner non-profits receiving capacity-building grants doubled their programme outputs within three to five years.[7] A similar analysis by intermediary organisation Atma found that there was a four-fold average increase in stakeholders served and average funding doubled amongst more than 85 partner NGOs that received OD support.[8]

The Center for Effective Philanthropy has found that non-profits that received large, unrestricted grants considered them transformational for their organisations and leadership.[9] The funding also played a role in strengthening their ability to achieve their missions, while enabling them to expand existing work and engage in new initiatives.

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[b] The authors are partners in Bridgespan's Mumbai office.

The Persistent Challenge of Underfunding

PWIT India's 2021 research, cited above and which included a survey of 388 NGOs and financial analysis of 40 Indian NGOs, revealed a pattern of chronic underfunding. More than half of the NGOs held less than three months' expenses in reserve. Eighty-three percent of respondents reported struggling to secure adequate core-cost coverage, with half of the respondents stating they have had no operating surplus in the three years prior.[10] Seventy-two percent of the non-profits reported that a lack of OD funding left them unable to make key investments in the core capabilities required to deliver better programme outcomes.

The research also suggests that non-profits from marginalised communities are more likely to struggle with receiving true costs funding. Seventy percent of non-profits led by members of the Dalit, Bahujan, or Adivasi (DBA) communities— populations who have historically faced systemic marginalisation—had not reported any operating surplus in the three years prior, compared to 45 percent of non-DBA-led NGOs. This was echoed in the 61 percent of non-metro and rural non-profits that reported fewer than three months' financial reserves, compared to 51 percent of non-profits in India's eight biggest cities.

Principles for Change

To achieve more inclusive growth for non-profits, it is imperative that funders change their grant-making practices. PWIT India has identified, through engagement and research, five principles for building a strong and resilient social sector:

- Developing multi-year funder-non-profit partnerships
- Paying a fair share of core costs

- Investing in OD
- Building organisations' financial resilience
- Embed diversity, equity, and inclusion in grant making

These principles become the cornerstone for building mutual trust and pave the way for purpose-driven partnerships.[11]

For funders open to exploring change, a three-step process would be helpful.

1. Funders should reflect on policies, which may otherwise limit NGO effectiveness.
2. Funders should engage with non-profit partners to identify priorities for funding true costs and OD on an ongoing basis. Funders may also engage with peers already funding true costs to learn from their experiences.
3. Funders can refine grant-making policies and practices in response to continuous engagement with non-profit partners along the five PWIT principles.

Conclusion

It was not through natural progression that SNEHA has arrived where it is today. As the organisation and its operations have grown, it has found the means to scale, innovate, and improve its programmes by meaningfully investing in OD. It has worked closely with funders to build capabilities and set up appropriate processes and systems to address OD in a structured and sustained manner.

Pursuing PWIT philanthropy requires adapting policies and practices to invest beyond programmes. By strengthening non-profits through

multi-year partnerships and investment in OD and true costs, funders can help non-profits achieve sustained and enhanced social impact. This would place India's social sector on firmer footing while ensuring improved contributions to the Sustainable Development Goals beyond 2030.

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III.

Building Human Capital

Embedding Resilience in Higher Education Interventions

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As we look beyond 2030, converging global challenges are disproportionately affecting developing countries and vulnerable populations. With the deadline for the Agenda for Sustainable Development on the horizon, it is timely to consider interventions that will embed resilience in our societies. This essay recognises that higher education plays an instrumental role in multiple Sustainable Development Goals (SDGs)[1] and, as such, is critical to promoting resilience and sustainable development beyond 2030. It explores the impact of global emergencies, enrolment trends, human resource disparities, and technological advancements like artificial intelligence (AI) on the sector, and offers recommendations for prioritising diverse talent retention and developing AI proficiency.

Lessons from the COVID-19 Emergency

Global emergencies—be they natural disasters arising from climate change, geopolitical conflicts, health crises, or mass displacement—expose vulnerabilities. This is true for education systems, which have struggled to maintain continuity and quality in such contexts of crisis and conflict,[2] thereby revealing heightened inequalities. The COVID-19 pandemic carried broad and long-term impacts across nine interrelated higher education domains: geopolitics and jurisdictions; system regulation; financing; infrastructure; teaching and learning; research and training; pathways, governance and leadership; and human resources.[3] To effectively prepare for future crises, it is necessary to analyse the post-pandemic recovery trajectories of countries, alongside parallel developments occurring in this time period (2020-2024). The following sections examine three key areas: system size (focusing on enrolment trends); human resource considerations; and AI deployment in education and research.

Enrolment Trends

There is now evidence that the COVID-19 pandemic disrupted education globally, intensified learning poverty,[4] and increased the divide between the Global North and Global South.[5] Enrolment in higher education, however, remained positive, reflecting adaptations instituted to shift from traditional and hybrid formats to remote, technology-enabled learning. Globally, the number of enrolments in higher education increased from 223 million to 254 million between 2017 and 2022. Notable increases occurred in regions with the largest education systems (i.e., China and India). Women's higher education enrolments throughout this period exceeded men's in most regions (see Table 1).[6]

Table 1: Enrolment in Higher Education, All Programmes, Males and Females (2017-2022)

	2017	2018	2019	2020	2021	2022	% Women (2022)
East Asia and the Pacific	72,813,215	72,830,538	75,270,971	79,146,789	83,365,972	87,078,222	51%
South and West Asia	43,183,345	44,084,843	45,991,424	47,114,707	49,908,901	51,879,542	48%
North America and Western Europe	37,767,217	38,012,678	38,522,697	38,927,294	39,199,988	39,726,213	56%
Latin America and the Caribbean	28,079,335	28,407,344	28,791,645	29,311,412	30,255,818	30,241,462	57%
Central and Eastern Europe	19,488,896	19,505,567	19,499,020	19,526,828	19,790,716	19,708,252	52%
Arab States	11,348,085	11,925,149	12,367,167	12,696,929	12,798,505	13,003,988	51%
Sub-Saharan Africa	8,350,615	8,663,079	8,902,061	9,505,146	9,621,994	N/A	43% (2021)
Central Asia	2,075,198	2,082,028	2,215,371	2,385,649	2,600,446	2,654,737	51%
Small Island Developing States	1,362,538	1,369,961	1,387,564	1,394,068	1,428,551	1,412,422	61%
World	223,105,905	225,511,226	231,560,355	23,8614,753	247,542,341	254,323,818	52%

Source: UNESCO UIS (2024)[7]

Yet, historical challenges within higher education, such as gender disparities, have also been persistent. The gaps are particularly observable in the fields of science, technology, engineering, and mathematics (STEM)[8] and at different programme levels and types (undergraduate/postgraduate coursework; research).[9] Similarly, discrimination and stigmatisation continue based on students' disability, sexual identity, race, and class.[10,11]

Human Resources

The profiles of human resources in higher education have shifted in recent decades. As of 2022, women comprised over 50 percent of teaching faculty in some regions (including Central and Eastern Europe and Central Asia); that share, however, is only 43 percent on average worldwide. Lower representation was reported in several regions, including South and West Asia (40 percent).[12] The gender gap is more pronounced in research, with women comprising only 32 percent of roles globally in 2021. The highest proportions of women in research are in Central Asia and Latin America (45 percent), while Europe, Northern America, and Western Asia marginally exceed the world average at 35 percent. Of concern are Southern and Eastern Asia, which lag behind.[13] A particular challenge is that women remain underrepresented in STEM and senior academic positions,[14] and the pandemic disproportionately impacted individuals who have historically been marginalised because of their gender and/or other socio-economic characteristics.[15,16]

The prevalence of labour market discrimination compounds the loss.[17,18] Women and marginalised faculty exiting higher education (e.g., through non-renewal of casual/short-term contracts, or redundancies) often struggle to secure alternative employment and utilise their specialist

knowledge and skills in the wider job market. This phenomenon results in a loss of talent for both academia and the broader economy, with a significant underutilisation of diverse intellectual resources, impeding economic growth. It illustrates the urgent need for purposive affirmative action strategies that anticipate and mitigate potential discrimination during emergency recovery phases, and future crises. By strategising targeted interventions now, higher education institutions can better protect the progress made by women and marginalised communities, ensuring that their representation and contributions remain resilient in the face of future disruptions. Simultaneously, the knowledge and skills of others more readily absorbed into alternative labour markets outside higher education can be utilised effectively across the economy.

AI Deployment and Competency: Teaching, Research, and Operations

In addition to tensions and vulnerabilities exposed during the COVID-19 pandemic, parallel developments are proving similarly transformational for higher education. The emergence of generative AI (including Large Language Models such as ChatGPT) presents both known and unknown opportunities and challenges. AI tools that generate text, images, music, and videos are changing the landscape of teaching, research, and operations while also raising questions about academic integrity, ethical standards, the digital divide, and resourcing profiles.

Institutions urgently need to increase AI exposure and proficiency and explicitly acknowledge that students, faculty, professional staff, and industry are increasingly deploying AI to automate and augment tasks and occupations.[19] Higher education institutions must balance these radical educational, technological, and industrial transformations, alongside the contraction and casualisation of the academic labour

market, with an emphasis on enabling students' deep disciplinary knowledge, innovation, and excellence. The challenge lies in incorporating AI into curricula, pedagogy, research, and operations—amid increasing fiscal constraints—while maintaining a quality educational experience and ethical research environment. The aim should be to nurture people capable of contributing meaningfully to a society characterised by disinformation, cyber insecurity, job displacement, uncertainty, and polycrisis.[20]

Recommendations

- **Prioritise the retention of diverse talent during emergency response and recovery phases**

  By protecting women and those from marginalised communities, purposefully retaining high-level knowledge and skills within academia and the broader economy, institutions can mitigate the loss of human capital and contribute to more equitable economic growth and sustainable development.

- **Develop faculty and student proficiency in AI**

  By embedding AI education within core curriculum, pedagogy, and research training, institutions can enhance faculty and student proficiency in AI. They can also ensure that graduates are well equipped to navigate an increasingly AI-driven world, fostering a workforce that is both technologically adept and socially responsible.

Higher education institutions must proactively address the challenges and opportunities presented by global emergencies, persistent disparities, and rapidly emerging AI technologies to build resilience and promote sustainable development beyond 2030. By prioritising diverse talent retention and developing AI proficiency, higher education can play a vital role in shaping a more equitable, sustainable, and resilient future.

The author acknowledges the assistance of ChatGPT and Claude in identifying potential data sources and condensing certain textual content in the drafting of this article.

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Ageing: The Next Frontier in Low- and Middle-Income Countries

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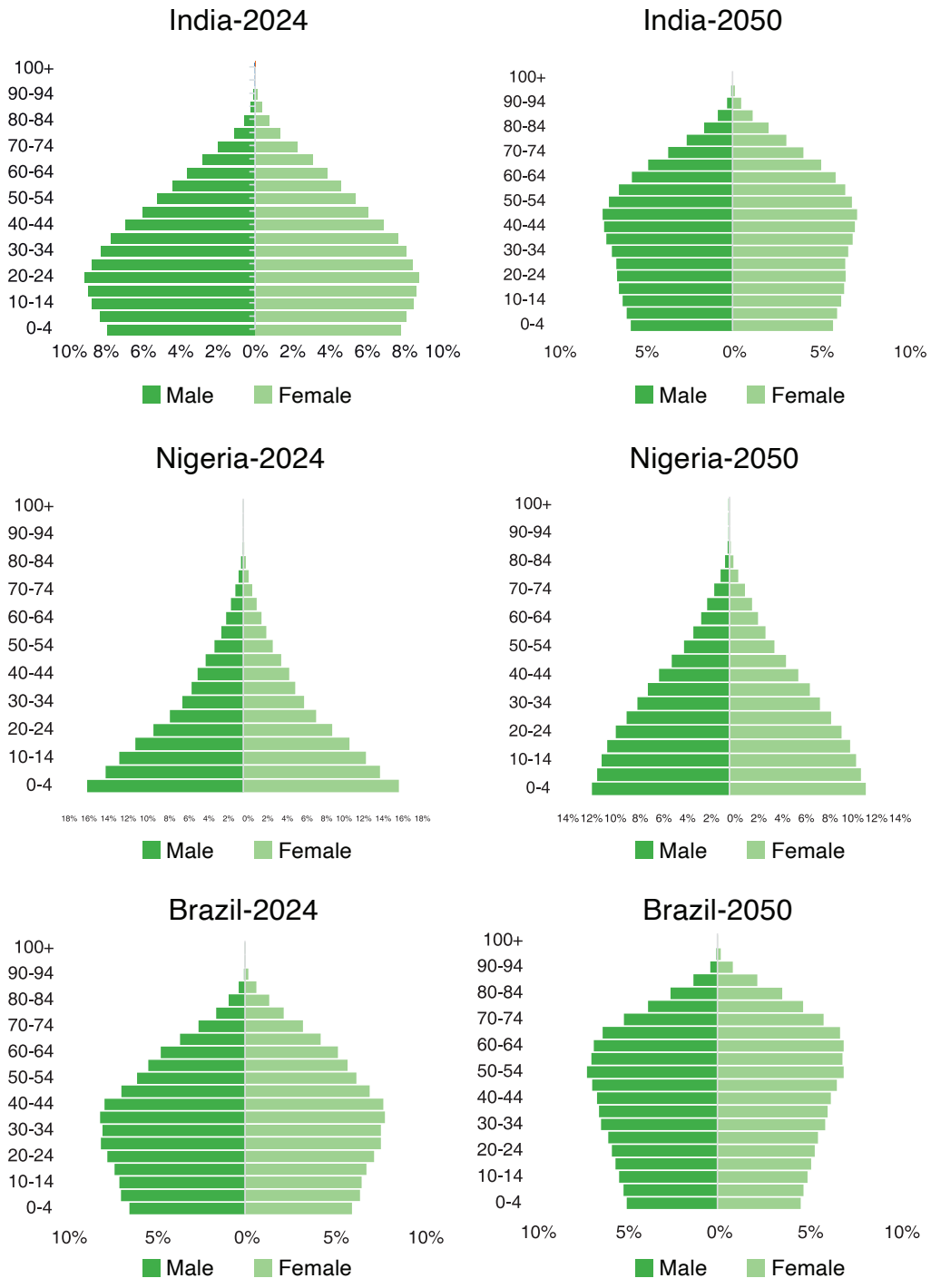
Low- and middle-income countries (LMIC), particularly those in Asia and Africa, have the world's fastest ageing populations.[1] By 2050, 80 percent of the world's older population will be living in LMICs. In 2024, India is estimated to have 153 million people above the age of 60, while Nigeria, the most populous country in Africa, has around 11 million. This is expected to double by 2050 for both countries to 345 million and 25 million, respectively.[2]

Similar doubling trends are projected in many other LMICs. Figure 1 shows the population pyramid of the most populous countries in Asia (India), Africa (Nigeria), and Latin America (Brazil) at present, and

by 2050.[3] The rapid growth in the population of older people is driven by declining fertility and, more importantly, by the increase in life expectancy, both at birth and after the age of 60.[4] Population ageing reflects healthcare improvements and reduction in communicable or infectious diseases, which previously caused a higher burden of disease.[5]

But while increased life expectancy is to be celebrated it also comes with social and economic consequences. Since there is still time before the complete transition to an aged population takes place in LMIC countries, they would do well to implement the needed social and healthcare systems[6] and develop programmes and mechanisms to track the trends.[7] To prevent policies meant for the well-being of older persons from giving rise to negative perceptions about them, as has happened in some high-income countries,[8] the ageism bias in society needs to be addressed.

Figure 1: Population Pyramids: India, Nigeria, and Brazil (2024 and 2050)



Source: PopulationPyramids.net[9]

Addressing Ageism and Age-Based Stigma and Discrimination

Ageism is "the systematic stereotyping and discrimination of people because of their age."[10] It is one of the last few prejudices still socially acceptable in many LMICs, often characterising the old as irrelevant or incompetent.[11] Efforts and strategies to combat ageism should be implemented to enable older people's full participation in all aspects of life and society.[12]

Age-Friendly Health and Social Care Systems

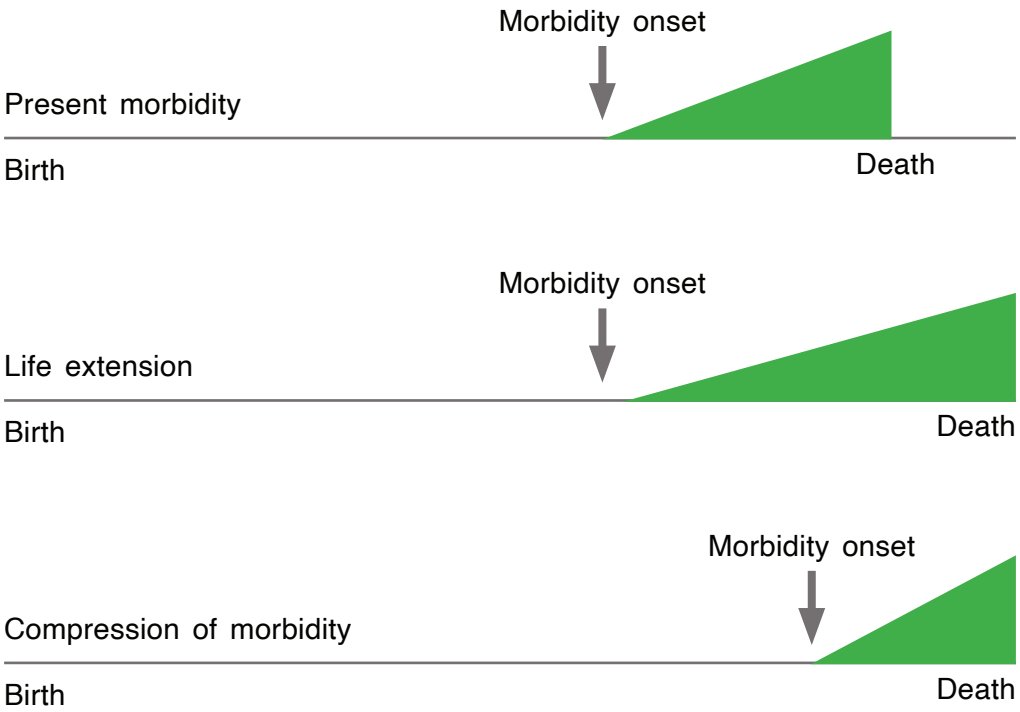
Ageing is associated with a decline in capabilities, alongside an increase in the likelihood of disease, calling for both healthcare and social care.[13] Healthcare and social care systems for an ageing population need to be developed and adapted to local LMIC contexts, taking into account social structures, economic realities, and changes in family dynamics.[14] While preventing onset of chronic diseases through early detection should be a paramount concern, health systems should also be adapted to enable persons with chronic illnesses to have quality lives by reducing the negative consequences of such diseases.[15] Long-term care systems for people who are no longer able to manage without assistance are needed. Informal care provided by family and community needs to be combined with formal care services that support the changing lifestyles, complex care needs, healthcare and social care requirements of an ageing population.[16]

A Life-Course Approach to Ageing

Many people in LMICs—as elsewhere—enter old age with chronic health conditions. Whereas life expectancy has increased, a significant number of older people spend their final years in poor health or with disabilities, which make more demands on healthcare and social care.[17] A life course approach to ageing—one which promotes healthier lifestyles and preventative measures all through people's lives—is a crucial strategy. Preventive measures to check the onset of chronic diseases and inculcate the concept of healthy ageing should be emphasised. Having a larger proportion of older people living longer and healthier lives will relieve the high social costs and healthcare costs associated with an ageing population.[18] Interventions and investments should be initiated at an early age to increase healthy life expectancy with minimal morbidity and disability.[19]

Figure 2 shows three scenarios: lower life expectancy (A), higher life expectancy with expansion of morbidity (B), and higher life expectancy with compression of morbidity.18 With a life-course approach to ageing, the aim should be to achieve Scenario C where morbidity is compressed to as late in life as possible, with a significant duration of the lifespan spent with lower likelihood of disability and morbidity.

Figure 2: Scenarios on Expansion and Compression of Morbidity



Source: Fries[19]

Conclusion

Ageing is the next frontier for LMICs. It is critical for governments and development agencies to begin using strategies to address the challenges associated with rapid population ageing and increasing population of older persons. A long-term approach is needed in planning, which incorporates life course perspectives. Implementing strategies appropriate for the current, intermediate and future cohorts of older people should start at the earliest.

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Defining the Global Health Agenda Beyond 2030

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Health is closely linked to most Sustainable Development Goals (SDGs)[a] and is a part of all development efforts.[1] The SDG Monitoring Report 2024 highlighted that the COVID-19 pandemic caused a massive setback to global health, reversing a nearly decade-long improvement in life expectancy. Even post-pandemic, while most health-related indicators are improving worldwide, progress is inadequate to meet the 2030 targets.[2] Despite reaching a historic low in

[a] For instance, ending hunger (SDG 2) has a direct link to health outcomes, with food intake ensuring that basic nutritional needs are met; quality education (SDG 4) empowers individuals to acquire knowledge and skills that enable making positive health choices; SDG 6 (clean water and sanitation) helps prevent diseases; decent work and economic growth (SDG 8) promote better living conditions for better health; SDG 10 reduces inequity; and building sustainable cities and communities (SDG 11) facilitates an environment where healthy humans can thrive.

under-five mortality in 2022, the maternal mortality ratio remains alarmingly high, and progress on child mortality has decelerated, placing the lives of 35 million children at risk by 2030.

The global fight against infectious diseases is threatened by inequalities and new health challenges, highlighting the need for continuous and innovative efforts. Over half of the global population lacks essential health services, and an ageing health workforce faces increased demands from an ageing population.[3] Achieving universal health coverage without financial hardship is vital for the well-being of all. In 2024, the Partnership for Maternal, Newborn and Child Health suggested that, to stay on track with SDG 3 on health, it is crucial to prioritise universal health coverage, strengthen health systems, invest in disease prevention and treatment, and address access disparities, particularly for vulnerable groups.[4]

The earlier Millennium Development Goals (MDGs) and the current SDGs have prioritised health in global development. The MDGs emphasised health outcomes, such as reducing child and maternal mortality and combating HIV/AIDS, malaria, and other diseases, while the SDGs have embedded health within a broader framework that acknowledges the multifaceted nature of sustainable development.[5] SDG 3 has extended its targets to aim for reducing maternal mortality to non-communicable diseases and ensuring universal health coverage across the globe.

Looking ahead to the post-2030 development agenda, it is clear that health will continue to be influenced by a spectrum of development goals rather than being confined to a revised health goal alone. The interplay of factors such as climate change, technological advancements, and socioeconomic inequalities will shape the health landscape.[6] For

instance, climate change poses risks to public health through the increased prevalence of vector-borne diseases and the impacts of extreme weather events. At the same time, technological advancements hold promise for improving healthcare delivery and disease prevention, but they also present challenges in terms of accessibility and equity.[7] Socioeconomic inequalities remain a persistent barrier to achieving health equity and last-mile access, necessitating the continued focus on reducing disparities.

Experts have extended proposals to make the SDGs more "achievable" by streamlining them.[8] These proposals suggest redistributing the 17 goals into six 'entry points' or 'transformations'. One proposal groups the goals into human well-being, sustainable economies, access to food and nutrition, energy access and decarbonisation, urban development, and global environmental commons.[9] Another categorises them into education and inequality, health and demography, sustainable industry, food and ecosystems, sustainable cities, and digital revolution.[10] Health features prominently in both proposals.

This article centres on health-specific issues that need to be addressed to expand the reach of the framework after 2030 through three focus points: enhancing community engagement and health communication, leveraging technology for health improvements, and transforming the health sector to respond to climate change and create healthier populations. These themes reflect insights gained from current literature on the limitations and constraints of the SDGs towards building a comprehensive and forward-looking health agenda for the future.

Enhancing Community Engagement and Health Communication

Citizen engagement has been a priority for the multilateral system since the UN Charter was adopted in 1945; however, it often remains poorly executed. This is particularly evident in health systems, where marginalised groups such as the homeless and migrants are underserved. Effective community engagement and health communication are crucial for fostering trust, successfully implementing health interventions, and promoting health literacy. The zero draft of the UN Pact promises "a new beginning in international cooperation" built on renewed trust between people and institutions.[11] Supporting and investing in frameworks that elevate citizen participation is essential. Tailoring health initiatives to meet the unique needs of diverse communities, especially marginalised populations, is an imperative.[12]

Research shows that community-based strategies have proven effective in addressing priority health issues, particularly when integrated into broader health strategies.[13] Co-producing knowledge with communities can help implement existing approaches and identify new solutions for health system reform.[14] Recognising and understanding power dynamics is vital to avoid exacerbating existing divisions and to ensure that marginalised groups have opportunities to participate.[15] Interventions and services to prevent diseases and strengthen social protection and healthcare need to be integrated around people and patients to ensure that health outcomes are maximised. There is a need to ensure that every service, technology, system, policy, and payment aligns towards meeting people's needs and improving their health and healthcare experiences, which can be achieved through citizen engagement.

The COVID-19 pandemic highlighted the necessity of engaging and empowering communities for the response to, and prevention of public health emergencies. Key strategies include empowering communities to have control over their health status and health outcomes through initiatives such as training health workers to engage efficiently with community members, forming health committees, and fostering local health champions. Additionally, developing culturally sensitive health messages and utilising digital platforms for real-time engagement and feedback are essential. These strategies ensure that health interventions are applicable across diverse populations and address specific community needs.

Leveraging Technology for Health Improvements

Technology has had a significant impact on healthcare delivery. Kickbush et al. (2021) describe the digital ecosystem as an important determinant of health and highlight that the achievement of Universal Health Coverage (UHC) will depend not only on the rapid adoption of digital technologies but also on decision-makers who would ensure that these benefits are distributed equitably.[16] Proper governance of digital transformations is necessary to harness its benefits and opportunities.[17] At the first global summit on information in 2003, then United Nations Secretary-General Kofi Annan called for political commitment and investment to create an open and inclusive information that benefits all people.[18] In the post-SDG era, leveraging technology to create digital solutions that improve health may only be as effective as the way in which such technology is governed and distributed.

In recent years, technology has been widely leveraged to advance human health, such as in the provision of healthcare using telemedicine for hard-to-reach populations,[19] the use of mobile phones to collect

population-level estimates in low- and middle-income countries,[20] and the use of robotics in healthcare.[21] Additionally, the COVID-19 pandemic period resulted in the rapid integration of health and technology through the use of Geographic Information System GIS for vaccine distribution[22] and electronic health records (EHRs) for primary data collection and web-based artificial-intelligence-driven analyses.[23] The pandemic also highlighted the weaknesses of the health system, such as poor Health Information Systems (HIS), in many countries.[24]

In the post-pandemic period, and midway to the SDGs as well as beyond, the momentum to strengthen HISs must expand. Political commitment is vital to ensure that the allocation of resources is prioritised to enable interoperable HIS that are built for better data, leading to improved health outcomes. Therefore, a strong global political agenda that leverages system-wide digital technology that trickles down to all countries is essential. Digital health technologies will also support reducing inefficiencies due to poor coordination and fragmented health systems, which often causes duplication of efforts across programmes in health systems in Low- and Middle-Income Countries.[25]

Transforming the Health Sector to Respond to Climate Change

A 2019 World Health Organization (WHO) survey found that while knowledge of the health implications of climate change is shaping policymaking, adequate financial resources, including from climate change funding sources, have not shifted to health budgets.[26] Financing was identified as one of the main barriers, with only 9 percent of National Adaptation Plans for Health (H-NAP) being fully funded.[27]

Linking health justice, social justice, and climate justice is integral to transform the health sector to address the climate crisis. Health-sector response to climate change can be transformed through promoting health policy and systems research, whereby the health policy and systems research (HPSR) community can play a catalytic role, empowering researchers and communities to make informed decisions and influence political action.[28] Governments must prioritise and provide political backing for the design and construction of health facilities that are resilient to climate impacts. Climate-smart health policies have to be developed and implemented to address the health impacts of climate change, integrating climate considerations into health planning, preparedness, and response strategies.

Furthermore, the changing needs of the community due to rapid ageing and the growing burden of non-communicable diseases, including mental health challenges, must be addressed. The ageing population presents unique health challenges, such as the increased prevalence of chronic diseases and the need for long-term care. A forward-looking strategy incorporating these suggestions can help consolidate and accelerate SDG gains in the post-2030 era.

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Building Care Economies for Gender-Inclusive Global Development: Leadership from the Global South

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The care economy, which is also referred to as the 'purple economy',[a] refers to an array of paid and unpaid activities related to caring for people, including childcare, eldercare, care of highly dependent adults, and domestic work. Globally, women perform three times more unpaid care and domestic work than men. Gender gaps in unpaid care and domestic work have led to the exclusion of women from labour markets. The undervaluation and invisibility of care work has resulted in labour market failures,[1] manifesting as increased time poverty for women, inefficient allocation of women's talent, lack of well-paying jobs in the

[a] It is an ode to feminist advocacy, with purple being the colour associated with the fight for gender equality.

care sector, and motherhood penalties, ultimately lowering women's labour force participation and constraining economic development. The Organisation for Economic Co-operation and Development (OECD) estimates that a two-hour increase in women's unpaid work correlates with a 10 percentage-point decrease in female labour force participation rates.[2]

These gender gaps are 11-12 times higher in emerging markets and developing economies of the Global South.[3] The burden of unpaid care and domestic work is also typically higher in the Global South compared to the Global North. Countries in the Global North are more likely to have the financial resources to invest in well-established social security systems that prioritise care service delivery. Developed countries are also able to attract highly skilled care workers from across the world by offering higher wages and other incentives. This reduces the availability of skilled care workers in the Global South.

Recognising these gaps in unpaid care work, the Ministry of Women and Child Development (MWCD) of the Government of India has earmarked almost US$270 million under its Samarthya umbrella programme in the FY2025 Budget, which will include investments in the Palna scheme to establish around 17,000 crèches at Anganwadi Centres.[4] These initiatives demonstrate a focus on strengthening childcare infrastructure along with improving the employability and economic empowerment of women.[5]

Best Practices from the Global South

Despite resource constraints, a number of countries in the Global South are pioneering innovative approaches to develop care economy ecosystems.

Cross-country data from the World Bank's Women, Business and Law database 2024 shows that, out of 130 low- and middle-income economies in the Global South, nearly 48 have legal provisions to guarantee the establishment of childcare centres with government support, and 27 countries require employers to ensure childcare facilities for employees.[6] Moreover, about 26 countries provide financial support to families for childcare, mainly through vouchers and tax incentives, and 21 countries offer financial support to private-sector childcare providers.[7]

Argentina has initiated measures to provide social and financial support for childcare as well as to support caregivers. The country introduced the Universal Child Benefit to provide financial support to caregivers for up to five children as early as 2009.[8] In 2019, a law was introduced to include a Time Use Survey in the national statistical system to gather regular, gender-disaggregated data on unpaid care.[9] The government established an Inter-Ministerial Committee for Care Policies in 2020 for a whole-of-government approach towards the care economy.[10] Regulations were also brought forth in 2022 that required companies with over 100 workers to provide daycare facilities, ideally within the office premises, with the alternative to provide financial support for remote workers.[11]

In Vietnam, several regulations on the public provision of childcare are enshrined under the Education Law since 2005.[12] The new 2019 Labor Code and Politburo Directive in 2023 further reaffirmed the national government's commitment to expand childcare facilities and kindergartens in partnership with the private sector.[13,14] Vietnam is the only economy in East Asia where employers are mandated to assist in building daycare facilities or cover part of childcare expenses incurred by employees.[15]

The Government of India conducted a comprehensive Time Use Survey in 2019 to understand gender disparities in unpaid care work.[16] Since 2017, the law has mandated the provision of crèche facilities in establishments with over ten employees, and the MWCD has established National Minimum Standards and Protocols for Crèches. In 2024, the Palna Scheme set a target of establishing 17,000 Anganwadi cum crèches by 2025-26.[17] Most notably, building on the MWCD's estimates of the notional value of women's unpaid care work at 15-17 percent of India's GDP, the Economic Survey 2023 laid out a long-term strategy for the care economy, with a vision to enhance women's employment and entrepreneurship opportunities.[18]

During India's G20 Presidency in 2023, the country championed the care economy, culminating in the Delhi Declaration urging G20 nations to invest in affordable care infrastructure.[19] Moreover, childcare provisions led by civil society have also begun emerging in India, with organisations such as Mobile Crèches, Apanalaya, and SEWA Sanginis leading the establishment of community-managed crèches across major cities. In a number of cases, these crèches operate as social enterprises, offering affordable childcare services, ensuring the safety and well-being of children, and generating job opportunities for women within the community.[20]

Strategies to Strengthen the Care Economy

Countries from the Global South can strengthen their care economies through a range of interventions, which can be categorised around five pillars: gender-neutral parental leave policies; subsidy programmes to enhance the affordability and accessibility of care services; investments in care infrastructure; standardised training programmes and certified courses for care workers; and robust quality assurance mechanisms to maintain standards of care.

First, countries could introduce gender-neutral parental leave policies and flexible work arrangements that encourage both mothers and fathers to take time off for childcare, such as Sweden's "use-it-or-lose-it" quota for fathers. Governments can also consider financial support for small and medium enterprises to reduce parental leave costs.[21]

Second, developing subsidy programmes can make care services more affordable and accessible. This could include voucher systems for low-income families to access childcare or eldercare services or tax incentives for employers who provide on-site care facilities. For instance, Australia's Child Care Subsidy (CCS) supports daycare and after-school care expenses.[22] The subsidy is determined by household income, making childcare more affordable for low- and middle-income families.[23] For elderly care, the Australian Government provides subsidies for individuals receiving aged care.[24] Subsidies are paid directly to approved care providers.

Third, investing in building and maintaining care facilities such as childcare centres, eldercare facilities, and community care hubs is crucial, especially through public-private partnerships. Uruguay's National Integrated Care System, which supports publicly funded childcare and eldercare centres operated by community-based organisations, trade unions, and companies, offers a replicable model.[25]

Fourth, developing standardised training programmes and certification systems for care workers can professionalise the sector and improve the quality of care. This could include creating specialised curricula for different types of care work and establishing clear career pathways. The Philippines' Technical Education and Skills Development Authority has defined skilling frameworks for elderly care[26] and child development workers with pathways for career advancement including sectoral specialisations and seniority levels.[27]

Lastly, establishing quality assurance mechanisms, including regular inspections of care facilities, user feedback mechanisms, and national care quality standards, can improve service delivery. The United Kingdom's Office for Standards in Education, Children's Services and Skills[28] and Singapore's Enhanced Nursing Home Standards for elder care provide frameworks that can be adapted based on local care demands and service gaps.

Investing in care economies is not only a matter of social justice but an economic imperative. Countries in the Global South are demonstrating innovative leadership in addressing care needs while promoting women's economic empowerment. The Global South's experiences and approaches offer valuable lessons for creating sustainable, equitable care systems worldwide, paving the way for a more inclusive and prosperous future for all.

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Beyond Tokenism: Cultivating Inclusive and Sustainable Leadership for Women and Youth

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American author and diversity consultant Verna Myers once wrote, "Diversity is being invited to the party; inclusion is being asked to dance."[1] As the world inches closer to the deadline for the Sustainable Development Goals, it is time we start thinking of the world beyond 2030. More so, because the world as we knew it has undergone an overhaul in the aftermath of the COVID-19 pandemic. Digital transformation through artificial intelligence, and climate change, are undoubtedly going to be two of the most critical focus areas as no lives will remain unaffected by them.

As we move forward to chart the future goals and scenarios for global development, it is imperative that we look back at the gaps and unattained goals, learn from them and incorporate the learnings into

strategies for the future. A key area of concern in this respect is sustainable leadership for women and young people that is far more meaningful as compared to their currently tokenistic representation in making policies and programmes, and community building.

Tokenism and Leadership

It is important to first differentiate between the concepts of 'tokenism' and 'leadership'. Tokenism happens as a result of focusing on increasing the representation, in the form of numbers, of a minority group. At best, its impact is limited to improving the diversity ratio or creating a façade about an organisation in the public domain about its focus on the Diversity-Equity-Inclusion mandate. Leadership, meanwhile, is a by-product of power that emerges from having decision-making rights or influence. Tokenism could provide women or young people a seat at the table or elect them in ceremonial roles; but leadership gives them an unfiltered voice to speak their mind and heart and put forth their perceptions and lived experiences. Tokenism usually results in the creation of superficial policies and programmes whereas leadership breeds policies and programmes that go deeper into the root causes and social barriers, resulting in sustainable impact.

Tokenism in women's representation can be witnessed at many levels such as organisations nominating one woman on a board among a group of men, to fulfil their mandate on diversity. While such initiatives are a good first step, they do not invest decision-making and influencing power in women. In India, about one-third of the seats in *panchayats* (village councils) are reserved for women.[2] The constitutional amendments providing for women's reservation in local governance bodies have had a transformative impact at the grassroots, resulting in the elevation of over 1.4 million women to leadership

positions.[3] However, there are gaps that still exist where women find it difficult to assert authority in the presence of male members.[4,5]

Key Communities of Focus

We live in a world that has a population of approximately 8 billion people[6] with roughly 4 billion women;[7] 1.2 billion are young people between 15 and 24, accounting for 16 percent of the global population.[a,8] Of this number, India is home to approximately 1.4 billion people, with roughly 690 million women.[9] Efforts have been made over the decades to nurture both women and young people as leaders through government policies and programmes as well as initiatives from the private sector and civil society.

SDG 5 strives for gender equality and empowerment of all women and girls. As per UNDP's report, 'Youth as partners for the implementation of the SDGs', 20 targets across six SDGs are strongly focused on youth—these are the goals of Zero Hunger; Quality Education; Gender Equality; Decent Work and Economic Growth; Reduced Inequalities; and Climate Action.[10] An imperative, therefore, is to move beyond tokenism and embrace women and youth leaders for inclusive transformations as a means to achieve the next set of goals.

The COVID-19 pandemic brought to the fore the importance of leadership by women and young people—women were heads of state and governments in only 21 countries worldwide, but their leadership was lauded for effectively managing the health crisis in their territories.

[a] The United Nations defines 'youth' as persons between the ages of 15 and 24 years.

Women heads of government in Denmark, Ethiopia, Finland, Germany, Iceland, New Zealand, and Slovakia were recognised for leading rapid responses, which not only included measures to 'flatten the curve'—such as confinement measures, social distancing, and widespread testing—but also the transparent and compassionate communication of fact-based public health information.[11]

Meanwhile, one of the powerful examples of youth leadership was demonstrated through the Young Warrior movement started by the United Nations Children's Fund (UNICEF).[12] The movement aimed to support young people through capacity building, verified resources and information, and psychosocial support to safeguard themselves, their families, and communities against the pandemic. Interactive Voice Response System and community radios were used to reach digitally-disenfranchised youth with the support of multiple ministries in India. While planning this movement, young people were made to feel as equal partners in the system through co-creation support while programming, feedback pathways, and platforms to share their unfiltered experiences.

For any policy or programme to succeed, it needs to adopt an inclusive and participatory approach where those who would potentially be benefitted are at the forefront of designing and implementation. Through various global convenings in the past decade, it is clear that climate change will feature as one of the most pressing challenges for the development agenda beyond 2030. It is thus imperative that the youth, who will form the future workforce of the world and will be most impacted by the negative outcomes of climate change, are consciously offered leadership roles while drafting plans for mitigating the impacts of climate change.

Similarly, the inclusion of women in policymaking, right from the grassroots level, is strategically important to build an equitable world. In India's agriculture sector, for example, women make up more than half of the labour force but their economic contributions are not reflected in their power. Only 7 percent of married women are owners of their land and women barely have any control or ownership of the income. This economic inequality also percolates into other spectrums of life, leading to social and systemic inequalities.

Inclusivity Initiatives

In early 2024, the Ministry of Women and Child Development and the Ministry of Labour and Employment launched an advisory for the private sector to chart a path for 'women-led development' by adopting a comprehensive, whole-of-government approach.[13] The Asha-Anganwadi-ANMs (Auxiliary Nurse Midwife) that forms the backbone of maternal and childcare in India's rural districts is a classic example of women leading the development agenda within their own communities and gaining economic autonomy. Beyond this, they also foster social cohesion in the communities, provide a safe space for women to talk about their issues, and promote gender empowerment. Similarly, some of the Self-Help Groups of rural women in India have created impactful case studies of women thriving as successful entrepreneurs, running profitable collectives through financial inclusion programmes such as Kudumbashree in Kerala and Jeevika in Bihar. UNICEF's YuWaah programme[b] specifically focuses on 'youth-led development' of the country for young people to access skilling, learning, and economic opportunities through public-private-youth partnerships. Such

[b] The author is affiliated with YuWaah.

programmes equip these stakeholder groups to act as leaders at every stage from policymaking, to planning, formulating, implementing, and improvising. The primary question that they try to answer through data and voices is "What do women and young people of the country want?", and not the more typical, "What do we perceive they want?" These programmes show the positive side of moving beyond tokenism to tackle social issues in the communities.

Learnings and Way Forward

As we move towards 2030 and beyond, it is essential to integrate women and young people as equal stakeholders at all levels of decision-making, policy implementation, and societal transformation.
To bring about this massive shift from tokenism to sustainable leadership of women and young people at scale would mean targeted investment in the agenda at multiple levels. The intentional investment can only happen when the leaders of today are equipped with the right resources and tools to undergo this behavioural transformation to pass on the baton to the leaders of tomorrow.

The shifts are needed at both individual and organisational levels. Increasing the number of women and young participants in the processes, discussions, and policymaking is perhaps the first crucial step. But it is equally important to appreciate that for these groups to thrive in leadership roles, they would need deeper support and engagement. Leadership is a huge responsibility that comes with power as well as accountability. Therefore, it is critical to nurture women's and young people's abilities and step them up through capacity building, skilling, education, training, lifelong learning, enabling economic opportunities, mentorship, and networking.

Financial support to women leaders, particularly at the grassroots, may encourage them to come forward and actively participate in decision-making. Creating employment opportunities focusing on the needs and requirements of women and young people will further empower them in the economic as well as social spaces to come forward, participate and foster sustainable development. Moreover, mentorship and handholding support is a key factor in helping encourage underrepresented groups to advance to leadership roles.

The world beyond 2030 is likely to be even more deeply rooted in technology, which can be harnessed to conduct leadership trainings remotely and enable virtual networking opportunities. Last but not the least, tokenism is largely an outcome of unconscious bias at every step of the journey towards leadership. Institutional practices to rectify biases and disparities, with a balance of trainings and audits, is the way forward to eliminate the biases. Only then can we hope for a powerful 'Beyond 2030' era, where women and young people thrive as successful leaders and decision-makers across all platforms, sectors, and communities.

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IV.

Nurturing Food Security

Envisioning Sustainable Food Systems for Africa

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Every step in the food value chain, from farm to table, affects nature and the environment. Across Africa, it is food systems that are contributing to the degradation of forests, savannahs, and wetlands; polluting water; depleting soils; and producing increasing amounts of greenhouse gases (GHGs). Total arable land in use in Sub-Saharan Africa increased from 133 million hectares in 1980 to 240 million hectares by 2020. The Food and Agriculture Organization (FAO) projects that the area of arable land could further increase to 291 million hectares by 2050. This expansion, along with land degradation and landscape fragmentation, will continue to negatively impact essential ecosystem services like healthy watersheds, which millions of people rely on. Already, GHG emissions from agriculture comprise over 30 percent of the continent's GHG inventory.[1]

Further, Africa's agriculture, which relies heavily on rainfall, is highly susceptible to climate change. The continent frequently experiences severe climate shocks such as droughts, floods, and extreme temperatures. This year's El Niño event has exacerbated the situation, leading to more than 10 million people in southern Africa—in the countries of Malawi, Zambia, Mozambique, and Zimbabwe—requiring emergency food aid.[2]

The current challenges in agricultural production and food security are being exacerbated by the war in Ukraine. Despite their geographical distance from the conflict, African countries are seeing the ramifications. According to the African Development Bank (AfDB), African nations spend over US$75 billion annually to import more than 100 million metric tons of cereals.[3] In 2020, 15 African countries imported over 50 percent of their wheat from either Russia or Ukraine, with six of these countries—Eritrea, Egypt, Benin, Sudan, Djibouti, and Tanzania—relying on the region for over 70 percent of their wheat imports.[4] With supplies of wheat no longer forthcoming, the war has thus exacerbated food insecurity and undernourishment in Africa.

Food insecurity also has a detrimental impact on human health. According to the FAO and other global agencies, undernourishment in Africa rose from 17.6 percent of the population in 2014 to 19.1 percent in 2019, with an estimated 239 million people being undernourished and suffering from hidden hunger.[5] The increase in hunger across Africa is also tied to persistently high consumer food prices and the spread of violence and instability, particularly in parts of the MENA (Middle East, North Africa) region and Sub-Saharan Africa.[6]

Yet agriculture remains the backbone of African economies. It is the main source of livelihood, with most households consuming at least

some of the food they produce. Around 42 percent of household income in Africa is spent on food, and in countries facing conflict and insecurity, this share can rise to as much as 60 percent.[7]

However, the way food is produced is often at odds with efforts to conserve the natural capital that both people and wildlife rely on. With Africa holding 60 percent of the world's remaining arable land and its population projected to reach 2.5 billion by 2050, the pressure to use more land for agriculture will only intensify. This will place Africa at the forefront of the ongoing conflict between the immediate need for food production and the long-term requirement of conservation investments.

Africa must, therefore, redesign its food systems and rethink the way food is produced and consumed. African countries need to nourish a growing population, minimise human-wildlife conflict and biodiversity loss, while also promoting sustainable value chains that provide benefits for both people and nature.

The World Wide Fund for Nature's (WWF)[a] Africa Food Futures initiative is promoting a model of such development in the Kavango Zambezi Trans Frontier Conservation Area (KAZA-TFCA)[b] and the Southern Kenya Northern Tanzania (SOKNOT) Integrated Trans-boundary Wildlife Corridor,[c] where the future of people, wildlife, nature, and agriculture

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b The KAZA-TFCA, which derives its name from the rivers Kavango and Zambezi, includes parts of five countries of southern Africa: Namibia, Angola, Zambia, Botswana and Zimbabwe. It was set up, following a treaty between these five countries in August 2011, to sustainably manage the Kavango-Zambezi ecosystem.

c The SOKNOT-unganisha ('unganisha' means 'connected' in Kiswahili), started in 2019 by WWF, spans the areas of southern Kenya and northern Tanzania, and seeks to improve conservation along the wildlife corridor.

are intimately intertwined. Both initiatives promote a landscape approach that provides a framework for integrating multiple land-uses across large spatial scales. The KAZA and SOKNOT landscapes illustrate the complex tension between agriculture and conservation, and underscore some of the key challenges in developing sustainable food systems in the region. These areas are characterised by high biodiversity and critical natural capital on one side, and mixed subsistence cropping, livestock systems, low productivity, and imbalanced supply chains, on the other.[8] Adopting a landscape systems approach facilitates investments in key aspects of a sustainable food system, such as access to safe drinking water, adequate sanitation, education, gender equality, and financial support for smallholder farmers.

By replicating this landscape approach across the continent, Africa can reduce human-wildlife conflict and biodiversity loss, while enabling food security alongside alternative livelihoods like sustainable tourism in three ways:

1. **Rethinking Food Production:** Expansion of agriculture through land conversion is the leading cause of ecosystem disruption and biodiversity loss. To prevent it, Africa must acknowledge nature as a legitimate land use that needs to co-exist with goals such as improving agricultural production and ensuring food security. For example, studies show that nature-based tourism creates economic benefits for communities living around protected areas (PAs), including the poorest households. An additional tourist increases annual real income in communities near the PAs by US$169—US$2,400, which could be used to pay for essentials such as food, education, and health.[9] Policymakers must recognise

the critical services provided by nature and ensure these services are protected and enhanced through the effective implementation of appropriate land use plans.

2. **Revamping Farming Practices:** Food systems vary across different regions, and it is essential to adopt a rigorous approach to identify the right innovations that can deliver the appropriate impact in the right locations. WWF's new 'right innovation, right impact, right place' framework[10] evaluates the suitability of various innovations for different contexts. The 'right' impact involves anticipating the type and scale of change—small or otherwise—that a proposed innovation might bring to a specific area. The 'right' place focuses on the social and ecological context where the innovation will be implemented. To succeed, Africa must leverage data, innovation, and technologies. Organisations like the Consultative Group on International Agricultural Research (CGIAR) have been developing climate-resilient crops and technologies that increase yields and reduce the need for land conversion in many African landscapes.[11] It is vital to extend these technologies to the areas where they are most needed, as African countries implement their national strategies to transform food systems and achieve the Sustainable Development Goals (SDGs) by 2030, ensuring a healthy and sustainable future for all.

3. **Reimagining the Food Value Chain:** Some of the most crucial challenges in the current value chain include low agricultural productivity, over-reliance on a few staple crops (such as maize and sorghum), and significant food loss due to inadequate storage solutions. It is estimated that more than 35 percent of post-harvest losses are due to insufficient storage capacity and inadequate transportation facilities, and that improving these could

boost yields by 20 percent. A key step in reimagining the value chain should involve creating a support network with various stakeholders, including development partners, to pilot sustainable value chain models for smallholders, with measures to ensure fair and timely payments and reduce post-harvest losses. Africa must embrace city-region food systems that meet the needs of a rapidly growing urban population.

This is the time for Africa to redefine its relationship with nature towards food security and the conservation of its natural resources. We must rethink, renew, and re-imagine agriculture in Africa while supporting the development of economic and policy frameworks that accurately reflect the value of natural capital and encourage investment in sustainable, nature-positive agriculture. This transformation is essential to ensure our very survival.

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Organic Farming in Sikkim: Changes for Catalysing Long-Term Sustainability

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Sikkim is the only Indian state where farming is entirely organic. The state embraced organic farming[a] in 2003 and has traditionally followed a natural farming pathway, with farmers rarely using chemical fertilisers. There are persisting challenges, however, in sustaining this achievement and generating better returns for farmers.[b]

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a According to the International Federation of Organic Agriculture Movements (IFOAM), "Organic farming is a sustainable production system that supports soil health, ecosystems, and people by utilizing ecological processes, biodiversity, and cycles adapted to local conditions and eventually enhances the wellbeing of farmers. It combines tradition, innovation, and science to promote fair relationships and a good quality of life."
See:
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According to IMARC Group, the Indian organic food market is projected to grow from US$1,582.2 million in 2023 to US$ 8,918.5 million by 2032, with a Compound Annual Growth Rate (CAGR) of 21.19.[1]

In Sikkim, farmers' transition to organic farming is aided by the unique agro-climatic conditions and farming cultures in the state. Growing niche commodities like cardamom, ginger, orange, tea, kiwifruit, passionfruit, mountain vegetables, and food grains helps reduce dependence on foreign food and improves not only the people's self-reliance but their welfare indicators as well. The state has varied rainfall and soil texture, supporting diverse horticultural and field crops in three seasons: pre-*Kharif* (pre-autumn reap season), *Kharif* (autumn reap season), and *Rabi* (winter season). Some commonly grown crops include maize, ginger, turmeric, potato, tomato, local beans, rice, and other vegetables.

Despite being awarded the UN Future Policy Golden Award 2018, Sikkim has one of the highest shares of people living below the poverty line (in rural areas) amongst all the Indian states and UTs. It also has the highest undernourished population (57 percent).

The state has implemented an action plan aimed at phasing out synthetic inputs and supporting the use of organic fertilisers and seeds. In 2010, the government launched the Sikkim Organic Mission, aimed at converting the state into an organic state by 2015.[2] The mission included the phase-out of chemical fertilisers, the removal of subsidies, and the closure of sale points and outlets supplying synthetic inputs. The Sikkim Agricultural, Horticultural Inputs and Livestock Feed Regulation Act was passed in 2014,[3] prohibiting the import of chemical inputs for agriculture and horticulture. Pilot programmes such as bio-villages and biodynamics were launched between 2003 and 2010.[4] The mission gained support, including for organic seed and

planting material production, seed and soil testing laboratories, and the establishment of Organic Centres of Excellence.[c] Furthermore, the National Organic Farming Research Institute (NOFRI) was established in Gangtok to promote research and education on organic farming, followed by the establishment of a state-level steering committee to coordinate agencies.[5]

Table 1: Organic Farming in Sikkim: A Timeline

Phase I: Foundation (2003)	2003	Declaration in the State Legislative Assembly by Chief Minister Pawan Chamling for Sikkim to be India's first organic state.
Phase II: Preparation (2003-10)	2003	• Action plan titled "Going for Organic Farming in Sikkim – A Concept Paper and Action Plan, May 2023", prepared by the Department of Agriculture • Planned reduction of chemical fertiliser subsidy by tapering off 10 percent on subsidies, resulting in nil subsidy from the year 2007-08. • Promotion of on-farm production of organic manures initiated. Adoption of various technologies of recycling farm wastes like rural composting, vermicomposting, EM composting, and biodynamics and making the state chemical-free. • Capacity building initiated for training all farmers to make appropriate changes in the package of practices and the adoption of better technologies. Officers as well as field functionaries trained on organic farming both within and outside the state.

[c] Centres where farmers receive scientific information on organic farming, marketing, storage, and post-harvest technology in addition to receiving training in organic farming as incubatees.

	2006	Units of vermiculture hatcheries beginning to be established; by 2008, these were established in five Government Farms and three KVKs (Krishi Vigyan Kendra-Agricultural Science Centre).
	2008 2009	• Soil-testing laboratories established, and a fleet of mobile soil testing vans included. • Ginger processing unit established at Birdang Farm, West District, being operated by SIMFED (Sikkim State Co-operative Supply and Marketing Federation Ltd.). • Bio-fertiliser production established. • System comparison trials conducted at Bermiok farm, with consultancy services from ICCOA (International Competence Centre for Organic Agriculture), Bangalore.
Phase III: Implementation (2010-15)	2010	• Sikkim Organic Mission launched. • Three livelihood schools established at Tadong, Bermiok, and Daramdin. More than 800 educated and unemployed youth trained and more than 700 engaged in ICS (Internal Control System) and certification. • 74,303 hectares set as target for conversion. • 14 service providers and six certifying agencies engaged for ICS and certification. • Automated greenhouses established for the production of disease-free quality planting material. • Organic retail outlets outside the state established.

	2012	In the trade licence, chemical inputs substituted by inputs of organic origin, thereby avoiding sales of chemical agricultural inputs.
	2013	State organic policy and prospective five-year plan prepared.
	2014	The Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act, 2014 passed.
Phase IV: Sustaining the movement	2016	• State declared the first organic state in India. • National Organic Farming Research Institute (NOFRI) established at Gangtok to promote research and education on organic farming, and provide research and technological backstopping to organic production systems for Sikkim as well as the whole North East Hills Region of India.

Source: Indiaspend.com;[6] Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act, 2014

A survey[7] of 60 organic farmers in the state highlighted that the main constraints faced by organic farmers are lack of reliable marketing channels, low yields, incidence of pests and diseases, competition from non-organic food, lower profitability compared to conventional farming, exploitation by middlemen, high transportation costs, lack of knowledge about bio-inputs and technology, lack of storage and processing facilities, and timely access to seeds.

Table 2: A SWOT Analysis: Elements of Organic Farming in Sikkim

Strengths	
Farm/Production-related	Sikkim's organic food production has historically had a comparative advantage due to low chemical fertiliser use, at 12 kg/ha compared to the national average of 90 kg/ha. Young agri-entrepreneurs are using smart farming techniques like GIS (Geographic information system) to expand production. The government has certified all farmers in the state, covering approximately 76,169 ha in 2016. The emotional and cultural connection between Sikkim farmers and organic farming has strengthened the mission.
Weaknesses	
Farm/Production-related	The Sikkim mission has been criticised for its top-down policy approach, focusing on large cardamom, buckwheat, ginger, turmeric, and oranges, and its dependence on the public distribution system for food security, despite the focus on organic farming.
Value-chain-related	Concerns arise over the lack of cold-chain infrastructure and post-harvest processing facilities, hindering organic premium realisation. Despite certification across the state, farmer consultations reveal a disconnect with organised procurement and certification, with some farmers only meeting officials once.
Policy-related	Irrigation infrastructure requires a boost but there are budgetary constraints.
Institutions-related	Farmer Producer Organisations (FPOs) are being utilised to enhance farmers' bargaining power. However, they still lack institutional credit support from banks due to their status as cooperatives. Farmers prefer to maintain existing trade relationships with traders for cash instead of initiating new market relationships.

Market-related	• There are concerns regarding weak market linkages for domestic and export orientations, with local markets often playing a greater role in achieving organic premiums. • Generating marketable surplus is a challenge due to smallholder farmers and high aggregation costs in Sikkim which, as a hilly state, requires significant institutional support.
Weaknesses	
Farm/Production-related	There is great potential for creating new farming methods targeted to increase productivity through setting up proper research and development in the area.
Value-chain-related	• There is a need for strengthening the local value chain by setting up localised processing units, possibly under the guidance of FPOs, given the emphasis on FPOs for the mission. • The options in livestock such as pig farming could generate additional income, which can be integrated into the farming system as well as local diets.
Policy-related	The youth could be re-integrated into farming activities by encouraging further entrepreneurial ambitions.
Institutions-related	There is a need for rethinking old institutional mechanisms for organic farming that requires a reorientation of old methods to capture all benefits. This needs to be aligned with a green economic growth trajectory for the entire state.
Market-related	The urban demand for organic produce is increasing, particularly in cities like Kolkata. Entrepreneurs are utilising this demand to capitalise on the market. Export-oriented interests are also entering the Sikkim organic mission ecosystem, establishing market relationships for post-harvest processed produce. Marketing Professionals need to develop a strong Sikkim organic brand to integrate with the state's tourism potential and develop organic cuisines.

Threats	
Farm/Production-related	The availability of farm labour in Sikkim is a concern due to the diverse livelihood options available to households, causing some farmers to leave their lands fallow. Climate change impacts are also evident, resulting in phenomena such as erratic precipitation.
Policy-related	The Sikkim government's grazing ban has negatively impacted livestock maintenance, affecting the availability of organic inputs for farms. Additionally, a preference for government jobs has led to people avoiding farming, and a significant portion of the budget is allocated to government staff salaries, affecting infrastructure like irrigation.
Market-related	The organic certification process in Siliguri faces significant competition from non-organic produce, affecting the capture of organic premiums. The indistinguishability of organic produce in bazaars makes it difficult to distinguish it from Siliguri's produce, further complicating the certification process.

Source: Approaches to Doubling Farmer's Incomes, Agro-Ecological System-Based Considerations (2020-22)[8]

Key Challenges to the Sikkim Organic Model

- **Lack of marketable surplus:** To boost the incomes of farmers, there is a need to generate surplus that can be sold in the market. However, farmers grow a variety of produce for self-consumption and are not in the practice of monocropping, thus limiting the space for generating a requisite surplus. Additionally, the cost of aggregation in a hill state is high for any government agency to undertake. Finally, the option to grow a single crop to increase the marketable surplus may negatively impact the agro-biodiversity.
- **Extracting organic produce premiums:** Generating premiums from organic produce is challenging. Most premiums are captured in local markets. Therefore, value addition is required to enhance longevity and attract export-oriented trade.

- **Policy coherence:** The Sikkim organic farming model faces challenges due to interconnected policies and a lack of evidence-based policymaking. The Forest Department's grazing ban reduced livestock incentives, impacting the model's viability. Government departments may also work in silos.
- **Rethinking institutions:** Organic farming has not been given much attention in the process of reimagining institutions and their collaborative linkages. The current system relies on traditional farming networks, leaving little room for new opportunities.
- **Interest from the younger generation:** The youth's lack of interest in agriculture as a livelihood option is resulting in a farm-labour shortage and the potential for agri-entrepreneurial efforts in Sikkim. This lack of interest hinders the viability of the organic mission as well as the growth of the agri-entrepreneurial system.
- **Climate Change:** Climate change is expected to have a greater impact on mountain landscapes by affecting farming livelihoods. To sustain agriculture, it is crucial for farming communities to adapt and receive the necessary support and training.

Conclusion

The organic farming mission in Sikkim aims to improve on-site interventions like crop and livestock productivity, ensure resource-use efficiency, and diversify to include high-value crops for enhanced farm incomes as well as offsite activities like strengthening FPOs, firming up the value chain, and improving market recognition. Besides capacity building, improved technology dissemination would help farmers adopt organic farming practices. The strategy needs to shift from an approach that is based on push factors to one of pull factors, including organising organic producers, post-harvest processing facilities, and organic

bazaars and promoting organic agro-tourism. This second-generation initiative will increase scaling up and contribute to sustainable farming across the state and the North-East region.

Additionally, integrating organic farming with the Sustainable Development Goals (SDGs) can foster a sustainable, resilient, and equitable agricultural system that benefits both individuals and the planet. There are various ways in which organic farming can be enhanced in line with the SDGs; promoting organic farming would encourage agro-ecological practices that help smallholder farmers increase their productivity and improve their livelihoods without compromising environmental health. It will help minimise waste and maximise resource efficiency and enhance food security and nutrition by increasing biodiversity, fostering resilient ecosystems, and promoting diverse crop varieties, thus contributing to sustainable food production systems. Notably, it would aid in climate-change mitigation and adaptation by enhancing carbon sequestration, improving soil health, and reducing greenhouse gas emissions. It would also foster partnerships among various stakeholders, including governments, NGOs, research institutions, the private sector, and marketing channels, and, above all, consumers.

Endnotes

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Achieving Zero Hunger: Assessing Progress and Future Challenges

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Achieving "zero hunger" by 2030 is a primary objective of the United Nations Sustainable Development Goals (SDGs), particularly SDG 2, which aims to "end hunger, achieve food security and improved nutrition, and promote sustainable agriculture."[1] As the world nears the deadline for the SDGs, notable progress has been made across the globe; yet, massive challenges remain, and the world is off-track in achieving the 2030 agenda.[2] The Global Hunger Index 2023 indicates that "little progress" has been made at a global scale in reducing hunger since 2015.[3] The report estimates that given the current pace, over 58 countries will not reach the target for zero hunger by 2030.[4] Moreover, the 2023 "State of Food Security and Nutrition in the World" report

indicates that nearly 691 to 783 million people faced hunger in 2022, with 122 million more people experiencing hunger since 2019. Also in 2022, some 2.4 billion people around the world faced moderate to severe food insecurity.[5]

Multi-Sectoral Challenges in Achieving Zero Hunger

Addressing the complex challenge of hunger and malnutrition requires coordinated and actionable policy solutions aimed at transforming food systems and service delivery institutions towards sustainability, resilience, and equity. This ambitious target has the potential to positively impact other SDGs related to health, quality education, and economic growth.[6] Assessments estimating the economic impact of malnutrition burden indicate that the cost of undernutrition, including stunting and wasting of children and micronutrient deficiencies alone is nearly US$1-2 trillion for the world economy.[7]

The March 2024 meeting by the Food and Agriculture Organization (FAO) on the global progress for targets under SDG 2 concluded that the world is at a moderate distance to achieving SDG 2, having achieved "no improvement" since 2015.[8] The lack of progress is attributable to multiple factors, including a series of global shocks such as the COVID-19 pandemic and the Ukraine war.[9] Recent studies estimating the impact of conflicts on food security highlight how the Ukraine war can put global food security at risk, compromise the capacity of food supply chains, and ultimately lead to food shortages and malnutrition.[10] Compounding the challenge is climate change. Rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events are negatively impacting agricultural productivity.[11]

Global Action Agenda on Hunger, Food Security, and Malnutrition Post-2030

Inclusive Governance for Zero Hunger

Inclusive governance is one of the keys to achieving zero hunger, ensuring that all stakeholders, including smallholder farmers, women, and marginalised groups, are involved in the formulation and implementation of policies. A participatory approach improves the legitimacy and effectiveness of policies by incorporating diverse views, experiences, and perspectives. This includes involving local communities in designing and implementing agricultural programs to make them more relevant to their context and thereby capable of generating sustainable solutions.

Inclusive governance also enhances accountability and transparency. By holding decision-makers accountable, inclusive governance may prevent corruption and misuse of resources, ensuring that they reach those in need.[12] A 2021 survey to gather insights on the zero-hunger goal recommends that "ensuring solutions to hunger are truly inclusive"; it underlines how the aim of "leave no one behind" requires more dialogue with local communities when shaping policy responses.[13]

Achieving truly inclusive governance requires overcoming massive challenges. First, political will and commitment from governments at all levels are essential. Second, building the capacity of local institutions and communities to participate in governance processes is crucial. This involves providing training, resources, and platforms for engagement. And third, inclusivity in governance and decision-making should pay particular focus on reducing inequities in rural areas, conflict zones, and within marginalised communities, who often face higher rates of hunger and malnutrition.

Sustainable Food Value Chains

The concept of 'sustainable food value chains' underlines the imperative of tackling sustainability challenges across food availability, accessibility, consumption, and waste on three crucial fronts: economic, environmental, and social. These efforts have a direct impact on reducing poverty and hunger by promoting practices that are economically viable, environmentally sound, and socially equitable.[14] Such value chains minimise environmental impacts through practices such as bringing down greenhouse gas emissions, conserving water, and protecting biodiversity. Sustainable food value chains also ensure economic viability. For instance, supporting smallholder farmers through fair trade initiatives and providing access to markets can enhance their livelihoods and promote economic development.

Promoting local and regional food systems may emerge as a key strategy for sustainable food value chains. Strengthening local food systems reduces reliance on long and complex global supply chains, thereby enhancing food security and resilience. Latest evidence shows that regionalised food systems, particularly those in urban areas can shorten supply chains, reduce transportation emissions, and provide fresher and healthier food to consumers.[15]

Social equity is another critical aspect of sustainable food value chains. For instance, targeting women farmers by ensuring their access to land, credit, and technology can enhance food security and promote gender equality. Similarly, smallholder farmers can be provided special support through the provision of microfinance, extension services, and promotion of farmer cooperatives. Finally, educating consumers about the environmental and social impacts of their food choices can also drive demand for sustainably produced food.

Resilience for Zero Hunger

Building resilience is crucial for achieving zero hunger in the face of various shocks and stresses. As identified in the United Nations Food Systems Summit 2021, "diversification" for enhanced "food systems resilience" emerges as a key strategy. Studies have found that encouraging diversified income sources for rural communities has the potential to reduce the vulnerability of households to economic and environmental shocks.[16] For example, promoting non-farm income-generating activities, such as agro-processing and handicrafts, can provide additional sources of income, reduce dependence on agriculture, and ultimately lead to greater disposable incomes. Increased incomes can equip households with more power to consume.

Climate-resilient agriculture is another critical component for ensuring food security in the face of worsening climate change.[17] Investing in climate-resilient crops, improved irrigation systems, and soil health can help farmers adapt to changing climatic conditions.[18] For instance, drought-resistant crop varieties and efficient water management practices can enhance productivity and resilience to climate change.

Emergency preparedness is also essential. Developing early warning systems and disaster response mechanisms can mitigate the impact of crises on food security.[19] For example, "pro-active" climate information services can provide timely information and support to vulnerable communities and mitigate the potential impacts of natural disasters on food safety.[20]

Achieving zero hunger by 2030 is an ambitious goal that requires concerted efforts across multiple fronts coupled with long-term planning to address both immediate needs and future challenges. Inclusive

governance, sustainable food value chains, and building resilience are essential strategies that can contribute to this goal. These efforts must be supported by strong political will, adequate resources, and robust collaboration among all stakeholders. By addressing these challenges and leveraging the potential of inclusive and sustainable approaches, the global community can make strides towards eradicating hunger and ensuring food security for all.

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Aligning Sustainable Agriculture, Farmer Producer Organisations, and Carbon Markets for the Post-2030 Development Agenda

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Amidst increasing awareness of climate action and renewed emphasis by the Conference of the Parties (COP),[a] sustainable farming practices are receiving greater attention globally. In India, the focus has been on mobilising farmer-producer organisations (FPOs), particularly those that are women-led, to embrace sustainable agriculture, reinforced by government directives and civil society activities. "Carbon markets"[b] appear to be a viable tool to encourage farmers to practice sustainable

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a Each year, the United Nations Climate Change Conference is organised under the auspices of the UN Framework Convention on Climate Change (UNFCCC) to evaluate the progress made in addressing climate change against the backdrop of the Kyoto Protocol 1992, which imposes legally binding obligations on nations to reduce their greenhouse gas emissions. These gatherings are known as the Conference of the Parties (COP) of the UNFCCC.

b Trading platforms for carbon credits are known as carbon markets. Compliance markets and voluntary markets are two trading mechanisms.
See: https://climatepromise.undp.org/news-and-stories/what-are-carbon-markets-and-why-are-they-important

agriculture.[1] Agencies have also expressed interest in using FPOs for the measurement of greenhouse gas (GHG) emissions and adaption to carbon markets. However, the pathways to intensifying sustainable agricultural practices and ensuring the accrual of carbon market benefits still need experiential consolidation. In the context of the Sustainable Development Goals (SDG), the following decade would see more such actions. Consequently, it would be crucial to create an ecosystem of support at the nexus of sustainable agricultural practices, FPOs, and carbon markets.

PRADAN[c] has worked for decades with about a million smallholder farmers, resulting in about one-third of them adopting regenerative farming; over 200 bio-input resource centres (BRC)[d] have also been established so far. With more than 50,000 women farmers as shareholders across 100 FPOs, PRADAN has significant experience in designing interventions—from promotion to marketing, and from plot-based adoption to a landscape-based approach. Moreover, PRADAN's engagements in carbon offsetting projects make it a suitable contributor to the formulation of this agenda.

The Sustainable Agriculture Landscape in India

Agriculture in India has long been dependent on local resources, including indigenous crop varieties and knowledge acquired through persistent interactions with the environment. Nevertheless, the last few decades of external input-driven agriculture—involving the use of

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c The authors are practising professionals affiliated with PRADAN.

d A Bio-Input Resource Centre (BRC) is a small facility where farmers can acquire locally prepared inputs or formulations that use biologically derived inputs to improve crop growth, soil health, and pest and disease management.

pesticides and fertilisers, exploitative irrigation practices, hybrid crop varieties, and mechanisation—have put a lot of stress on natural resources like land and water.[2] The counter-productive nature of the market-based high-input model of agriculture has been widely discussed and acknowledged.[3] The net irrigated area in India constitutes 49 percent of the total net sown area. Of this, approximately 40 percent is irrigated via canal systems, while 60 percent uses groundwater.[4] Some eighty-six percent of Indian farmers are smallholders, i.e., having a landholding size smaller than 2 hectares.[5] The farming of small land results in ecological stress, as these farms are largely rain-fed and highly dependent on groundwater for irrigation.

Economically unviable practices with unassured returns to farmers are also unsustainable and may not be adopted by farmers. This has further intensified the debate in policy and executive circles around promoting the adoption of sustainable farming practices.

The National Mission for Sustainable Agriculture (NMSA), 2014 set guidelines and strategies to promote location-specific integrated and composite farming systems that encompass resource restoration and management, infrastructure development, knowledge creation, research, and data management.[6] Maintaining the present status of productivity, profitability, soil and water conservation, and resilience to climate change are some of the pillars of promoting sustainable agriculture.

It may appear aspirational to address climate-change issues, soil and water conservation, profitability, and farmers' well-being all at the same time. In a scoping study on the adoption of regenerative farming, 60 percent of women farmers stated that the unavailability of raw materials is a critical challenge. Additionally, chances of decreased yield in the initial years, the fear of pest attacks, increased drudgery, and lack of

assurance to cover losses discourage farmers. In that sense, economy and ecology are linked, and for smallholders to adopt sustainable agriculture, there is a need to ensure investment, inputs, knowledge, and market support.

The Importance of FPOs

One of the biggest hurdles for smallholder farmers is getting competitive prices for their commodities, and accessing markets, to begin with. In the last few years, FPOs have emerged as possible channels for lowering transaction costs and boosting market participation. The Government of India scheme, "Formation and promotion of 10,000 FPOs", launched in 2020 with a budgetary provision of INR 6,865 crores[7] is a boost to the FPO landscape; as of 30 November 2023, some 7,600 FPOs have been incorporated under this scheme.[8]

Over the next five years, the scheme intends to benefit around ten million producers or 10 percent of all agricultural households, significantly improving the livelihoods and well-being of smallholder farmers.[9] FPOs are expected to provide their members with end-to-end services in farming and support the linkage among farmers, processors, traders, and retailers to obtain essential business development services including market data, input supplies, and transportation services.

PRADAN, in its engagement with about 100 FPOs across the Central India Tribal Region (CITR), found that there is a constant tension between FPOs' profitability and the need to promote sustainable agricultural practices. One of the challenges that FPOs face is that the commodities grown through sustainable means are less likely to be measured and incentivised. Focusing on the sustainability of resources and the impacts of climate change gives little motivation

for farmers to opt for adoption. The lack of investment to create data and evidence-based systems in FPOs is another challenge towards attribution, measurement, and accessing niche markets.

Can Voluntary Carbon Markets Play a Role?

Getting premium prices for commodities without organic certification is an arduous task; the organic certification process itself is tedious, especially for smallholder farmers. At present, the voluntary carbon market[10] is being viewed as a strategy, mostly by civil society and market actors, to incentivise farmers. In 2023, the Ministry of Agriculture & Farmers Welfare (MoA&FW), Government of India, created a framework for the Voluntary Carbon Market (VCM), where FPOs are projected as enablers.[11] The expectation is that the national carbon market will be implemented soon. However, the VCM is yet to specify eligible activities, and challenges include inadequate capacity for designing carbon pricing instruments and addressing social implications.[12]

PRADAN is engaged in one of the projects on carbon offsetting in rice farming and is roping in another project. In 2023, PRADAN in one of its pilot projects on alternate wet and drying (AWD) in rice farming[e] found that an incentive of only 40 paise per kilo could be ensured—this was not encouraging for farmers or for FPOs. There is a challenge in skilling farmers and FPOs on the carbon market to create a robust mechanism. In turn, an imperative is a clear understanding of how carbon markets operate before they can be promoted on a larger scale.

[e] The pilot was in Madhya Pradesh and involved 5,000 farmers.

The Way Forward

Amid efforts from various government agencies and NGOs to build synergies among sustainable farming practitioners, FPOs, and carbon markets to simultaneously address climate issues, incentivise farmers, and create business for FPOs, a focus on evidence-building is crucial. In the next few years, there will be increased action towards incorporating FPOs to promote sustainable agriculture and engage in carbon trading.

A clear pathway is required to establish coordination and partnership among various actors to devise mechanisms, test and validate interventions, and establish carbon credit protocols for FPOs to participate and understand whether climate issues can be addressed without compromising on the productivity and profitability of the FPOs and their members. The alignment of these domains of intervention would provide a foundation for the development agenda beyond 2030.

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V.

Crafting Climate and Environmental Governance

Smart Cities, Safe Climates: AI's Role in Resilient Futures

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The Asia-Pacific is off-track to achieving the Sustainable Development Goals (SDGs) by 2030, with current progress falling far short of what is required.[1] Yet, the SDGs will continue to be relevant beyond 2030, which necessitates an examination of the enablers of the global development targets.

The use of Artificial Intelligence (AI) and emerging digital technologies in disaster risk reduction and climate action will be instrumental in building resilience for the most vulnerable communities, aiding in the achievement of disaster and climate-related SDGs post-2030. This is particularly true for SDG 1 (No Poverty), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). These technologies can address complex challenges across various sectors, enabling informed decision-making,

optimising resource allocation, and enhancing resilience against natural disasters and climate-change impacts.

The Current Status of Disaster and Climate SDGs in the Asia-Pacific
The Asia-Pacific region has had mixed progress in achieving SDG 1 and SDG 11. Although there have been notable improvements in reducing poverty and enhancing access to basic services like water and sanitation, massive challenges persist in disaster and climate-related indicators.[2] Since 2015, poverty reduction has slowed, and in 2020, the COVID-19 compounded the challenge, reversing earlier gains. By 2030, an estimated 575 million people, or 7 percent of the global population, may still live in extreme poverty.[3] The 2024 ESCAP Asia Pacific Disaster Report[4] notes that, while there has been a marked improvement reducing the incidence of disaster-related deaths, economic losses from disasters, alongside inadequate local disaster risk reduction (DRR) strategies, are on the rise—these threaten the attainment of SDG 1 targets by 2030.

Urban areas in the Asia-Pacific are growing rapidly, with over 45 percent of the population currently living in cities and expected to rise to 60 percent by 2050.[5] This urban growth brings interconnected challenges, including supply chain disruptions, transportation network vulnerabilities, and infrastructure strain, exacerbated by extreme weather events and natural hazards.[6] Despite progress in disaster risk management policies, resilience to disasters is regressing, particularly in LDCs (Least Developed Countries), LLDCs (Landlocked Developing Countries), and SIDS (Small Island Developing States)—these are the regions within the Asia-Pacific that are lagging in SDG targets.[7] SDG 13, which emphasises urgent action to combat climate change impacts, is also regressing in most countries in the Asia-Pacific.[8]

AI and digital technologies are pivotal to accelerating and enhancing climate action, offering innovative solutions to complex environmental challenges. These technologies promise to revolutionise climate understanding, mitigation, and adaptation, fostering a more resilient and sustainable global ecosystem for a more sustainable post-2030 agenda.[9] This article explores the areas in climate and disaster resilience where the current momentum in AI and digital technologies can leapfrog the achievement of sustainable development beyond 2030.

The Transformative Potential of AI and Digital Technologies

AI-Enhanced Early Warning Systems

AI enhances disaster preparedness and response by improving Early Warning Systems (EWS) and forecasts in data-scarce areas, thus reducing the vulnerability of impoverished communities to natural hazards.[10] Google's AI for Climate Resilience leverages historical datasets to improve flood forecasting, wildfire tracking, and real-time disaster response, outperforming traditional models.[11] Microsoft's collaboration with IHME (Institute for Health Metrics and Evaluation) and Planet uses AI and satellite imagery to map vulnerable populations, informing public health strategies, disaster response, and resource allocation, as seen in efficient aid distribution in Ethiopia.[12,13] Similarly, ESCAP's Asia Pacific Risk and Resilience Portal[14] integrates AI and machine learning to provide comprehensive risk assessments, bringing together climate, hazard, and socioeconomic data to identify risk hotspots and support targeted adaptation strategies across the Asia-Pacific region. More recently, deep learning technologies are being piloted for the automatic detection of seismic phases, with a potential for longer lead times for earthquake EWSs.[15]

Agricultural Productivity and Sustainable Land Use

AI-powered precision agriculture optimises agricultural practices, increasing crop yields and enhancing food security. Advanced sensors and AI algorithms monitor soil health, crop growth, and weather conditions in real-time, enabling sustainable water usage and reducing chemical inputs.[16] These practices support poverty reduction by providing stable incomes for farmers in vulnerable regions. AI has further aided in reforestation, afforestation, and desertification efforts by identifying optimal planting sites and monitoring forest health, which are crucial for climate action and sustainable land management.[17]

Social Interventions and Infrastructure Resilience

AI refines population estimates and understands demographic changes, enabling targeted social interventions and aid distribution. Machine Learning with satellite imagery and survey data generates visualisations and predictions of poverty in areas that lack survey data. ESCAP, for example, has used advanced spatial downscaling methodology to develop country-level climate-projection information and identify critical infrastructures under future risk of sea-level rise and coastal flooding in the Maldives on the Asia Pacific Risk and Resilience Portal. Similarly, climate model-based analysis on the glaciers in Bhutan could help identify the hydropower plants that might be impacted by the reduced water availability in the coming decades.[18] Additionally, AI assesses and improves the resilience of critical infrastructure against natural disasters and shocks. This includes stress-testing infrastructure and optimising evacuation routes, which can help save lives and reduce poverty during crises.[19]

Integrating Adaptation and Mitigation for Comprehensive Resilience

AI's ability to process vast datasets and uncover intricate patterns advances climate modelling and predictive analytics. Enhanced AI algorithms provide precise climate projections, aiding disaster preparedness and risk management. These models simulate various climate scenarios, helping policymakers integrate both adaptation and mitigation strategies.[20] AI-driven energy management systems optimise renewable energy sources, dynamically balancing supply and demand, reducing energy wastage, and enhancing grid stability. These advancements also contribute to reducing greenhouse gas emissions.

Advancing Nature-Based Solutions

AI and digital technologies advance nature-based solutions (NbS) like reforestation, wetland restoration, and sustainable land management. The speed with which AI analyses satellite imagery to identify degraded areas suitable for reforestation and monitors the growth and health of restored forests is essential to restoration.[21] Machine Learning models predict the impacts of various restoration strategies on biodiversity and carbon sequestration, enabling informed decision-making. Drones equipped with AI algorithms can survey large areas quickly, assessing vegetation health, soil conditions, and water availability to facilitate adaptive management practices.

Enhanced Climate Monitoring and Reporting

Digital technologies, including satellite imagery and Internet of Things devices, revolutionise climate monitoring and reporting. A network of interconnected sensors and satellites provides real-time data on greenhouse gas emissions, as well as deforestation rates and other

environmental indicators.[22] AI algorithms analyse this data to offer actionable insights, enabling effective policy interventions. Blockchain technology ensures transparency and accountability in climate finance by tracking funds and verifying the implementation of climate projects.

Facilitating Global Cooperation and Knowledge Sharing

AI and digital platforms enhance global cooperation and knowledge sharing, which are crucial for addressing the transboundary nature of climate change. Collaborative platforms powered by AI enable the seamless sharing of climate data, research findings, and best practices among nations and organisations. These platforms facilitate the coordination of global climate initiatives, ensuring synergistic and impactful efforts. AI also assists in developing equitable climate policies by analysing socio-economic data and predicting the impacts of different policy measures on various demographic groups.

Way Forward

Despite the transformative potential of AI and digital technologies, various barriers hinder their widespread adoption, particularly in regions outside North America and Europe. These obstacles include funding constraints, inadequate infrastructure, and a shortage of skilled professionals. Ethical concerns such as data privacy, algorithmic bias, and potential misuse also pose challenges. Addressing these issues requires clear regulatory frameworks, ethical guidelines, and robust data governance.

Strong regional leadership, supportive policies, and international cooperation are also essential to drive AI adoption. Investing in research and innovation, enhancing education and training, and

promoting inclusive policies can help bridge the talent gap and democratise access to AI technologies. Building public trust through transparent communication and demonstrating tangible benefits are also crucial for widespread acceptance. Overcoming these barriers through a multifaceted approach will enable the full potential of AI and digital technologies to be harnessed for achieving SDG 1, SDG 11, and SDG 13 beyond 2030.

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Fishing for Waste: Exploring Solutions to Oceanic Plastic Waste

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About 60 Indian cities generate 15,343 tonnes of waste dumped in the South Asian seas each day.[1] Such figures should motivate action at multiple levels. However, data on plastic waste pollution is so vast and often too removed from reality that it is inaccessible to those living in coastal communities who are at the forefront of any solution to reduce ocean-bound plastic.[a,2] It is only when an individual or groups understand those parts of the data that are relevant to them and where they can have an impact (individually or as a community) that they are motivated to make the necessary changes.

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[a] Ocean-bound plastic is 'abandoned plastic waste' (microplastics, mezzo-plastics, and macro-plastics), located within 50 km from the shores where waste management is inexistent or inefficient. Waste abandoned in an uncontrolled or informal dump site is considered ocean-bound plastic. Notably, plastic waste located in a landfill or managed dump site is not considered ocean-bound plastic.

This is the premise on which Clean Hub[b] built the *Clean Pondicherry project.* The initial goal was to build an initiative with strong community engagement using data to understand the scale of plastic pollution in the waters and what can be done to stop it.

Clean Hub has been active in Puducherry city for about three years, working alongside implementation partner Recity, an Indian plastic waste management company. The work focuses on diverting low-value plastic to processing facilities, so that it does not end up in the environment. This is done by setting up a material recovery facility (MRF) where plastic waste collected from coastal municipal wards is sorted and sent for recycling or processing. The MRF is set up by Recity along with the municipality of Puducherry.

Each project where Clean Hub has co-designed waste management solutions has highlighted that having the right infrastructure is essential to setting up a waste management process. Awareness building, community engagement, enforcement of law, and other initiatives can only be successful if there is infrastructure.

Puducherry has about 12 fishing villages, one of which is located near the existing MRF. The fisherfolk in this village work next to a mangrove forest and the Thengaithittu estuary, two vulnerable points affected by the mismanagement of waste. Without the supporting infrastructure and data, this fishing community could not take any action to safeguard its waters and marine life. Importantly, since Clean Hub already had the

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[b] Clean Hub is an organisation working to reduce plastic waste leakage into oceans by partnering with local waste management firms. The author is Head of Impact at Clean Hub.

infrastructure, it could now address the second component—capturing the data of waste. The Clean Hub team decided to reach out to this fishing community to understand how they could work together and it was decided to adopt a community-led approach that could solve for long-term sustainability from the initial design stage. The Clean Hub team also adopted the principles of human-centred design so that community input could be included at every stage.

Using Data for Sustainable Waste Management

> *Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.*
>
> - Margaret Mead, American anthropologist.

Inspired by this idea, the Clean Hub team reached out to the fishing village since the first step is to build trust. It was soon realised that what the community really needed was for the team to build a solution that was reliable and not a short study. This was an interesting challenge for the team as it meant building a pilot while also developing a long-term solution.

The team held a few meetings with the community members and community leaders, to enable designing a programme together. Given their deep understanding of the waters, community members indicated that large fishing boats that go for multiple days into the deep sea do not collect much plastic, while those involved in shallow-water fishing do as the plastic floats closer to the surface.

The Clean Hub team organised a group of five boats—three small boats mostly fishing within the estuary and shallow waters, and two medium boats that went for a maximum of one day into semi-deep waters—with a total of 10 people from the fisherfolk community to work on the six-month pilot project beginning in August 2023. Clean Hub provided the team with collection equipment and instructions on drying the plastic and sorting out recyclable plastic. They also set up an incentive scheme to pay for the collected recyclable materials. Prior to this, any plastic that was found in the fishing net was thrown back into the sea. But even a few plastic covers or bottles amount to large volumes of waste.

A crucial outcome of the six-month pilot phase was that the community realised that there was a lot of plastic in the water. Indeed, within the first three months, the team collected, on an average per month, about 360 kg from each small boat and 1,500 kg from a medium boat as by-catch. This plastic collection was done during two to four hours of fishing per day, according to the data recorded through the CleanHub app.[3] Three months into the project, the Clean Hub team met with the larger community to present its initial findings. The following were the main changes observed:

- One boat team set up an additional handmade contraption that enabled the collection of plastic waste from the seabed at a depth of about 9 feet.
- Looking at the amount of waste, the fisherfolk proactively started collecting floating plastic even beyond their fishing hours by going to areas in the river that had more plastic waste.

The long-term solution would be to share these findings with the larger fisherfolk community and with the fisheries department. The larger

community is ready to extend their full support to the project and engage in any way possible, including supporting the project team if we reach out to the fisheries department. Indeed, in the words of one of the fishermen in the pilot team, "We do this work with love, not with effort."

These were used to secure funding to expand the programme to 50 boats over a one-year period. The Clean Hub team was keen to reflect on the learnings from the pilot to build a better programme, and spent February and March 2024 redesigning the project.

Key Learnings

Although the focus was to build a community-led project to understand the volume and nature of plastic waste in the waters, there were several other learnings from the pilot that encouraged Clean Hub to redesign the programme:

- Although the fishing community is organised, it is unable to access all government schemes that will help it in its work, primarily due to a lack of access to information and support.
- Fisherfolk using smaller boats have little space to work, which is why there are many discarded nets on the shore. If they had shaded spaces, they would perhaps have cleaned up some nets and sent these for recycling.
- The tides have a big impact on the fishing and the plastic. When the tide changes, the flow of plastic allows for better ways to stop it from entering the ocean if such action is well planned.
- The community is aware of the importance of mangrove forests. They are keen on protecting these forests as it directly affects the food chain and, in turn, their livelihoods.

- During off-fishing season, the plastic waste collection was adding a nominal income to the fisherfolk. With understanding plastic types, they could earn an additional income.
- Women and children are an integral part of the work, with most children becoming fisherfolk as well, even if they have finished some level of formal schooling. As such, building relationships with the children is a great way to ensure long-term solutions.

Based on these learnings, the team returned to the community to present a partnership model for the programme. This led to the new design, which had the elements of plastic collection and improved with the greater involvement of women and children.

Ongoing Efforts

The second phase of the project commenced in April 2024, involving three fishing villages and 50 boats. Clean Hub is now engaging with the onboarded fisherfolk to encourage a better understanding of financial planning, and government schemes on health and subsidies. When not actively fishing, fisherfolk can focus on waste collection as an alternative income source. Clean Hub is also building shelters for the fisherfolk so they can work on waste sorting, fishnet repair and storage.

It has also launched a school programme to build zero-waste campuses. The children learn how waste travels from their dustbins to the ocean, how to stop this, and how to participate in waste management. Since these students come from fishing communities, such knowledge, along with the plastic collection programme, encourages them to adopt better fishing practices.

The current goal of the programme is to onboard fisherfolk from one harbour so that all the boats can bring the plastic back to the shore and send it for recycling. To reduce waste inflow, the Clean Hub team works with other government bodies to build river barricades upstream. The waste that gets stopped can be managed by the municipal bodies and their boats.

The Way Forward

This project presents some crucial lessons on ensuring the achievement and long-term viability beyond 2030 of Goal 14 of the Sustainable Development Goals ('conserve and sustainably use the oceans, seas and marine resources for sustainable development'). These lessons can be replicated through community-led solutions at the fishing village level.

- Plastic pollution is everywhere. It is important to collect the relevant data and identify the impact that is to be achieved for each community.
- If the focus is only on building awareness without establishing the necessary infrastructure to support a solution, initiatives have a high risk of failure.
- Inputs from all members of the communities are crucial to accelerate the research phase.

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Designing a Holistic Framework for Oceans: The Importance of the Blue Economy for India

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The Blue Economy encompasses the sustainable use of ocean resources for economic growth, improved livelihoods, and job creation while preserving ocean health. It includes traditional sectors such as fisheries, tourism, and maritime transport, as well as emerging industries like renewable energy, aquaculture, seabed mining, and marine biotechnology.[1,2]

The global ocean economy, valued at approximately US$1.5 trillion per year, is crucial for the livelihoods of over 3 billion people and the facilitation of 80 percent of world trade via seas.[3] With 40 percent of the world's population living near coastal areas, ocean conservation requires a comprehensive approach. The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) aims to address

ocean health and sustainability, calling for a transformative shift beyond the Blue Economy's focus on economic activities.[4] This approach integrates social, environmental, and economic dimensions to achieve the Sustainable Development Goals (SDGs). As of April 2024, sea-surface temperatures reached record highs for 13 consecutive months, leading to global coral bleaching and declining fish stocks due to overfishing, pollution, climate change, and poor management.

The Importance of Blue Economy for India

India's 7,516.6-kilometer coastline spans nine coastal states and four union territories. Coastal districts account for 17 percent of India's population, with nearly 250 million people living within 50 kilometres of the coast. These areas are significant due to population growth, urbanisation, and development. The Blue Economy contributes 4.1 percent to India's total economic output, with key sectors including fisheries, aquaculture, shipping, and tourism providing substantial employment. The fisheries sector alone supports around 16 million fishers and fish farmers.

In order to marry the concepts of conservation and sustainable development with Blue Economy,[5] it is important to sustainably manage living and non-living ocean resources, including fisheries, marine minerals, and energy resources. A sustainable Blue Economy model ensures marine ecosystem protection, crucial for biodiversity, climate change mitigation, and livelihood support. Policies focused on marine spatial planning and environmental monitoring balance economic activities with ecological conservation.

Sustainable exploitation can lead to long-term economic benefits and environmental conservation. Inclusive transformation in ocean governance emphasises equitable resource access and opportunities

within the Blue Economy. Future strategies should thus include and empower marginalised communities, particularly women and indigenous populations, through skill development, financial inclusion, and leadership training.

Further, investing in ocean science and technology is crucial for sustaining the development along the coastlines. While India conducts regular geophysical surveys and develops technologies for deep-sea fishing, seabed mining, and marine biotechnology, vital for economic diversification and resilience, there is a need for larger collaboration among ecosystem stakeholders to enhance the sustainability along the blue lines.

Enhancing Blue Economy through Advanced Ocean Information and Advisory Services

India's Blue Economy is strengthened by the Indian National Centre for Ocean Information Services (INCOIS), an autonomous organisation of the Government of India, under the Ministry of Earth Sciences, which provides essential ocean data and advisory services. Through initiatives like Potential Fishing Zone (PFZ) Advisories, Coral Bleaching Alerts (CBAS), and Algal Bloom Information Services (ABIS), INCOIS supports the fishing, shipping, and coastal sectors by offering real-time information.

A key focus of the organisation is risk management, with INCOIS delivering early warnings for tsunamis, storm surges, oil spills, and marine heatwaves. These insights, powered by advanced computing and real-time ocean data, help stakeholders take preventive actions, reducing economic losses and safeguarding livelihoods.

Prediction and forecasting technologies are central to this strategy, enabling proactive risk mitigation and informed decision-making. A 2020 study by the National Council of Applied Economic Research highlighted the economic benefits of investment in high-performance computing for ocean forecasting.[6] INCOIS's partnerships with global organisations and government programmes like the Pradhan Mantri Matsya Sampada Yojana (PMMSY) further amplified its role in promoting sustainable resource use and protecting marine ecosystems. This comprehensive approach positions India to lead the Blue Economy movement while ensuring resilience and prosperity for coastal communities.

The partnership between INCOIS and Reliance Foundation[a] exemplifies the transformative power of public-private collaborations in advancing India's Blue Economy. INCOIS provides essential oceanographic data, while Reliance Foundation translates this complex scientific information into user-friendly advisories for fishing communities. Through tools like the 'Machli' app,[7] which provides critical fishing zone information and ocean state forecast for both personal and asset safety, WhatsApp-based advisories, and tele-consultation services, Reliance Foundation reaches nearly 25 percent of India's active marine fisherfolk, offering life-saving information on fishing zones and disaster preparedness.

This collaboration plays a vital role in risk management, with a focus on prediction and forecasting technologies. By delivering real-time insights, such as Early Warning Systems (EWS) for cyclones and tsunamis, the partnership equips coastal communities to proactively

[a] The author is affiliated with Reliance Foundation.

respond to natural disasters, reducing risks and safeguarding livelihoods. Reliance Foundation also empowers women in fishing communities by connecting them to government schemes and high-value economic activities, contributing to both gender inclusion and economic growth.

The INCOIS-Reliance Foundation collaboration enhances public awareness of ocean health and its critical role in economic prosperity, demonstrating the potential of public-private partnerships to drive innovation. As India continues to invest in ocean science, this partnership sets a strong foundation for sustainable growth, resilience, and community empowerment in the Blue Economy.

Inclusive Framework Post-SDGs: Strategies for the Future

The 2024 Sustainable Development Goals Report highlights the pressing challenges of overfishing, pollution, and climate change, which continue to deplete fish stocks and threaten coastal livelihoods.[8] To sustain a thriving Blue Economy beyond 2030, it is essential to dismantle barriers, empower communities, foster partnerships, and promote knowledge sharing to ensure fair and sustainable growth.

Marginalised coastal communities often lack access to education, technology, and economic opportunities, making it crucial for the ecosystem to address these gaps. Offering digital and technical training can bridge the divide and empower these communities to leverage emerging technologies. Integrating ocean health education into school curriculums will cultivate a generation that values sustainable practices, ensuring long-term stewardship of marine resources.

Empowering women and youth through inclusive decision-making processes is a key aspect of sustainable development. Programmes like Reliance Foundation's initiatives to enhance women's skills in marine fisheries are vital in building resilience, improving job opportunities, and creating a more inclusive economic landscape.

Nature-based solutions, such as mangrove restoration and sustainable aquaculture, enhance climate resilience while supporting livelihoods. These strategies not only mitigate climate impacts but also create sustainable economic opportunities for coastal populations.

Global collaboration is critical to bridging innovation gaps and promoting sustainable coastal development. Platforms like the Global Ocean Observing System (GOOS)[9] and the Ocean Teacher Global Academy (OTGA)[10] facilitate knowledge exchange, enabling countries to share best practices and improve ocean governance.

Leveraging technology such as autonomous platforms, AI-driven data analysis, and digital tools for education empowers communities with real-time insights. This enhances decision-making and enables faster responses to environmental challenges, ensuring more resilient coastal economies.

Current metrics for measuring progress in the Blue Economy often overlook the interconnectedness of social, environmental, and economic factors.[b] Developing new metrics that capture biodiversity, community

[b] Metrics for measuring progress in the Blue Economy fall into three categories: economic, environmental, and social. Economic metrics include GDP contribution, fisheries revenue, employment, and tourism footfall. Environmental metrics assess fish stock health, biodiversity, pollution levels, and carbon sequestration. Social metrics focus on livelihood improvements, access to resources, food security, and coastal community resilience. These metrics must be integrated to capture the interconnectedness between economic, environmental, and social factors.

well-being, and climate resilience will ensure that growth benefits both people and the planet, laying the foundation for a sustainable Blue Economy that supports livelihoods without endangering the environment.

Conclusion

To build a sustainable Blue Economy,[11] India can focus on balancing economic growth with the health of its oceans. This involves creating new opportunities while conserving marine biodiversity, promoting sustainable fishing, and nature-based solutions. Collaboration between academic institutions, research organisations, and industries is vital, along with regional and sectoral partnerships that are especially crucial for Global South nations.

Public-private partnerships are key to scaling innovation, creating jobs, and improving coastal livelihoods. A coordinated approach to ocean governance—driven by real-time data, financial tools like blue bonds, and active community engagement—will position India as a leader in building a resilient and equitable Blue Economy, safeguarding both people and the planet for generations to come.

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VI.

Leveraging Technology and Innovation

Bridging the Gender Digital Divide: A New Era of Empowerment in India

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In the digital age, connectivity is more than just a technological advancement—it is a crucial factor in economic empowerment, social inclusion, and overall well-being. The global expansion of digital infrastructure has helped reduce gender disparities in digital access. According to the *GSMA Mobile Gender Gap Report 2024,* across low- and middle-income countries (LMICs), 83 percent of women own a mobile phone, 60 percent own a smartphone, and 66 percent use mobile internet.[1] However, women are still less likely than men to have access to a mobile phone, mobile internet, and other digital services, and they are also less likely to use these devices and services.[2]

India too, has made strides in narrowing the gender digital divide. According to the 2021 National Family Health Survey, more women in India are using a

mobile phone than ever before; the percentage of women who own a mobile phone they can use by themselves has also increased to 54 percent, up from 45.9 percent in 2015-16.[3] Despite this progress, further efforts are needed to help ensure that women can fully access and benefit from digital connectivity.[4] This underscores the importance of building on current momentum and accelerating initiatives for women's digital inclusion. Recognising the transformative potential of digital inclusion, the U.S. Agency for International Development (USAID) and Reliance Foundation[a] have partnered through the WomenConnect Challenge (WCC) India.

Inclusive Transformations: A Step Towards Equitable Access

Created in 2018, the WomenConnect Challenge is USAID's global call for solutions to improve women's participation in everyday life by meaningfully changing the ways women access and use technology. It aims to inspire, identify, and develop effective, culturally appropriate interventions that target the root causes of the gender digital divide, underscoring the US Government's commitment to gender equity. To date, WCC has reached more than 10 million women in 16 countries.

In India, the Challenge was launched in 2020 with 17 awardees selected across two rounds, focusing on innovative and culturally contextual solutions to bridge the gender digital divide. The awardees were selected based on criteria that emphasised the ability to effectively dismantle barriers, ensure equitable access, and digitally empower women from marginalised communities through innovative solutions.

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[a] Authors Alexandria Huerta and Vanita Sharma are affiliated with USAID and Reliance Foundation, respectively.

To drive these goals forward, WCC India focuses on four pillars that are essential for bridging the gender digital divide and creating lasting impact.

1. Addressing systemic barriers to digital access

To address systemic barriers to digital access, it is essential to understand the multifaceted nature of the gender digital divide. Women in LMICs are 13-percent less likely than men to own a smartphone, resulting in approximately 200 million fewer women equipped with this technology. Additionally, women in LMICs are 15-percent less likely than men to use mobile internet.[5] This disparity highlights not only a lack of access but also a gap in digital literacy and awareness.

WCC India addresses these issues by supporting projects that focus on digital literacy and skills development, aiming to bridge these gaps in both access and knowledge. For instance, the Society for Development Alternatives, a Round One grantee, targeted sociocultural norms affecting women's access to technology in Lalitpur, Uttar Pradesh. Using their WomenConnect Challenge funding, they implemented a behaviour change campaign utilising street plays, community radio broadcasts, visual aids, focus group discussions, and door-to-door-engagement.[6] The campaign aimed to raise awareness of the benefits of women's use of technology and promote systemic changes in gendered perceptions of digital access and use.

2. Unlocking opportunities with digital literacy

Digital literacy is essential to bridging the gender digital divide. WCC India's approach to strengthening digital literacy involves not just training, but also integrating technology into daily life. For example, the M.S. Swaminathan Research Foundation, an awardee in Round Two, is using ICT tools, including an app, to equip women in post-harvest

fisheries with both digital literacy and domain-specific skills. Similarly, the Manjari Foundation is training rural women in entrepreneurship and helps them use digital skills, apps, and platforms to access government services and e-commerce marketplaces. These initiatives demonstrate how practical applications of digital literacy can improve livelihoods and redefine traditional gender roles.

3. Empowering women and youth

Empowering women and youth goes beyond simply providing access—it involves creating environments where they can actively participate and drive development strategies. WCC India supports this by funding innovative solutions tailored to local needs and challenges. A core strategy across nearly all funded projects is building local women champions. These women promote technology and train other women in digital skills, tools, and platforms. This approach ensures that women not only benefit from digital tools but also become advocates for digital use within their communities. For example, Seven Sisters Development Assistance trains adolescent girls in digital skills and the safe use of technology, laying the foundation for a new generation of technology advocates.

4. Promoting knowledge sharing and collaboration

Knowledge sharing and collaboration are keys to bridging global innovation divides. WCC India facilitates this by creating a Community of Practice where organisations involved in digital inclusion can collaborate and build momentum. The Community of Practice acts as a capacity building and resource hub, hosting webinars on topics such as human-centred design, and integrating sustainability and cyber safety into digital inclusion initiatives. It has also provided a platform for WomenConnect Challenge grantees from both Round One and Round Two to share insights and best practices. The collaborative approach

ensures that successful strategies and solutions can be scaled and adapted to different contexts, amplifying their impact.

Resilient Progress: Building Shock-Resilient Communities

Building resilient communities is crucial in the face of recurrent geoeconomic and environmental challenges. WCC India focuses not only on digital inclusion but also on creating resilient systems that can withstand shocks and stresses.

1. Mitigating risks for marginalised communities

Marginalised communities often face increased risks due to environmental and economic challenges. The WomenConnect Challenge India aims to mitigate these risks by funding projects that provide digital tools and training to enhance resilience. For example, ACCESS Development Services trains women micro-entrepreneurs in Rajasthan to use digital tools to improve their enterprise operations, helping them build resilient businesses that can adapt to changing conditions.

2. Leveraging traditional knowledge and new technologies

Combining traditional knowledge with new technologies is essential for building resilient communities. WCC India supports projects that integrate these approaches. For example, the Centre for Youth and Social Development created an application for tribal women enterprise leaders in Odisha to access market information on non-timber forest products, while the Goat Trust trained livestock care providers in Uttar Pradesh and Assam to use digital skills to enhance their services. By combining traditional knowledge and practices with modern technology, these projects enhance the resilience of communities and improve their capacity to respond to challenges.

3. Reimagining development metrics

Accurate measurement of progress is crucial for assessing the impact of digital inclusion initiatives. The Challenge emphasises the need to reimagine existing metrics to track progress effectively. The publication, 'Women Connected: Strategies for Bridging the Gender Digital Divide in India' highlights the importance of incorporating digital literacy into livelihood programs and developing new metrics that capture the diverse ways in which digital technology meaningfully impacts women's lives, beyond mobile access and usage.[7]

Sustainable Evolution: Charting a Path Forward

As we look towards a sustainable future beyond 2030, the focus shifts to addressing the 'ingenuity gap' and aligning private-sector innovations with social objectives. WCC India exemplifies this approach by supporting projects that offer innovative solutions that address specific local challenges, accelerating women's digital inclusion. These innovations are crucial for ensuring that digital technology equally benefits all members of society, particularly those who have been historically marginalised.

Aligning private-sector innovations with social goals is key to creating shared value. The partnership between USAID and Reliance Foundation demonstrates how the government, private-sector, and philanthropic organisations can work together to drive social impact. By investing in digital inclusion initiatives, USAID and Reliance Foundation are addressing the gender digital divide and contributing to broader goals of economic empowerment, security, and social inclusion.

Globally, addressing digital inclusion gaps has the potential to bridge development divides and foster sustained growth, which is essential for addressing global inequalities. WCC India's approach to digital

inclusion aligns with this goal by promoting collaboration, leveraging global resources to address local challenges, and providing models that could be replicated across the Global South. By creating a platform for knowledge sharing and collaboration, the challenge contributes to a more inclusive and equitable global development framework.

Conclusion

The WomenConnect Challenge India represents a significant step toward closing the gender digital divide and empowering women across India. Through innovative solutions, strategic partnerships, and a focus on inclusive transformations, resilient progress, and sustainable evolution, this initiative is driving meaningful change. The lessons learned from the WomenConnect Challenge India will guide future efforts to ensure digital technology becomes a tool for empowerment and inclusion for all.

The WomenConnect Challenge India is a showcase of how targeted, collaborative efforts can bridge gaps and drive progress, making a profound difference in the lives of millions. Through continued innovation and partnership, we can ensure that the benefits of the digital age are shared equitably, paving the way for a brighter, more inclusive future.

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Promoting Genuine Inclusion in Multilateral Discussions on Digitalisation

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Multilateral discussions around issues of digitalisation often fail to consider the interests of developing countries, thereby leading to their exclusion from the benefits of data sharing and the digital economy. This article argues that while restrictions on data flows are typically justified on theoretical grounds, they are adopted for political purposes that exclude or subordinate developing countries, preventing them from accruing the full benefits of digitalisation. The article also underscores how bias and exclusion can occur in discussion forums, which overlook the interests of developing countries or disregard the obstacles to their participation in these settings.

Global restrictions on cross-border data flows are motivated by multiple reasons, including privacy,

regulatory/audit issues, national security, and development/industrial policy.[1,2,3] These restrictions have led to two main types of regulation: conditional/adequacy/equivalence measures and localisation restriction measures.

In the first regulation, a data exporter or a public body evaluates whether the recipient entity provides adequate levels of protection and conforms to the applicable privacy principles required by the exporting country law. Usually, this evaluation is undertaken by a data protection authority that certifies that the data privacy protection regulation of another country can be considered adequate or even equivalent. This can be done unilaterally or bilaterally.

The second type of regulation deals with requirements for data to be stored and/or processed locally. These regulations can be targeted only at specific sectors such as health and defence or at all data flows. They may or may not affect cross-border flows—that is, some countries demand data to be stored locally but do not restrict copies from being sent abroad, while others do not impose such restrictions. These regulations lead to the three models of cross-border data flows regulation:

- Free flows, based on a market-oriented approached, defended by the United States (US)
- An intermediate model, in which restrictions are implemented, for example, on the basis of privacy and individual protection justifications, as in the European Union (EU) model
- Restriction of flows, similar to China's model[4,5,6]

The majority of countries have adopted a law based on the EU's approach, with a number attempting to meet the adequacy levels for

data transfer to and from the EU. However, the literature indicates that the EU law imposes high costs, especially on small and medium enterprises, and that similar laws may be too costly and complex for lower-income countries.[7,8,9]

While restrictions may appear to be based on theoretical grounds, they can be also justified on economic and political terms. For example, the US's pro-market approach can also be characterised as pro-American companies—that is, they defend free flows because American companies have a leadership position and any barriers would be bad for business. China restricts data flows both domestically and across borders as their economic model is characterised by strong government intervention. The EU rhetoric is based on individual and privacy protection; this prioritisation of consumer protection over companies can be attributed to fewer platform companies being based in Europe compared to North America and Asia.[10]

In developing countries, institutional, judicial, and fiscal restrictions may also affect enforcement. Some countries may prefer to restrict flows altogether in order to protect its citizens when enforcement conditions are not ideal. Many countries also view data-flow restrictions as a way to foster growth in their domestic markets instead of relying on American and Chinese companies.[11]

The EU model can be highly restrictive; for example, it allows free flows only within its borders and requires third parties to meet certain

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[a] The present list of countries that currently meet EU criteria includes Andorra, Argentina, Canada (commercial organisations), Faroe Islands, Guernsey, Israel, Isle of Man, Japan, Jersey, New Zealand, Republic of Korea, Switzerland, the United Kingdom (under the GDPR and the LED), the US (commercial organisations participating in the EU-US Data Privacy Framework), and Uruguay.

standards, which can be difficult for some countries.[a,12] Many consider the EU criteria to be a localisation requirement because it is easier to have a data centre in the EU than to meet these standards.[13]

This leads to the fallacy of international treaties on data sharing. When signing a treaty, the signatories constitute a select group that meets the standards, while the rest of the world does not. Therefore, the rhetoric of free cross-border data flows or intermediate models is similar to the rhetoric of free trade: it is free as long as it is convenient and for whom it is convenient.

This highlights the fact that bias and exclusion occur not only when countries impose restrictions but also in discussions in multilateral organisations. Multilateral organisations such as the United Nations (UN) and its agencies, the Organisation for Economic Co-operation and Development (OECD), and the World Bank (WB) serve as negotiation forums as well as think tanks that develop research that informs policymakers. However, discussions in these organisations tend to focus on issues that are relevant to developed countries, such as privacy, interoperability, and the development of a robust digital governance, even as many developing countries struggle to address older challenges such as data collection and infrastructure.

Developing countries do not actively participate in the process. Data sharing and digitalisation are usually discussed in forums with a focus on trade, privacy, and cybercrime. These discussions are also often conducted only in English, such that most contributions to official documents come from English-speaking countries or countries in which English-language literacy is high. This results in the neglect of other multidimensional aspects, the lack of participation of developing economies (especially African countries) in trade forums that discuss data-flow clauses, and the lack of participation from non-state actors.

UN agencies hold the position that such issues should be discussed in more open and diversified forums—this is a biased view, as it favours bigger forums like the UN itself[14,15] in comparison to, for example, OECD or G20. To be sure, the influence of the Global South has been increasing in the last few years; the recent G20 presidencies have been consecutively held by Indonesia (2022), India (2023), and Brazil (2024), and in 2025, it will be taken by South Africa. This has helped shift discussions towards issues that align with these countries' interests, such as digital inclusion and digital public infrastructure. However, the effect on international policy remains limited, with most developing and lower-income countries still being excluded from larger discussions.

Therefore, there is a need for forums that are open, truly democratic, and not self-serving and which recognise that inclusion goes beyond signing a treaty or holding discussions behind closed doors between a few, non-representative countries. There is need for an integration that works for both sides, rather than a data value chain in which one side is the provider of raw data while the other accrues the benefits. This will help ensure that digitalisation can serve as a tool for development and growth all over the world.

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Data for Public Interest

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India is generating data at unprecedented rates. In 2023, there were over 100 billion UPI transactions across the country;[1] in the same year, the Poshan Tracker recorded the nutritional status of over 75 million children.[2] The rate of data generation is complemented by the growing demand for datasets for purposes such as data-driven policymaking and training Artificial Intelligence (AI) models. In this context, there is a need to examine how India's growing data wealth can be used to create value for all stakeholders while allowing them to become meaningful participants in the growth and development of AI in order to achieve resilient and sustainable growth in public interest.

The current data policy landscape in India is fragmented, with the rules for the Digital Data Protection Act (DPDP 2023) still awaited at the time

of writing this article. Non-personal data was addressed, first with the Expert Committee report in 2021, followed by the inclusion of the data protection legislation and the potential creation of the Indian Data Management Office (IDMO)[3] in 2023; however, these efforts are currently only being contemplated. The Digital India Act is anticipated, along with a more comprehensive regulatory framework on AI, in consonance with efforts such as IndiaAI.[4] Older efforts such as the Open Government Data (OGD) platform are fraught with concerns on quality, schema, and metadata standardisation.[5] Newer efforts such as the National Data Access Policy (NDAP) of the NITI Aayog, which was opened for public use in 2022, push for standardisation, but their uptake and utility need to be studied further.[6] State-level efforts such as Karnataka's Open Data Initiative also need updates to become relevant to the current reality.

After decades of data hoarding and siloed collection, there has been a simultaneous effort from the private sector to make data available, such as Zomato's Weather Union,[7] Ultrahuman's Open Glucose Database,[8] and Namma Yatri's dashboard for live usage data,[9] which are useful for training models in the immediate term. There are a number of efforts being undertaken at different levels by multiple stakeholders in the Indian landscape, such as addressing biases and barriers in foreign-developed models through the development and growth of India-specific efforts, such as AI4Bharat at IIT Madras, Ola's Krutim,[10] Sarvam AI's Open Haathi, and the Government of India's Bhashini and Bhashadan.

While these efforts reflect public interest, the lack of coordination and cohesion in the strategy mean that the idea of public interest is fragmented and interpreted by each stakeholder in their own way. Missing from the current discourse is the role of citizens—the critical stakeholders who generate data on government and private platforms

and both benefit from better data-driven public policy and are harmed by the misuse of data through privacy breaches, exclusion, and misrepresentation.

The public and private sector are currently pushing towards the creation of large datasets. This provides an opening to initiate a conversation about data and how it can be used to enhance public interest through public involvement. There is a need to reimagine outcomes geared towards the well-being of the public while ensuring accountability through participation and regulation.

The first fundamental shift that is required is to centre data and its uses on public interest. While data for development (D4D) is a starting point, the idea of public interest goes beyond achieving the Sustainable Development Goals.[11] Fundamentally, 'development' is often defined as a top-down effort as actualised through the efforts of government and multilaterals, whereas public interest in more complex and therefore, needs to be defined for different societal issues through deliberative and participatory processes.[12]

Data is delinked from citizens despite being derived from their experiences, and therefore, its direction should be determined through consultation and participation rather than top-down directives from private service providers. It is also important to move away from instruments such as notice and consent, which have long been recognised as insufficient[13] for more engaged interactions, as they do not serve as checkboxes for compliance nor meaningfully empower individuals or communities.

For example, the generation and use of data in contexts such as cities should be considered part of the urban infrastructure and should

be governed as "commons" through public participation. Consequently, citizens, residents, and tourists should be actively engaged in the governance and use of data, which will help monitor issues such as the rejuvenation of urban lakes in Bengaluru,[14] as well as enhance accountability. These approaches have already been implemented in cities such as Barcelona and Hamburg,[15] where the democratic governance of urban data is a central issue for city administrations and offers blueprints for what is possible.

The reconception of data as infrastructure also empowers the government to lay greater claim to data through governing data as an infrastructural asset that belongs to everyone rather than controlling various datasets. To achieve this, the government at the centre, state, and municipal levels must advocate for a robust open data ecosystem that is led by the government and makes public data available and accessible in usable standards and formats. Governments will then be able to mandate the frequency and standards for private providers to do the same.[16] The civic potential of data is evidenced in Waze's collaboration with 450 cities, which allows citizens to report traffic and allows the platform to provide insights to people and the government.[17] Another example from India is the Indian Urban Data Exchange (IUDX), which has been used by non-profits to suggest safer walking routes for citizens.[18]

One of the ways to achieve the data requirements of governments is through the procurement process, ensuring that open data and data-sharing mandates are embedded in procurement processes, which are reflective of public interest and respectful of corporate confidentiality but can be enforced contractually.[19] India's Non-Personal Data Committee report[20] proposed mandatory sharing as well as an early version of

community data rights; however, the proposal did not progress due to a lack of consensus on government accountability and mandates for data sharing.

Cities are an important site for data sharing and data governance, providing the right scale for policy impact, public interest, and accountability of the private sector and local governments. Cities also have the potential for citizen action, especially on immediate concerns such as climate change. Cities such as Delhi, Mumbai, and Bengaluru are equipped to handle a fundamental reimagination of data through allowing citizens to mobilise on issues such as air pollution, rain water management, lake rejuvenation. These engagement opportunities can be set up through policy processes—such as citizen assemblies on public data quality and use—and procurement, which can bring more data into the public domain under a commons governance framework. Participative data practices can also help garner more public interest in AI.

As India races towards 2030, democratising value from data should be a key goal which will help achieve meaningful AI innovation. There is a need to develop new frameworks that empower citizens to renegotiate power in the digital economy and direct data in the interest of the public, which includes but is not confined to development goals. Citizen action is already simmering, and governments should work towards enabling this.

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Making Education Systems More Resilient for the Low-Income Segment in India

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Education is a powerful tool for poverty alleviation and sustainable development. India has the world's most extensive education system, with around 260 million children taught by 9.5 million teachers across 1.5 million schools.[1] In the last decade, India has made massive strides in prioritising access to primary education; however, despite a near-universal primary school enrollment of 98.4 percent, more than 56 percent of children aged ten in India are unable to read or understand a simple text.[2] The Indian education system is grappling with systemic challenges that lead to poor learning, including a shortfall of nearly 1.1 million teachers[3] and increasing dropout rates as students move to higher grades.[4]

One factor that is often overlooked in analyses of the impediments to learning is climate change. But the consequences of climate change, including the more frequent and intense incidence of extreme weather events, are disrupting the learning of millions of children worldwide.[5] In many countries, schools do not operate multiple times a year due to factors such as heatwaves, flooding, and high levels of pollution. The COVID-19 pandemic exposed and exacerbated these challenges, highlighting the urgent need to build resilient education systems. This article explores how remote-learning programs and ed-tech solutions can enhance the resilience of education systems for vulnerable groups that are disproportionately impacted by the effects of climate change, such as low-income segments in India.

Increased Household Digital Infrastructure

With the increasing penetration of smartphones and the growing acceptance of blended learning post-pandemic, the use of ed-tech at home offers a practical approach to maintaining learning continuity during school closures. Ensuring access to digital infrastructure for children from low-income households is becoming increasingly achievable.

A recent study by the Central Square Foundation[a] found that 72 percent of children from low-income households have access to a shared device, with no variation observed by gender.[6] Additionally, 74 percent of children spend more than 30 minutes daily on their parents' phones, and 89 percent of parents expressed willingness to allow their

[a] The author is affiliated with the Central Square Foundation.

children to use their devices for school work. Data from the *Annual Status of Education Report 2022* shows that smartphone ownership in rural India more than doubled (from 36 percent to 75 percent) between 2018 and 2022.[7] The report further revealed that over 95 percent of rural households now have a mobile phone and 75 percent have a smartphone, of which almost 90 percent had internet available on the day of the survey. This widespread smartphone access opens up opportunities for leveraging ed-tech solutions to improve learning outcomes and bridge educational gaps.

Home Learning: Evidence and Case Studies in India and Other Countries

There is emerging evidence on the use of ed-tech for supporting learning at home globally and in India. The Global Learning XPRIZE competition, launched in 2014, incentivised teams from around the world to create open-source, scalable software that empowers children to attain foundational learning skills. The XPRIZE teams field-tested the selected solutions in remote parts of Tanzania, where children had no access to formal schooling, and saw learning gains in both literacy and numeracy across competing solutions. Similarly, Angrist, Bergman, and Matsheng provide experimental evidence on strategies to support learning when schools close.[8] Using a randomised control design, they tested two low-technology interventions—SMS messages and phone calls—with parents in Botswana to support their child's learning, and found that combined treatment improves learning by 0.12 standard deviations, which translates to 0.89 standard deviations of learning per US$100, ranking among the most cost-effective interventions to improve learning.

A recent study from India evaluates the impact of a game-based ed-tech solution called Chimple on foundational literacy and numeracy among first- and second-grade students.[9] Integrated into the Satya Bharti Schools programme by the Bharti Airtel Foundation during the 2022-23 academic year, Chimple facilitated supplemental learning for children through a teacher-directed, at-home learning model. A teacher would remotely assign content on the app for children to practice at home, based on their lesson plans for the week. The teacher was expected to monitor student data and continuously assign them relevant activities, and accordingly augment or change the pace of instruction in the classroom every week. Teachers also set up WhatsApp groups to inform parents about homework that had been assigned and remind them to have their children complete the activities.

The intervention improved maths results by 0.25 standard deviations in Grades 1 and 2—i.e., the treatment group saw a 50 percent greater improvement in test scores over the year with 10 minutes of usage of Chimple in a day. There was a 0.35 standard deviation improvement in test scores for Grade 1 students in maths, with the lowest performing students at baseline benefiting the most (~0.45 standard deviation). Ninety-four percent teachers felt that Chimple helps students learn better, and on average, 89 percent parents felt that Chimple helped with their child's learning. Students spent an average of one hour per week on the Chimple app, which led to meaningful learning outcomes and high cost-effectiveness by utilising existing household smartphones.

The Chimple programme proved inclusive and flexible, allowing students to engage at their convenience using their parents' smartphones, thereby overcoming the barrier of limited access to dedicated devices. Compared to other educational interventions, Chimple's impact is notable, surpassing many non-computer-aided learning (CAL) programmes and

matching or exceeding those with CAL. The use of WhatsApp facilitated teacher engagement, making it easier to assign activities and share student progress, while enhanced parental involvement created a supportive home-learning environment.

Cost-Effectiveness and Sustainability of Remote Learning Solutions

Remote learning solutions, particularly those that utilise existing household devices, can be cost-effective and sustainable, reducing the need for significant investments in new technology and infrastructure, making them accessible to low-income households. The solutions can be designed to work on low-cost smartphones, ensuring that even families with limited financial resources can benefit from quality educational content. The EdTech Accelerator, supported by a consortium of credible funders like Reliance Foundation, Michael Susan Dell Foundation, UBS Optimus Foundation, USAID, and Central Square Foundation are currently supporting eight home-based ed-tech solutions including Chimple. The objective is to build a strong supply of solutions that are engaging, pedagogically sound, and can support foundational learning at scale in a cost-effective manner.[10]

By integrating these solutions into the education system, it is possible to build a more resilient and inclusive education framework that can withstand future disruptions from climate change and other shocks. Evidence-backed home learning programmes, which are designed to be scalable and adaptable, can provide a blueprint for how ed-tech can support resilient education systems for children in the low-income segment.

Recommendations

The following key actions are proposed to enhance the resilience of education systems for children in the low-income segment. These recommendations have been tailored for India but may be applicable to similar contexts in countries of the Global South.

- **Expand Connectivity:** Invest in improving internet connectivity in rural and remote areas to ensure that all students can access digital learning resources.
- **Integrate Ed-Tech Learning at Home with Traditional Methods:** Encourage the integration of EdTech at home with traditional teaching methods in schools to create a blended learning environment that leverages the strengths of both approaches.
- **Support Teacher Training:** Provide training for teachers to effectively use ed-tech tools and resources, building their awareness and confidence in the use of ed-tech solutions.
- **Focus on Inclusivity in Design:** Ensure that ed-tech solutions are designed to be inclusive in addressing the diverse needs of students from different socio-economic backgrounds.

Conclusion

Making education systems more resilient for children from low-income families in India requires a multifaceted approach that includes adopting remote programmes that can both support and enhance learning in school. By leveraging increasing smartphone penetration and designing cost-effective, sustainable programmes for learning at home, it is possible to ensure the continuity of education during school disruptions because of climate change and other factors.

These initiatives not only address immediate educational needs but also contribute to the long-term goal of providing inclusive and quality education for all, in line with the United Nations Sustainable Development Goal (SDG) 4 mandate. With continued investment and innovation, ed-tech has the potential to transform the education landscape in India and build a more resilient future for its children.

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The Use of GIS-Based Multi-Hazard Information Systems in Building Resilient Communities

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GIS Team

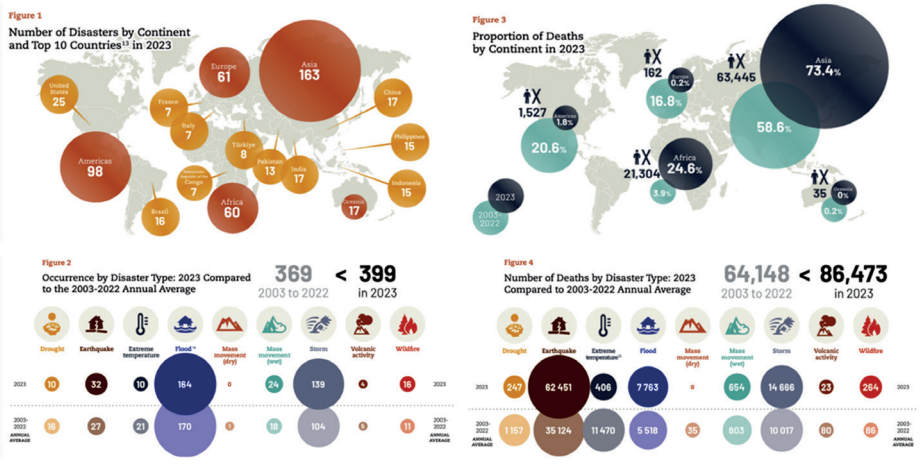
A community that has resilience to climate-induced disasters is equipped to anticipate, plan, and reduce risk and is able to effectively protect the people and their livelihoods, health, cultural heritage, socio-economic assets, and ecosystems.[1] Indeed, the term 'resilience' is becoming more relevant as both the frequency and intensity of hazards continue to rise as a result of climate change, urban migration, population growth, and worsening scarcity of natural resources.[2]

Natural catastrophes are affecting countries across the globe, and none of them are completely immune from disasters. Rapid urbanisation, population expansion, and variations in harsh weather are all contributing factors to the expanding global impact of natural disasters. Climate change brought about by human

activity and increasing population density makes natural disasters more devastating. Due to the varying temporal and geographical dimensions of hazardous occurrences and the potential for interactions between various hazards and socio-economic activities, multi-hazard risks present issues globally.

According to the Center for Research on the Epidemiology of Disasters (CRED), there were 399 natural disasters recorded in 2023, which resulted in 86,473 fatalities, 93.1 million affected individuals, and US$202.7 billion in damages globally.[3] The Joint Annual Report on Global Trends and Perspectives published by the United Nations Office for Disaster Risk Reduction (UNDRR) and CRED reveals that a number of nations suffered multiple natural disasters simultaneously.[4] Likewise, scientific evidence has shown that natural catastrophes are becoming more frequent, powerful, and distributed geographically, which is especially true for climate change-related natural disasters.[5]

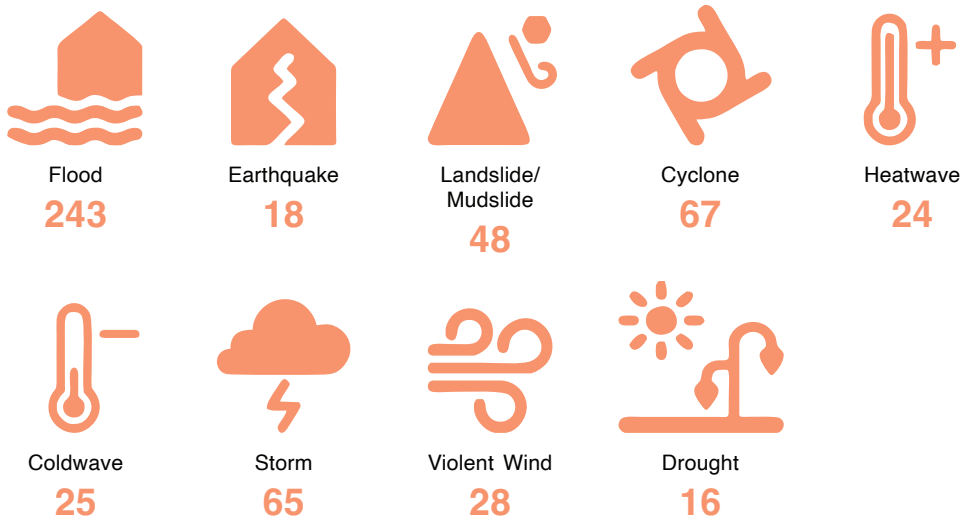
Figures 1-4: Disaster Occurrences and Deaths, Global (2003-2023)



Source: EM-DAT CRED Report 2023[6]

India alone saw extreme weather events on 88 percent of the days in the first nine months in the year 2022 and 86 percent of the days in the year 2023.[7,8] Given the rising likelihood of disasters, a more robust framework for development policies is needed to minimise their impacts on communities. CRED reports that India witnessed 1,254 disaster events between 1988 and 2023. The highest number of disaster events reported were floods, followed by storms. Comparing data from 2000-2019 with that of 1980-1999, it was found that both of these disaster event types recorded a substantial rise in incidence; other event types, such as earthquakes, extreme heat, drought, and wildfires also witnessed a spike in numbers. These events killed 54,897 people and affected more than 665 million. The economic losses due to these disasters amounted to US$122.04 billion nationwide.[9] In India, more than 56 million people have been displaced due to hazards.[10] Some 24 million livestock were affected during the 2007-2023 time period.[11]

Figure 5: Disaster Events, India (1988-2023)



Source: EM-DAT[12]

Figure 6: Impacts of Disasters, India (2007-2023)

Source: MHA, GOI; Internal Displacement Monitoring Centre[14]

To address these impacts, it is important to understand the multiple dimensions of the risk—i.e., vulnerability, capacity, exposure of persons and assets, and existing environmental conditions.[15] Such knowledge can be used for risk assessment, prevention, mitigation, preparedness, and response.

In a disaster-prone country like India, it is important to ensure that people have rapid access to the information system that encourages preventive measures and enables quick response to protect lives and livelihoods.[16] Completely avoiding natural disasters is not possible, but minimising the impact by creating proper awareness through hazard information systems can enhance the efficiency of disaster risk management.[17] The use of Geo-Spatial Maps and infographics along with Satellite Remote Sensing technology has emerged key to planning sustainable and disaster resilience infrastructure and systems. From a practical standpoint, they are key in identifying areas at high risk of

being affected by a hazard, planning for emergency management and humanitarian response in general, and determining resources for coping with these events.[a,18]

Reliance Foundation[b] provides technological assistance to communities to build resilience against adverse climatic or hazard conditions. As part of these services, Reliance Foundation has prepared a web version of the Hazard Information System of India for the most hazardous events[c] that cause loss of life, injury, other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.[19,20]

Approach

To mitigate these risks and enhance climate resilience, it is imperative to identify high-risk-prone zones and implement targeted strategies. The advanced geospatial (Remote Sensing & GIS with ML & DL)[d] mapping capabilities provide a comprehensive understanding of the physical and environmental landscape.

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a The importance of geospatial maps extends beyond these practical uses. Maps also serve as a communication tool, raising awareness among communities about the risks they face and the steps they can take to prepare for disasters. Effective anticipatory actions, when combined with impact-based forecasting and prompt warnings, can help avert large-scale damage and destruction.

b The author is affiliated with Reliance Foundation.

c These are cold waves, heat waves, floods, lightning, dust storms, hail storms, thunderstorms, wind hazards, extreme rainfall, drought, cyclones, landslides, and forest fires.

d GIS: Geographical Information System, ML: Machine Learning; DL: Deep Learning

As per the government's Ten-Point Agenda for Disaster Risk Reduction[21] and SFDRR 2030,[22] all development sectors must imbibe the principles of disaster risk management. This is possible only by understanding the risk. Reliance Foundation's WebGIS-based hazard information system will enable identifying and understanding climate-related hazards, allowing for targeted interventions and resource allocation.

The purpose of the Hazard Information System is for the actors in development sectors to identify multi-hazard-prone and vulnerable districts for taking preventive and adaptive measures. The hazard occurrence maps, hazard frequency maps, vulnerability maps, and vulnerability assessments are focused on the district level.

The information system provides district maps on hazard events and vulnerability for all the calendar months and at an annual scale. The Multi-Hazard Vulnerability maps are prepared based on climatological, hydrological, meteorological, and geophysical data, census data on population, and housing density and vulnerability to each hazard using the disaster data published by the India Meteorological Department, GoI, GSI, NRSC-ISRO, CEEW, BMTPC-Vulnerability Atlases, EM-DAT, SITREP from the government of India, NCS-MoES, CWC-MoWR, and Down to Earth[e] for the hazardous events that cause casualties in terms of deaths and other losses.

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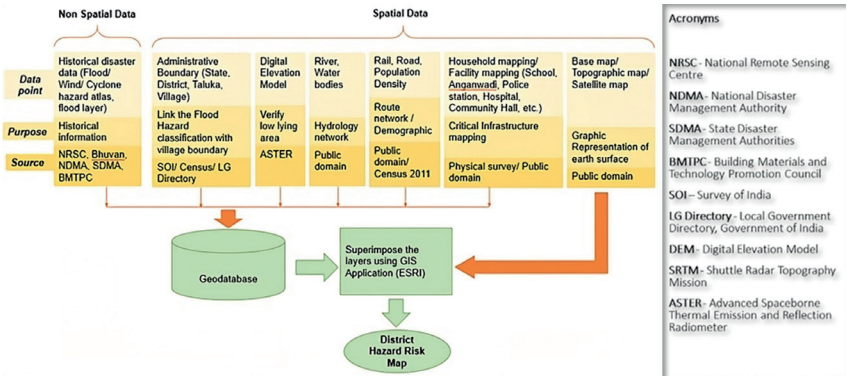
[e] GSI: GSI – Geological Survey of India; NRSC -ISRO: National Remote Sensing Centre, Indian Space Research Organization, GoI; CEEW – Council on Energy, Environment, And Water; BMTPC: Building Material and Technology Promotion Council; EM-DAT: International Disaster Database, Centre for Research on the Epidemiology of Disasters; SITREP – Situational Report (https://ndmindia.mha.gov.in/ndmi/); NCS-MoES – National Centre for Seismology, Ministry of Earth Sciences, Govt. of India; CWC-MoWR – Central Water Commission, Ministry of Water Resources; Down-To-Earth- Centre for Science and Environment (CSE)

The multi-dimensional data integration, such as the secondary data available on government and non-government websites, topography, climate patterns, and infrastructure, provides a holistic understanding of the landscape and its vulnerability to different types of hazards. Using the process above, it is possible to define the criteria for determining a district at high risk.

Figure 7: Spatial Data Processing Model for M-HIS



Source: Reliance Foundation – GIS

Assimilating all the datasets on a GIS platform helps to identify patterns, correlations, and hidden relationships that contribute to hazard risk and integrate results into RF-GIS platforms, enabling the creation of dynamic hazard maps, visualising spatial patterns, and providing a comprehensive overview of hazard and risk factors. It also helps to identify vulnerable zones, understand the geographic spread of hazards, and assess the potential impact on various regions.

Figure 8: Example of a Hazard Classification Map on the RF-GIS Platform

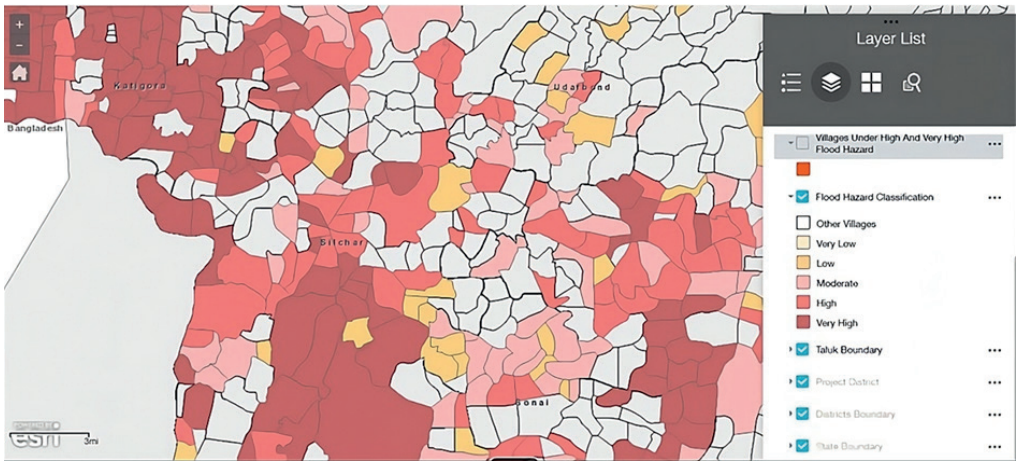


Figure 9: Example of a Hazard Classification Map with Superimposing River and Water Bodies and Critical Infrastructure

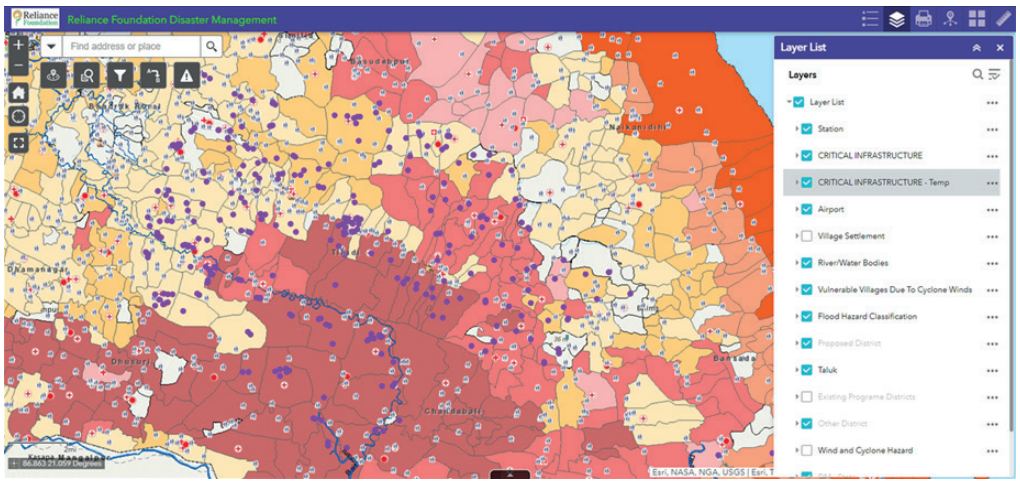


Figure 10: Example of Hazard-Prone Coastal Villages

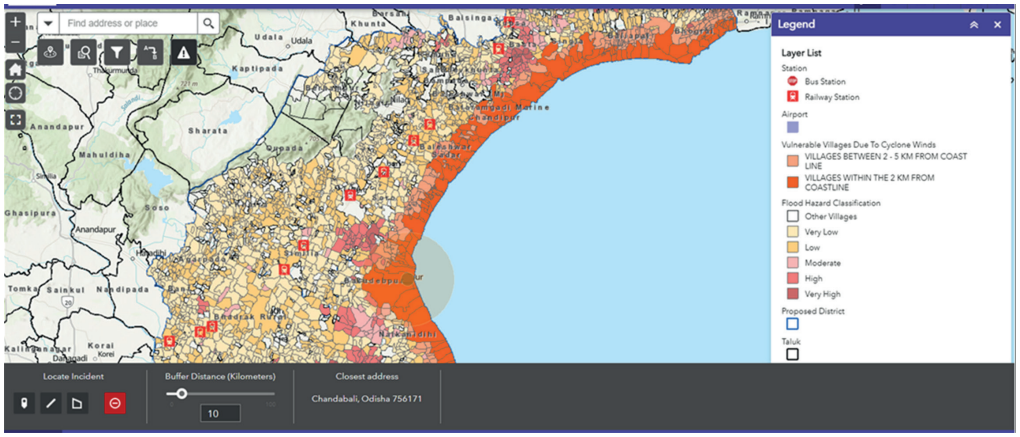
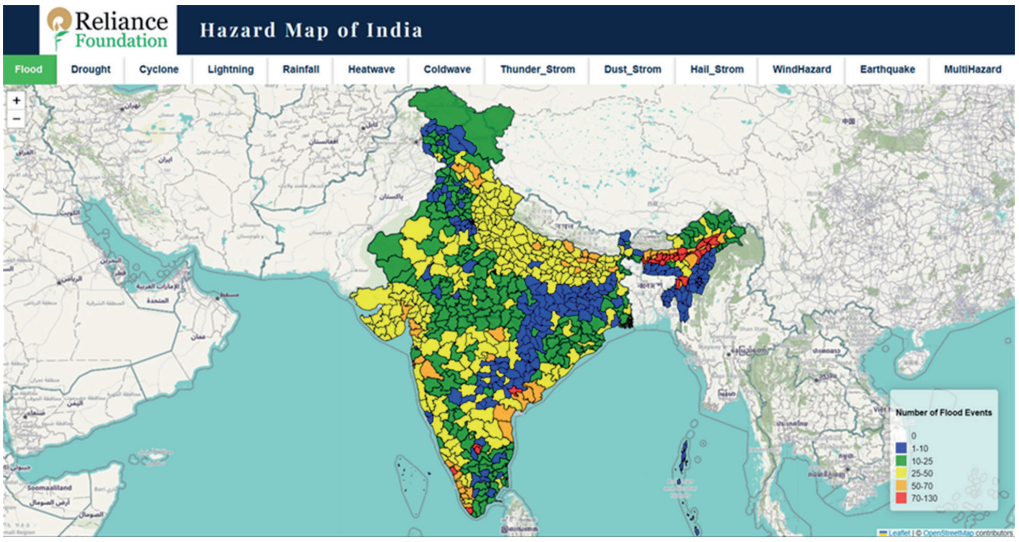
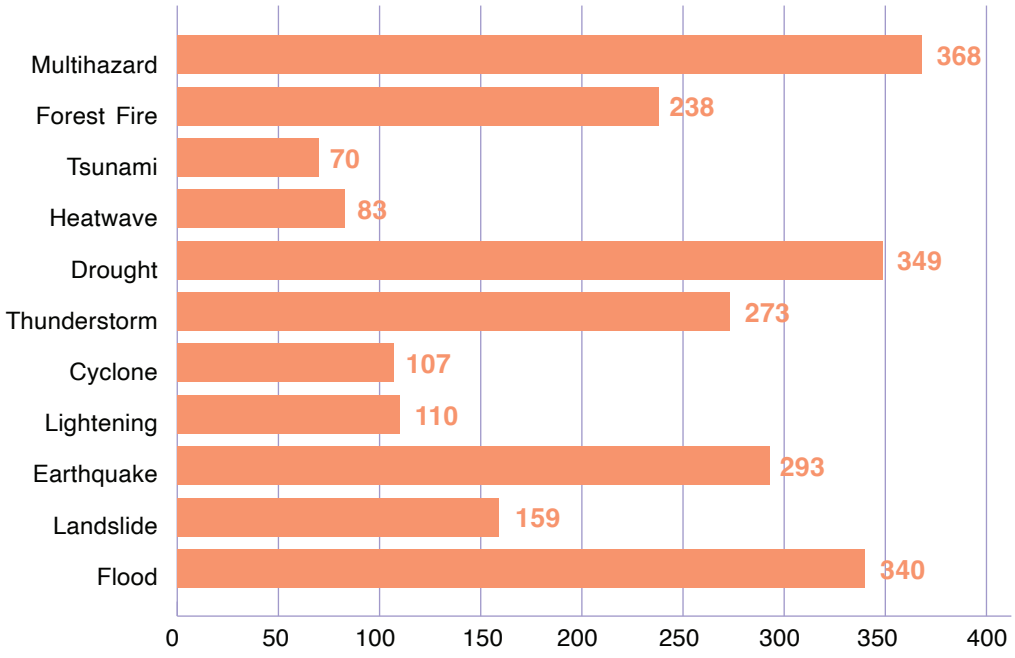


Figure 11: Web-GIS-Based Multi-Hazard Information System



Based on an analysis of the data received from different sources, as described above, 28 out of 36 states and Union Territories (UTs) in India are highly vulnerable to either primary hazards caused by climate change or secondary hazards resulting from climate change. Moreover, 215 districts are Very High Multi-Hazard Prone (where five or more hazards have occurred) and 153 are High Multi-Hazard Prone Districts (where four types of hazards occurred frequently). More than 48 percent of districts are vulnerable to more than four extreme events, and these districts have a low adaptive capacity for tackling such abrupt changes.

Figure 12: Number of Hazard and Multi-Hazard Prone Districts



Significance of Multi-Hazard Information System

The data and insights provided by the Multi-Hazard Information System (M-HIS) are indispensable for informed policy and decision-making. Policymakers rely on M-HIS to develop and enforce regulations and standards that enhance resilience.

One of the primary benefits of M-HIS is the dissemination of timely and accurate information about impending climatic hazards. By providing near real-time data and forewarnings, M-HIS will enable farmers to take preventive measures, such as crop selection with crop varieties, adjusting planting schedules (optimal planting times), implementing water conservation strategies (development of water harvesting structures), and protecting livestock. For instance, in the case of an anticipated drought, farmers can select drought-resistant crops and reduce water-intensive activities. Even during cyclones, farmers can receive the exact location

of landfall, based on which they can prepare themselves for the pre-harvesting of crops to minimise their loss. M-HIS will empower farmers to mitigate potential losses, safeguard their livelihoods, transition from reactive to proactive approaches, and build resilient farming communities that are better equipped to cope with climate challenges.

By leveraging M-HIS maps and infographics, communities can develop their resilience plans through networking with the National Disaster Response Force (NDRF), State Disaster Response Force (SDRF), or other stakeholders such as grassroots networks or gram panchayats by identifying nearby elevated infrastructure for human and livestock safety, climate resilient infrastructures, livelihood diversification planning based on sea level rise/storm surge height/surface temperature/type of wave, and cage fishing , thus promoting a better understanding of risks and encouraging the adoption of protective behaviours.

M-HIS provides safety tips, implications based on historical hazards, visual-based safety, and precautionary measures for information based on the understanding of the local community. Additionally, the system integrates local knowledge about historical events, traditional practices, and vulnerable areas to enhance the risk-assessment process. Community-based early warning systems integrated with M-HIS can empower local populations to take ownership of their safety and resilience.

Strategies for the Way Forward

The M-HIS application's visualisation capabilities will allow individuals to understand space-time factors and historical trends related to population, land use, and economic patterns. Such information is crucial for planning sustainable communities, combating climate change,

and protecting terrestrial ecosystems in alignment with the Sustainable Development Goals (SDGs).

Integrating M-HIS with earth observation (EO) data and technologies like ML and DL can improve predictive analysis and enhance the anticipatory action to be taken by decision-makers. It will also contribute to sustainability by empowering communities to harness valuable information and local knowledge to develop an ecosystem-of-ecosystem approach and achieve a build-back-better concept of sustainable development goals. The integrated M-HIS system will provide information crucial for refining the SDG agenda and addressing complex spatial challenges, ensuring evidence-based decision-making and a sustainable future beyond 2030. To maximise the benefits of the system, development sectors should facilitate data diffusion and create collaboration mechanisms between communities that enhance innovations and global use.

There are five key recommendations for building a climate-resilient society through geospatial technology:

- **Strengthening access, analysis, and visualisation of multi-hazard data for humanitarian action globally:** Valuable data on risks, susceptibility, and exposure must be effectively analysed for use in development and humanitarian contexts. Many nations struggle to make risk information accessible to decision-makers despite the availability of data and technical developments. In such cases, the M-HIS framework may be utilised to close data gaps and facilitate collaboration between national and international specialists in order to meet the minimal requirements for data availability for risk assessments. Risk profiles that emphasise the implications of socioeconomic growth and provide alternatives for risk management may be created using the M-HIS framework.

- **Developing a multi-hazard impact-based forecasting system:** The system integrates data from various hazards (e.g., floods, earthquakes, and cyclones) to predict their combined impact on communities and infrastructure. By offering detailed forecasts that include potential impacts on health (for example, for pregnant women, elderly people, children), houses (kachcha, pakka, etc.), economy, and environment, decision-makers from developmental sectors can implement targeted mitigation measures, allocate resources efficiently, and design recovery plans prioritising the most vulnerable areas. This proactive approach reduces immediate damage and strengthens long-term resilience, ensuring that rebuilding efforts (i.e., building back better) are more sustainable and adaptive to future risks.
- **Development of a high-resolution risk-informed decision-making index that can be used to map critical vulnerabilities at the district level:** The indices will be able to identify, assess, and project risks, such as extreme climate events, water stresses, and crop or livelihood loss. The index will provide the basis for understanding, identifying, and quantifying different hazards caused by climate change across geographies, sectors, and assets through dynamic micro-scale risk modelling. This will further quantify risks through probable loss and damage estimates using each different sector-wise risk rating. It will help build resilient geographies and sectors, emergency support and transportation, and allied sectoral infrastructure.
- **Integrated geospatial platform to enhance adaptive and resilience capacity:** The ever-changing climatic conditions and patterns require enhanced adaptive and resilience capacity to climate-proof lives, livelihoods, and investments. By integrating and mapping diverse datasets, an integrated GIS platform would facilitate a comprehensive understanding of the geographic distribution of risks and resources, enabling more informed decision-making for precise location-based

intervention. The scenario-based planning and impact assessment on a GIS platform helps communities evaluate the potential outcome of different adaptation strategies and disseminate information to enhance communication and collaboration among stakeholders, from government agencies to local communities, through a single portal. The same information will be imbibed into the mainstreaming of disaster risk reduction in developmental project planning and can mitigate loss and damage if matched with high-resolution exposure assessment that will strengthen the adaptive and resilience capacity of the community.

- **Increasing participatory engagement of all stakeholders in the risk-assessment processes:** Communities might not have scientific expertise, but they embody traditional management practices and priorities. These are low-hanging fruits that can be harnessed at the community level with less effort by involving them in GIS-based risk assessment processes for more tailored and effective risk-mitigation strategies. The GIS platform can also help in understanding the co-benefits of mitigation and adaptation. The assimilation of an inclusive approach, i.e., participatory engagement, co-benefits, and hazard sensitivity on a GIS platform for risk projection, can yield better results.

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Cultivating Equity: AI for Inclusive Digital Extension in the Post-2030 Development Agenda

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Meena Devi, 38, is a farmer in the eastern Indian state of Jharkhand and a recently appointed member of the Board of Director (BoD) of Kolebira Farmer Producer Organisation (FPO). She is one of the many farmers using Farmer.Chat,[1] Digital Green's[a] Artificial Intelligence assistant chatbot. Between getting inducted into a self-help group shortly after getting married and graduating into being a member of an FPO BoD, she has jumped through 'spirular' hoops and circumvented deep-rooted social inequalities, only to witness complexities of climate change and the ensuing income instability; 2023 was the second consecutive year of a drought spell in Jharkhand, and the rain deficit stands at 37 percent.[2]

[a] The authors are affiliated with Digital Green.

Devi raises more than five queries on Farmer.Chat per week—a frequency perhaps expected, given her task of looking after the needs of women farmers as she competes with limited skills in aggregation, negotiation, and marketing—domains where male farmers have more control. Being a member of the board at 38 in a women-only FPO is a rare event in these areas, where farmers lack the agency and information to access and negotiate competitive market prices, often receiving a fraction of their crops' final sales price, which throttles productive investment and slows the transition from subsistence to market-oriented farming. FPOs can turn things around by serving as aggregation points of both demand and supply of produce and leveraging economies of scale to negotiate better prices for their members.

Most smallholders in India like Devi lack access to targeted, relevant, timely, and actionable farm- and market-related advisory that could help them improve their farm productivity, climate resilience, incomes, and livelihoods. India's decentralised extension system is yet to transition from being production-centric and supply-driven to becoming value-chain-centric and demand-driven.[3] Currently, advisories are crafted to suit generic conditions and cater to men,[4] often discounting factors such as soil, elevation, microclimate, crop varieties, gender roles, and even access to resources. At the same time, unverified advisories from local retailers and social media influencers abound. Add to this new, more potent, climate-change-introduced pests that leave little time to carry out any useful abatement, which makes timing in crop cultivation more crucial.[5]

The Use of AI in Agriculture Extension Work

Digital Green's work began in 2008 in an attempt to close these gaps and upgrade the training of extension agents in group facilitation and technical skills. Their first innovation was the production videos by and for farmers, which reached 6.3 million farmers, 53 percent of whom are women, via 102,000 frontline workers (49 percent women. The videos increased advisory access by 40 percent and the adoption rate of promoted practices by 24 percent,[6] at one-tenth the cost of traditional extension (US$3.70 per adoption vs US$38).[7] The layering of complementary communication channels and datasets has enabled the delivery of more tailored and timely recommendations.

Digital Green launched Farmer.Chat in 2023, an AI assistant for frontline extension agents that provides information on demand by responding to queries sent using voice or text, push notifications, log feedback, and flag content gaps or inadequate responses.

Farmer.Chat aims to address the fragmented nature of India's agriculture extension system and create efficiencies. In a traditional extension model, a farmer who observes a pest new to the district—black thrips on chilli plants—would ask the village-level extension agent for advice. The agent leaves the field, relays the question to a district-level agronomist, who researches the answer and sends back the recommendation. With limited information sharing, the agronomist is unaware that agronomists in a distant district have already developed an effective solution.

The chatbot enables agents to ask a question and receive an immediate response based on content that has been produced elsewhere. This approach saves time and resources, which is essential to save crops

from destruction. If the system does not have a good answer, the agent can provide immediate feedback, which will enable the system to learn iteratively and respond. The system can immediately deliver the request for information to agronomists and research teams who can reply with answers to farmers' questions in a timely manner.

Technology for Inclusive Growth

Gender intentionality must remain at the core of product design and deployment. While AI is notorious for its inherent biases, serious efforts are being made to ensure that it does not exacerbate the social and economic inequalities experienced by women farmers. For example, Farmer.Chat is designed for low literacy environments and includes voice and local language options that increases its uptake among women. This is seen in the fact that 52 percent of chatbot users are women and that they ask a similar number of questions on average as men.[8]

AI tools like chatbots for farmers must recognise and accurately respond to gender-specific issues, such as those related to preferences, motivation, roles, and socio-economic challenges faced disproportionately by women. Along with testing for safety and relevance by conducting adversarial and bias testing on responses (both automated and with humans in the loop), running fairness assessments will ensure that error rates are similar for women and men users.

In addition, to further localise the recommendations, Farmer.Chat integrates weather APIs from the Indian Meteorological Department and other service providers like Tomorrow.Now, provide information on local weather conditions, which is paired with scientifically vetted research and a library of more than 8,000 locally produced videos by and for

the farmers that are synthesised to form an actionable advisory. In a March 2024 user satisfaction survey conducted by independent research agency 60 Decibels, 55 percent of interviewed users reported increased self-reliance, work efficiency, and access to updated knowledge and information after 45 days of use.[9]

Strategies for Impactful Technology Integration in Agriculture

A focus on capacity building for long-term sustainability and identifying key actors is necessary to facilitate building on existing systems and farmer networks, rather than implementers creating parallel systems for creating impact at the smallholder level. Using this approach, it would be possible to leverage the expertise of local and state agencies that have researched locally relevant regenerative agriculture practices, which can subsequently be woven into 'nudges' through in-app notifications that remind extension agents of identified practices to relay at relevant and actionable times.

The success of this mechanism rests on the intention of these communities to adopt scientific and accurate recommendations. It must be recognised that information alone may not be sufficient for sustainable and effective change. To understand how these interventions are influencing the capacity of individuals to make their own choices and exercise control over their actions and decisions, experimenting with improved 'self-efficacy' as a metric is advised.

Farmer.Chat users have reported feeling "advanced and modern" and indicated improved self-confidence as they do not have to depend on their supervisors to resolve issues unknown to them. Therefore, measuring self-efficacy could be a useful guide for further product development.

On a similar note, anecdotal evidence from several pilots indicate that the AI chatbot assistant has created avenues for farmers to explore livelihood options beyond traditional farming. Leading extension agents are not only asking the bot for high-value, exotic crops as production options but are also prompting farmers to undertake their production.

These learnings are also valid for other similar Global South contexts. In this instance, AI is effecting meaningful change for communities that are most vulnerable and resource-poor. Beyond 2030, as the technology evolves further, there will be more valuable lessons for understanding real change. For measuring the impact of similar initiatives, it is observed that when communities value the reduction in effort, time, and resources and experience improved self-efficacies, it is possible to eliminate the collection of meaningless data. Community reflection will then underpin the agency for change.

In the vibrant fields of India, with the support of tools like Farmer. Chat, women like Meena Devi are not just cultivating crops but also sowing the seeds of equality, hope, and change in their communities.

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Postscript

Renewing Multilateralism for 2030 and Beyond

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Today, while the world faces unprecedented risks, it is also seeing unparalleled opportunities for renewal and progress. The threat of crises looms large but advances in knowledge, science, technology, and innovation offer potential breakthroughs. Against this backdrop, leaders of the United Nations Member States have gathered at the Summit of the Future in New York to renew their commitment to international cooperation guided by trust and solidarity.

A collective failure to nurture multilateralism and boost international finance, especially to confront climate change, is undermining the attainment of the Sustainable Development Goals (SDGs). Nonetheless, there are key untapped vehicles for innovation and change, such as the largest youth generation in history and the rapid development of digital technologies.

The Summit of the Future is an opportunity to renew multilateralism for a more effective and just global governance to advance the development agenda beyond the 2030 milestone. This can be achieved by delivering a decisive Pact for the Future, a Declaration on Future Generations, and a Global Digital Compact while pushing forward a consensus towards an SDG Stimulus.[1,2,3,4]

The Growing Influence of the Global South

For many developing countries, 2030 is not just a deadline for achieving sustainable development; it is a milestone on the path to more equitable and shared progress. The 21st century has witnessed the re-emergence of the Global South as central to global prosperity and leadership. Developing countries, which comprise the world's biggest populations as well as the fastest growing economies, account for two-thirds of global growth and are positioned to play a more central role in global governance. A new multipolar world is emerging, with India playing a pivotal role.[5]

The success of this multipolar world depends on accelerating action for the SDGs. According to the 2024 SDG Progress Report, only 17 percent of the SDG targets are on track.[6] Progress on more than one-third of the targets has stalled or even regressed due to cascading crises, conflicts, and climate change impacts.

In this context, examples such as those of India are crucial for demonstrating how countries can deliver on the right to development for their populations while undertaking climate action. India's COP26 'Panchamrit' targets, such as installing 500 GW of non-fossil energy capacity by 2030, and the national Green Hydrogen Mission, showcase its commitment to a green economy.[7,8] These come with the recognition

that some two-thirds of India's urban infrastructure is yet to be built, implying large increases in energy demand, along the aspirational path to 2030 and then *Viksit Bharat,* or 'developed India', by 2047. India has also invested in multilateralism to help other countries enhance mitigation and adaptation capacities through initiatives like the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure.

A better future is within reach. To achieve it, however, the multilateral system must be strengthened to make it just, equitable, and representative. It should be inclusive, interconnected, and financially stable to make it fit for the present and prepared for the future. We need renewed multilateralism—to spread hope and opportunities far and wide.

Youth Voices, Digital Innovation, and Financing for Development

Concrete, action-oriented deliverables at the Summit of the Future can accelerate the momentum toward achieving the SDGs. The Pact for the Future can move the Global South to the centre stage of global governance. The Declaration on Future Generations can empower young people and help them seize opportunities for the future. A Global Digital Compact can ensure expanding access to digital connectivity that allows all countries to fully enjoy the benefits of the digital economy. An SDG Stimulus can unleash much-needed financing for development and climate to further accelerate momentum.

Pact for the Future

Rebalancing global governance will be key to building momentum to address new and emerging challenges and opportunities through 2030

and beyond. The Summit of the Future aims to adopt a forward-looking, action-oriented Pact for the Future to rekindle solidarity during a time of profound global transformation. The Pact can chart pathways for reforming multilateralism and its institutions, including the UN Security Council, to rebuild trust and reinvigorate global governance.

In the Global South, India has demonstrated an increasing willingness to take up the mantle of global leadership. A key signal was its G20 presidency in 2023 and the G20 New Delhi Leaders' Declaration, which made multilateral reform a priority and integrated more voices from the Global South into global governance with the inclusion of the African Union as a permanent G20 member.[9,10]

Declaration on Future Generations

The current generation of young people constitutes 16 percent of global population, representing the largest cohort of young people in history.[11] The youth's views and needs should be considered in policies and decision-making processes to safeguard their interests. The Declaration on Future Generations makes intergenerational solidarity a key element of renewed multilateralism. It recognises the obligation that present generations have towards those who will follow.

Thanks to technology and an increasingly global youth culture, young people today have bridged a divide that previously existed between countries. We can harness this solidarity by making young people central participants in renewed multilateralism.

India's young people, who add 15 million people to the job market each year, are at the forefront of this changing awareness, and the focus of the Declaration on Future Generations on meeting current needs

while ensuring a sustainable future will resonate with this population. India's growth and sustainable development, as well as that of the world's, depends on the youth playing a bigger role in innovation and global leadership.

Global Digital Compact

Expanding access to digital technologies and Artificial Intelligence (AI) can empower the Global South to become creators, and not just consumers. The Global Digital Compact offers a framework to tackle digital and data inequalities, balance technology's benefits with environmental impacts, and support sustainable development through international cooperation. It can guide AI governance and capacity building, including creating an AI Capacity Development Network, a Global Fund for SDG-focused AI, and a Global Data Framework to support local AI ecosystems.

Examples of frameworks that governments can implement to act as guardrails and enablers of digital innovation include India's Digital Public Infrastructure (DPI),[12] which has transformed the country over the last few years, bringing financial inclusion and building trust and solidarity.[a,13] India's focus on data for development and DPI under its G20 presidency have also demonstrated that digital best practices could serve as models to emulate and adapt across all countries.

[a] For example, India's Citizen Stack initiative is a digital system that improves citizen services and promotes global cooperation in digital infrastructure development.

SDG Stimulus

Accelerating momentum also requires taking overdue action on the SDGs and climate finance. Most developing countries lack the financial resources and fiscal space to invest in the future of their people. To increase this investment, more needs to be done to reduce debt pressures and debt-servicing costs as well as to expand access to contingency financing for countries at risk of a cash-flow crisis. Additionally, dramatically scaling up the lending capacity of multilateral development banks (MDBs) to provide more resources for climate action and sustainable development will be critical. Adapting the business models of the financial sector to embrace sustainability will also be necessary to leverage the amount of private finance that will be needed to accelerate progress.

A key catalyst for increased financing can be through increased efforts to deliver the UN Secretary-General's proposed SDG Stimulus. The Secretary-General is working with ten leaders from a diverse group of countries who are championing efforts to realise the SDG Stimulus. India has contributed through its 2023 G20 presidency, which delivered recommendations by an Independent Expert Group on Strengthening MDBs to make them "better" and "bigger" banks that can deliver US$500 billion per year in additional financing envisioned under the SDG Stimulus.[14]

The renewed multilateralism we seek must help everyone navigate current and future uncertainty and disruptive change beyond 2030. We in the United Nations in India are proud to be close partners with the government as a key driver in delivering development results at scale, both at home and internationally, through South-South Cooperation.

This year's Summit of the Future is an opportunity to signal a sea-change in addressing the imbalances in our global governance system to ensure that the Global South is able to take its rightful place at the table. Without that place, many people are at risk of being left out of the crucial transitions that are underway and can accelerate SDG progress through the 2030 deadline and beyond.

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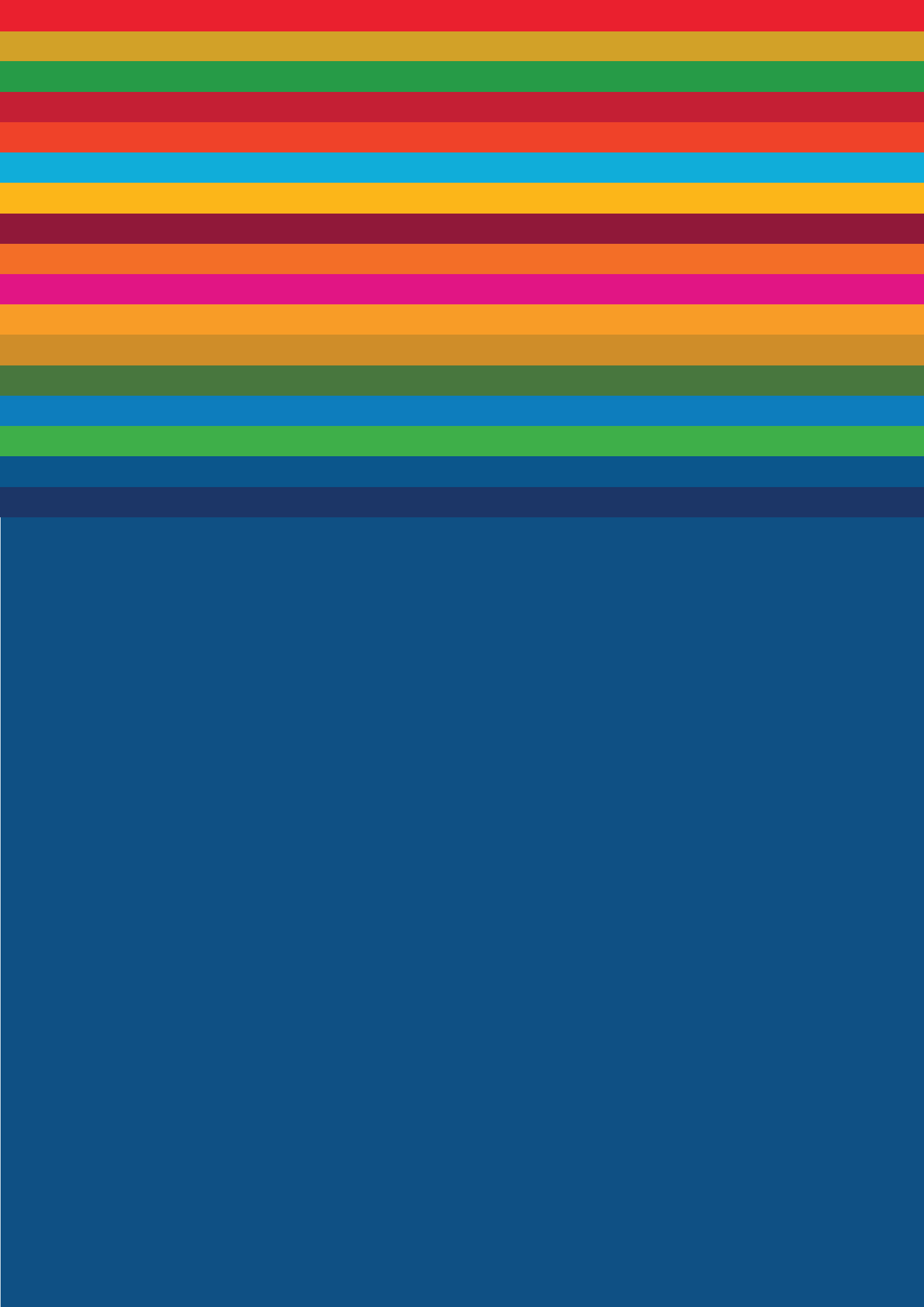

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