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India's Journey Towards the SDGs








IDEAS, INNOVATION, IMPLEMENTATION

India's Journey Towards the SDGs

Editors

Jayashree B, Anirban Sarma, Vanita Sharma and Shoba Suri



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Introduction

AS THE WORLD reaches the mid-point of the window for the achievement of the United Nations Sustainable Development Goals (SDGs), two questions confront global leaders and development stakeholders: Are we on track to achieve the SDGs? What can we do to accelerate efforts to meet them? For many countries, the COVID-19 pandemic was a shock that reversed decades of progress. Nonetheless, the world demonstrated remarkable resilience in making a recovery, and India managed the pandemic without allowing it to derail development and growth.¹

A reason for India's resilience has been the wealth of lighthouse initiatives that bulwark the nation against external shocks. India's Presidency of the G20, and its leadership in crafting a development agenda for the Global South, has allowed the country to draw attention to many of these best practices and encourage their adoption. As we begin to look ahead to a world beyond the 2030 Agenda, this publication showcases 17 lighthouse case studies from

India—each primarily addressing one specific SDG—which could bring about a potential transformation if scaled and replicated in other geographies. Implementing these ideas could hasten our journey to the SDGs, and provide a strong foundation on which a post-2030 agenda might build further.

A new pathway to development

Before the SDGs, between 2000 and 2015, the global community aimed to achieve the United Nations Millennium Development Goals (MDGs) and the period witnessed a surge in development initiatives worldwide. As 2015 dawned, however, it was apparent that while impressive strides had been made on many of the MDG targets, progress was uneven across regions and countries. For instance, 800 million people continued to live in poverty and experience hunger globally. Yet, the considerable success of the MDG agenda proved that global action works and a concerted approach to international development must be adopted.²

For India, the MDG era was marked by notable gains: despite slow progress in the targets on hunger, maternal mortality, and sanitation, the country met the goals related to poverty, education, health, environment, and information technology.³ This provided the context for India's adoption, along with other UN member states, of the historic document, *Transforming Our World: The 2030 Agenda for Sustainable Development* at the 70th Session of the UN General Assembly on 25 September 2015.⁴

Comprising 17 Goals and 169 associated Targets, the Sustainable Development Goals (SDGs) are the most wide-ranging and ambitious global goals in history that seek to integrate the social, economic, and environmental dimensions of development.⁵ At the heart of the SDGs lies the principle of universality—the resolve to 'Leave No One Behind'. Moreover, the idea of inclusion, and the awareness that it is no longer sufficient to focus only on economic growth but on building more equal societies, threads the Goals.⁶ The SDGs place the onus on countries to monitor and review at their level the implementation of the Goals and Targets between 2016 and 2030.



Addressing the UN on the occasion of the adoption of the SDGs, Prime Minister Narendra Modi declared that “just as our vision behind the Agenda 2030 is lofty, our goals are comprehensive.”⁷ He went on to identify some of the priorities the SDGs address, which if acted upon, could transform the global development landscape. These included the “elimination of poverty in all forms”, the recognition that “economic growth, industrialisation, infrastructure, and access to energy provide the foundations of development”, a strong focus on “environmental goals, especially climate change and sustainable consumption”, and a concern for the “ocean ecosystem [that] reflects the unique character of its challenges and opportunities.”

The prime minister observed that much of India’s current development agenda was mirrored in the SDGs. Eliminating poverty, for instance, has been an aspiration India has pursued single-mindedly by uplifting the poor and focusing on education and skill development. The country has transcended the traditional dichotomy between the public and private sectors by “defining a new personal sector of individual enterprise, micro enterprises and micro finance” that leverages digital devices and applications.⁸ National goals to achieve housing, electricity, water, and sanitation for all have concrete timelines which India is adhering to rigorously. And all development efforts are “intrinsicly linked to the empowerment of women”, beginning with a massive nationwide programme to educate the girl child.

At a broader sectoral level too, India had powered ahead by boosting its service sector, upscaling infrastructure, building smart and progressive cities, investing in renewable energy, and reducing the energy intensity of national growth. Taken together, the prime minister said, India's citizen-focused and macro-level initiatives demonstrated the country's "commitment to the future", and represented "a culture that calls our planet Mother Earth".⁹

Indian development thought and action

From being an underdeveloped and resource-poor country at the time of independence, today India is on the verge of becoming a US\$ 5-trillion economy. The International Monetary Fund has forecast that India could cross this milestone in 2026-27,¹⁰ and the country is making every effort to fast-track progress despite the setbacks caused by the COVID-19 pandemic.

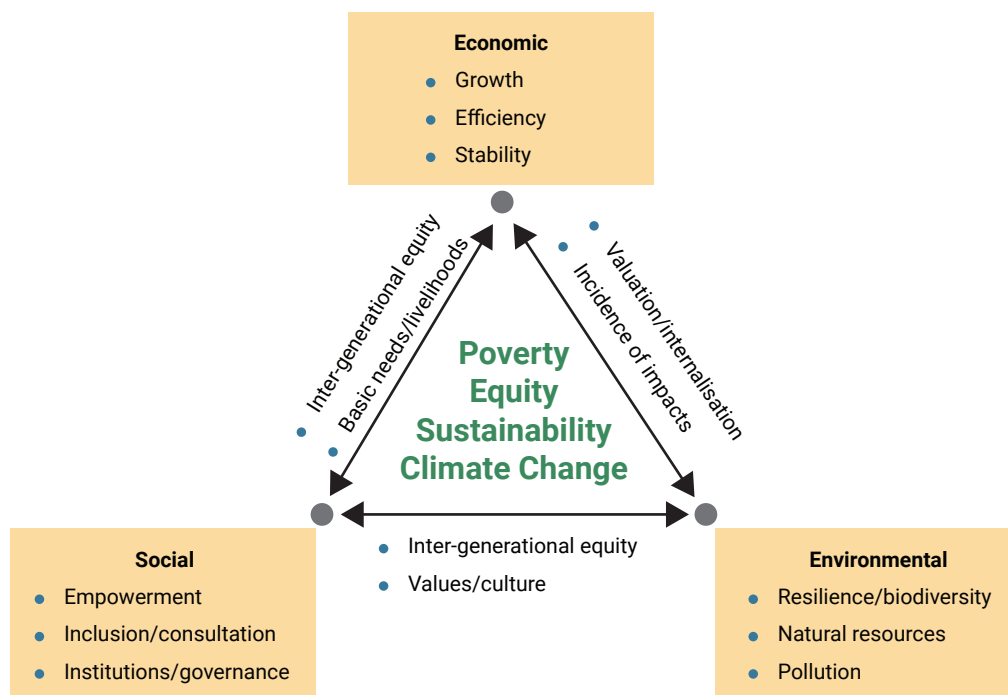
Even as the suitability of Gross Domestic Product (GDP) continues to be debated as a measure of economic growth but not necessarily of economic well-being,¹¹ in March 2023, the Indian Minister of State for Finance pointed out that the nation's roadmap for transforming the country into a US\$ 5-trillion economy includes key measures such as focusing on inclusive growth, promoting technology-enabled advancement and the growth of the digital economy, supporting climate action and the energy transition, and facilitating a positive cycle of investment and growth.¹² In other words, India's vision of economic growth has expanded to encompass many of the core elements that the SDGs emphasise, and to suggest a reflexive relationship between personal welfare and macro growth. More recently too, the Indian leadership has reiterated the need for a shift from a "GDP-centric worldview to a human-centric one."¹³

This was not always the case. Indian development thought and action following independence, and particularly in the post-liberalisation years of the early 1990s, may occasionally have tended to privilege the pursuit of economic growth without fully recognising its possible implications for issues of equity, environmental concerns, and the preservation of natural ecosystems.¹⁴ In the long term, these approaches may sometimes have revealed the costs of growth—contributing to intermittent pockets of inequality, belatedly triggering rehabilitation challenges even as the creation of infrastructure continued

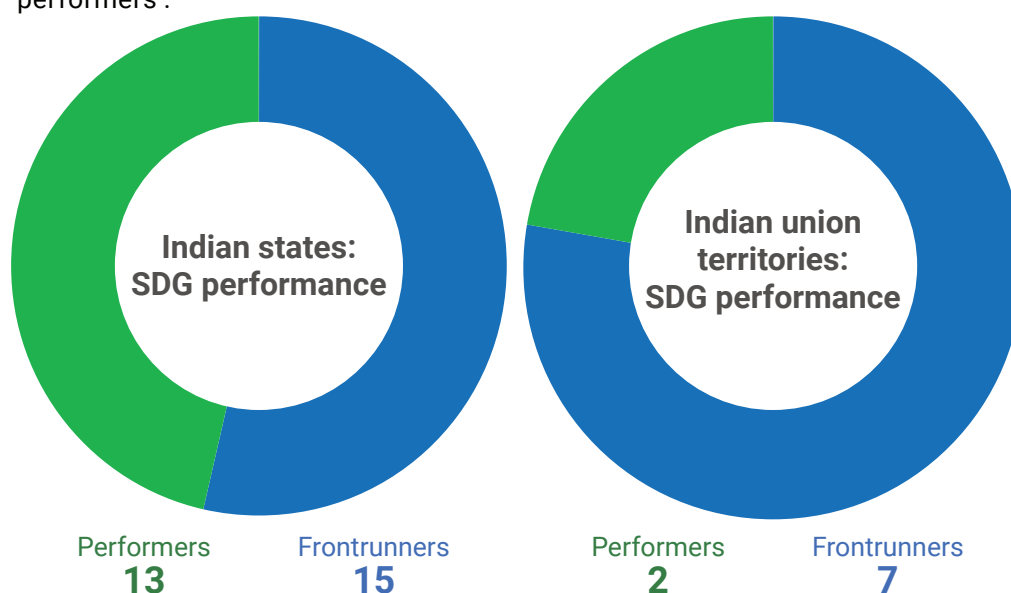
apace, or adversely affecting human habitats.¹⁵ Nonetheless, the importance of physical capital for spurring economic growth cannot be overlooked, and there is evidence to show that physical infrastructure has strengthened India's economic competitiveness at a national level.¹⁶ Perhaps the 'growth versus development' conundrum is a paradox every erstwhile colony and young nation must contend with.

To be sure, decades of debates about whether growth can be regarded as the only parameter of development or economic progress have had an effect on the discourse. So have the Club of Rome's persuasive 'limits to growth' theory that warns of a catastrophe unless the relentless depletion of natural resources and conventional notions of technological progress were abandoned;¹⁷ and the Brundtland Commission's classic definition of sustainable development as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."¹⁸ Similarly influential has been Sri Lankan economist Mohan Munasinghe's conception of 'sustainomics', presenting a model of engagement between social, economic and environmental concerns which constitutes a "practical framework for making development more sustainable",¹⁹ and providing much of the theoretical underpinning for the SDGs.

The sustainomics triangle



India's own development trajectory has been influenced by these global ideas as well as the successes of some of its own domestic development programmes during the period of the MDGs. As the SDG era began, the Indian government formally acknowledged that the 2030 Agenda "reflects our evolving understanding of the social, economic, and environmental linkages that define our lives."²⁰ The pathway to development that this new way of thinking has set India upon has yielded valuable dividends since 2016. With tangible achievements across sectors, today the NITI Aayog has designated^a 15 of India's 28 states as 'frontrunners' with respect to their SDG performance, and the remaining 13 are labelled as 'performers'.²¹ Meanwhile, seven of the country's nine union territories are regarded as 'frontrunners', and two are 'performers'.



^a The NITI Aayog's SDG Index measures the performance of Indian states and union territories on their SDG performance, and categorises them as 'Achievers' (with a full score of 100), 'Frontrunners' (with a score of 65-99), 'Performers' (with a score of 50-64), and 'Aspirants' (with a score of 0-49).

India's G20 Presidency and the SDGs

In December 2022, India assumed the Presidency of the Group of 20 (G20). It was a pivotal moment. For the first time in the Group's history, the G20 troika—i.e. the outgoing President, Indonesia; the incoming President, India; and the future President, Brazil—would consist of developing nations.²² And with South Africa slated to succeed Brazil in 2025, emerging economies stood to helm the G20 for four consecutive years. As Prime Minister Modi and other world leaders have pointed out, this presented a crucial window of opportunity to reflect the voices and challenges of the Global South at the G20, to put inclusive growth and sustainable development squarely on the Group's agenda, and to steer that agenda over a four-year period.²³

During the Indian Presidency, the SDGs have been a cross-cutting focus of the G20 Working Groups and Engagement Groups. But it is India's extraordinarily inclusive and participatory approach to shaping a global development agenda that has consolidated its position as the legitimate voice of the Global South, and as a champion of the growth of underrepresented nations. Among India's first actions as President was to conduct a pioneering exercise called the 'Voice of the Global South Summit' in January 2023, whereby it entered into a dialogue with 125 countries in order to better understand their development concerns, and to shape its priorities at the G20 accordingly.²⁴ Guided by the same imperatives, and encouraged by a long history of development cooperation, India has also pushed for the inclusion of the African Union as a permanent member of the G20.²⁵

There have been a number of standout SDG-related interventions during India's tenure. Arguably, chief among these is the unanimously adopted *G20 2023 Action Plan to Accelerate Progress on the SDGs*, a bold seven-year integrated roadmap to meet the 2030 Agenda. The Action Plan aims to "accelerate achievement of all SDGs in all regions by promoting collaboration among G20 work streams."²⁶ It begins by outlining a set of high-level principles towards this end, and then moves into more specific domains such as financing for advancing the SDGs. The 'Targeted Actions on Transformative Transition Areas' constitute the heart of the document, outlining the G20's commitment to an inclusive digital transformation; laying down the 'G20 High Level Principles on

Harnessing Data for Development (D4D)’ (which also endorse India’s decision to launch a voluntary ‘Data for Development Capacity Building Initiative’ for G20 stakeholders); evolving concrete actions to implement just transitions globally; and proposing a blueprint for attaining ‘Sustainable Development through Gender Equality and Empowerment of Women’. The Plan concludes by suggesting G20-wide coordination mechanisms for its effective execution. It is by any measure a seminal document, and one of the principal instruments through which “India’s G20 Presidency brought development back in the spotlight,” as External Affairs Minister S Jaishankar described it.²⁷

A number of other India-led actions have had a significant impact at the G20. For instance, the promotion of digital public infrastructure (DPI)—seen as a powerful accelerator of the SDGs—has been a core priority.²⁸ India’s foundational DPIs (i.e., the Aadhaar digital ID, the Unified Payments Interface, and the Data Empowerment and Protection Architecture) have transformed public service delivery and citizen empowerment, and unleashed innovation at scale.^b At the G20, India has been able to achieve a shared understanding of DPI; build acceptance of a high-level *G20 Framework for Systems of DPI* outlining principles for the design, development and deployment of DPIs; and ensure agreement on the need for increased funding for developing DPIs in low- and middle-income countries.²⁹

Women-led development has been yet another rallying point. Foregrounding the role of women’s leadership for achieving progress is a novel approach that goes beyond SDG5 (that calls for gender equality), and envisions a new narrative of social, economic, and political transformation. In June 2023, Prime Minister Modi urged G20 Ministers to adopt a “game-changing action plan for women-led development,”³⁰ and earlier, in March, he had remarked that over the last nine years, India had transitioned from supporting women’s development

^b Today, over 99.9 percent of Indian adults use their Aadhaar digital ID to avail public services; Indians make 30 million transactions daily via the Unified Payments Interface; and the country operates the world’s largest tech-enabled financial inclusion programme.

to enabling women-led development.³¹ The figures bear this out. Today, women occupy 36 percent of senior and leadership positions in mid-sized businesses in India, surpassing the global average by 4 percentage points. As the pandemic paralysed the country, women from 6 million self-help groups spearheaded India's mission to save lives.³² Nearly 280 million women have availed of loans under the MUDRA (Micro Units Development and Refinance Agency) scheme,³³ unlocking personal economic potential on an unprecedented scale.^c And women's enrolment in the fields of STEM is currently at 43 percent, and is powering a rising, digital India.³⁴

Finally, India's pathbreaking LiFE (Lifestyle for Environment) Mission has gained traction, and helped mainstream the idea that the environment-friendly and responsible consumption choices we make as individuals could contribute to a cleaner, greener planet. These deliberations have culminated in the G20 High-Level Principles on Lifestyles for Sustainable Development.³⁵ In the space of environmental stewardship and climate action too, a consensus has been forged on a normative framework for building a sustainable and resilient blue economy.³⁶ The Indian Presidency has been able to infuse both developing and advanced nations with forward-looking ideas about leaving no one behind. At a time when there is much to be gained from putting humanity first, adopting a pro-planet outlook, and placing inclusion and equity at the heart of internationalism, India—with its ethos of *Vasudhaiva Kutumbakam* (One Earth, One Family, One Future)—is showing the way.

Ideas, innovation, implementation

Visiting India in October 2022, António Guterres, Secretary-General of the United Nations, observed that with one-sixth of the world's population and the largest proportion of young people, India could "make or break" the 2030 Agenda. Presaging what India would go on to do at the G20, he said that "India has an unprecedented opportunity to speak up for the Global South and to lead by example, as a model of resilience and an advocate for

^c Launched in 2015, the MUDRA scheme provides loans to the non-corporate and non-farm small business sector.

sustainable development and climate justice.” Indeed, many of the examples in the foregoing sections point to a uniquely Indian approach—the desire to *experiment and excel domestically, share these experiences internationally, and work with partner nations to elevate them to the level of best practices globally.*

Governments, however, also need a supporting groundswell of initiative and zeal from civil society organisations (CSOs), businesses, and citizens to make development a reality. CSOs in particular often bridge communities, on the one hand, and the government’s vision and efforts to steer progress, on the other. With their on-ground stakeholder relationships, practical insights about local contexts, and reach at the last mile, CSOs are especially well-placed to implement development targets. As the UN notes, “civil society organizations link governments and people” and “play a critical role to deliver on the SDGs.”³⁸

September 2023 is a watershed moment. With the G20 Leaders’ Summit in New Delhi, the Indian G20 Presidency entered its concluding phase; and the high-level SDG Summit in New York marked the culmination of the global mid-term review of the SDGs. The former reaffirmed the G20’s commitment to act on the SDGs “fully and effectively”,³⁹ and the latter heralds a new phase of accelerated progress towards them, with the UN Secretary-General underlining that the Goals “carry the hopes, dreams, aspirations and expectations of people everywhere.”⁴⁰ It is also an especially important moment to acknowledge the outstanding contribution that CSOs are making to the 2030 Agenda, and to recognise that they will be key actors over the next seven years, and beyond.

This is the context of our publication of *Ideas, Innovation, Implementation: India’s Journey Towards the SDGs*. The book explores 17 civil society lighthouse initiatives that are advancing the 17 SDGs in India. In doing so, it presents a broad spectrum of successful development models that could be replicated in other nations of the Global South and North. The book is also a celebration of diversity; it brings together the different voices and approaches of multilateral agencies, philanthropic foundations, grassroots CSOs, community-based organisations, and inspiring individuals, all united in their mission to catalyse India’s journey towards the SDGs.

For SDGs 1 to 16, every chapter outlines a development challenge encountered in a particular region, or across regions, or at a pan-India level. It then goes on to examine a programme implemented to address the challenge, with a focus

on its objectives and rationale, the early difficulties encountered and solutions found, and—in some detail—its execution, innovativeness, and impact. In the process, each chapter identifies some of the key drivers of the ecosystem that supported the programme’s success (such as enabling policies or institutional capacities), and also reflects on what makes the initiative a lighthouse case, a potentially replicable best practice, and a legacy for the post-SDG era. We have assigned case studies to each SDG, but these examples show how interconnected development challenges and solutions are, with case studies targeting multiple secondary SDGs and demonstrating the importance of taking an integrated approach.

The chapter on SDG17 (‘Partnerships for the Goals’) is somewhat different from the first 16, dealing as it does with India’s highly effective development cooperation models, and the in-country multistakeholder partnerships it has been able to set up between governments, CSOs and the private sector. The volume concludes with a chapter that explores what a post-2030 development agenda might include, and particularly how India might navigate the 17 years after the 17 Goals until 2047, when India turns one hundred.

Given the multiplicity of thematic areas, the breadth of interventions, and the practical details of planning and implementation that it covers, *Ideas, Innovation, Implementation* could act as a valuable tool for policymakers, programme administrators, and field-level practitioners alike. For this volume, we are grateful for the partnership of the United Nations in India, and their support for the collective commitment of Reliance Foundation and Observer Research Foundation (ORF) towards India’s development agenda. This is the fourth and most ambitious book yet in the Reliance Foundation-ORF series about transformations in development and governance. As India moves ahead through the Amrit Kaal, the crucial 25-year period for national development which will transform the country in the lead-up to its centenary of independence, Reliance Foundation and ORF will continue to promote and publish research on models of engagement and action that are changing lives and shaping futures. These studies of institutional leadership, innovation, and triumph must be brought before the widest possible audience, and we remain committed to doing so.

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NO
POVERTY



01

Meeting Farmers on Their Ground: Building Livelihood Resilience through Digital Farm Schools

Reliance Foundation



DFS addresses real-time farmers' needs through group learning, and equips them with the tools to make informed decisions amid agro-climatic changes.

At a Glance

- Reliance Foundation's digital farm schools (DFS) are participatory agriculture education platforms. Targeting Sustainable Development Goal 1 (end poverty in all its forms everywhere), the programme brings together groups of farmers to learn from each other and provides expert support for livelihood improvement and resilience.
- Through the 'phygital' format (voice message services, WhatsApp groups, and physical interactions), the programme aims to increase

access to tailored information and the use of sustainable and the latest agricultural methods.

- There are currently over 300 DFS active across 15 states in India, working with mostly small and marginal farmers who farm nine crops that are key to improving the country's food security and growing the GDP. Given its digital focus, the programme is immensely scalable, deployable across regions with ease, and is aimed to be accessible to people with all levels of formal education.

Introduction

Digital farm schools (DFS) are being established across India as part of an ongoing five-year initiative begun by Reliance Foundation. The programme started taking shape in 2019, with a pilot project in Villupuram district of Tamil Nadu. The five-year programme began in 2022-23, and soon came into its own, with 214 DFS being established across 15 states in its first year alone. These DFS are currently focused on nine crops, many of which contribute to the nation's food security, GDP, and nearly half of the country's agricultural workforce. For instance, India is the second largest producer of wheat in the world, with its yield in the 2000-2020 period second only to China, and most of this is for domestic production.¹

The DFS provides a digital platform for farmers, with multiple modes of communication that help disseminate knowledge about crop management technologies and practices. It addresses the real-time needs and challenges of farmers in a local ecosystem through group learning, equipping them with the tools to make informed decisions when faced with agro-climatic changes. Scalability is brought in through the use of technology that has a wide user base and low learning costs.

DFS act to reduce time and opportunity costs for farmers in accessing the information they need while providing a participatory platform for access to knowledge. Says Ajay Biswas, who participates in the programme in Nadia district, West Bengal, "The best part of digital farm school is that I get all the information on my phone either through advisories or by participating in audio conferences. I don't have to go anywhere or spend any extra money for it."

Digitisation allows for the democratisation of knowledge, as it is disseminated beyond individuals in the programme. It also increases flexibility by reducing the need for the physical presence of the farmers or the experts.

Participatory Education for Sustainable Agriculture

The roots of DFS's participatory format can be traced back to Farmer Field Schools (FFS), which originated in the paddy fields of the Philippines and Indonesia in the late 1980s. The Food and Agriculture Organization (FAO) of the United Nations created the FFS to bring together a group of small-scale farmers to solve production problems through sustainable agriculture. They started by promoting integrated pest management (IPM) in rice cultivation. Since then, the FAO has been incubating, nurturing, and promoting FFS worldwide. FFS have been implemented in many countries, and evidence suggests that they tend to improve productivity and income.² In 2018, a synthesis of evaluations of FFS models globally indicated positive impacts which led to improved food security, empowerment, and poverty reduction.³

In India, the FFS for IPM in cotton production was introduced in 1989 under the FAO's assistance. Later, the concept was adopted by other stakeholders, such as the state agricultural universities, Krishi Vigyan Kendra,^a and private stakeholders. The FFS set out to create a group learning atmosphere that would lead to sustainable agriculture. However, in India, as in many other parts of the world, climate change has rendered the sector and those associated with it increasingly vulnerable. There has been an increase in weeds, pest proliferation, and reduced quality and yield of desirable crops. The International Food Policy Research Institute had noted as far back as 2009 that developing countries in general, and South Asia in particular, could expect to see yield decreases in important crops, including rice.⁴ Moreover, farming input prices have also risen in the past two years,⁵ making agriculture increasingly costly and unprofitable.

^a These are government-financed institutes which have been functioning as Knowledge and Resource Centres of agricultural technology supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district.

DFS has taken into account improvements in technology, leading to a pioneering agricultural education model that integrates the FFS's participatory approach with digital innovations. The digital platform provides real-time information to farmers at each crop stage and promotes group learning, field observation, and cross-learning. The programme supports increased climate risk resilience in a crucial sector, thus enhancing food security, and also supports largely small and marginal farmers (who constituted about 63 percent of the programme's beneficiaries in the first year).

DFS also differs from the FFS model as it is less dependent on the quality of the local facilitator, due to the wider network and digital connections available. It also heavily reduces time costs for farmers, who can stay connected on an ongoing basis, and gain knowledge from experts without traveling. Moreover, it reduces the time for experts and institutions to connect with farmers. Finally, given the removal of some constraints of time and space, much larger groups in each region can engage with the model.

The programme is expected to impact Target 1.4 of SDG1 in ensuring better access to economic resources and appropriate new technology, as well as Target 1.2 of reducing the proportion of people living in poverty. A 2017 assessment of the National Sample Survey Office data from 2012-13 showed that per capita income of marginal farm households, who cultivate landholdings less than or equal to one hectare and comprise about 70 percent of the total farm households, was estimated to be slightly more than INR 11,000. This is below the national poverty line, and far below the internationally accepted poverty line of US\$1.25 per day, which concerns Target 1.1.⁶ Only about 10 percent of farmers have per capita income exceeding INR 30,000.

The aim of the programme is twofold: to increase access to information and, consequently, to enhance the uptake of sustainable and/or advanced agriculture methods. The programme's objective is to meet Target 1.5^b by reducing climate and disaster vulnerability of primarily marginal farmers (those having less than one hectare of operational holding), many of whom are women and face

^b By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.

additional dimensions of vulnerability. The Agricultural Census of 2015-16,⁷ the most recent available data, indicates that 72 percent of women operational holders were marginal farmers. The DFS programme also works with small farmers with operational holdings between one and two hectares. Increasing the income and access to knowledge of vulnerable people, it will additionally support the completion of Target 1.2. It is also expected to impact Target 1.4 to some degree by increasing farmers' control over appropriate new technology.

Common Digital Platform: The Approach and Challenges

The programme focuses on bringing together groups of small and marginal farmers on technological platforms. In 2019, as a pilot study, a DFS was implemented in Tamil Nadu's Villupuram district with 100 paddy-growing farmers. The pilot amply demonstrated the strengths and limitations of the programme's methods.

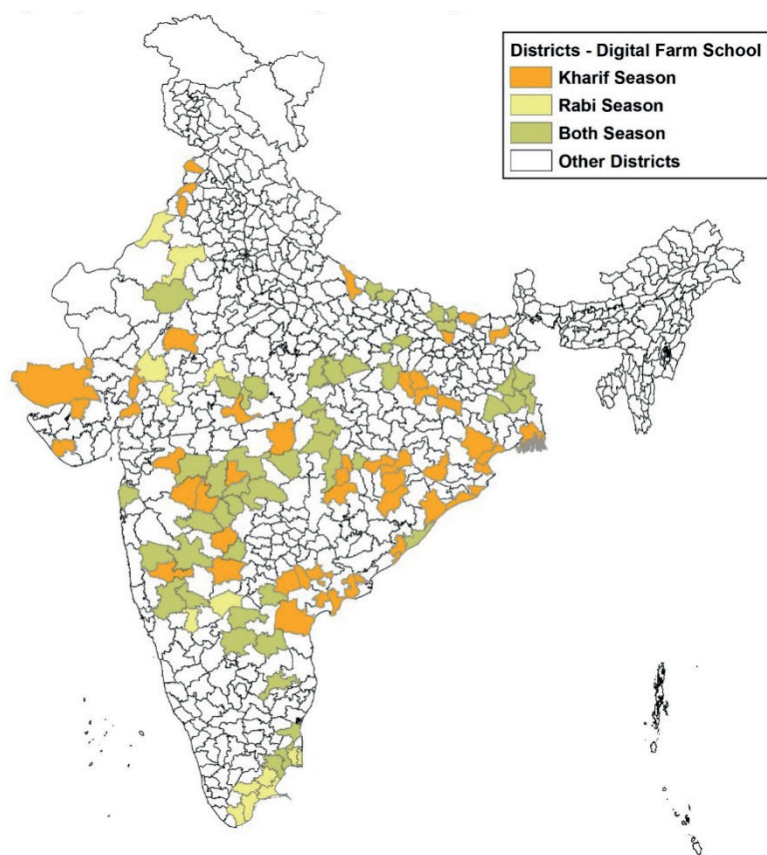
The five-year programme started in 2022, with 214 DFS, bringing together 25,990 farmers from 15 states (Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, and West Bengal). Nine crops—six primarily kharif^c (paddy, maize, soybean, groundnut, cotton, and red gram) and three rabi^d (mustard, wheat, and Bengal gram)—were identified for the programme, and included a single cash crop (cotton).^e The states contributing 75 percent of the national production of each identified crop were included in the DFS programme. In the identified states, all the districts that contribute to crop production were considered. The crop-wise area coverage, production, and average yield for these districts were studied, and those whose average yield for a selected crop was lower than that which can be achieved using improved technologies were prioritised for the project.

^c Kharif crops are those sown at the beginning of the rainy season (between April and May).

^d Rabi crops are those sown at the end of monsoon or the beginning of the winter season (between September and October).

^e Cash crops are those that are planted to sell on the market or for export to make a profit.

Figure 1: Geographical Coverage of Digital Farm Schools



Map not to scale and for illustration purpose only

Source: Reliance Foundation

Table 1: Coverage of Digital Farm Schools, by Season

Season	No. of DFS	No. of Farmers
Kharif	138	16,699
Rabi	76	9,291
Total	214	25,990

Source: Reliance Foundation

Voice message services (VMS)^f and WhatsApp^g were used as a primary method to send advisories to the farmer groups and enable them to communicate with experts and each other.

Two challenges emerged during the pilot study in 2019.

Engagement: Upon investigation, some of the farmers were reluctant to make time to engage fully with the DFS. They were also reticent in sharing personal information such as financial status and details about crop failure, which would prevent them from accessing tailored information and the ideal experience of the DFS.

Technological challenges: A crucial part of choosing the beneficiaries was ensuring they could utilise the digital platform effectively. Many of the beneficiaries, however, did not have the sufficient digital literacy to use Whatsapp and Youtube and operate a smartphone device. Additionally, women farmers had little access to personal mobile phones.

As a result of the limitations found through the pilot, the process was made more rigorous through the use of focused group discussions (FGDs). The FGDs facilitated the process of selection of farmers in addition to assessing their digital skills as well as their enthusiasm for the programme. This ensured the enrolment of participants who would be fully engaged, and thereby reduced the dropout rates from the programme. Additionally, deploying multiple information delivery platforms like voice messages to reach all phone users with 2G connectivity, and audio conferences, has helped make the platform more digitally inclusive.

^f Voice Message Services are advisories in audio format that are provided as calls to the beneficiaries' mobiles (mobile phones with 2G capability are compatible).

^g A free instant messaging software that is popular in India and that allows communication via text, voice messages, images, and videos.

Implementation and Impact: A Year of Learning

In its first full year (2022), the programme saw increased crop yields, reduced cost of cultivation, and increased (net) income for farmers of almost all crops. It validated the agricultural educational model and the use of technology for coverage. In the second year (2023), the engagement has increased, from 214 to over 300 DFS, and learnings from the results of the first year have ensured more focused content development and facilitation of answers to farmers' queries.

Implementation

DFS engagement occurs at all stages of the crop cycle. The principal modes of engagement are through audio or video advisories and meetings that are facilitated with experts at crucial times in cropping to ensure sustainable and scientific agriculture management. The programme works intensively throughout the life cycle of the representative crop in an agro-climatic region and focuses on providing expert advice on identified issues and needs of the target agriculturists in the region. This is a two-way system, which involves gaining feedback through the beneficiaries' queries and responding accordingly. However, the culminated knowledge and technologies were also disseminated to a larger set of farmers with similar livelihood patterns and within the same agro-climatic zone in the selected districts through various mobile-based platforms like voice messages, text messages, WhatsApp audio, video, and image advisories, and instructional videos on YouTube. Along with the 'phygital' mode of the DFS, the spillover allows for wide reach and scalability.

DFS Group Preparation

Farmers were brought together in groups of 60 to 150. The primary person who cultivates the land, and not necessarily the owner, is invited to be part of the group. The programme prioritises small and marginal farmers as they have unique problems, such as a lower likelihood of application of technological solutions. About 63 percent of the programme's beneficiaries were small and marginal farmers with less than two hectares of land, and 23 percent had between two and four hectares of land (semi-medium farmers). An FGD was

conducted with the farmers to choose group members who are tech-savvy, fully engaged, and ambitious to improve agricultural outcomes. A brief profile with details of these chosen group members was collected and livelihood advisories were disseminated through VMS or WhatsApp.

Digital Engagement

Digital engagement allows for higher access by participants, with both more numbers of meetings possible and digital engagement able to reach greater numbers of people; over the first year of the project, digital interactions reached almost five times as many people as physical interactions.

Localised package of practices: The programme curates and localises knowledge from partner organisations and develops it into easily comprehensible formats, including text, audio, video, and images in the vernacular of each region. These are then made accessible to registered farmers through WhatsApp and Chatbot, YouTube, Internet Radio, and QR-based audio/video streaming. Additionally, to increase outreach, this is also shared through local media and networks of local tech-savvy livelihood practitioner networks. The digital mode reduces the time required for farmers to engage, the formats increase ease of use, and finally, the language localisation ensures wider reach.

Expert interaction: A calendar of interactive programmes facilitated by subject matter experts with farmers is prepared by Reliance Foundation at each crop stage to address queries. Later, the queries and responses of each interactive programme are transcribed, validated, and further disseminated to other farmers who follow a similar cropping pattern, with parallels in seasonal crops and climate. The members also have access to a helpline at all times for further queries and clarification on the advisories disseminated through various platforms.

Physical Engagement

Along with digital meetings, periodic physical interactions are organised in small groups with all participants for the collection of feedback on content dissemination of focused crops and clarification of doubts and new information.

Physical programmes are also used for demonstrating any new technologies/ practices and to observe crops suffering from pests and diseases at various stages of cultivation. So far, 291 such physical programmes with 11,099 participants have been conducted.

Impact

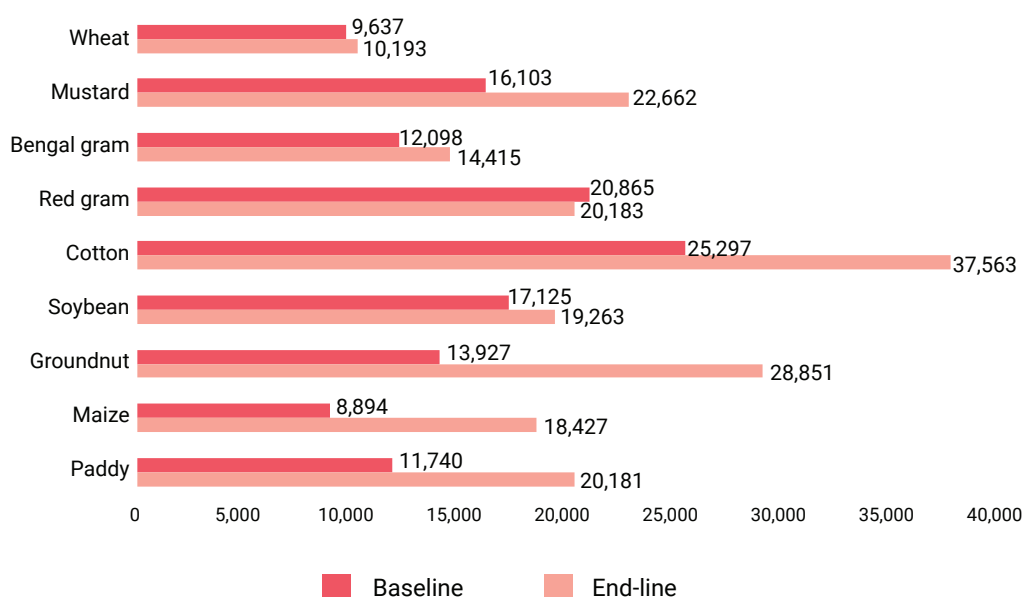
Impact assessment was conducted both during the pilot period (2019) and during the first year of the programme period (2022-23). The programme was assessed through an experimental study where a baseline survey was conducted pre-intervention and an assessment was conducted post-harvesting of the crop. The pilot demonstrated a reduction in input cost by 34 percent, and an increase in the yield of paddy.

The key variable for the programme is livelihood improvement. This was evaluated through a survey that collected demographic baseline data of the sample farmers and also assessed their agricultural data for both kharif and rabi crops, pre-intervention, including landholding details, quantity and cost of agricultural inputs, and yield of crops. A survey after the first year of intervention found an increase in net income across eight of nine crops.

The programme assessment was extensive, with 74 of 214 DFS (6,224 farmers) selected for the study, covering all 15 states, and with each crop in each state covering two different agro-climatic zones. The sampling criteria ensured that natural variation in agro-climatic features did not skew the impact assessment. About 13 percent (or 816 people) in the sample were women, which is coincidentally close to the operational holdings reflected in the Agricultural Census, where female holdings were 14 percent in 2015-16,⁸ a rise from 12.8 percent in 2010-11.⁹

Overall, the data showed a 41-percent rise in net income (see Figure 2). Groundnut and maize farmers saw substantial increases, while red gram farmers saw almost no change.

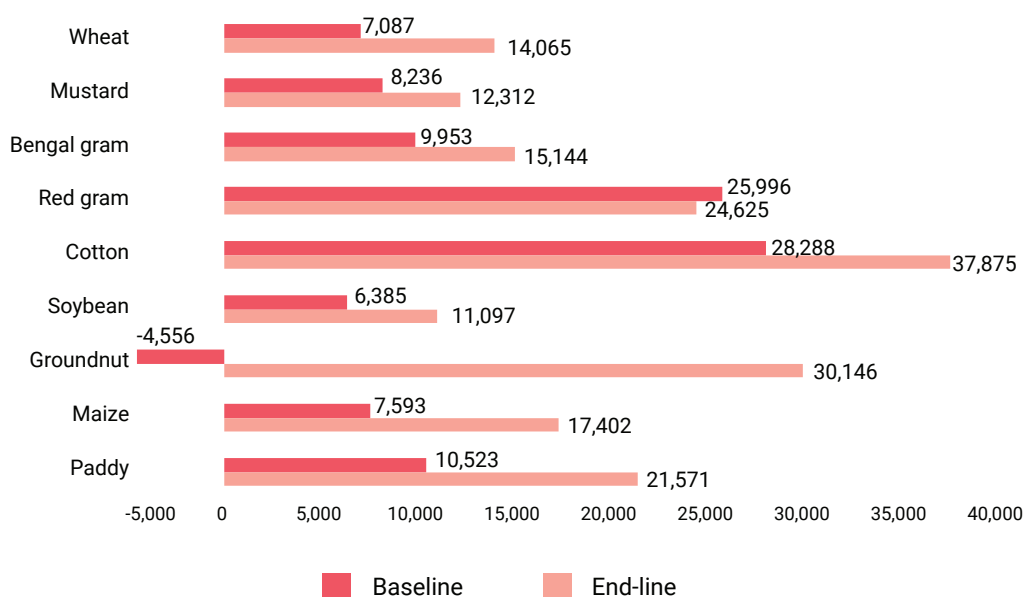
Figure 2: Net Income of All Farmers (INR per acre)



Source: Reliance Foundation

The programme's impact on the participating women farmers is also noteworthy. While women's participation was relatively lower, the impact assessment shows that even where women's baseline net income was lower than the overall average, the programme has led to remarkable improvements for them. In wheat and groundnut, for instance, women farmers had lower baseline net income and higher endline net income than the overall average (see Figure 3). It is evident that women farmers who participated in the programme are seeing positive impacts on a par with their male counterparts.

Figure 3: Net Income of Women Farmers (INR per acre)



Source: Reliance Foundation

The programme's impact assessment also showed a yield increase on average for the nine crops. However, the analysis showed a rise of between four percent to 26 percent for seven crops and a decline in the case of wheat and red gram, skewing the overall analysis. A primary reason for the undesirable outcomes in the latter two is extreme weather events, partly caused by the impacts of climate change.

Timely Advisory Provision

"I found it very difficult to manage weeds. Based on DFS's suggestion, I opted for the Lokman, a high-yielding variety of wheat, treated them with bio-fertilizer and sowed it in the right time. I could arrest the spread of weeds using the recommended dose of herbicides as prescribed by experts during an audio conference. The best part of DFS is that all the information and advice is free and on time." - Anita Singh, Raikwar village, Amarpatan tehsil, Satna district, Madhya Pradesh.

New Directions: The Year Ahead

In the second year of the programme, the project base has been expanded to 300 DFS in the same 15 states. Learnings from the first year of the project are being implemented. A key change in the programme is that to ensure livelihood improvement and target SDG1, the areas that had only coverage of one season (kharif or rabi) of crops had to be covered throughout the year. This necessitated adding black gram to the primarily kharif crops in some areas.

Building on the assessment of the programme's first year, it is evident that course correction was required for wheat and red gram, which did not see the same positive impact as the rest of the crops. Based on needs assessments conducted with the appropriate DFS groups, and the queries that were raised on the helpline and during interactive sessions with experts, the programme is overhauling the package of practices to focus on the most important gaps. A key finding is that extreme weather events and extended dry spells, which are becoming more frequent due to climate change, affected the sowing and harvesting periods. Greater focus will be given to practices for climate resilience in the second year of the programme.

Making Farmers Climate-Resilient

From 2023-24 onwards, an important addition to the programme is the inclusion of millets to address climate implications that force farmers to stop cultivating or have other negative impacts in rain-fed/water-stressed regions. However, this part of the programme is not focused on productivity outcomes; it is to primarily increase the area under millet cultivation. It will also increase awareness about nutritional benefits and consumption.

Other climate-resilient practices to be included will be the recommendation of appropriate climate-smart varieties of seeds, improvement of foliar application, use of methods such as raised bed system, forecasting weather, and optimising crop calendars to adapt agriculture to extreme weather.

In the areas where DFS has been established, 62 percent of the farmers' households covered in the programme own livestock and other micro-enterprises for additional income, constituting a significant part of their livelihood. Women are chiefly responsible for the management of these micro-enterprises. In this context, in the first quarter of the fiscal year 2023-24, there have already been 75 livelihood improvement programmes on livestock management and kitchen gardens or vegetable farming, engaging 2,032 women.

Over the next four years of the programme, this initiative will be scaled up to bring in more women from these DFS areas and other economic improvement activities.

Conclusion

The intervention has now widened from 214 to 300 DFS, with technology and language localisation making the programme an immensely scalable operation. The practice of sharing information freely through multiple processes, in the local language, ensured greater access and understanding. The DFS model has an advantage in increasing participation at a relatively low cost and time investment. It can also ensure frequency of information exchange dynamically, and work on real-time needs and challenges of farmers.

The perpetually available digital platform serves as a knowledge-rich repository containing observations from the field and other research solutions, which can potentially be shared widely with non-DFS farmers in the same agro-climatic regions where seasons and cropping patterns remain the same. This has already allowed the programme to scale.

The formal impact assessment process brought clarity to the end results in 74 DFS. This demonstrated a concrete increase in the yield of most crops, a reduction in the cost of agri-inputs, and rise in net income of farmers across nearly all crops. It also showed a demonstrable impact on women farmers in the programme. The programme is therefore highly suitable for large-scale implementation for impact on SDG1, and also SDG5 (gender equality).

Voices from the field bring up some additional thoughts; there is significant evidence showing improved intermediate outcomes, such as enhanced knowledge and uptake of new techniques and technologies. For instance,

Gyarsi Lal Parmar of Madhya Pradesh noted that after seeing a demonstration of the improvements from a combined harvester, he opted for mechanised harvesting, saving him money and time. He also stopped burning crop residue. Some of the women farmers who were part of the intervention also showed increased interest in building their own capacities, in terms of both knowledge and resources.

The digital mode and flexibility of the DFS will also make it useful in large parts of Southeast Asia, and other parts of the world, particularly as we work towards adjusting to the agricultural impacts of climate change. Farm Field Schools, for instance, have been utilised in 90 countries all over the world, and the lower time investment for DFS offers remarkable potential.

With improvements in such intermediate outcomes, it is expected that changes will persist. Farmers will be equipped to manage further changes, and the intervention will thus lead to lasting outcomes. A scalable programme such as this is also expected to pick up steam over time, and spread to many other areas. In the current scenario, while the programme is working directly only with farmers selected in the DFS, the information collated, including responses to their queries, is shared with local media and groups that have outreach in the region. These are facilitating transmission of farmer expertise and other expert knowledge to agriculturists who are not part of DFS on their issues and needs and creating a repository of localised knowledge and technologies. With greater scale, Reliance Foundation's DFS will have a direct impact on the livelihood of farmers, and contribute to resilience for the country as a whole, leading to lesser vulnerability to food crises caused due to climate risk. In this sense, the programme also impacts SDG2 (zero hunger) through Target 2.3 by increasing agricultural productivity affecting food security.

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ZERO
HUNGER



02

**THE ‘PARTICIPATORY
LEARNING AND
ACTION’ APPROACH TO
EMPOWERING RURAL
COMMUNITIES**

Ekjut



“

Improvements in maternal and child nutrition will happen when community capacity-building approaches such as PLA are coupled with nutrition-centric service delivery initiatives.

At a Glance

- Participatory Learning and Action (PLA) is a community-led approach to identifying, understanding and addressing challenges in community health and nutrition.
- The process involves a series of meetings where community groups are invited to engage in dialogue, gain knowledge, and make decisions that will help them take action to resolve local issues.
- The NGO Ekjut is supporting government to implement PLA in over 68,000 villages across five states in India.

The Enduring Quest to End Hunger and Malnutrition

Sustainable Development Goal 2 (SDG2) aims to end hunger globally by 2030. The goal is to end all forms of malnutrition, including reducing stunting and wasting among children under five years and addressing the nutritional needs of pregnant and lactating women.

Ekjut (meaning 'coming together') is an NGO founded in 2002 with the aim of empowering rural communities to improve their health. Ekjut contributes to the achievement of SDG2 through the implementation of a capacity-building strategy known as Participatory Learning and Action (PLA) to improve the health and nutrition of tribal populations in India's rural districts. In structured monthly meetings, community members gather as women's or community groups to identify, prioritise and address the health and nutrition challenges they face, with help from a trained facilitator. The approach was first tested through a cluster Randomised Controlled Trial (cRCT) (2005-08) in Jharkhand and Odisha, where it led to a 32-percent reduction in neonatal mortality.¹ These positive results prompted the Government of India's Ministry of Health and Family Welfare (MoHFW) to recommend scaling up PLA in 10 states, with existing frontline workers called Accredited Social Health Activists (ASHAs) serving as facilitators. The approach was then extended to improving maternal and child nutrition. When combined with home visits and the establishment of crèche facilities for children six to 36 months, PLA with women's groups increased women's and children's dietary diversity and reduced child underweight and wasting in Jharkhand and Odisha.² Five states are currently implementing PLA: Jharkhand, Odisha, Madhya Pradesh, Rajasthan, and Uttarakhand. Monthly meetings are happening in around 68,000 villages, reaching a population of 66 million across 75 high-priority districts.

The PLA Approach

India is on-track to achieving only five of the 13 nutrition-related SDGs and has the largest number of undernourished people in the world (>190 million).³ Rural tribal communities face particularly high levels of maternal and child undernutrition: 25 percent of women belonging to Scheduled Tribes are underweight (BMI<18.5), as are 39 percent of children under three years.⁴ Ekjut's programme is embedded in States where tribal communities constitute



a large proportion of the population, including rural districts in the eastern states of Jharkhand and Odisha.

Earlier initiatives in the 1980s and 1990s aimed to reduce undernutrition in tribal communities by strengthening services and offering information about optimum nutrition practices. They had limited engagement with communities to understand the barriers faced by families in adopting nutrition recommendations or using services. By contrast, PLA is a participatory, community-focused problem-solving approach where people are engaged in a respectful way, empowering them to collectively mobilise local resources and explore practical strategies to improve their nutrition. During a PLA cycle, group members prioritise and discuss the health and nutrition problems that matter to them most, and find locally feasible ways to address their social determinants. For example, dietary restrictions in pregnancy are a common cause of poor maternal nutrition, and discussion groups commonly choose to focus on these.

On its own, PLA has led to gains in maternal and child dietary diversity, as well as reductions in infant mortality.⁵ Coupled with family-centric home visits, PLA has also reduced wasting by 34 percent and underweight by 25 percent among children in rural Jharkhand and Odisha. With the addition of rural crèche facilities for young children (6 – 36 months), child wasting reduced by 27 percent and underweight by 40 percent.⁶ Another recent cRCT illustrated the benefits of using PLA over more didactic approaches to health promotion: women and children in villages that took part in the PLA intervention had greater gains in dietary diversity than those in other villages who did not.⁷

Ekjut's PLA programme is most aligned with SDG targets 2.1 and 2.2 (Ending hunger and all forms of malnutrition), 3.2 (reducing neonatal and child mortality), and 5.5 (Ensuring women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life). Keeping sustainability in mind, PLA has the potential to change social norms: this includes increasing people's understandings about balanced diets especially for mothers and young children, and improving food habits like building on indigenous food consumption practices by adding different food components in diets.

Overall, the PLA programme aims to improve maternal and child nutrition by building the capacities of community members in India's rural, deprived, and remote regions with a focus on tribal and other vulnerable populations living alongside them. The approach emphasises engaging with pregnant women and mothers of small children from underserved communities to help them identify, prioritise and address common nutrition challenges and their social determinants.

Early Experiences and Scaling up Through Government Systems

Ekjut's early research on PLA found that the approach could improve maternal and newborn health, including early and continued breastfeeding for infants.⁸⁻⁹ Other early evaluations of PLA for nutrition offered promising evidence of effects on maternal and child dietary diversity but also suggested that additional child-centric activities including crèche facilities and home visits might help further reduce undernutrition.¹⁰⁻¹¹ Ekjut conducted several medium-sized studies to refine these intervention combinations and establish proof of concept before scaling up in larger geographies.

In parallel, Ekjut and the Ministry of Health and Family Welfare (MoHFW) also worked on how to deliver PLA at scale. Initially, group meetings were facilitated by trained women from the community, but early evidence showed that the frontline health workers, or the ASHAs, a vital link between communities and health services, were just as effective.¹² However, ensuring continued quality and cost-effectiveness at scale remained a massive challenge. The solution was in innovating a cascade mode of training where ASHAs were trained on the job by ASHA Facilitators (their supervisors) who were trained residentially by master trainers, themselves mid-level officials in government. This innovative approach was first tested in a smaller geography (six sub-districts) for a year, before lessons were incorporated in state-wide scale-up in Jharkhand.



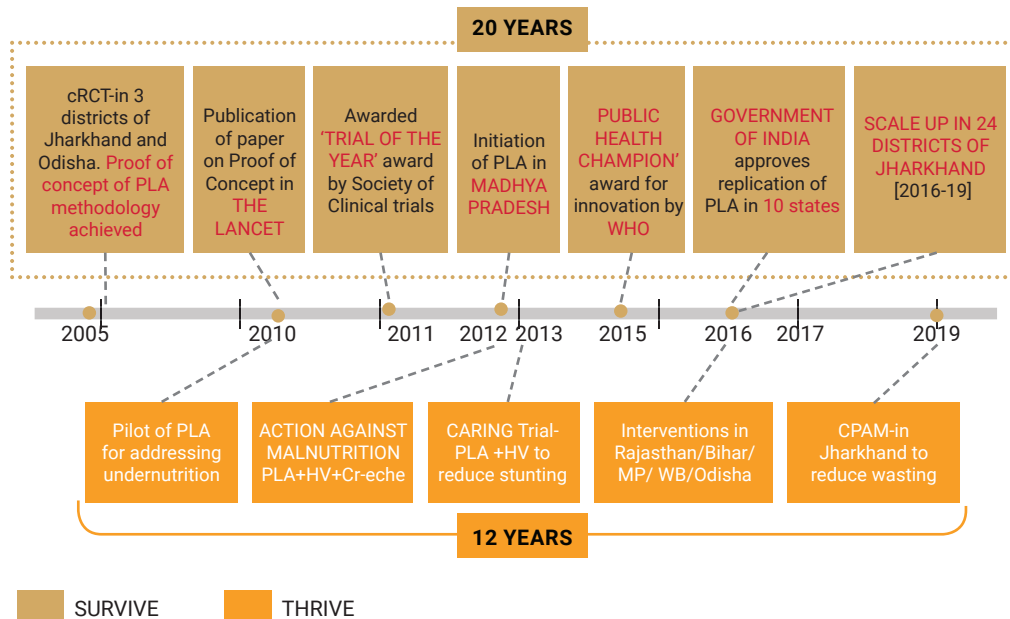
Another challenge was regular assessment of coverage and quality at scale. To address this, a dashboard was developed integrating Monitoring Information System (MIS) and Geographic Information System (GIS) options that enabled real-time data input at granular (i.e. ASHA) level with staggered access up to state levels to monitor key processes and quality indicators to inform program strategies. The challenge of ensuring a dedicated budget for PLA was overcome through continuous engagement with officials at all levels.¹³

Besides communities, Ekjut's programme has been supported by partnerships with Central and State governments as well as academic institutions such as the University College London (UCL). Exclusive allocations for PLA in the state annual budget included incentives, training and facilitation materials for 2,200 ASHA Facilitators and 40,000 ASHAs in Jharkhand and other states. Significant enablers were the Ministry of Health and Family Welfare (MoHFW)'s 2016 recommendation in support of scaling up PLA in 10 states and a global World Health Organization recommendation in 2014. Regular sharing of findings and experiences in different states, national and international platforms, as well as with academia, senior bureaucrats and political leaders helped mobilise key individuals within government support agencies and domain experts as stakeholders. These stakeholders continue to support the journey of PLA, one that started with 0.2 million people in 2008 and has now reached more than 50 million in some of India's most underserved areas.

Implementation and Innovation

Ekjut's current PLA programme to improve maternal and child nutrition has evolved with the help of lessons learned from four medium-scale studies in Jharkhand, Odisha and Rajasthan:

Ekjut was established in 2002 to improve health and nutrition of mothers and children through community capacity-building interventions



A first cRCT (2013-15) evaluated the effects of PLA and counselling through home visits, and found that more pregnant women and children in PLA intervention areas attained minimum dietary diversity, more mothers washed their hands before feeding children, fewer children were underweight at 18 months, and fewer infants under 12 months died.¹⁴

In a subsequent quasi-experimental evaluation (2012-17), multiple civil society partners in Jharkhand, Bihar and Odisha tested the effects of PLA with women's groups coupled with targeted counselling through home visits for undernourished children and, in particularly underserved areas, crèche facilities for children 0-36 months with free supplementary food, care, a safe environment and early childhood stimulation. The initiative resulted in improvements in anthropometric indicators (wasting, underweight and stunting) and dietary diversity among women and children in all intervention areas, especially those with crèche facilities.¹⁵

Concurrently (2016-'18), Ekjut supported the implementation of PLA and counselling through home visits to improve dietary diversity among pregnant women and children aged 0-24 months in the tribal districts of Rajasthan. An

unpublished quasi-experimental evaluation found improvements in the proportion of children receiving timely introduction to complementary feeding, and those receiving minimum acceptable diets.

Finally, the UPAVAN cRCT (2016-20) found that adding PLA to the broadcasting of nutrition-sensitive agriculture videos resulted in mothers and children aged 6-23 months having better dietary diversity compared to a control area.¹⁶

Scaling up

Building on lessons from these four studies, Ekjut has been supporting the implementation of PLA beginning in 2012, to improve the nutritional status of women and young children (aged 0-36 months) in high-priority regions of five states (Jharkhand, Odisha, Madhya Pradesh, Rajasthan and Uttarakhand), where State Governments are deeply engaged in delivering the process through frontline workers. Ekjut conducts trainings for ASHAs and ASHA facilitators through a 'training of trainers' module and provides handholding support to ensure that nothing is lost in transmission in the cascade of trainings. Some states have included home visit counselling along with PLA within their programmes.

In the state of Jharkhand, the largest scaled-up PLA programme is called 'Community-Led Prevention of Acute Malnutrition' (CPAM). This collaboration between the National Health Mission and Ekjut is at different stages of implementation in 21 districts.

The programme uses a three-pronged approach to improve maternal and child nutrition, with the explicit goal of reducing child wasting:

1. Monthly PLA group meetings by ASHA Facilitators (Sahiya Sathis) and ASHAs (Sahiyas) with a focus on including the most underserved pregnant women and mothers of children under three years of age, but open to all community members.
2. Family-centric home visits and counselling with simplified tools (picture cards) and restructured counselling sessions to make them more participatory and engaging for families, and more convenient for ASHAs.

3. Systems-strengthening efforts focused on improving the quality of Village Health Sanitation and Nutrition Day sessions through capacity-building on growth promotion and antenatal care counselling, as well as ensuring adequate availability of drugs and supplements (IFA tablets and syrup, albendazole, Vitamin A), weight and height measuring equipment, improving FLWs (ASHA, AWWs and ANMs) skills and understanding, and identifying gaps in last-mile reach and delivery.

The programme also includes three other innovative components:

- a. A custom-built Sahiya (ASHA) Information Management Application (SIMA) for timely and accurate coverage data of PLA and tracking each child covered through home visits.
- b. Special emphasis on at-risk children and households, including those with a child who is with low birthweight or severe acute malnutrition, families belonging to Scheduled Tribe or Scheduled Caste groups, and those residing in the outskirts of villages or hamlets.
- c. Building capacity within the health system through regular data collection and analysis on the quality of PLA, home visits and VHSND^a activities. Findings are shared routinely with government officials at subdistrict, district and state levels and through capacity-building and mobilisation of government functionaries at all levels, focusing on identified gap areas.

All PLA initiatives, including the ones described above, consider gender and equity issues by design. This includes thinking about ways to centre women's voices, agency and problem-solving skills during meetings, involving male stakeholders when possible and relevant (e.g. in wider community meetings), as well as tracking the participation of the most vulnerable (e.g. pregnant, tribal or scheduled caste women and adolescents in PLA meetings, and families with low birth weight children and families residing in distant hamlets for home visits).

^a Village Health, Sanitation and Nutrition Day



The Road Ahead

Ekjut's experiences and the evidence generated with partners suggest that improvements in maternal and child nutrition are more likely to happen when community capacity-building approaches such as PLA are coupled with nutrition-centric service delivery initiatives such as crèche facilities or the provision of hot cooked meals. This is particularly true in areas of high food insecurity, such as districts with underserved tribal communities. Crèche facilities are highly valuable and impactful where the most vulnerable population groups (e.g. Particularly Vulnerable Tribal Groups, or PVTG) reside. One important future direction will therefore be to further mobilise resources—including from philanthropists—to scale up crèche facilities for children in underserved areas. From a systems perspective, Ekjut has found that direct service delivery initiatives (e.g. providing hot cooked meals) often appear challenging at first because they involve interdepartmental collaboration and high costs, and raise concerns about sustainability. To address this, it is critical to bring policymakers and key influencers on-board, manage expectations of 'quick results' given the expansion of quality programmes and improvements in nutritional status require time and investment, but also generate evidence to support or recalibrate further investments.

The PLA programme for nutrition is currently expanding in two ways:

1. In scale - Drawing on past experiences, Ekjut and government partners continue to work together to refine a model that achieves improvements in maternal and child nutrition (including anthropometric indicators) at scale. Evaluation of the ongoing CPAM initiative is expected to build evidence on the model's effectiveness and cost-effectiveness at scale.
2. In depth - The second expansion involves mobilising further interest and resources to support rural crèche facilities for children ages 6-36 months. Support for crèche facilities has gained traction from some agencies (e.g. District Mineral Fund Foundation, Azim Premji Philanthropic Initiatives) and through efforts to expand the National Creche Scheme for Children of Working Mothers. Ekjut and their partners will continue to generate evidence on the role of crèche facilities in improving the growth and development of children in rural, tribal areas, to support such efforts.

Conclusion

Ekjut's evolving PLA programme for maternal and child nutrition is a lighthouse project as it demonstrates how long-term engagement of stakeholder coalitions that include women's groups, the wider communities they belong to, frontline service providers, government partners, philanthropists and academic researchers can bring about positive change. In the words of a group member in one of Ekjut's earliest PLA projects, "We could not do much as individuals but as a group we could find a way to solve each other's problems."¹⁷ This partnership of stakeholders has built strong evidence on PLA and community interventions for nutrition more generally, as well as collaborated on advocacy both for the PLA approach and for generating evidence about whether, how, for whom and in what context community interventions for maternal and child nutrition work.

Over the last decade, PLA has helped advance not only SDG2 but also SDG3 and SDG5 in the rural, underserved areas of India through its intersections with health and gender equity. The next steps for the programme will include extending implementation and research on the effectiveness of PLA for maternal and child nutrition into new geographies, bringing along government, bilateral agencies and philanthropic stakeholders, as well as advocating for strengthening service delivery (including crèche facilities) in underserved areas.

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Together, building healthier communities





The India Sustainable Soy Programme

Solidaridad Network

Introduction

In alignment with the targets of the Sustainable Development Goal (SDG) 2, the India Sustainable Soy Programme (ISSP), developed by Solidaridad Network, was conceptualised to deal with the food security requirements of a rapidly growing population through sustainable and resilient agriculture. To achieve this, it was important to empower farmers, especially the smallholders, by equipping them with access to technical and technological resources. The programme also addresses the challenge of declining agricultural productivity, and making

the soy value chain resilient and inclusive.

India depends heavily on imported edible oils because of the mismatch between supply and demand.¹⁸ This presents a huge opportunity to develop a sustainable and resilient supply chain for edible oils, including soybean, that can benefit small producers, buyers, and consumers. In response, ISSP was launched in Madhya Pradesh in 2016, and it has now expanded to 16 districts across Madhya Pradesh and Rajasthan.

A Multi-Pronged Approach Beyond Sustainable Agriculture

As of July 2023, ISSP works with some 160,000 small-scale farmers to promote soy cropping in central India.

Demo plots to showcase climate-smart agricultural (CSA) practices.

Under ISSP, front-line demonstrations have been set up to showcase the advantages of research-backed good agriculture practices (GAPs) and CSA practices for soybean farmers. These practices include the promotion of high-yielding, pest-resistant, climate-smart seed varieties, and crop diversification. The Internet of Things (IoT)-based devices provide farmers hyper-local weather advisories on their phones, helping them farm more efficiently and check against crop loss.

Good farming, good nutri-food: This objective aims to tackle malnutrition among the rural poor in five districts of Madhya Pradesh. To ensure inclusivity, women farmers have been trained to become community mobilisers and 'nutri-sakhis' to raise awareness on nutritious food in the community, thereby becoming agents of social and behavioural change.

Indian standards for sustainable soy (ISSS) production.

Along with the apex industry body (the Soybean Processors Association of India (SOPA) and ICAR-Indian Institute of Soybean Research), the ISSS has been developed for India's own sustainability benchmark for sustainable soy production and trade. It outlines country-specific sustainability criteria for improving soy productivity, ensures better socio-economic conditions for farmers and workers, and reduces ecological footprints while enhancing the competitiveness of Indian soy industry globally. In 2022, some 10,151 farmers were successfully certified by a third-party audit agency under ISSS.

Promoting Soy Sustainability Beyond Numbers

The results of ISSP have been encouraging so far. Around 51,676 farmers under the programme have reported an increase in their income because of a reduction in production cost and increase in yield. Around 18,825 farmers have diversified into different crops. About 28 farmer producer organisations (FPOs) and more than 200 rural entrepreneurs have been supported to promote entrepreneurship. Under the SDG



2.4 target of promoting resilient agricultural practices, the effectiveness of ISSP is evident: An evaluation found that around 100,530 hectares of land were now under sustainable management, against a near-zero awareness about sustainability among farmers before the programme's inception.

The ISSP, through a multi-pronged approach, has gone beyond the sustainable agriculture and food security targets to also deal with nutritional security for farming communities in rural India.

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Solidaridad

Endnotes

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GOOD HEALTH AND
WELL-BEING



03

Improving Adolescent Health In Himachal Pradesh

Mamta Health Institute for Mother and Child



Collaborations between governments and NGOs can result in long-lasting improvements in adolescent health.

At a Glance

- Anaemia, harmful practices like smoking, and the incidence of suicides are some of the key challenges confronting adolescent health in Himachal Pradesh. The *Rashtriya Kishor Swasthya Karyakram* policy has been implemented in the state through a multifaceted government-NGO collaboration that aims to strengthen the policy, engage with stakeholders, and ensure effective resource utilisation.

- The partnership between the Himachal government and the Mamta Health Institute for Mother and Child has resulted in increased access to health services, with the number of adolescents registered at adolescent-friendly health clinics (AFHCs) rising significantly. The key outcomes of the partnership include higher service delivery at AFHCs and improvements in reporting systems.
- Innovations under the partnership, such as the gap analysis checklist (accessible via QR code), aid AFHCs in addressing gaps and operationalising facilities. Plans for the partnership include enhancing service registration, mental healthcare delivery, and peer educator training. Intersectoral collaboration can help improve efficacy, and technical advances will ensure sustained progress. This partnership showcases how NGOs and governments can effectively collaborate to ensure a lasting impact on adolescent health, aligning with the SDG target 3.7.

Strengthening the Delivery of Care and Health Services for Adolescents

Since 2021, the Himachal Pradesh government and Mamta Health Institute for Mother and Child, New Delhi, have been collaborating to improve adolescent^a health under the Indian government's Rashtriya Kishor Swasthya Karyakram (RKSK; or the National Adolescent Health Programme). The key stakeholders of the partnership include the state and district project management units (DPMUs) of the Himachal government, the adolescent health division of the central Ministry of Health and Family Welfare, the state education department, and the state's women and child development department.

As part of the collaboration, Mamta provides technical assistance to the state's RKSK implementation cadres across its 12 districts. Since 2021, the partnership has contributed to improving the quality of care and health service delivery in the state. The partnership has also yielded nationally recognised best practices, including the use of a gap analysis checklist to strengthen adolescent-friendly health clinics (AFHCs) in the state, prepared and piloted

^a Those aged between 10 and 19 years.

by Mamta under the guidance of the Himachal government. The checklist is based on evidence and research related to adolescent healthcare, and using it has shown to increase the likelihood of meaningful improvements in AFHCs. While designed for Himachal Pradesh, the methodology and principles used to create the checklist can potentially be adapted to the requirements of other states. The Himachal government was active in filling the service delivery gaps based on the outcome of the checklist. This makes it a valuable resource that can contribute to improving adolescent health services across the country. The checklist has helped in generating evidence-based insights to promote sustainable solutions at a broader scale, and was showcased at 'Health of Youth-Wealth of Nation', a G20 event organised in Delhi in June 2023 by the Ministry of Health and Family Welfare and the Partnership for Maternal, Newborn, Child Health, Geneva.

Access to health services in the state has significantly increased in the years since the programme's launch. As per the Himachal Health Management Information System, the number of adolescents registered at the 99 AFHCs statewide has increased from 30,662 (2021-22) to 87,567 (2022-23). Further, the number of adolescents receiving clinical services has increased from 25,059 (2021-22) to 68,854 (2022-23).¹

Pathways to Improved Adolescent Health

Adolescents account for about 20 percent of the population in Himachal Pradesh. According to the National Family Health Survey-5 (2019-21),² about 5.4 percent of girls in the state are married before the age of 18 years; the adolescent fertility rate (in the 15-19 age group) is 22 percent; about 53 percent of girls and 22.1 percent of boys in the 15-19 age bracket are anaemic; and over 1 percent of adolescents aged 13-15 years smoke tobacco. Additionally, the rate of suicides (the number of suicides per one lakh population) in the state was reported to be 12.3 in 2021 (higher than the national average of 12).³ This indicates that adolescent health must be prioritised in the state.

The RKSK programme was launched in Himachal in 2014.⁴ Several NGOs have been actively involved in implementing the 'reproductive, maternal, newborn child plus adolescent health' strategy, although most of these efforts have focused on specific projects. For example, World Health Partners works in Chamba

district on a project focused on improving maternal neonatal and child health. However, the Himachal government-Mamta partnership is the first of its kind in the state and has three facets: it has a central objective of strengthening the implementation of an approved government policy and strategy; it is a partnership of equals (between the NGO and district health teams); and the government staff—and not the NGO—are responsible for policy implementation.

The challenge of adolescent health can be addressed through multiple lenses and is aligned with several targets under goal 3 (good health and well-being) of the Sustainable Development Goals (SDGs). The specific target that the Himachal government-Mamta partnership addresses is aligned with SDG target 3.7 (By 2030, ensure universal access to sexual and reproductive healthcare services, including for family planning, information, and education, and the integration of reproductive health into national strategies and programmes).

As a national resource institution for RKSK, Mamta is committed to promoting the health and well-being of adolescents in India. It has previously designed and implemented programmes to strengthen health systems in different parts of the country, including Himachal Pradesh. The Himachal government has partnered with Mamta to strengthen the implementation of RKSK initiative through the facility, community, and school-based approaches. The key objectives of the partnership are to: (a) facilitate district planning to roll out the RKSK, including through human resources at different levels; (b) facilitate trainings as per the provision of the RKSK at different levels; (c) strengthen mentorship and supportive supervision to enable different functionaries in their roles and responsibilities. The intended outcomes include an increased client load at the facilities, increased coverage of weekly iron and folic supplements, and increased coverage of the menstrual hygiene scheme.

Early Hurdles, Creative Solutions

To ensure the successful implementation of the RKSK programme, the Himachal government-Mamta partnership has sought to address several challenges:

Lack of state-specific guidelines to aid implementation of government-NGO partnerships: For better clarity on how a state government can partner with NGOs, the state programme officer for the RKSK initiative organised

multiple meetings with different senior National Health Mission officials on the feasibility of such a partnership in Himachal Pradesh and to allocate resources in the programme implementation plans (PIPs). A vigorous stepwise procedure to empanel the NGO and allocate state resources was established—the announcement of a tender by the state government, the submission of a proposal and budget by the NGOs, and the selection of an NGO based on its experience in strengthening the RKSK programme.

Prioritising adolescent health at district and subdistrict levels: The focus at the district and subdistrict levels had long been inclined towards maternal and child health. To ensure the partnership between the state government and NGO ran smoothly and that adolescent health (as well as other public health concerns) was prioritised, the state RKSK programme officer initiated monthly consultations with district project management units (DPMUs) and subdistrict level RKSK teams.

Improving client load at the AFHCs: Although AFHCs were established across the state (per the central government guidelines), many were not operating as per the national rules. For instance, while the guidelines call for allocating separate rooms for the adolescent health programme, designating trained staff, and ensuring that medical supplies and equipment are available at the AFHCs, many of these directions were not followed. The Himachal government-Mamta partnership has addressed many of these gaps.

Training data officers and improving reporting mechanisms: Data officers in the DPMU were trained on various data points (including community activities like Adolescent Health Day, Kishor Swasthya Manch, and Menstrual Hygiene Day), and were supported in updating data promptly on the Health Management Information System. Further, critical decision-making to enhance the RKSK programme was improved by intensifying reviews.

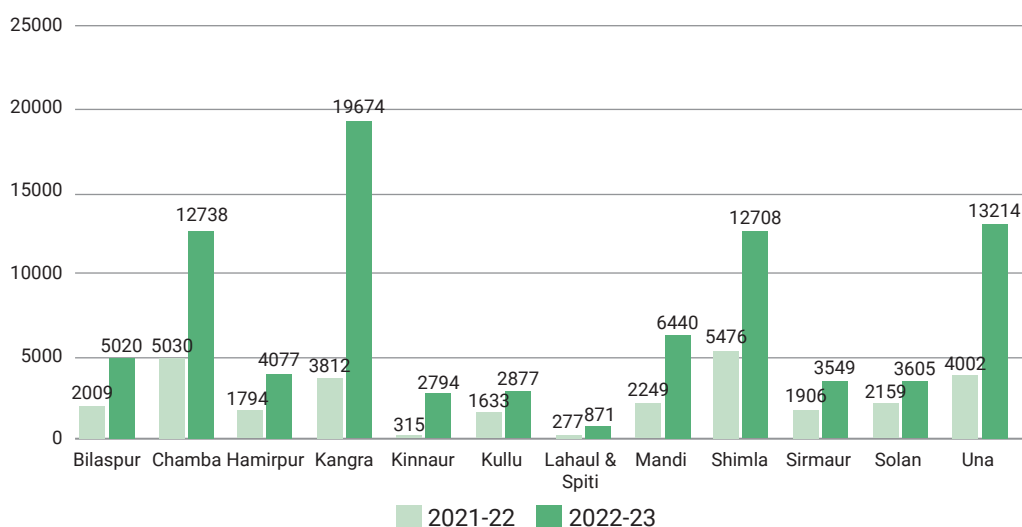
Implementation, Innovation, Impact

The Himachal government-Mamta partnership is a five-year initiative, with an annual renewal clause. The partnership is nearing the end of its second year of implementation. The different RKSK components have been implemented across all Himachal districts during this period.

In the first year (the formative phase), Mamta (with the state government's agreement) focused on establishing and positioning an internal team; co-creating the district health information system; gap analysis and needs assessment; planning at the state and district levels; and projecting targets for the next annual PIP.

In the second year (the implementation phase), the focus of the partnership is on improving the capacities of the RKSK cadres (counsellors, paramedical and medical staff); operationalising and improving the quality of district and subdistrict planning; monitoring improvements at the AFHCs (infrastructure, human resource positioning, client loads); improving the supply chain of commodities and medical items; and supervising and supporting paramedical staff in rolling out community engagement activities and selecting peer educators. The emphasis was on strengthening the reporting mechanism to capture the number of adolescents visiting the AFHCs (see Figure 1).

Figure 1: Number of Adolescents Registered at AFHCs in Himachal Pradesh (by district, in 2021-22 and 2022-23)



Source: State Health Management Information System

The formative phase: This phase began with the signing of the memorandum of understanding between the state government and Mamta, and approval from the National Health Mission to implement the technical assistance intervention in the state. Next, internal human resources were hired and positioned across the state, and the technical assistance intervention team (comprising six district coordinators, one state coordinator, one state partnerships lead, one national programme coordinator, and one national management information system/researcher) was formed. The team was led by a project director (a senior professional with experience in adolescent health and known in national and international policy circles). The district, state, and national teams were trained on the do's and don'ts of working with district officials, data and information on each district, and working with the DPMU and subdistrict-level RKSK teams.

The state coordinator and state partnerships lead co-created the indicators and benchmarks to be included in the district health information system to support the state government in digitising the indicators. An important step in this phase was the preparation of the needs assessment and gap analysis checklist (with the state AFHC guidelines as a benchmark).⁶ The checklist was reviewed and approved by the state government and was subsequently implemented in all AFHCs across the state (under the direction of the state government). The checklist was the first innovation within the intervention, steered by the Himachal government, and was implemented across the state. District coordinators then began meeting with key functionaries of the DPMUs to arrange activities per the facility-, school-, and community-based approaches.

The implementation phase: The second phase began with the capacity building of the key implementation cadre, including medical officers and auxiliary nurse midwives, at the AFHCs. About 95 medical officers and over 100 paramedics were trained in aspects related to adolescent health. Mamta also facilitated training of state-designated adolescent health master trainers (at the state level) and about 150 master trainers (at the district and block levels) on RKSK guidelines. Mamta's district coordinators worked with DPMUs to develop detailed micro-plans for each activity/target outlined in the state PIP. These plans were developed considering specific district priority issues, the target groups, and the strengths and weaknesses of the DPMUs. The micro-plans were measurable and impact-oriented. The Himachal government-Mamta partnership teams worked on systemising the monitoring mechanisms of the AFHCs regularly for proper resource allocation and utilisation, and effective service delivery. The

teams also organised regular meetings with the state RKSK officials to nudge them to issue letters to the block resource centres to expedite the supply of commodities to the AFHCs. The block-level paramedical staff were sensitised on protocols for organising adolescent health and wellness days. Given the large size of this cadre, digital techniques were used to educate them on government protocols.

Key Outcomes of the Partnership

1. Increased service delivery at AFHCs: The number of adolescents accessing clinical services increased from 25,059 in 2021-22 to 68,854 in 2022-23 (see Table 1 for district-wise data).

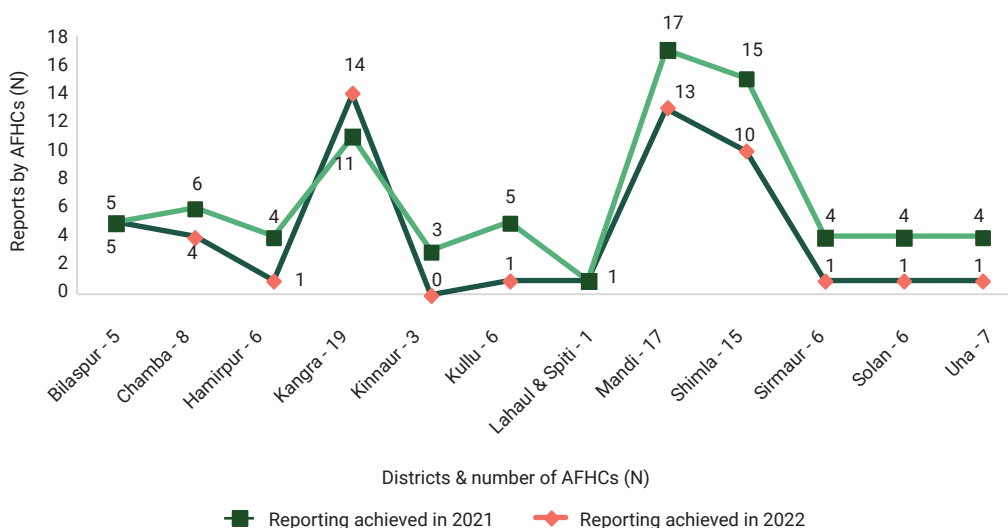
Table 1: Number of adolescents accessing clinical services at AFHCs in Himachal Pradesh (by district, in 2021-22 and 2022-23)

District	2021-22	2022-23	% increase
Bilaspur	1912	4613	1.41
Chamba	4755	12581	1.65
Hamirpur	1029	3852	2.74
Kangra	3463	16479	3.76
Kinnaur	176	448	1.55
Kullu	1600	2510	0.57
Lahaul & Spiti	403	858	1.13
Mandi	1945	4698	1.42
Shimla	4297	8823	1.05
Sirmaur	988	1627	0.65
Solan	1741	3197	0.84
Una	2750	9168	2.33
Total	25059	68854	1.75

Source: State Health Management Information System

2. Improvement in AFHC reporting system: There was a significant improvement in the reporting systems used by the AFHCs across the state (see Figure 2 for the level of change in the reporting of different districts in the state).

Figure 2: Status of reporting by AFHCs in Himachal Pradesh (by district, in 2021-22 and 2022-23)



Source: State Health Management Information System

Standout elements and tech innovation

The gap analysis checklist adopted by the Himachal government is divided into three sections—observation, questions for designated personnel at the AFHCs, and questions for ASHA^b and other health workers involved in implementing the RSKK at the village level. It is accessible through a QR code, and has helped medical officers and designated staff at the AHFCs make the facilities operational by taking appropriate action on the identified gaps.



Additionally, as an institution, Mamta has developed and scaled promising digital solutions that address critical gaps in India’s adolescent health programme. For instance,

^b Accredited social health activists, or ASHAs, are women who have received training to serve as health educators and promoters in their neighbourhoods.

Mamta and the Ministry of Health and Family Welfare have jointly developed a multilingual mobile application for peer educators (one boy and one girl from Class 6 to Class 11) to report on their work under the RKSK. The 'RKSK PE' app can be downloaded by scanning the QR code.

New Directions

At the programme level, the number of adolescents seeking services at the AFHCs can be boosted further by enhancing the registration at these facilities with a focus on repeat adolescent clients and client satisfaction. Furthermore, the capacities of medical officers, counsellors, and other AFHC staff to deliver mental healthcare services (per the RKSK guidelines) must be enhanced. The programme's peer educators must be trained and supported continuously in all public schools and at the community level across the state.

At the policy level, an intersectoral collaboration involving important departments such as health, education, youth affairs, social welfare, *Panchayati Raj*,^c and livelihoods, can increase the RKSK programme's efficacy and effectiveness.

Collaborations between governments and NGOs have the potential to impact a wide subset of vulnerable adolescents, as evidenced by the Himachal government-Mamta partnership. Such initiatives will be particularly rewarding in states with significant adolescent subpopulations, including among populations that are hard to reach. Bringing clinical services closer to adolescents through sub-centres can make a significant difference in their lives.

^c The system of local self-government of villages in rural India.

Technical advances in training medical and paramedical cadres across states will significantly address knowledge and skill gaps, particularly in the context of ever-threatening pandemics. Developing an eLearning platform for medical officers on RKSK (with support from the World Health Organization) to train a state's medical officers on the RKSK themes and implementation framework is a step in this direction. In the future, this will allow new RKSK-designated medical officers to be certified in adolescent health interventions (non-clinical) with no additional funding and within shorter timeframes. This eLearning platform can also be replicated in different thematic domains.

Conclusion: Sustaining Improved Adolescent Health

The Himachal government-Mamta partnership follows implementation science principles, and many states can benefit from performance-based monitoring (the basic tenet of the initiative). Such a partnership is a forward-looking strategy and can be replicated in many other Indian states, provided four fundamental criteria are met with adequate evidence for its effectiveness and efficacy.

First, NGOs with expertise in adolescent health programming at the state level should have a presence. Second, there should be NGO support champions within the government who help drive partnerships and non-traditional approaches (for example, by negotiating with high-level functionaries) to adopt the government-NGO partnership. Third, there should be an acceptance by the state governments that partnering with NGOs as technical support institutions can yield effective results in terms of performance and coverage achievements. Fourth, state governments should be willing to allocate resources through their PIPs under the public-private partnership framework for government-NGO partnerships.

The government-NGO partnership is a departure from the top-down, short-term, single-sector approach that typically does not deliver long-lasting impact. The government-NGO partnership model conforms with the 2030 Agenda, and is hinged on a bottom-up planning approach informed and supported by state leadership, technological advancements, and effective coordination between the government-NGO implementing teams.

To achieve SDG target 3.7, the Himachal government-Mamta initiative demonstrates how all actors must play unique roles and utilise their resources, with partnerships being an essential means to optimise the collective impact of available resources.

Going forward, the partnership will harness the state's interest in adolescent health and launch a school-based adolescent health survey for evidence-based planning. This will help Himachal Pradesh and can be scaled up in many other states for contextual planning.

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MAMTA HIMC
BRIDGE TO HEALTH & BEYOND



Project ASPIRE

People to People Health Foundation (PPHF)

India has a high mortality rate from non-communicable diseases (NCDs).⁷ Urban slums have a higher burden due to the nature of urbanised lifestyles, and tobacco and alcohol consumption, among other factors. A pilot intervention by the People to People Health Foundation (PPHF)^a highlights the impact dedicated frontline healthcare workers can have on the quality of NCD services and raising awareness in a community when they

are trained, supervised, and provided with appropriate remuneration. It demonstrates how this cost-effective initiative can be introduced in challenging settings across urban India for sustainable results, provided there is adequate government support.

In 2021, PPHF implemented 'ASPIRE', a community mobiliser project, in 52 *basti dawakhana*^b (community health clinics) and two urban primary health

^a PPHF, a global health non-profit organisation headquarter in New Delhi, works towards transforming lives for improved health and wellbeing through locally-driven solutions.

^b Basti dawkhana are government health facilities offering OPD-based healthcare services to a population of 10,000 in urban areas. For more, see: <https://vikaspedia.in/health/health-care-innovations/good--replicable-and-innovative-practices/basti-dawakhana>

care centres (UPHCs) in the Medchal-Malkajgiri district of Telangana. The project aims to close knowledge gaps on NCDs by raising community awareness and emphasising the importance of early screening, detection, and prevention strategies. It also aims to facilitate access to healthcare services to reduce the morbidity and mortality associated with NCDs, thereby contributing to achieving target 3.4 of the Sustainable Development Goals.^c Between December 2021 and December 2022, it successfully screened 3,43,767 individuals, representing a substantial 74 percent increase compared to the pre-intervention year at the project site.⁸

During the project's initiation phase in 2021, a rapid formative assessment was undertaken to identify prevalent NCDs and understand the knowledge gaps within the community. This data-driven approach ensured targeted interventions and the optimal allocation of resources. Next, 60 community mobilisers in the two UPHCs and 52

basti dawakhanas were trained. In 2022, the execution phase focused on:

- **Community engagement:** Community mobilisers organised regular house visits, awareness campaigns, and health education sessions. These engagements utilised interactive methods and culturally-tailored approaches to effectively communicate health messages and encourage active participation from community members.
- **NCD screening in population-based camps and facilities:** The intervention accomplished its primary objective of linking the community with the urban primary NCD healthcare system to receive services.

The project is ongoing and is regularly monitored.

Impact and Way Forward

The project utilises Telangana-specific apps like the Asha Disease Profile^d app to collect and manage patient

^c Reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

^d This is the modified community-based assessment checklist form used specifically by the Telangana government. It is used by Accredited Social Health Activists, or ASHAs, for early detection of NCDs, Tuberculosis, and leprosy.

information, thereby enhancing data collection, analysis, and the tracking of NCDs. Real-time data access allows healthcare professionals to monitor NCD prevalence, identify trends, and make data-driven interventions. By leveraging technology, the community mobiliser model maximises outreach, ensures accurate data collection, enables remote monitoring, and facilitates timely interventions.

This community mobiliser intervention has significantly impacted the community's health and well-being. In addition to the substantial increase in the number of people screened for NCDs, it facilitated 481 screening camps, and completed 5,81,253 village

health registries and 3,4,7191 ASHA disease profiles.

The project has increased community awareness about NCDs and their risk factors, has curbed misconceptions, and encouraged healthcare-seeking behaviour. It has also empowered women by engaging them as community mobilisers, providing them with job opportunities, financial independence, and enhanced knowledge about NCDs. These women have played a crucial role in bridging the gap between the community and the healthcare system. These outcomes have snowballed into concrete policy actions, with the Telangana health department recruiting over 1,500 urban ASHAs.⁹

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QUALITY
EDUCATION



04

Back To Basics: Promoting Equitable Quality Early Learning For All

*Bal Raksha Bharat
(also known as Save The Children)*



“

By focusing on strengthening existing systems and not reinventing the wheel, we are able to deliver an effective and impactful solution that prepares children holistically for primary schooling.

At a Glance

- Bal Raksha Bharat's 'Back to Basics' programme aims to improve a child's learning experiences at the basic or foundation level—both at the Anganwadi Centres (AWCs) for children 3-6 years old and at home, as they transition from AWCs to Grade 1 in schools. AWCs serve as a focal point for the implementation of the Integrated Child Development Services (ICDS) scheme which targets children up to 6, pregnant and lactating mothers, and women 16-44

years of age. There are six services provided by AWCs: Supplementary Nutrition, Pre-school non-formal education, Nutrition & health education, Immunisation, Health check-ups, and Referral services.

- It adopts a multi-pronged strategy comprising ready children, ready families, ready schools and ready systems, with innovative approaches like Gulmohar (easy-to-follow audio-visual aids) and Story Ghar (a digital compendium of 450 stories).
- The approaches are now being adopted by a number of state governments as part of their Foundational Learning and Numeracy (FLN) frameworks, demonstrating its scalability and capacity to contribute to India's FLN mission.

Introduction

Path-breaking research in neuroscience in 1998 found that brain development in the early years of a child is very rapid and 90 percent of this growth happens by age six.¹ Interventions focusing on immunisation, food and nutrition, and preschool education given to children in their early years show long-term benefits beyond the realm of economics. These interventions contribute to broader societal gains, including a healthier population with reduced disease prevalence, improved educational attainment leading to a more productive workforce, decreased inequalities through equitable access to essential services, enhanced social cohesion, indirect economic stability, and crime reduction by fostering a strong societal foundation. Under the world's largest integrated early childhood programme called Integrated Child Development Services Scheme (ICDS), India, by 2022 had built 13,99,697² Anganwadi Centres (AWCs) across the country. However, despite widespread availability of early learning centres, awareness and enrolment rate remains low. In 2020-21, of the 19,344,199 students admitted in Grade 1, only 50.9 percent had attended preschool.³ The year before, preschool attendance was recorded at 44 percent in urban districts and 39 percent in rural.⁴

The India Early Childhood Educational Impact (IECEI), a collaborative, three-tier research study by the Centre for Early Childhood Education and Development (CECED), Ambedkar University Delhi (AUD) (2011-2016)⁵ found that on average, children's school readiness at age 5 was far below expected levels. Crucial factors include the poor quality of preschool services and the absence of

age-appropriate methods, materials, and activities. The study recommended that a curriculum be designed to cover preschool to primary grades, thus building upward from what three-year-olds need, meeting the specific content and pedagogical requirements of this foundational stage with play-based opportunities and experiences for emergent and early literacy and numeracy.

Since 2020, *Bal Raksha Bharat* (globally known as Save the Children) has been working to foster a continuum of Early and Primary Education for three- to eight-year-old children. A core focus area is on giving children a Right Start through its quality Early Learning intervention—i.e., ‘Back to Basics’ programme, which is in sync with India’s National Education Policy (NEP) 2020.⁶

Identifying the Gaps

A 2023 study commissioned by Bal Raksha Bharat, titled, ‘Cost of Universalising Early Childhood Education in India’⁷ found that while 99 million children in India are eligible for ECE services, public sector provisioning through Anganwadi services and the pre-primary sections in government schools covers only 31.4 million children. This implies that some 68 percent of children between three to six years are out of the ambit of the public provisioning for early childhood education in India. A 2020 UNICEF report⁸ also noted that 286 million children from pre-primary to secondary levels in India were affected by the school closures that happened as a response to the COVID-19 pandemic; the study warns that the impact has been near permanent, irreversible, and irredeemable for young children.

A further challenge has been the non-availability of trained cadres of teachers. At present, the number of teacher education institutions offering programmes preparing teachers for preschool is extremely low. Only 1 percent of teacher education institutions in the private space (which comprise 92 percent of teacher education institutions) offer programmes for preschool teachers.⁹



Bal Raksha Bharat's 'Back to Basics'

The 'Back to Basics' programme of Bal Raksha Bharat aims to improve a child's learning experiences at the basic or foundation level—both at the Anganwadi Centres (AWCs) and at home, as they transition from pre-school to Grade 1.

Designed to have large-scale impact, the programme covers 1,237 Anganwadi Centres and 505 government primary schools in nine blocks across the states of Bihar, Delhi, Odisha, Jharkhand and West Bengal. Launched in 2020, the programme is being implemented in collaboration with the Department of Women and Child Development (DWCD) and Department of Education (DoE).

Eight Early Learning Resource Centres have been established in government schools and premises at the block/district level. These centres seek to contribute to the Ministry of Education's NIPUN Bharat mission by ensuring that every child in the country achieves foundational literacy and numeracy by the end of Grade 3. Initiatives such as development and use of audio-video modules for early learning are being leveraged and used by the different government departments.

Since its inception, 'Back to Basics' has benefitted more than 60,000 children between the ages of three to eight. The programme has transformed the beneficiary AWCs into vibrant hubs of learning and development for children. By emphasising the importance of this formative period and focusing on strengthening existing systems rather than reinventing the wheel, we are able to deliver an effective and impactful solution that prepares children holistically for primary schooling.

What sets this programme apart is the unique approach to early learning. Unlike other interventions, we do not create a parallel system. Rather, we prioritise the strengthening of current systems and leverage existing government mechanisms. Given the challenges in the area of early learning, Bal Raksha Bharat is focusing on building the capacities of the Anganwadi Workers (AWWs) and teachers on learning through activity and play-based, child-centric teaching methodologies as an immediate step towards improving the quality of

early learning programmes. By providing equal access to quality education and support services for marginalised children, the intervention strives to address underlying inequities in access to quality education.

Aligned with the NEP 2020, the intervention aims to create a conducive learning environment in preschools, Grade 1 and 2, as well as in households. By establishing effective communication between DWCD and DoE through regular interactions between officials of both the departments, the programme ensures smooth progression for children from AWCs to Grade 1. The following are the objectives of the programme:

- To create a quality, inclusive, child-friendly learning environment in AWCs, schools (primary and secondary), and at home to enhance the overall quality of early education.
- To support a seamless transition for boys and girls aged three to eight, to ensure a smooth progression from AWCs to Grade 1.
- To conduct research and evaluation to generate evidence on effective learning practices during the foundation stage, which could contribute to the improvement of early education initiatives.

To address the difficulties posed by the COVID-19 pandemic, we introduced an innovative and cost-effective technology solution called 'Gulmohar'. The solution entails the use of audio-visual aids disseminated through WhatsApp groups, offering easy-to-follow instructions to caregivers at home. This helped ensure continuity of learning.

However, the lack of access to smartphones and limited connectivity posed a challenge to caregivers. When movement became possible as lockdowns were lifted, the project team reached out to the community members and caregivers to give support, directly and through the AWWs. We also launched 'Story Ghar,' a low-cost digital compendium of 450 stories broadcast on All India Radio in Jharkhand, Rajasthan and Karnataka. These creative delivery mechanisms allowed us to reach children despite the closure of institutions and provide engaging educational content.



The key stakeholders in the programme are children, caregivers at home, Anganwadi Workers, teachers, and officials from ICDS/DWCD and DoE at the cluster, block, district and state levels. Since its inception, this circle of stakeholders has grown as we have started to engage with various education and child development organisations, civil society groups, and policymakers. Their involvement has been crucial in expanding the reach and impact of the programme.

The programme has been enabled by key policies, their implementation and regulations on early childhood education. For one, the National Education Policy 2020 is an anchor: it emphasises the importance of the early years and provides a framework for early childhood education.¹⁰ The document underlines that reforms in secondary school and higher education rest on first getting the fundamentals right. The National Curriculum Framework (NCF) for the Foundational Stage 2022, aligned with NEP 2020, has also supported the programme's goals. The policy states that the "highest priority of the education system will be to achieve universal foundational literacy and numeracy in primary school by 2025."¹¹

A Two-Phase Approach to Quality and Continuity

The intervention can be demarcated into two phases: Phase 1 (2020 – 2022) and Phase 2 (2023 – 25). In the first phase, with an effort to reach the most marginalised children, the intervention included capacity-building of officials from ICDS/DWCD and DoE, with Anganwadi Workers and teachers receiving trainings and on-site academic support (i.e., demonstrating innovative activities and facilitating classroom activities). The intervention focused on play and activity-based learning, establishment of Early Learning Resource Centres, strengthening Anganwadi Development Committees and School Management Committees, and fostering convergence between schools and Anganwadi Centres. We reached out to 1,237 AWCs and 505 government primary schools throughout the 2020 – 2022 period.

The primary obstacle during the first phase of implementation was the closure of Anganwadi Centres and schools due to the pandemic. The successive waves of COVID-19 prolonged the closure of AWCs and schools and increased the uncertainty about their reopening. During the first phase, emphasis was given

on bringing children back to the AWCs and schools through 'Safe Back to School' and Anganwadi campaigns as well as ensuring learning continuity at home. To optimally utilise the time, we continued to strengthen the capacities of concerned stakeholders and provided regular handholding through video calls, creating adequate learning environment within the centres, establishing Early Learning Resource Centres, and improving WASH facilities.

The baseline survey for the intervention was conducted between January – March, 2020, and the end-line was from October to December, 2022. It was found that there had been an improvement in the proportion of Anganwadi Workers and teachers using child-centric teaching methodologies in AWCs and schools.

Fig. 1. Anganwadi Workers Using Child-Centric Teaching Methods in AWCs (%)

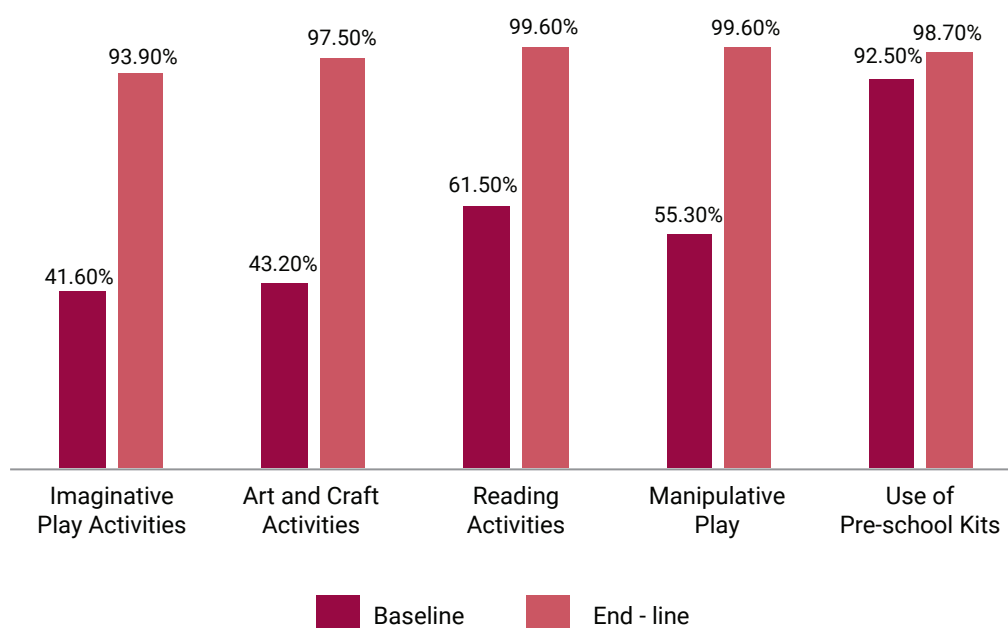


Fig. 2. Teachers Using Child-Centric Teaching Methods in Grade 1 and 2 (%)

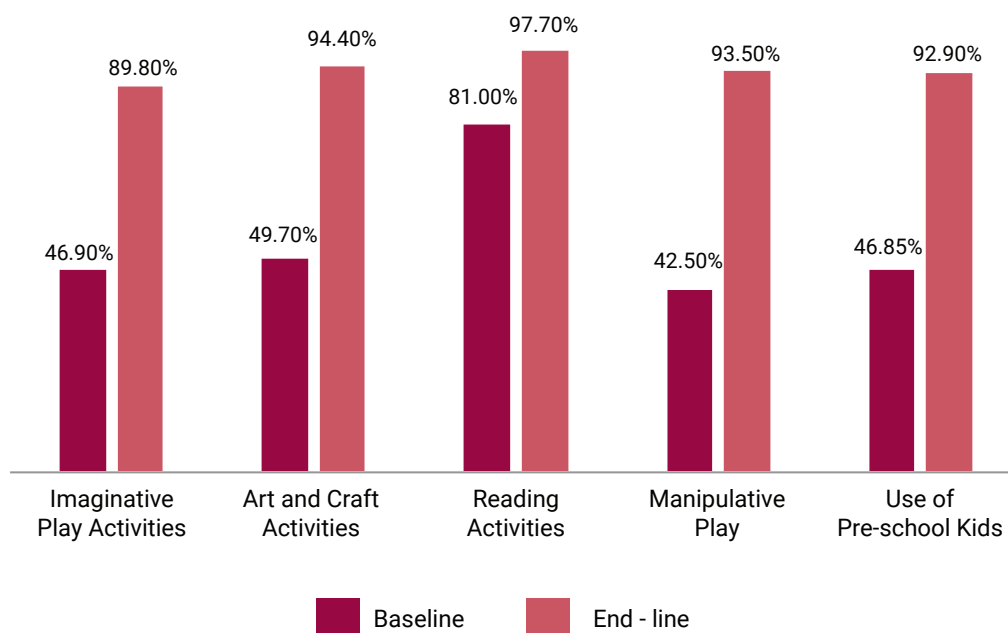


Fig. 3 Perception of AWWs to what extent pre-school education activities should be taken up in the AWCs

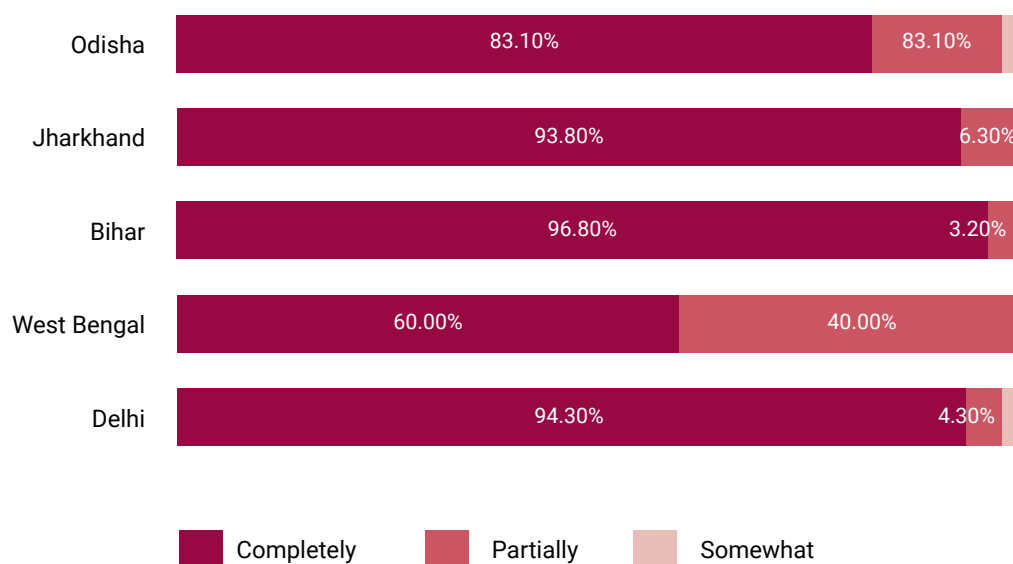


Fig. 4 Perception of teacher regarding frequency of using PSE Activities after implementation of the intervention

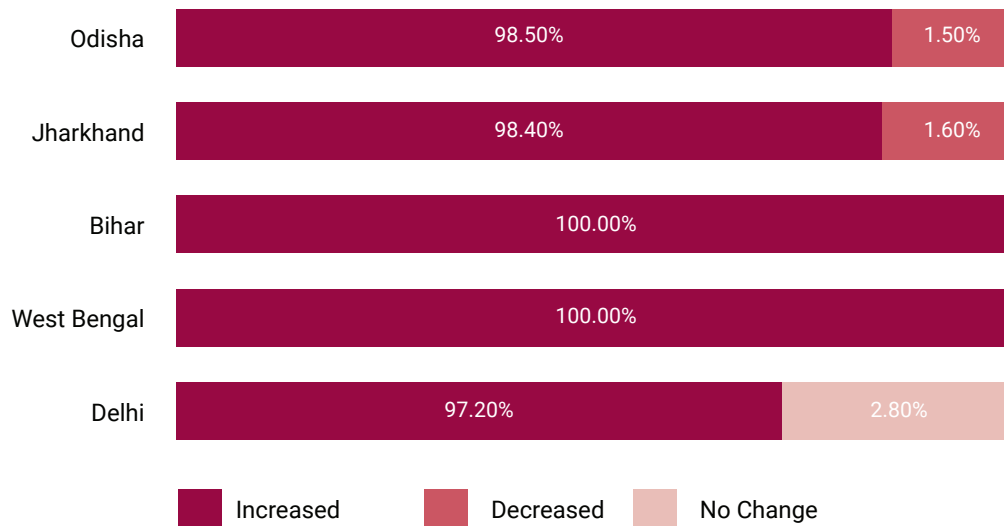
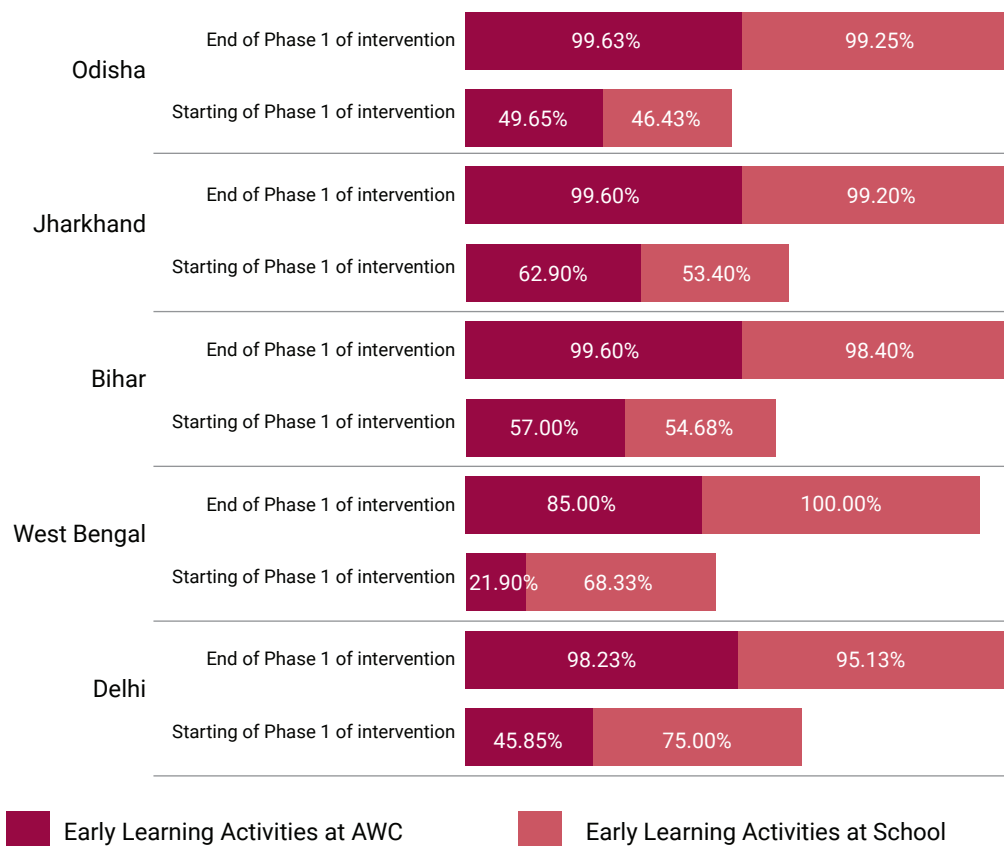


Fig. 5 Early Learning Activities: Early 2020 vs. Late 2022

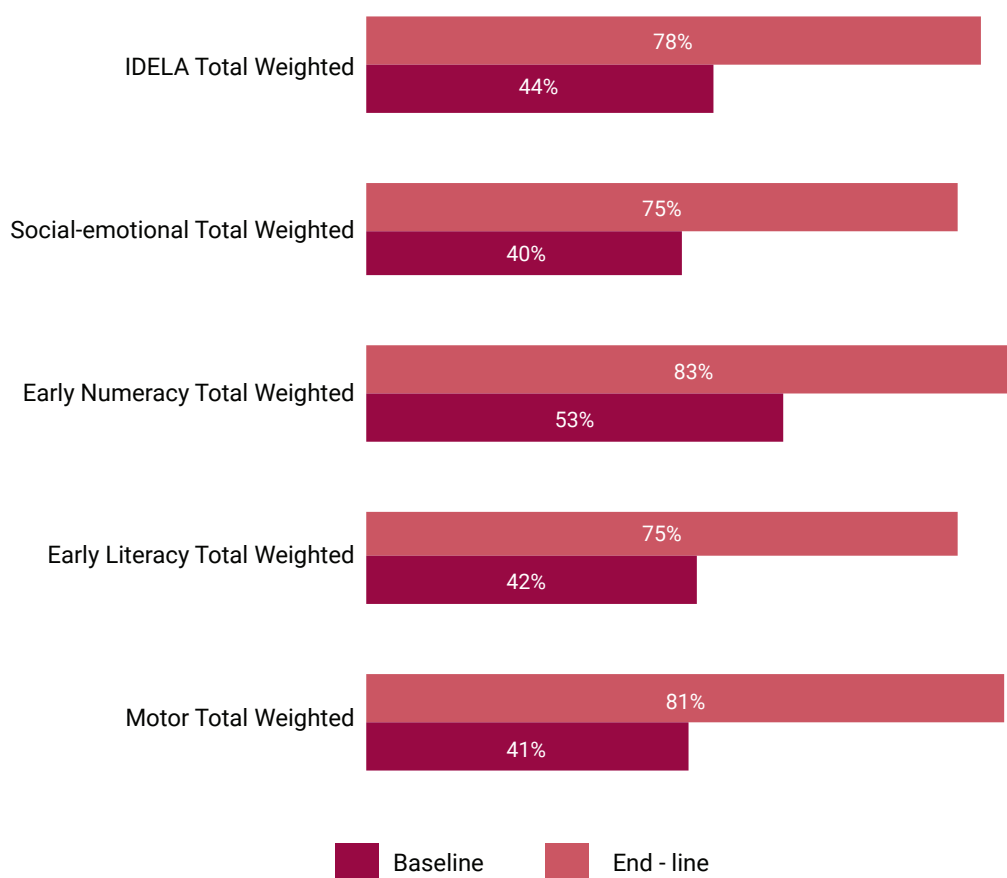


The difference between the baseline and end-line in the use of early-learning activities in AWCs and schools has been attributed by the AWWs and teachers to Bal Raksha Bharat's trainings, provision of materials, and regular on-site support.

Measuring the Impact

To understand children's development, Bal Raksha Bharat used the International Development and Early Learning Assessment (IDELA¹²)—an easy-to-use, rigorous global assessment that measures children's motor development, emergent literacy, emergent numeracy and problem solving and socio-emotional skills.

Fig. 6 IDELA Scores



The results indicate a positive impact on children's early learning across all states, with significant improvements in motor skills, early literacy, early numeracy, and socio-emotional skills. They demonstrate the alignment with SDG 4, specifically indicator 4.2, which focuses on early childhood development and universal pre-primary education.

During the COVID-19 pandemic, the programme had to adapt to ensure that the children continued to learn. After all, unprecedented times call for the creation of new pathways. Without the AWCs and schools, caregivers, though not formally trained as educators, were left with little choice but to step into the role; the home became the new classroom. To help navigate the challenges of the pandemic, Bal Raksha Bharat developed the 'Gulmohar' framework which focused on activities pertaining to development of learning environment at home, socio-emotional well-being, physical development, emergent literacy and math. Based on the framework, easy-to-follow audio-visual (AVs) aids were developed with support of the caregivers from the community, and disseminated through WhatsApp groups and other messaging services.

Some 60 videos were professionally developed, all falling under the main theme, "*Kal ki Neev (Foundation for Tomorrow)*" and based on the Gulmohar framework. These AVs aim at empowering caregivers with strategies and knowledge to engage with children in a meaningful way, and helping parents understand the significance and impact of providing a nurturing and stimulating environment in the early years. This AV module is a hands-on learning tool that parents can use to organise activities for children at home, based on their child's interests and skills. The material is based on the principle that children learn best through play and by interacting with their surrounding environment. Spread over three months, and based on a format of maintaining close contact through telecommunication with communities, this initiative helped more than 60,000 families in supporting their children's learning at home across the intervention states during the mass closure of AWCs and schools in 2020-21 because of the pandemic.

The governments of Jharkhand, Karnataka and Bihar have used Gulmohar as a part of their Foundational Literacy and Numeracy framework, demonstrating the scale-up potential of the programme. The government of Bihar, for example, has uploaded videos of Gulmohar on their YouTube channel. ECCE Bihar, and



in collaboration with Jharkhand Education Project Council (JEPC), Gulmohar framework has been referred while developing the state level Foundational Literacy and Numeracy framework of Jharkhand.

Realising the potential of storytelling, Bal Raksha Bharat also created *Story Ghar*—a low-tech, low-cost storytelling digital compendium of 450 stories targeting children aged 3-10. The stories were broadcast on All India Radio (AIR) in Jharkhand, Rajasthan and Karnataka in 2021. Bal Raksha Bharat, in partnership with Jadavpur University Community Radio and West Bengal Commission for Protection of Child Rights, launched this audio programme to help children who did not have access to other digital media continue their education while confined at home during the pandemic lockdown. Over 200 audio-video sessions covering all domains of development—physical, motor, cognitive (emergent literacy and math), socio-emotional well-being and creating a learning environment at home—were recorded and disseminated through WhatsApp groups. These sessions were subsequently supplemented by regular feedback calls. The video content was spread out over a span of 12 weeks.

In the second phase of the intervention, the focus was on providing handholding support to the already existing geographies, and slowly replicating a similar model in the adjacent blocks and districts of the same states. Beginning in 2023, along with foundational literacy and numeracy, the programme will also emphasise on inclusive education, with a specific focus on those with disabilities. This will be followed by training of government officials, Anganwadi Workers, and teachers, and advocacy with the government on disability inclusion and use of assistive technologies to support children with disabilities in regular AWCs and schools.

Throughout its many components, capacity strengthening is at the core. In the first phase, we worked to build capacities of the functionaries (i.e., Anganwadi Workers and teachers) working with the children. The officials from ICDS/DWCD and DoE were regularly oriented on the same. To ensure that Anganwadi Workers and teachers continue the activities beyond the duration and develop a sense of ownership over the programme, there is a need to ensure that the officials from ICDS/DWCD and DoE are given extensive trainings, and in turn they will train and provide mentoring and support to the Anganwadi Workers and teachers. We are working on establishing strong relationships with the

relevant departments by effectively integrating Bal Raksha Bharat's Ready to Learn Common Approach (framework) during the various workshops being held, and will ultimately contribute to the government's FLN Mission.

When the AWCs and schools opened up, we leveraged the platforms such as the monthly Early Childhood Care Education (ECCE) Day (where parents are able to participate in group activities with their children and various topics pertaining to children between 3 – 6 years are discussed) to orient parents on the ways they could ensure that their children do not lose out on learning.

Despite the existence of inclusive education and disability inclusion in government policies, on-ground implementation often falls short. Children with disabilities largely remain excluded from the educational system and rarely progress beyond primary education. As per the results of the 76th round of the National Sample Survey 2018,¹³ 48.8 percent of persons with disabilities are literate and only 62.9 percent of those aged between 3 to 35 years have ever been enrolled in a regular school. The report also highlighted extremely low retention rates for CWDs, with only 23.1 percent of enrolled children currently attending schools. Therefore, the implementation pathway for disability inclusion remains unclear, necessitating that Bal Raksha Bharat include this component in its programme. Advocacy efforts will accompany the trainings and engagements with government to promote policy reforms that foster disability inclusion and support inclusive education practices.

Conclusion

The programme 'Back to Basics' stands out as an exemplary lighthouse initiative that showcases effective, innovative and sustainable approaches in early childhood learning. The sustainability plan is inherent in the intervention's design by making it a multi-pronged strategy of "ready children, ready families, ready schools and ready system". By strengthening the capacity of local stakeholders at the level of knowledge, behaviour and practice, a community demand is created to ensure quality educational opportunities. The programme recognises the significance of working with Anganwadi Workers and teachers who play a pivotal role in early learning. They possess an ability to bridge the gap between educational services and communities and skilfully contextualise the early learning activities. Their close ties with families enable them to



enhance parental engagement, educating caregivers about the significance of early childhood development and also play a vital part in the early identification of developmental concerns, ensuring timely interventions and support. Further, since the officials along with Anganwadi Workers and teachers live and interact with the communities, there would be spillover effects to additional AWCs, schools and communities. The entire project intervention is in sync with government schemes to deliver quality learning environment for all.

A key factor that makes it a lighthouse project is the establishment of Early Learning Resource Centres in government premises that support institutionalising and sustaining the child-centric early learning practices. These resource centres serve as hubs for knowledge dissemination, capacity-building and the development of educational materials that provide a solid foundation for ongoing improvements in early learning. Moreover, the programme's elements, particularly, Gulmohar and Story Ghar, exhibit innovation and creativity in delivery mechanisms.

The programme seeks to create a pathway to improving early childhood education, as outlined in SDG 4 (Quality Education), and also contributes to other Sustainable Development Goals (SDGs) such as SDG 1 (No Poverty) and SDG 5 (Gender Equality). By providing quality learning opportunities, the programme attempts to address one of the most crucial causes of poverty and inequality—i.e., the absence of adequate opportunities for quality education. Moreover, the emphasis on gender equality ensures that both girls and boys have equal access to education, breaking down barriers and fostering inclusive learning environments.

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Back to Basics: Providing Local Youth and Women with Street Libraries

Ngurang Learning Institute

Ngurang Learning Institute (NLI) is a non-profit organisation based in Arunachal Pradesh that was founded in 2014 by Meena Ngurang, a young teacher and community organiser, and her sister Reena, to address practices that prevent women and children from obtaining high-quality education. Since its inception, NLI has helped over 1,000 people learn to read and write, offering various skill development programmes, and advancing SDG 4 of ensuring access to inclusive and equitable quality education through their self-help street library.

The demographic of Arunachal Pradesh is young, with 31 percent of its population below 15 years of age. However, in 2019–2020, only 6 percent of children attended pre-primary school. This translates to low literacy rates, particularly affecting rural areas and girls and women the most; indeed, only 69 percent of the state's rural women are literate.¹⁴ The state's challenging topography, poor digital and road connectivity, lack of libraries, and certain social practices such as child marriage and polygyny drive poor educational outcomes. In this context,

the NLI aims to reach both school-age rural children and adult women, many of whom are either illiterate or have poor reading skills, to empower them to pursue their foundational education.

Execution and Innovation

During the peak of the COVID-19 pandemic in 2020, when education and mobility were restricted, Meena had to suspend the NLI's operations and close its library. Nevertheless, her enthusiasm for making education accessible to her community remained steadfast, motivating her to launch a self-help roadside library. Inspired by a Facebook post about a street library in Mizoram, Meena launched the project's first phase with only a few resources and the remainder of the NLI library. She bought books worth INR 10,000 and built shelves to materialise her idea—a standing library accessible to all children, for free. Although children seemed interested in the space, her initial challenge was to convince them to engage with the books. She decided to invest in books that would attract readers, such as the *Harry Potter* series

and self-help books. Additionally, she would gift sweets and offer guidance to incentivise children to return and stay at the well-lit stand to read or borrow a book for 15 days.

In its second phase (2021-22), the NLI worked with various partners to widen its reach and amplify the impact. The state government supported expanding the street library project into a state-wide initiative. The NLI has also partnered with the British Council and Roli Books, and Bee Rowlett, a British journalist and co-author of the bestselling book, *Talking about Jane Austen in Baghdad*.

Impact and Outcomes

The project is currently in place in three districts in Arunachal Pradesh, and the Ngurang family is looking to scale its presence in every district in the state. The project has grown substantially: since 2020, more than 25 libraries have been built with books donated by students and professors from nearby institutions.

Before the pandemic, the libraries were seeing some 50 to 100 visitors daily. During the outbreak, however, the number of visitors fell to between 20–40 readers per day. But, with the help of the Capital Deputy Commissioner, the NLI involved school headmasters and principals in campaigns to raise awareness of the importance of reading and visiting libraries. This has spurred many primary schoolchildren and youth who want to continue

learning and pursue their studies to visit the facilities.

Meena believes that the NLI has not only made reading and learning accessible, but has also empowered young boys and girls to strengthen their political, social, and economic participation, facilitating active engagement in community development. The NLI team has received many messages of gratitude on social media.

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Ngurang Learning Institute



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GENDER
EQUALITY



05

**Technology for
Transformation:
WomenConnect Challenge
India's Strides towards
SDG 5**

Reliance Foundation and USAID



Closing the gender divide would help foster gender equality and empower women by granting them access to previously unattainable opportunities.

At a Glance

- 'WomenConnect Challenge India (WCC India)' is designed to help achieve gender equality by closing the gender digital divide. Its innovative approach involves strategic collaboration between Reliance Foundation, the US Agency for International Development (USAID), and local organisations, leveraging expertise and resources to accelerate digital literacy towards the achievement of SDG5.

- The programme employs five key strategies to empower women: challenging harmful social norms; creating economic opportunities; cultivating women's self-confidence; investing in women-centric technology; and developing community advocates.
- Generating a high impact in its first round in 2021-2022, WCC India has already reached over 300,000 beneficiaries, and its second round continues to strive for substantial positive change.

Introduction

'WomenConnect Challenge India (WCC India)' is a programme inspired by a vision of empowering women through digital technology. Launched in 2020 by Reliance Foundation and the United States (US) Agency for International Development (USAID), it aims to close the gender digital divide by developing projects that consider gendered needs, aspirations, and challenges. It is designed to make strides towards the achievement of Sustainable Development Goal (SDG) 5: Achieve gender equality and empower all women and girls. WCC India specifically aligns with SDG target 5.b: to enhance the use of enabling technology, in particular information and communications technology (ICT), to promote the empowerment of women.

Between 2021 and 2022, the first round of WCC India supported 10 organisations across 19 Indian states and reached more than 3 lakh (300,000) beneficiaries.

WCC India has contributed to empowering women by challenging social norms and prejudices that discriminate against women's use of technology; promoting financial inclusion; developing women's self-confidence; investing in and creating women-centric technology; and nurturing community advocates. WCC India tackles the barriers to women's digital inclusion and promotes greater access and utilisation of technology among women, particularly those from low-income backgrounds—a group that plays a crucial role in driving sustainable development.

An impact assessment of the first round found an increase in the number of women who use mobile devices independently, along with a rise in entrepreneurial ventures, greater awareness of digital banking services, and positive shifts in attitudes of families and communities towards women's use of technology. Women who participated in digital literacy programmes also acquired greater decision-making power. On the heels of the high impact of the first round, WCC India's second round was launched in 2023, with seven organisations awarded grants for their projects that seek to empower women and girls by bridging the gender digital divide.

Driving Progress with Digital Literacy for Women and Girls

The digital divide is commonly understood as the gap between those who have access to ICT resources and those who do not¹ a disparity on access to resources to engage, mobilise, and participate in the digital world using technology.² While there is no universal formula for calculating the gender digital divide, the Groupe Speciale Mobile Association (GSMA)^a calculates gender gap in mobile phone ownership and mobile internet use as follows:

$$\text{Gender gap in ownership / use (\%)} = \frac{\text{Male owners/users (\% of male population)} - \text{Female owners/users (\% of female population)}}{\text{Male owners/users (\% of male population)}}$$

Source: GSMA, 'The Mobile Gender Gap Report 2022', 2022.

^a GSMA is a worldwide group that brings together the mobile ecosystem to explore, create, and implement innovative advancements that form the basis for favourable business conditions and societal transformation.



Globally, in low- and middle-income countries (LMICs), over 3.2 billion people use the internet on their mobile phones.³ While 84 percent of women in LMICs own a mobile phone and 60 percent use mobile internet, there is still inequality in mobile ownership and use.⁴ Women, particularly those with low literacy, low incomes, who live in rural areas or have disabilities, are less likely than men to have access to mobile phones and use mobile internet.⁵ Affordability, literacy and digital skills, as well as safety and security, are identified as the primary obstacles that hinder women across the globe from owning a mobile phone.⁶ In LMICs, women are 7 percent less likely than men to own a mobile phone—131 million fewer women than men own a mobile phone of any kind and 315 million fewer women than men own a smartphone—this gender gap closely mirrors that of mobile internet use.⁷

India is one of the fastest growing telecommunications market in the world; during the COVID-19 pandemic, businesses accelerated their adoption of internet connectivity, reducing the gap with other countries.⁸ The ownership of mobile phones among the country's women has reached unprecedented levels. According to the fifth round of the National Family Health Survey, in 2021, 54 percent of women⁹ had a mobile phone, increasing from the 45.9 percent recorded in 2016.¹⁰

Closing the gender divide would help foster gender equality and empower women by granting them access to previously unattainable opportunities. By ensuring equal access to digital technology and the internet, women can enhance their digital literacy skills, broaden their knowledge, and avail opportunities in education, employment, and entrepreneurial activities. Consequently, this can contribute to breaking the cycle of poverty and stimulating economic progress. Indeed, technology serves as a crucial gateway for women to access information, which not only enhances their livelihoods but also enables them to make substantial contributions to their families and their community.¹¹



A shopkeeper from Bihar, who had participated in WCC India Round 1, shown using her mobile phone to conduct digital financial transactions.

Overcoming Obstacles

Round 1 of WCC India was launched in 2020 and the 10 awardees were announced in 2021. Unfortunately, the COVID-19 pandemic had broken out around the same time, and the awardee organisations' projects experienced difficulties during the initial stages—mobilisation and in-person gatherings were a massive challenge; there was shortage of staff due to COVID-relief activities, and the uncertainty faced by both staff and communities was heightened. With a few modifications to their timelines, activities eventually gained momentum as the vaccination rollout began and normalcy gradually returned.

Although the COVID-19 pandemic posed significant challenges for the awardee organisations, it also catalysed awareness of the importance of technological solutions to an unexpected shock such as a virus outbreak. Local organisations working with rural women on livelihoods and education faced obstacles due to the circumstances created by the pandemic. Access to mobile phones and the internet could have prevented their programmatic setbacks. Motivated by this realisation, many awardees applied for and made remarkable efforts under WCC India by training women to use mobile phones and the internet to pursue their enterprises.

Some awardees also faced challenges in mobilising women for digital literacy trainings due to prevalent social norms in their communities. Training women to use mobile phones was often perceived as a waste of time, at best, and a cultural transgression at worst. Awardee organisations designed innovative ways to change negative social norms and cultural perceptions.

For instance, in rural Uttar Pradesh, WCC India Round 1 awardee Society for Development Alternatives (DA) launched a behavioural change campaign called '*Fayde Ki Ghanti*' ('The phone ring that brings in benefits'). It focused on women, their family members, and community members who wield influence. Rather than directly targeting the latter groups, the campaign utilised methods such as street plays, community radio broadcasts, posters, interpersonal communication, focus group discussions, and door-to-door engagement to reach and influence them indirectly.

On the use of this multi-pronged approach, Jyoti Sharma, Assistant Programme Director, DA elaborated, "It is important to modify your communication as per your target group. Definitely our social systems are quite patriarchal, if we challenge these beliefs directly, we do not want to cause tensions. Initially there is stark resistance and that does not do any good. It is important to first create a perforation, where people start listening to your ideas and slowly as they see change, they start to become a part of that change. So it was tactical in nature, to talk to them and make them understand how it is going to affect them and then as they start seeing the benefits, we see them changing [their attitudes]."



जब होगा फ़ोन औरतों के पास, तब लगेगा फायदा सबके हाथ ।

फायदे की घंटी आपके घर भी बज सकती है ।

 कॉल करे - 1234567890

Wall painting as part of the 'Fayde Ki Ghanti' behavioural change campaign. The message reads: 'When women have their own phones, everyone will benefit. Benefits can reach through a ring even at your home.'

As the projects were largely implemented in rural areas, awardees had to struggle with low network connectivity. Remote areas faced challenges due to limited access to digital resources and network connectivity. To address this, community technology centres were set up, all equipped with necessary resources—enabling low-literacy women to build digital skills despite infrastructural constraints. Likewise, offline women-centric solutions were designed to overcome low network connectivity in remote areas.

Similarly, tailored approaches for low literacy levels involved developing specific modules using audio-visual aids; awardees also leveraged voice-based technologies such as Google Assistant to facilitate access to information and online services. Other obstacles in implementing the projects included limited transportation to and from training centres and not being able to afford mobile phones due to low incomes.





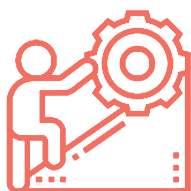
A woman from Koraput, Odisha using her mobile phone to operate 'Banashree', an application developed as part of WCC India Round 1.

Empowered Women; Transformed Communities

The projects under WCC India focused on entrepreneurship, skill development, digital literacy tailored for users who have low literacy, edutainment-based courseware, mentoring, sports for development, and support for women working in agriculture through value-chain linkages. Awardees received support through symposiums to strengthen their programmes and a Community of Practice^b to foster collaboration and sustain a network of practitioners across India. A webinar series was also organised on topics such as technology ecosystem for India's rural communities and online access to government schemes.

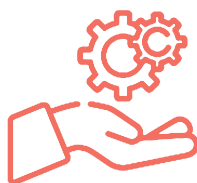
^b 'Community of Practice' refers to a collective of individuals united by shared concerns, problems, or interests, collaborating to achieve individual and collective objectives with an emphasis on exchange of best practices.

Table 1. Strategy and Scope of WCC India Round 1



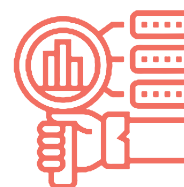
Theory of Change

- Gender equality and women’s empowerment is fundamental to the realisation of human rights and key to effective and sustainable development.
- WCC India aims to identify and nurture innovative solutions to close the gender digital divide and empower women with access to technology and drive positive health, education, and livelihood outcomes.



Focus Areas

- Identified solutions focus on the following:**
- Change Social and Cultural Perceptions that keep women offline.
 - Develop Economic Opportunities to increase economic opportunities for women.
 - Build Confidence and address gender stereotypes in communities.
 - Design Creative Women-Centric Technology.
 - Grow Community Advocates to increase access to technology.



Impact

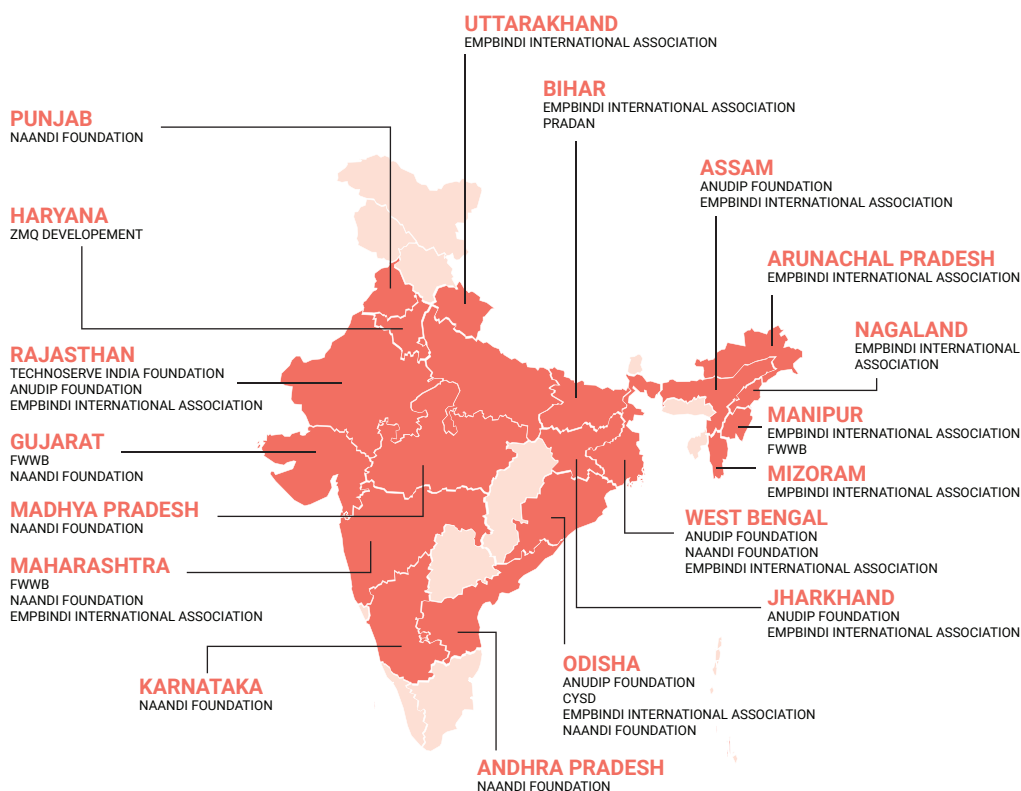
- Projects focused on Leadership & Financial Inclusion, Empowering Women Entrepreneurs, Digital Literacy, Capacity Building, and Sports for Development.
- The projects are scalable and sustainable.
- Over 3 lakh beneficiaries across 19 states.
- Community of Practice: Virtual platform to serve as a capacity building and resource hub for awardees.

The interventions implemented strategic and tailored training for women in basic literacy for enhanced livelihood opportunities. Women-centric applications like ‘Sakhi’ and ‘Banashree’ were developed for women who have had no formal education, to form market linkages in their home states. Another application, ‘SportStar’, was developed to train sports allies to promote physical fitness, nutrition, and health information among young girls. Inclusive mobile learning platforms and all-women digital classrooms helped overcome learning hurdles experienced by participants with low literacy. In some states,



innovative solutions—like the use of the Theatre of the Oppressed^c and behavioural change campaigns—were implemented to minimise resistance from the community. WCC India enabled awardees to leverage their existing networks with self-help groups and other women collectives to provide need-based capacity-building for women with entrepreneurial aspirations. Almost all projects included elements of financial literacy, where women were educated about bank accounts, government schemes, and digital transactions using UPI (Unified Payment Interface) applications like GooglePay and PhonePe.

Map 1. The Awardees and Geographical Regions of WCC India Round 1



^c 'Theatre of the Oppressed' is a democratised form of theatre for community building, where elements of entertainment are combined with education.

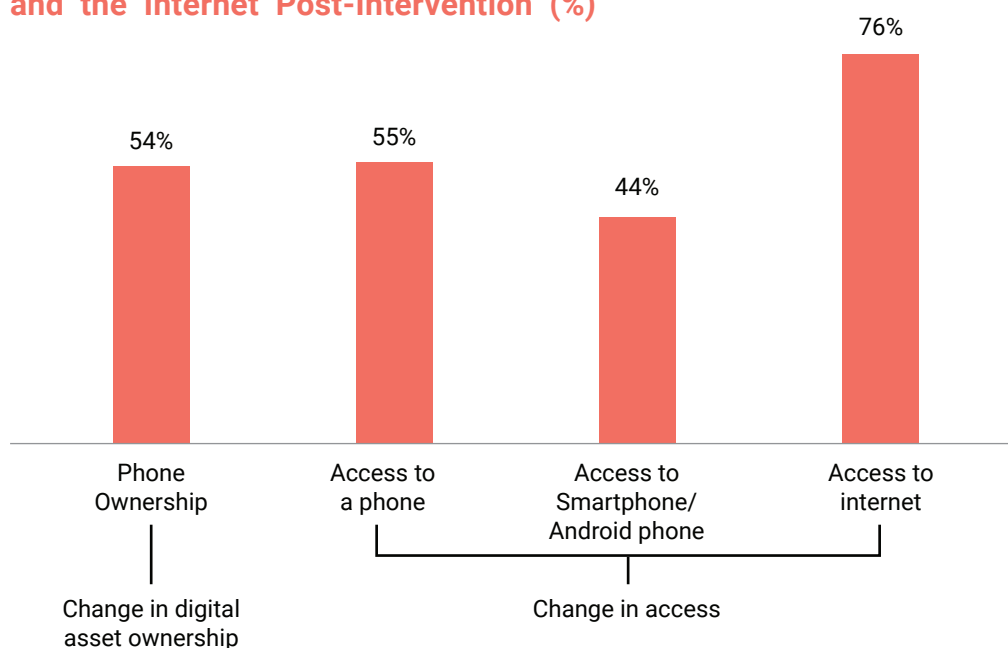
These initiatives have reached over 3 lakh (300,000) direct and indirect beneficiaries. Direct beneficiaries refer to the women and girls trained in digital literacy and/or digital financial literacy and capacity building, and whose learning progress was monitored and reported during the intervention. Indirect participants are the cohort of women, men, children, families, and other community members who benefitted indirectly through components of orientation, sensitisation, and awareness within the project.

Table 2. The Impact of WCC India Round 1

Total number of states covered	19
Number of direct beneficiaries	127,078
Number of indirect beneficiaries	196,375
Total number of beneficiaries	323,453

An external organisation carried out an impact assessment study by examining indicators related to digital assets ownership, internet access, women's autonomy in usage, knowledge and digital fluency, financial inclusion, essential e-services, access to welfare schemes, and stakeholders' perceptions.¹² The findings showed a 74-percent overall increase in fluency with digital tools. More than half (54 percent) of women reported an increase in phone ownership post-intervention.

Fig. 1. Women Who Reported an Increase in Access to Devices and the Internet Post-Intervention (%)

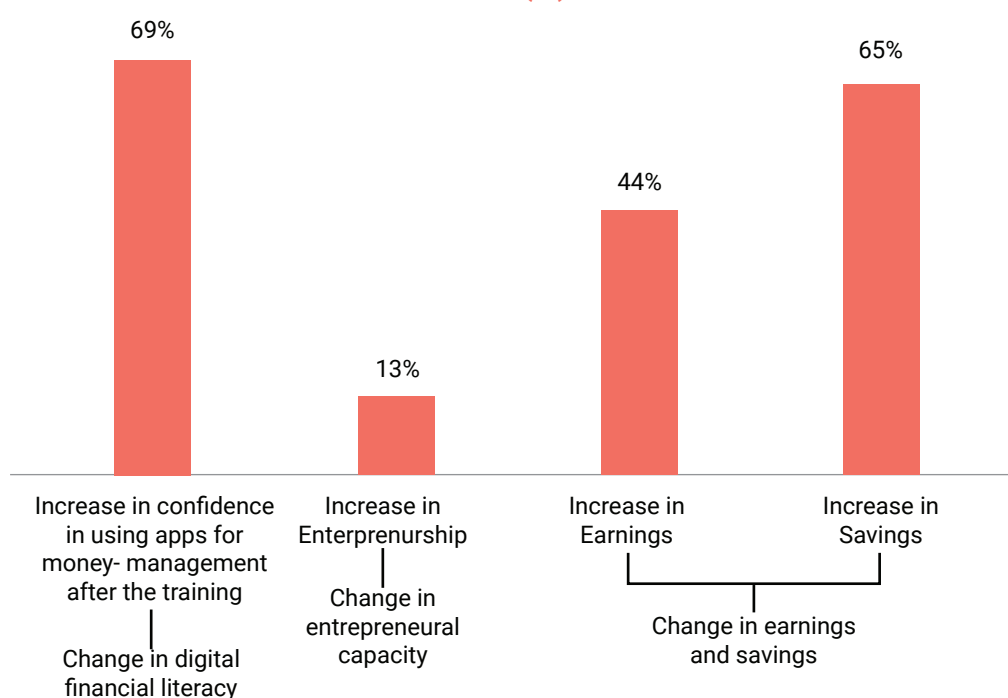


Women who took part in the first round of WCC India witnessed notable improvements in their access to digital tools. Post-intervention, 44 percent of women reported an increase in access to a smartphone and 76 percent of women said their access to the internet improved. Regarding ease of use, 88 percent of women reported being able to use a mobile device independently and 59 percent of women reported being able to use the internet without support from others, post-intervention.

WCC India challenges social beliefs that discourage women from using mobile phones and the internet. A significant majority (76 percent) of women reported a more positive attitude from male family members towards their use of digital technology after participating in the programme. Women's involvement in economic decision-making also witnessed an increase compared to the pre-intervention status. Seventy-six percent of participants reported an increased agreement with the concept that women and men should have equal access to social, economic, and political resources and opportunities.

In WCC India, boosting women's confidence was both a strategic approach to enhance their technology use and an intended outcome of the programme. After the programme, 69 percent of women reported increased sense of confidence in using digital apps for financial transactions. Thirteen percent of women reported increase in entrepreneurship, 44 percent of women mentioned a rise in their income level, and 65 percent of women said their savings increased.

Fig. 2. Women Reporting Increase in Digital Financial Literacy and Livelihood Post-Intervention (%)

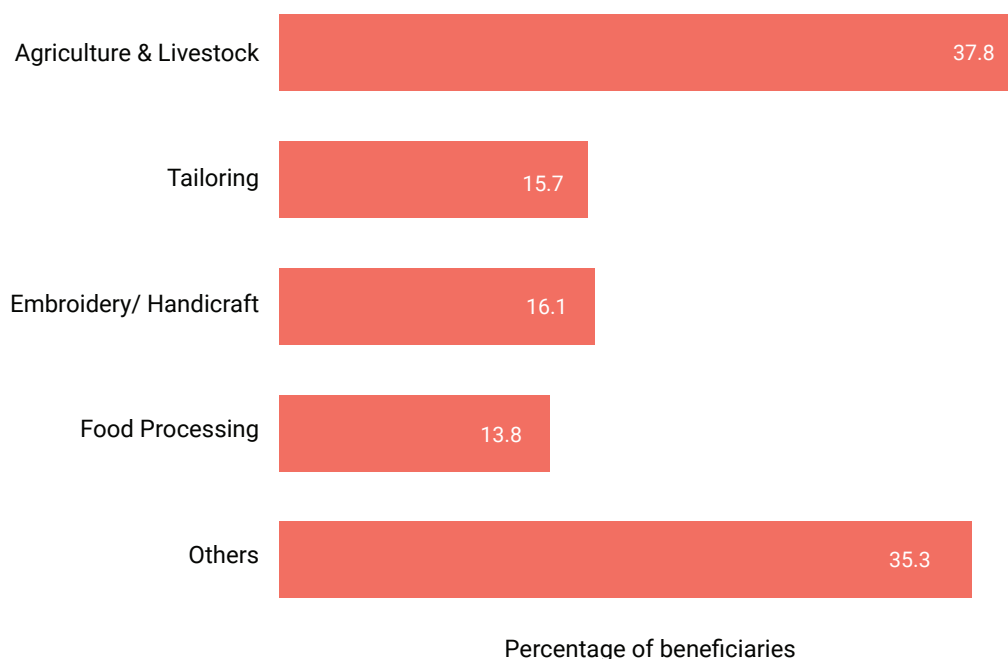


Moreover, nearly 46 percent of women reported a significant increase in their contribution towards household expenses and 75 percent of women reported a boost of up to INR 2,000 in their income after participating in the intervention.

Suvarna Tapkir, a micro-entrepreneur and one of the beneficiaries of WCC India leveraged her programme learnings to use a smartphone and the internet to acquire new skills, effectively market her business, and manage financial transactions. Her increased income now allows her to contribute to her children’s education. She proudly shared, “I have always believed that my children should be educated, find a good job, and become independent. They go to an English-medium school, which costs a lot – fifty thousand Rupees a year. Now I can take care of their educational expenses.” Besides education expenses, she saves for the future and unforeseen circumstances, providing assurance during emergencies. While sharing how proud she makes her husband and children, Suvarna added, “My kids say, ‘Our mother is always here for us. While she is by our side, we have nothing to worry about.’” The additional income has allowed her to purchase a two-wheeler, expanding her entrepreneurial journey beyond her town. Suvarna’s story exemplifies the transformative power of technology and ‘low-stakes digital tools,’¹³ creating and expanding business opportunities for micro-entrepreneurs.¹⁴



Fig. 3. Enterprises Started by Beneficiaries Post-Participation in WCC India Round 1



All 10 interventions boast many such success stories. Women participants' awareness of banking, financial services, and digital payment platforms also experienced growth. Additionally, by engaging and providing digital literacy training to active community members, these interventions created a group of self-assured women who have now become lifelong champions for the advancement of women's digital inclusion. These results demonstrate the impact and effectiveness of WCC India in empowering women across intervention areas.

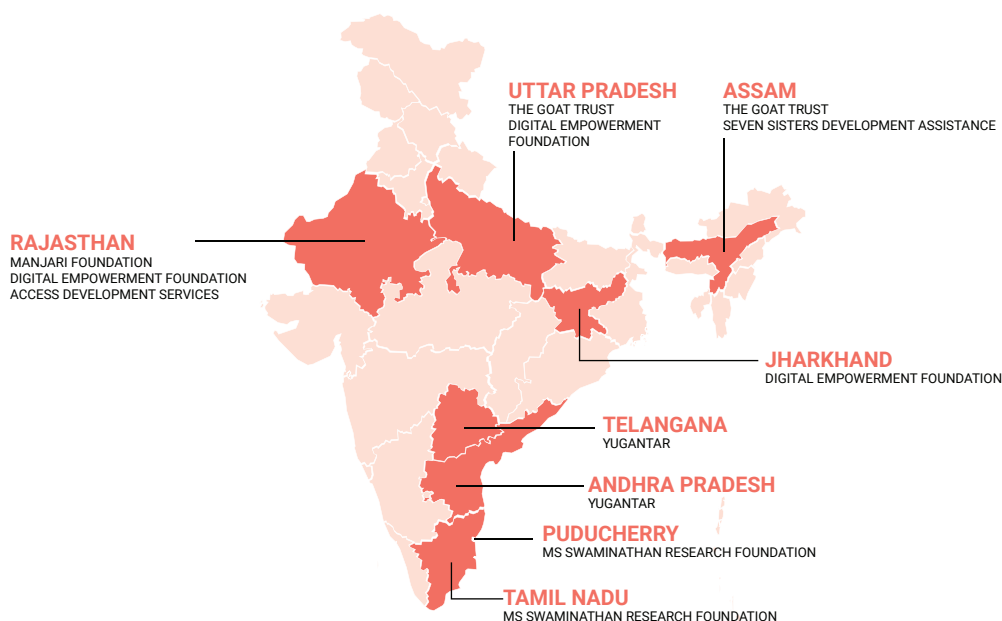
Navigating New Pathways

By influencing normative and behavioural shifts at the individual, family, and community levels, WCC India enabled women participants to use digital technology for economic and social empowerment. Even with the positive changes within intervention areas, there is still scope of improvement when it comes to women's use of technology.

The programme improved societal and individual attitudes towards women’s use of technology. However, many women still encountered resistance from their families when it came to attending digital literacy trainings. To overcome these obstacles, additional efforts are required, including intensive work with family members and community leaders. By employing effective messaging and innovative approaches, targeted interventions can create opportunities for women to participate more actively in public life.¹⁵ In Round 1, participants expressed the need for simplified content and longer training duration to keep up with their faster peers. Implementing these changes in WCC India’s second phase could accelerate efforts to bridge the gender digital divide.

Given the strides made by WCC India in narrowing the gender digital divide in India during its first round, Reliance Foundation and USAID launched Round 2 in October 2022. After receiving applications from 260 non-profit organisations, seven received grants in May 2023.¹⁶ The Round 2 awardees are collectively targeting more than 3 lakh (300,000) beneficiaries from 34 districts across seven states and one union territory.

Map 2. The Awardees and Geographical Regions Under WCC India Round 2



Conclusion

The importance of bridging the gender digital divide cannot be overstated. WCC India creates an ecosystem that empowers women by providing digital literacy training, which equips them with knowledge, skills, and opportunities to improve their lives. This helps low-income women generate income, break the cycle of poverty, and contribute to family and community growth. Using digital tools enables women to establish social connections, participate in online communities, share experiences, and build supportive networks. It also equips them with tools to amplify their voices and advocate for their rights and gender equality.

WCC India's innovation stems from the strategic collaboration between local organisations, Reliance Foundation, and USAID. Leveraging their expertise in global and national policy, Reliance Foundation supports funding and together with USAID conducts workshops, webinars, and overall capacity building for awardee organisations. In turn, the awardees combine these resources with their on-ground expertise, existing rapport with communities, local staff, and other assets to accelerate the use of digital literacy for women's empowerment. This collaborative approach accelerates impact at the grassroots level and intensifies it.

This model also allows for scalability and replication in other regions, as evident in the second round of WCC India. WCC India skilfully leverages global, national, and hyper-local resources to achieve the best possible outcomes for women and girls, thereby contributing to India's strides towards achieving the fifth SDG. The following infographic showcases WCC India's effects on individual, societal, and institutional levels achieved during its first round.

Table 3. WCC India's Impacts: Individual, Societal, and Institutional

Individual (women)	<ul style="list-style-type: none"> • Improved connectivity and access to information • Diversified livelihood opportunities • Greater socioeconomic autonomy • Increased agency and resilience
Household	<ul style="list-style-type: none"> • Increased economic stability and social security • Increased opportunities for girl children • Increased involvement of women in decision-making • Improved gender dynamics
Women's collectives	<ul style="list-style-type: none"> • Enhanced digital capacity of women collectives • Increased information access and data management • Improved efficiency in value chain management • Better access to market linkages and fair pricing
Community	<ul style="list-style-type: none"> • Increased gender awareness and sensitivity • Enhanced recognition of women advocates as change agents • Improved inclusivity & community cohesion • Increased ownership and support
Local government	<ul style="list-style-type: none"> • Increased contribution to state and national goals of gender equality • Increased ease of implementation by participative governance by community • A successful model for adoption and scaling
State and national levels	<ul style="list-style-type: none"> • Enhanced awareness of the gender digital divide • Increased capacity for gender-transformative planning • Strengthened partnership with civil society organisations • Improved access to and appreciation of digital technology

Efforts to address one SDG can impact other goals, often due to their intricate symbiotic relationships.¹⁸ Similarly, addressing a specific target within one SDG can act as a catalyst towards other targets. WCC India directly aligns with SDG 5—to achieve gender equality and empower all women and girls, and addresses the following targets:

Target 5.1	End all forms of discrimination against all women and girls everywhere.
Target 5.5	Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.
Target 5.a	Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.
Target 5.b	To enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

Progress in one goal can impact other goals, creating a virtuous cycle of sustainable development. Apart from working towards SDG 5, WCC India also advances SDGs 1 – end poverty in all its forms everywhere; 2 – end hunger, achieve food security and improved nutrition and promote sustainable agriculture; 3 – ensure healthy lives and promote well-being for all at all ages, 4 – ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, 8 – promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; and 10 - reduce inequality within and among countries.

With women accounting for 48.4 percent of India’s population of 1.4 billion as of 2022, and considering that one in three women face unmet digital needs,²⁰ the task of providing digital access to this substantial portion of the



population presents a massive challenge. Addressing this challenge requires collaborative efforts from governments, funding agencies, technology partners, and policymakers to implement proven strategies.²¹

In its first round, WCC India collaborated with technology partners and local non-profit organisations to provide digital literacy training to low-income women in India. Building on the success of its first round, the programme is now entering its second phase, with plans in motion to partner with seven organisations this year. Through newer collaborations, WCC India seeks to amplify its impact while striving to make significant strides towards achieving gender equality and the empowerment of women and girls.

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Contributors: Aanchal Aneja, Arundhati Yadava, Saradiya Mukherjee (Reliance Foundation)





Women Leading the Charge: Transforming Health Outcomes in Rural India

The Antara Foundation

The ability of women to exercise their agency and ensure they can access health services at the right time is crucial for maternal, child, and reproductive health, and is a core element of goal 5 of the Sustainable Development Goals (targets 5.5 and 5.6). Progress happens when women take charge of driving change within their families, communities, and health systems.

Most maternal and child deaths across the globe occur due to known, preventable, and treatable causes. The Antara Foundation (TAF) was set up in 2013 to support governments and local communities in preventing such

deaths by designing solutions that work at scale. These solutions focus on the early identification and management of risk for pregnant women, new mothers, and young children. TAF programmes have three specific touchpoints—where women and children interact with community health workers; their experience with health facilities and facility staff; and within the community, where health-seeking behaviours are practised. TAF's programmes place data and knowledge at the forefront of the healthcare ecosystem, offering a replicable and guiding model for maternal and child healthcare.

The TAF journey began in Rajasthan and continues in Madhya Pradesh. TAF currently operates in over 5,700 villages in Madhya Pradesh, spanning 38 blocks in eight districts, working closely with various state government departments. Its programmes reach over 379,000 pregnant women and lactating mothers and over 650,000 children under five. Its flagship programme brings together the three crucial groups of women frontline workers that deliver healthcare for women and children—ASHAs, *anganwadi* workers, and auxiliary nurse midwives (AAAs).^a Under the AAA intervention, the health workers create village maps, thereby reconciling their data on pregnant women, young children, and lactating mothers, and keep track of those at the highest risk by using *bindis* (coloured dots worn by many Indian women on the forehead) on the maps. The bindis act as visual aids, and women and children identified this way are then prioritised for care, follow-up, and counselling.

TAF trains the AAAs on maternal and child health and nutrition basics to provide quality services, especially to at-risk women and children. The frontline health workers use simple data capture tools to ensure that no one is missed from the community by aligning the various reports, registers, and checklists they need to fill (through a process known as ‘rationalisation of registers’). TAF also trains staff nurses at facilities designated as delivery points (typically primary health centres and community health centres) to manage complications at the time of birth and refer patients to a suitable facility, if needed. TAF works with the government supervisory cadres to improve how they manage the AAAs and trains them in managerial skills and data-centric tools. A low-cost and efficient sophisticated monitoring system collects real-time granular data, which feeds into the programme design and helps supervisors and the AAAs plan and support women and children

^a ASHAs (Accredited Social Health Activist) are community health workers that form the frontline cadres of the Indian public health system. Anganwadi workers run daycare centres for children from ages 3-6, and provide supplementary nutrition, health, and educational services for these children and take-home rations to pregnant women and lactating mothers under the Integrated Child Development Scheme. Auxiliary nurse midwives are trained to provide the first line of care at health and wellness centres at the village panchayat level, and are responsible for immunisations, ante-natal and post-natal check-ups, and can receive training as birth attendants.



who need help the most. Baseline, midline, and endline knowledge assessments help identify those frontline workers that need the most support. Finally, TAF closes the loop by working with women to vocalise their demands for better healthcare facilities for themselves and their families. TAF's approach encourages women's leadership within the health system and within communities to create lasting change.

In Rajasthan, two TAF interventions—the AAA programme and the Rationalised register specifically for auxiliary nurse midwives—have been scaled up across the state, reaching over 46,000 villages. In Madhya Pradesh, TAF redesigned the register used by ASHA

workers (called the ASHA diary, and used to record activities for payment and documentation), and this is now used by over 77,000 ASHA workers across the state. TAF's interventions have led to a three-fold increase in the identification of high-risk pregnancies, a 1.7x increase in women completing four ante-natal check-ups, and a 30 percent improvement in the knowledge scores of frontline workers.

TAF's experiences in Rajasthan and Madhya Pradesh show that empowering women frontline workers to use data and knowledge makes them more effective custodians and ambassadors of care, and that enabling women to demand better healthcare can transform the lives of their families.

Authors: Chandrika Bahadur and Perna Gopal (Antara Foundation)



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CLEAN WATER AND
SANITATION



06

Inclusive Development: Sustainable Water Solutions and Resilient Agricultural Ecosystems

Reliance Foundation



Today's water crisis is related to its availability, distribution, rate of depletion, and management in the context of the country's development goals.

At a Glance

- This chapter showcases Reliance Foundation's development programme^a in the water domain, including water recharge, harvest and conservation of ground and surface water sources, and enhancing equitable distribution of safe potable water and sustainable irrigation to accelerate India's journey towards SDG6.

^a Reliance Foundation has enabled rural communities in India with opportunities and sustainable, innovative, and scalable solutions since 2010. The aim is to holistically transform the rural hinterland, predominantly in the rain-fed regions of India where water scarcity is affecting quality of life and agricultural productivity. There are various interventions in the water domain in more than ten states in India to ensure access and availability of water across the social strata and diverse scales of agriculture.

- Perhaps the greatest success of these initiatives has been the nurturing of ‘communities of practice’ by empowering community partners around shared objectives and fostering ownership of the programmes.
- The aim is to build climate-resilient water communities through the use of participatory approaches across rural India. These initiatives have covered some 57,861 hectares of land brought under assured irrigation and increased access to potable water in 2,669 villages.

Introduction

Worldwide, agriculture has been one of the sectors most affected by climate change. Depleting levels of groundwater and irrigation, compounded by erratic weather conditions, are forcing farmers to either give up farming in non-rainy seasons or spend exorbitant amounts to obtain irrigation in non-sustainable ways. According to NITI Aayog (2018), 600 million people—nearly half of India’s population—are experiencing severe water stress.¹ The study constructed a composite water management index that measured water outcomes (groundwater sustainability and rural potable water coverage) and water management (efficiency measures and regulations), and found that many parts of the country are suffering from varying degrees of water crises. The index shows that 60 percent of India’s aquifers will be at critical levels and water scarcity alone could cause a 6-percent decline in GDP.² India’s agro-climate zones feature hot, moist, and sub-humid conditions. Changes in rainfall patterns and erratic rainfall unevenly distributed throughout the year adversely impact groundwater and surface water levels. Though the catchment of rivers encircles the agrarian villages, the catchment dries up after the monsoon season, resulting in low water levels.

Today’s water crisis is related not only to its availability and distribution, but also the rate of water depletion, its quality, and its management in the context of the country’s development goals. The challenge is whether all households will consistently obtain sufficient water of adequate quality for domestic use and irrigation. The lack of agricultural employment, and the low economic gains



for those who still manage to engage in farming, are compelling villagers to migrate to nearby urban centres to find income.^b This affects the social fabric of the villages.³

In this context, this chapter explores the various interventions of Reliance Foundation in enhancing the availability and accessibility of water for domestic use and irrigation to sustain agriculture. Since their inception, these programmes have served as a journey in social development that has brought the community together to own and lead the change process, as much as it has improved water availability, food production, and economic well-being in the villages.

Rationale and Objectives

The overarching objective of the Rural Transformation Programme, one of the key initiatives of Reliance Foundation, is “to create resilient and self-reliant rural communities that contribute to developing and sustained economies.”⁴ The additional objectives are the following: the identification and preservation of sustainable water sources and enhanced recharge of groundwater; enhanced access and availability of well-managed water for agriculture with no gap in critical irrigation; enabling climate-smart and water-efficient agricultural practices among marginal, small, and medium-scale farmers; the enhancement of access to safe drinking water and the reduction of drudgeries, especially for women and girls who are responsible for fetching drinking water; and to facilitate collective community behaviour to encourage optimal and efficient utilisation of water and water resources.

By collaborating with government flagship programmes and partnering with other public departments, the strategy of the programme enables the scaling up of viable water access solutions in diverse agro-climatic conditions.

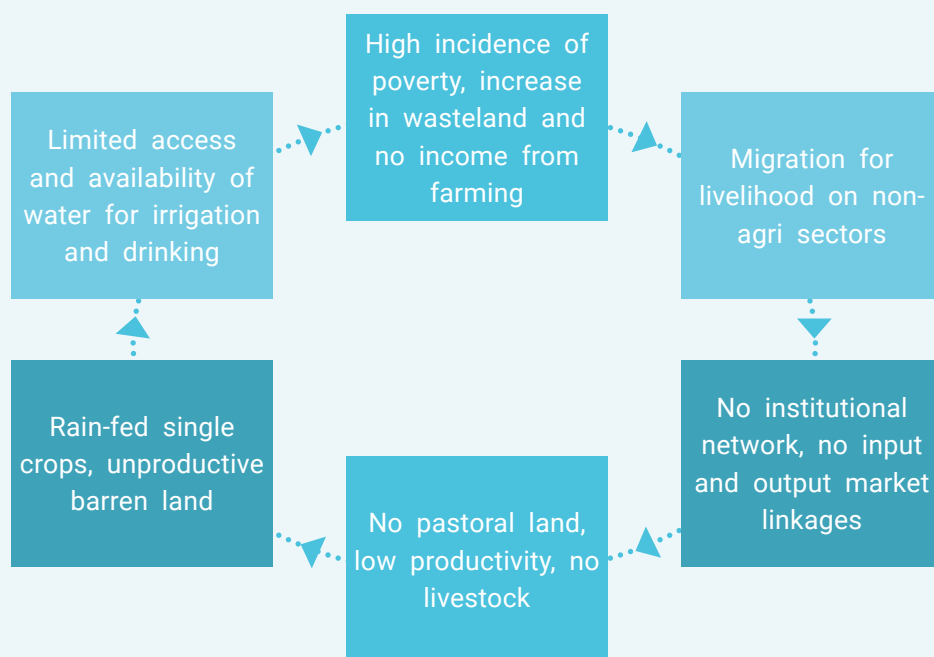
^b Outmigration has influenced the local employment market in several areas, including the livestock sector. Many people observed that agriculture in many places was seasonal. While most migrants were males, there were communities and villages where whole families or teenage women and men migrate.



Through its various interventions, Reliance Foundation directly addresses key SDG targets for equitable access to safe and affordable drinking water (SDG 6.1), water use efficiency (SDG 6.4), water management (SDG 6.5.1), and local community participation in water management (SDG 6. b).

Box 1. Water Security and Thriving Economies: The Story of Mansram

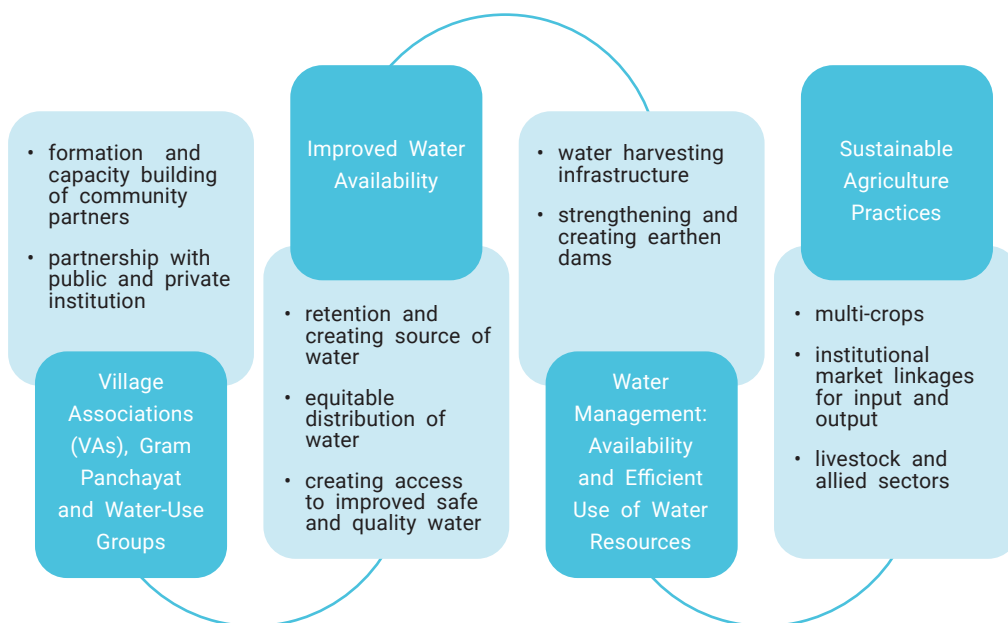
During the resource mapping exercise in the initial phases of the programme, Mansram Tekam, a marginal farmer, spoke about the multidimensional and interconnected challenges they were facing. She described a vicious cycle of low yields due to rain-fed agriculture, dried watersheds that are prone to drought, and lack of adequate infrastructure and resources for farming; and how the low yields result in low incomes for the farmers.



She remarked, “Earlier, we used to cultivate minor millets, which needed very little care and were highly nutritious. Today, the usage of farm yard manure has reduced as the number of cattle has decreased. The availability of labour is also decreasing as people prefer to migrate to cities for work.”

Enhancing Local Community Institutions and Water Infrastructure

The programme is on strengthening community partnerships and institutions to create ownership of creating an enabling environment for retaining water sources and enhancing infrastructure and management that has far-reaching effects on the social, human, and natural capital of villages. This intervention also gives equal importance to processes and outcomes, and the implementation process is depicted in the following diagram.



Village associations (VAs) comprising community partners from each village act as sites for sharing problems and getting resources, such as financial services and local knowledge ecosystems. This sets the stage for communities to think and work together. Water budgeting was introduced as an important strategy that provided the community with a realistic understanding of their water demand, water availability, and seasonal demand-supply disparities in relation to their water requirements. The programme implementation team and members of the village association have also introduced a system to display programme-related costs to ensure accountability and transparency. The village association used the walls in the villages to display computations of the expenses incurred during the programme's implementation.



The village associations also developed a 'resource mapping document' which included the distributional obstacles to both domestic and agricultural water accessibility. In the resource mapping, it was also decided to initiate interventions in accordance with the village's needs and its geographical features, ranging in resource scale, precipitation, and susceptibility to drought. The mapping, along with water budgeting and planning in the programme villages, determined that each farm household requires 2,500 CuM of water for agriculture. By ensuring the availability of 2,500 CuM of water, farmers could produce between 20 and 40 quintals of edible grains, according to the Food and Agriculture Organization (FAO). Over the last decade, Reliance Foundation moved from enhancing water availability through surface water management to undertaking watershed approach, capacity building of the Panchayats so that they could include water management in their Gram Panchayat Development Plans (GPDP), and handholding them to prepare these GPDPs and activate them.

Box 2. Approaches and Techniques for Efficient Use of Water

- o Assist farmers in adopting drip irrigation, sprinkler irrigation, greenhouse farming, and mulching practices to retain soil moisture and reduce irrigation needs.
- o Efforts related to soil conservation include terracing, land-levelling, and contour bundling.
- o Encourage the direct sowing of rice, which uses less water than transplanting.
- o Encourage resource-efficient agricultural practices and the cultivation of less water-intensive crops, such as millets.
- o Community awareness for the promotion of grey water management, which includes recycling for other purposes such as backyard kitchen gardens, fruit plants, and groundwater recharge through soak pits, is a crucial element of efficient water management for recycling domestic waste water.

The construction of community water storage tanks and restoration of wells and ponds were the initial measures undertaken to address the growing demand for potable water. Under the programme interventions, new and existing water storage tanks and rejuvenated wells and ponds were connected to pipes to provide continuous water supply to the villages.

Construction and renovation of farm ponds, community wells, and community earthen dams were given priority to create water harvesting infrastructure in the villages. Various methods have been adopted for rainwater harvesting systems, including those installed on rooftops. Under ridge areas, the activities include staggered contour trenches, continuous contour trenches, and the creation of water absorption trenches. Along with the construction of water infrastructure that supports surface and underground water, the operation prioritises continuous engagement with community stakeholders on the optimal use of water, and behavioural change to encourage communities to take responsibility for the efficient use of water resources. Box 2 describes a few approaches and techniques adopted to promote the optimal use of water in the villages.

Innovation, Impact and Learnings

1. Social and Technical Innovation: The programme has created several social and technical innovations during its journey. Some of them are as follows:

Social Innovation: The Village Development Fund (VDF). VDF is a common pool of financial resources generated from the funds collected as contributions from village association members. This fund, over a period of time, provides the financial self-reliance to meet recurring costs. VDF was also used to leverage any government schemes to enhance their coverage in the villages.

^c Some development projects, especially those focusing on livelihood, have used the Village Development Fund concept. A number of watershed development initiatives have also utilised revenue-generating resources, such as water user fees or village development funds, to foster a sense of ownership among villagers and programme participants.



Technical Innovation: The intervention identifies, revives and scales up traditional water harvesting structures in the villages and designs new, cost-effective, appropriate technical solutions. A few examples are:

- *Holiyas* - a conventional tube well introduced in Gujarat for safe drinking water. It prevents waterlogging, uses rainwater for recharge and reduces the salinity of groundwater to provide potable drinking water year-round.
- *Chal Khal* - pits on slopes—innovations in Uttarakhand that have been scaled up in many villages.
- *Bori Bandhan* - a temporary water-holding check structure created out of sand-filled bags; vegetative barriers, and dug-out ponds have been implemented in drainage treatment. The Broad Bed Furrow (BBF) method that increases moisture retention via agronomic practices was adopted.

2. Impacts

i. Sustaining and retaining water sources and increasing water levels

Over 51,900 hectares of land are now assuredly irrigated due to the creation of additional water collection capacity within the intervention villages across the states. Fig. 2 depicts the sources of irrigation. In the development of water infrastructure, in the district of Sawai Madhopur, Rajasthan, groundwater levels increased by approximately 7 metres (post-monsoon) over four years, from 2012 to 2016.

Fig. 2 Irrigation Sources

Source	% of households in project villages	% of households in control villages
Rain	79.7	91
Well (Self-owned)	34.4	15
Groundwater- Pump/Tube	33.9	8.7
Community-owned pond	21.8	5.6
Self-owned pond	11.6	1.2
Well (Community-owned)	9.1	2.9
Dam	9.1	2.4
River	10.4	10.4
Canal	11.5	2.7

Source: *The impact report of water based initiatives, 2021*

The programme also facilitated deep ploughing and land levelling of more than 5,000 hectares, to conserve soil moisture. Conservation of soil moisture, retention of water level, and reduction in soil erosion have a positive impact on the porosity of the soil, which directly enhances land productivity.

One of the most visible changes is the drastic reduction of wasteland in the Seoni cluster of Madhya Pradesh: from a high of 1,696 hectares in the initial phase of the programme in 2010-11, it came down to zero wastelands at the end of the programme in 2019.⁶ The area used to be dominated by single rain-fed agriculture, but this has now transformed into double and multi-crops. There is also observed transformation in the local labour market, as the increased availability of water restored the community's trust in agriculture. Nearly all of the men who had earlier migrated to Indian cities or other countries returned to contribute to village development and invest in agriculture. The returned labour force also increases employment in adjacent sectors such as livestock and goat rearing.⁷



A number of demonstration programmes with the goal of improving access to and availability of water sources, as well as water management for both domestic and agricultural use, have been implemented through partnerships with various institutions.⁸ With the aim of creating more feasible solutions, the programme fosters strategic partnerships with Central and State government programmes, such as the watershed initiative of the National Bank for Agriculture and Rural Development (NABARD), the Government of India's Jal Jeevan Mission, Krishi Vigyan Kendra (KVK), research organisations, and non-government organisations.

ii. Improved Safe Drinking Water

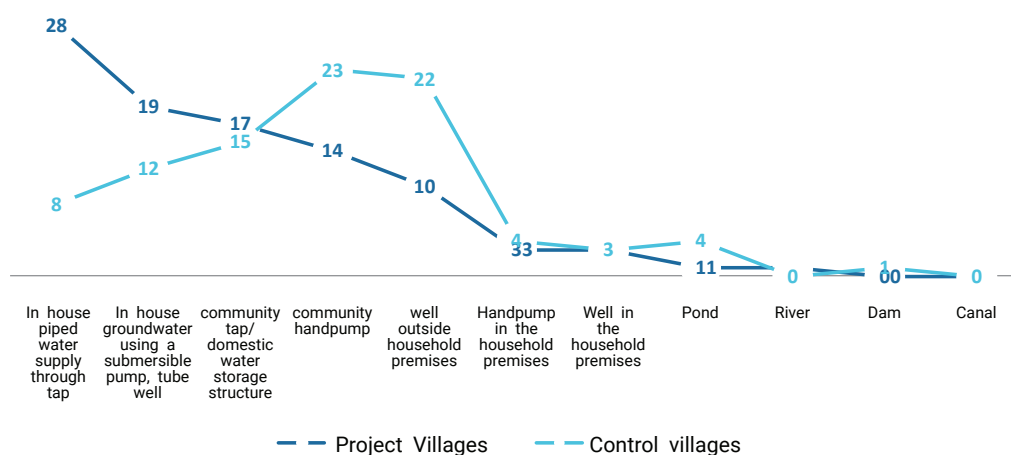
The implementation followed the adoption of low-cost technology solutions that enable simple access to potable water and reduce the burden on women and girls by installing community taps within 200 metres of each household. Any Time Water (ATW) is one of the innovative interventions of Reliance Foundation in the Kamareddy cluster of Telangana state that demonstrates the successful implementation of safe potable water 24x7 for the local community, as described in Box 3.⁹ Another initiative in Telangana provides students with potable water. Daily, the VAs distribute Reverse Osmosis technology-treated potable water to six schools, reaching 452 children; the availability of potable water helps safeguard against water-borne diseases.¹⁰

Box. 3: ATW - Access to assuredly-safe potable water-24x7

The programme introduced an innovative initiative, Anytime Water (ATW), for access to assuredly-safe potable water 24*7 for local households in Kamareddy cluster in the state of Telangana. Using cutting-edge technology such as Any Time Water (ATW) smart cards and dispensing machines makes it simple for households to recharge their cards based on their usage for a monthly fee of INR 90. Each household will receive 20 litres of safe, treated water per day for 30 days for a monthly fee. INR 3 per litre is levied. Automatically displays the amount accrued through recharge, utilisation by each member, and cumulative revenue. This provides greater flexibility for households to access potable water 24 hours a day, seven days a week. A total of 683 ATW certificates were distributed to households so they could access safe potable water from the potable Water Treatment Facilities at their discretion; 219 pipeline connections were provided to households for water supply at the doorstep in order to reduce drudgery for the women, who must otherwise spend a minimum of two hours per day fetching water for their families.

A 2021 impact study by an external agency found that around 28 percent of households in the intervention villages had access to piped water supply, compared to 5 percent in control villages. The same assessment observed that only 10 percent of households in the programme villages rely on a well outside their house premises, compared to 22 percent in the control villages.¹¹ As seen in Figure 2, due to the rejuvenation and maintenance of water sources, distribution of water has improved, as well as the provision of safe drinking water for the communities.

WATER SOURCES FOR HOUSEHOLD USE AND DRINKING WATER (%)



Source: *The impact of water based initiatives, 2021*¹²

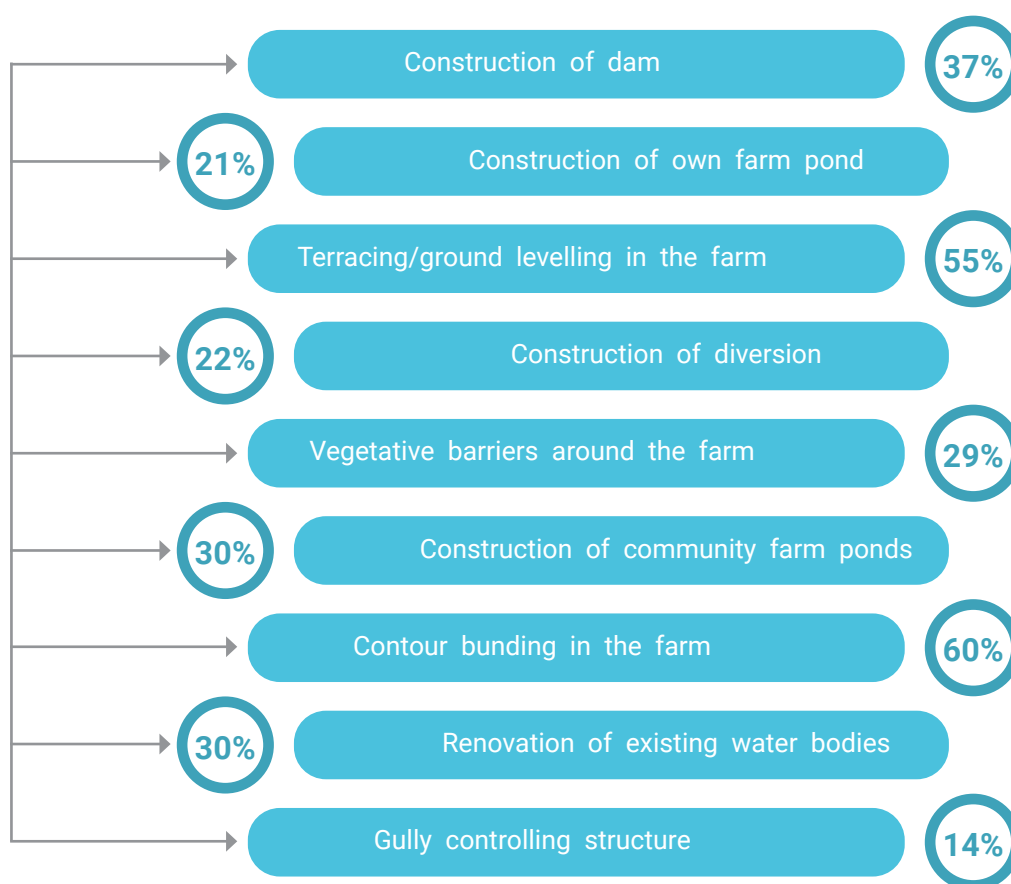
iii. Community-owned water governance system

Over the last decade, Reliance Foundation has expanded its intervention to encompass a systematic effort from ridge to valley for better recharge, conservation, and harvesting of water resources, in addition to building capacity of the Panchayats to equip them in incorporating water management in their Gram Panchayat Development Plans (GPDP). The impact of the village associations showed in their participation in governance and water management. Across 4,171 project villages, panchayats and key village members collaborate on water budgeting through a participatory approach. The impacts of village associations also reflect local governance and partnerships with public and private institutions in the locality. According to many farmers, their participation in the village association has enhanced their social standing in the community



and allowed them to negotiate directly with government representatives on various issues about their agricultural livelihood. Many from the small farming sector, including women, are getting elected as representatives in local governance bodies such as the Gram Panchayat, enhancing their role in decision-making. Promoting efficient utilisation of available water resources and effective monitoring by the community are bridging the supply-demand gap in the agrarian villages in the programme areas. The graphic depicts the patterns of users for the various sources of efficient water management created in the villages, their representation and enhancing their role in the decision-making process.

Impacts on efficient use of water management and % of users in each sources



Source: *The impact of water based initiatives, 2021*

3. Creating Climate-Resilient Solutions

The results of these interventions reinforce many lessons and insights that enable climate-resilient solutions including those that employ digital tools. The approaches evolved from an intensive engagement-focused direct

action programme to creating synergies by bringing ecosystem stakeholders together through strategic partnerships—implementation, knowledge, and public partnerships. The interventions focus more on integrated and holistic natural resource management. Due to climate change, the unpredictability of weather patterns and increasing vulnerability at farm level, the programme has taken a new direction: a climate-resilience strategy in which demand- and supply-side water management are equally important. It emphasises water regeneration, recycling, and reuse, including greywater^d management.¹³ The new path involves climate-resilience processes such as the provision of safe drinking water, the efficient use of water resources, the promotion of climate-smart agricultural practices, and the protection and restoration of water sources—all of which must become significant components of a comprehensive strategy towards a sustainable water solution.

Box 4. Key Lessons

- Tailored approaches address challenges more effectively: Replication of efforts is integral to scaling up impact, but rural communities experience similar challenges in dissimilar ways that makes exact replication insufficient for meeting the goals. The best engagement is taking a tailored approach after thoroughly understanding from a community its development aspirations and needs.
- Technology is an important enabler: Cost and scale often deter technology implementation, but finding ways to deploy it can help communities make big leaps and could be worth the cost. Many challenges, such as financial inclusion and market access, have been substantially narrowed by technological advancements, and they must be an integral part of any rural transformation endeavour.
- Partnerships drive transformation: Partnerships have to be cemented before implementing programmes to fully tap their value for rural transformation. By providing a close look at a holistic effort and crystallising learnings from it, this chapter hopes to inspire, offer knowledge and demonstrate the potential of India's rural communities for transformation.

^d Greywater refers to wastewater from non-toilet systems including from kitchens, bathrooms, and that used for washing clothes or utensils.



Towards a Sustainable Future

The initiative of Reliance Foundation addresses the challenge of security of surface and groundwater in the country's diverse agro-ecological regions by retaining and protecting sources, and strengthening and creating water harvesting infrastructure for sustainable solutions to water demand for domestic use and viable agriculture. Enabling the integration of heterogeneous communities residing in several villages towards a shared objective is a significant programme process and resultant consequence.

The interventions prioritise the efficient use of water resources and water management by creating community partnerships to enhance their role in the decision-making process in water budgeting, resource mapping, and village-wide strategies. It utilises an inclusive approach that ensures equitable distribution across the economic scale, including marginal and female producers and members of various social strata. The initiative has incorporated innovative technologies and inventions, resulting in multidimensional impacts on the village economy.

Overall, the interventions highlight the importance of collaborative efforts in achieving sound water management and promoting sustainable farming practices. Across 4,171 villages in more than 10 states, water budgeting has been conducted with the collaboration of the Panchayat and key village members using a participatory approach, contributing to SDG 6.5.1 (water management). A large majority (94 percent) of farmers in these villages conduct annual crop planning based on water budgeting exercises in the treatment areas, contributing to SDG 6.b (local community participation in water management).

Towards the achievement of SDG 6.1 (equitable access to safe and affordable drinking water), some 2,691 villages in the country have improved access to safe drinking water by setting up drinking water stations, water storage tanks, and water pipe connections. The availability of potable water within a 200-metre radius significantly enhances the conditions of adolescent girls and women. This enables rural women to earn a living instead of spending time to fetch water, in turn increasing family incomes.



The continuous engagement created 1,416 lakh Cu mt of rainwater harvesting capacity that will improve the groundwater recharge conditions and increase water availability during the summer season—this is aligned with SDG 6.4 (water use efficiency). The farmers' cultivation has become more profitable due to stable irrigation, and the rate of rural migration has decreased. People who returned were willing to invest in agriculture to diversify their livelihoods, as their resources have become more sustainable. Increased access to sustainable water solutions increased agriculture intensity and the community's ability to leverage government resources, leading to an increase in agri-allied livelihoods in the villages.

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AFFORDABLE AND
CLEAN ENERGY



07

Empowering Women in the Clean Energy Value Chain

UN Women



“

Research shows that access to electricity can reduce the drudgery of women's work, allow them to participate in the labour force, and unlock their economic potential.

At a Glance

- SDG 7 aims to ensure access to affordable and sustainable energy for all. Yet, women are underrepresented in energy value chains and carry a disproportionate burden of the time and work burden associated with lack of access to modern energy sources. The Women's Entrepreneurship for Sustainable Energy Programme seeks to address women's underrepresentation in the energy value chain.

- As part of the programme, UN Women and the Madhya Pradesh Urja Vikas Nigam (Department of Renewable Energy) co-financed a pilot programme to bring clean renewable energy to Anganwadi centres (rural child care centres) in Madhya Pradesh. The pilot installed decentralised solar energy systems at 63 centres in Alirajpur and Burhanpur districts, and also trained the anganwadi workers to maintain the upkeep of the solar systems.
- The programme demonstrates how the private sector, non-profit organisations and government can come together for transformational development, showing how rural women can benefit from renewable energy not just as beneficiaries of modern energy, but as participants in energy value chains.

Encouraging women's participation in clean energy solutions

The Women's Entrepreneurship for Sustainable Energy Programme was launched at the 21st session of the Conference of the Parties (COP) in 2015 in six countries: Senegal, Morocco, Myanmar, India, Indonesia, and Bolivia. The aim was to identify and remove gender-specific structural barriers facing women energy entrepreneurs, enhance women's productive use of sustainable energy, and increase women's participation and leadership in developing gender-responsive energy policies.

UN Women in India has since implemented various initiatives to facilitate women's access to clean energy solutions through the programme. In 2017, UN Women and the Madhya Pradesh Urja Vikas Nigam (Department of Renewable Energy) co-financed a pilot programme to bring clean renewable energy to Anganwadi centres in Madhya Pradesh. The pilot installed decentralised solar energy systems at 63 centres in Alirajpur and Burhanpur districts. For the first time, the centres had access to electricity for lighting and cooling as well as mobile and computer charging facilities. Some 185 Anganwadi workers were trained in the management and maintenance of the solar energy systems to ensure sustainability of the project.

With the successful implementation of the project, UN Women then used solar-powered technologies to provide entrepreneurship opportunities to women in two aspirational districts of Maharashtra and Odisha.^a UN Women worked in this initiative with several implementation partners, including S4S Technologies, PRADAN, and Chaitanya, to provide women access and ownership to solar dryers. The programme strengthened the capacity of women to use clean solar-powered dehydration technology to produce and sell dried and processed foods. The programme assured market access through a 'buy back' provision through which S4S Technologies—a programme partner that distributes and markets the products to hotels and retailers across India and internationally—bought the dehydrated food products from the women farmers.

Energy access is not gender-neutral

Men and women are affected differently by energy policies due to their varying roles at home, communities and workplaces. For example, when energy is scarce, the burden of collecting leaves, twigs and dung for fuel often falls on women and girls.¹

In rural India, women work predominantly in agriculture and small-scale income-generating activities, operating energy-intensive micro-enterprises or working as home-based workers, often without access to dependable energy (for powering agricultural operations, food processing, water pumping and irrigation).² This, coupled with climate-change-related risks, exacerbates the drudgery of their daily work and limits their economic prospects.

Research has shown that access to electricity can allow women to participate in the labour force and unlock their economic potential. In Guatemala, for example, access to electricity reduced time spent by women in cooking by 34 percent. In Nicaragua, 23 percent of rural women were more likely to take up paid work if they had access to electricity.³ In India, if women were able to participate equally as men in the labour market, it would boost the country's GDP by 16 percent by 2025.⁴

^a Districts designated by the Government of India as vulnerable and marginalised with high poverty pockets, and in need of targeted support.

UN Women's research has found that there is a strong willingness to pay for clean energy alternatives such as solar lights, solar home systems, and solar pumps. The opportunity for sustainable energy entrepreneurship, therefore, is quite significant for women.

Organisations such as the Barefoot College, Frontier Markets, and Solar Sisters^b have shown that a range of business models are possible when women act as agents of change to access clean energy.⁵ As entrepreneurs, women could play a significant role in fostering inclusive and sustainable economic growth. Since women hold strong social capital in communities, they are better able to reach out to other women to generate awareness about the benefits of clean energy solutions.

Yet, women are under-represented in the energy value chain, both at the policy and decision-making level, and in the workforce.⁶ This limits the welfare and economic potential of energy policies and programmes. Women are limited in their ability to participate in the energy value chain or establish and manage viable enterprises owing to deep-rooted social and cultural discrimination, and a range of other issues, such as: restricted mobility, time poverty (primarily because of the disproportionate burden of unpaid care work), lack of safety in public spaces and workplaces, difficulty in accessing finance, information and markets, and limited access to education and training.

Access to clean energy is a health imperative, too. Over 3 million people—mainly women and children—die prematurely every year from household air pollution caused by using traditional fuels.⁷ Improved and clean energy access leads to significant increase in school enrolment rates for rural girls and opens entrepreneurial opportunities for women.⁸

^b Barefoot College is a civil society organisation based in Rajasthan working on women's empowerment and electrification; Frontier Markets is a social commerce platform that connects rural consumers to markets and clean energy; and Solar Sisters invests in African women entrepreneurs living in off-grid communities.

Currently, 770 million people globally lack access to electricity,⁹ and 2.9 billion use solid biomass for cooking and heating.¹⁰ Based on current trends, it will take until 2080 to achieve universal access to electricity, and up to the middle of the 22nd century for access to non-polluting energy for cooking.¹¹ Women disproportionately bear the burden of energy poverty. They face significant health and safety risks from household air pollution, from carrying heavy fuel loads, and from lack of lighting.

Supporting women as agents of change in clean energy

Rapidly falling renewable energy technology costs and new business models mean that decentralised energy solutions hold great promise to accelerate universal sustainable energy access. Women can be powerful agents of change in this transition. Women entrepreneurs have enormous potential to lower customer acquisition and servicing costs and drive these decentralised solutions.

However, the potential of women as entrepreneurs is underutilised. The existing gender gaps in access to finance, information, technology, goods and services, add further investment risks. To address these gender-differentiated risks and unleash the potential of women entrepreneurs in sustainable energy, UN Women launched a global programme on Women's Entrepreneurship for Sustainable Energy at COP21 in Paris in 2015.

In India, the programme focuses on the aspirational districts. By improving access to clean energy and income of women in these areas, UN Women and its partners aim to deliver on the promise of "leaving no one behind" as part of the 2030 Agenda for Sustainable Development.

Since 2017, the Women's Entrepreneurship for Sustainable Energy programme has invested in technology that is most responsive to the energy needs of women and has the potential for women's energy entrepreneurship, such as solar rooftop solutions and solar dryers. This innovative initiative addresses both SDG7 on affordable and clean energy, as well as SDG5 on gender equality.

The programme aims to build the leadership and entrepreneurial skills of women through training sessions where they learn to operate, maintain and manage solar rooftop systems and solar dryers that can be used to produce and market dehydrated food products to generate income.

Taking off

UN Women developed the contextualised Programme Design and Implementation Roadmap for Women's Entrepreneurship for Sustainable Energy (WESE) programme in 2017, outlining their approach. The roadmap was based on three studies: an assessment of women's energy needs; women's and communities' demand and willingness to pay for renewable energy products and services; and an assessment and analysis of renewable energy technologies, business models, policies, and energy value chains, including financial instruments, products and services. These studies reached out to more than 6,000 women from the most marginalised communities, including women-headed households, scheduled castes, scheduled tribes, religious minorities, women with disability and survivors of violence, and key stakeholders including government, financial institutions, technology providers, energy entrepreneurs in 32 blocks, covering more than 115 villages in 16 districts. Findings from the studies and recommendations were validated in stakeholder consultations and meetings with the state Department of New and Renewable Energy, civil society organisations, financial institutions, clean energy enterprises, and community representatives.

The research found that women exercised limited agency on household financial decisions related to renewable energy products, such as solar home systems and lanterns and did not have control over the type of energy they used. They had limited awareness about renewable energy solutions and felt that they lacked technical skills. The gaps identified in accessing training for renewable energy were quality, distance, and cost.

On the supply side, service providers identified difficulties in communicating to women customers. For example, service providers faced difficulty in hiring women as sales and marketing agents. Another major barrier is the lack of skilled personnel for installing, maintaining and servicing renewable energy products.

Further, women have had little involvement in framing renewable energy policies, and the schemes that target women largely focus on domestic cooking, re-emphasising gender stereotypes. The design of the programme rests on addressing these gaps while building on the opportunities identified through these studies.

Implementation

In 2017, UN Women partnered with the Government of Madhya Pradesh to bring solar energy to women-run and managed Anganwadi centres (AWCs). AWCs are community centres that serve as main providers of nutrition, healthcare and early education for India's marginalised children and mothers. The Anganwadi system forms the backbone of India's integrated child development services. It is the world's largest community-based programme that seeks to holistically address health, nutrition and educational needs of children and future mothers.

Although the programme is well-designed, bottlenecks in service delivery and community outreach pose a challenge. For one, many Anganwadis are still lacking in basic facilities such as all-day electricity.¹² This affects attendance of children at the centres, especially during the summer months, when children may find it difficult to sit for long hours without cooling facilities, as found by UN Women research conducted for the programme roadmap.

UN Women, along with Madhya Pradesh Urja Vikas Nigam Limited, transformed 63 Anganwadis of Alirajpur and Burhanpur districts into Smart Anganwadis through solar installation. The pilot installed decentralised solar energy systems at 63 centres in the two districts, bringing electricity to these centres for the first time. As a result, more children started attending classes and stayed longer in the centres, where they also partook of nutritious meals.

The initiative also trained women Anganwadi workers in the installation, operation and maintenance of the solar units. Provision of electricity enabled the Anganwadi workers to use digital learning aids to educate the children, which was not previously possible.

“My son didn’t like coming to the Anganwadi centre. He would complain about the heat and would ask me to take him back home. However, now that the centre has electricity and the fans are working, my son enjoys his time in the Anganwadi centre. In fact, some days he goes back home very reluctantly,” says Rupali Sachin, a resident of Burhampur, Madhya Pradesh.

Anganwadis are not just spaces for children’s growth and education – they also provide safe spaces for women to access education, skill building, and other opportunities. After the installation of the solar systems, the centres were better equipped to provide technology-enabled, well-lit and safe spaces for women’s self-help groups to meet, learn vocational skills and participate in income-generating projects.

“Sometimes we get late working at the centre or have work during the evening hours. Earlier we used to avoid such situations whereas now we do not feel afraid and are able to work or come to the centres at any time of the day.” – Anganwadi Worker, Burhanpur, Madhya Pradesh.

Through the solar dehydration programme, S4S Technologies installed 60 solar dryers and trained 60 women who are small-scale farmers from aspirational districts in Odisha and Maharashtra to use clean solar-powered dehydration technology to produce and sell dried and processed foods.

The programme adopted learner-centric strategies of awareness generation and a gender-sensitive delivery mechanism to ensure effective participation of women in the trainings. The timings and duration of trainings were decided after assessment of their care burden. The programme enabled marginal female farmers access and ownership to UN award-winning technology solar-powered dehydrator, and strengthened the household’s food security by access to dehydrated food products round the year. S4S Technologies bought the dehydrated food products from women farmers, which helped increased their monthly income by an additional INR 5,000.

“It is so convenient for me to be able to work from home and to not have to visit the farm. I am also able to take care of my entire household expenses myself with the money I earn,” says 45-year-old entrepreneur Dhurpadaa Shevare of Vadala-Vadali village of Jalgaon, in Maharashtra.

The programme strengthened women's capacities to effectively participate in decentralised clean energy value chains as managers, assemblers, distributors and service providers. It addressed distribution barriers through women-owned and managed community centres. Working with civil society, energy enterprises and local and state governments, UN Women identified, trained and mentored female energy entrepreneurs, business associates and technicians to enhance their technical, marketing and business skills.

Impact

The programme supported the needs of women at the grassroots and reached out to the most marginalised of women and children in rural areas. While the solar-energy-powered Anganwadi Centres in Madhya Pradesh led to an increase in the number of children enrolling and staying for education, nutrition, and health services; the solar dehydration units in Maharashtra and Odisha boosted small-scale farmers' skills and incomes.

Women entrepreneurs who benefited from the solar dehydration initiative reported up to a 250-percent increase in their daily income since November 2020. Those who were trained in the installation and management of solar rooftop systems, reported enhanced skills, leadership, and access to renewable energy. The solar dehydration programme improved skills, leadership, market access for women entrepreneurs and increased incomes through the "buy back" component of the programme.

New directions

The Department of Women and Child Development in Madhya Pradesh replicated the initiative in select Bal Shiksha Kendras (early childhood care and education centres) across the state once they saw the impact that solar energy brought to women's lives.

The programme demonstrated the value of involving women in renewable energy projects, as potential sources of income and employment. Many technician jobs in the green economy can now be performed at a relatively low skill-level, and the programme is scalable across many other aspirational districts.

Conclusion

The programme shows how the private sector, non-profits and government can come together for the transformations needed to achieve SDG7 on clean and affordable energy for all. The programme brings decentralised renewable energy in a way that women benefit not just from the programme but also because they could participate in the energy value chain and have a voice in decision-making.

The smart Anganwadi programme has brought together a cadre of trained women for the maintenance and installation of the decentralised renewable energy systems. The centre today provides a pleasant learning environment where children can learn, play and eat nutritious meals. The programme not just brought back more children to the centres but also positively affected the productivity of the centre's workers.

UN Women's intervention supporting women small and marginal farmers to use clean solar dehydration technology, enabled women micro-entrepreneurs to generate additional income. As a result of the training and the technology and market support, the average daily income for each of the 60 women has more than doubled.

The programme successfully adopts a holistic approach to build and strengthen the ecosystem that impacts women's energy access. Most importantly, it not only builds awareness among women about renewable energy solutions for domestic and productive use, but also demonstrates scalable solutions led and managed by women, a model that has global significance, as UN Women shares learnings from India on the world stage.

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DECENT WORK AND
ECONOMIC GROWTH



8

Mission Swachhagini: From Hazard to Empowerment

United Nations Population Fund (UNFPA)



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The success of the Swachhangani campaign is testament to the transformative power of localised, community-based solutions.

At a Glance

- The Swachhangani initiative, a joint effort since 2021 by the Patna Municipal Corporation and the United Nations Population Fund (UNFPA), aims to end the hazardous practice of manual scavenging by training women in mechanised cleaning of sewer systems.
- The initiative targets SDG8 (decent work and economic growth) through enhancing the rights and working conditions for sanitation staff and manual scavengers. Additionally, it

targets SDG5 (gender equality) and SDG3 (good health and well-being), while also addressing broader inequalities through a holistic approach that considers sanitation, health, education, and gender dynamics.

- The implementation of this initiative emphasises collectivism and collaboration through women-led groups forming a cooperative society, ensuring the active participation of women in decision-making. Education and skill-building boost confidence, enabling change in norms and helping pave the way for a better future for women and girls.

Introduction

Manual scavenging—a hazardous occupation involving the manual removal of untreated human excreta from sewage systems—persists in India. Those employed in the occupation face serious health and safety risks; the practice violates human dignity and general well-being. The Women’s Mechanised Cleaning Cooperative (Swachhangini) initiative was launched in 2021 by the Patna Municipal Corporation (PMC) in the eastern state of Bihar, in collaboration with the United Nations Population Fund (UNFPA) with a dual objective—to eliminate the degrading and hazardous practice of manual scavenging and help women earn income and achieve financial independence.

The Swachhangini initiative has helped lift sanitation workers and their families out of extreme poverty and equipped them with more dignified and safer working conditions through mechanised cleaning. Additionally, the initiative has given these women various crucial life skills, in addition to the technical skills required to operate cleaning equipment, through training and capacity-building programmes. The training encompasses areas pertaining to crucial social issues such as awareness on gender-based violence, health education, and knowledge about the consequences of child marriage. The creation of groups and the founding of a higher-level federation, the Swachhangini Swawlambi Sahkari Samiti, has also generated a sense of unity and shared purpose.

Eliminating Inequality and Empowering Women

India has seen significant improvements in health and education over the past few decades, but vast inequalities still exist. According to Sunilkumar and Pillai,¹ the Indian economy continues to experience gender disparities despite a high



growth rate in Gross Domestic Product (GDP) as well as ample government measures aimed at promoting gender equality. Gender inequity persists in various contexts, including in decision-making, economic opportunities, and access to education. It is essential to ensure gender equality in order to provide women with the necessary resources and opportunities and to improve the chances for future generations.

The practice of manual scavenging persists in India despite being banned under the Manual Scavengers and their Rehabilitation Act, 2013; according to the Safai Karamchari Andolan, an advocacy group working to eradicate manual scavenging, there are still around 1.8 million manual scavengers in India. Manual scavenging is generally only carried out by those belonging to the Dalit community.² According to the National Commission for Safai Karamcharis, a total of 233 people died³ between 2019 and 2022 due to accidents while cleaning sewers and septic tanks.

Women experience the most severe repercussions of engaging in sanitation work; they are at increased risk of gender-based violence, both within and outside their families. The unsafe conditions of the slums they live in, substance abuse, lack of clean water and sanitation, and scarce access to sexual and reproductive health services leave women and girls vulnerable to illnesses, unintended pregnancies, and violence.

The Self-Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) was introduced in January 2007 with the aim of rehabilitating India's manual scavengers and their dependents in alternative occupations; the target was set for the first quarter of 2009. Due to delays, the scheme was extended to March 2010, with a provision for the coverage of spillover of beneficiaries even afterwards, if required. The scheme covered 1.18 lakh scavengers and their dependents across 18 states and union territories. Following the 2013 Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, the programme was changed to include financial incentives and skill development.

The Swachhngini initiative, launched in 2021, addresses both these challenges—gender inequality and the persistent practice of manual scavenging—by



targeting women and allowing them to make dignified and safe living in waste management. The initiative focuses on achieving SDG8, which aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. It also works towards achieving SDG5 (gender equality), SDG6 (clean water and sanitation), and SDG10 (reduced inequalities).

From Mission to Implementation

The project was implemented directly across 50 slums in Patna. Despite challenges in the implementation due to the COVID-19 pandemic, the project progressed and accomplished its objectives.

The first quarter of the project involved the capacity building of elected representatives regarding their roles and responsibilities, as well as slum development. In the second quarter, essential activities were conducted, such as promoting COVID-19 vaccination among frontline slum dwellers, conducting rigorous training of sanitation workers at their workplace, monitoring to ensure that sanitation workers are fully vaccinated, and reinforcing COVID-appropriate behaviour. By the third and fourth quarter, mechanised cleaning enterprises began working in the field after the machines were provided by the deputy chief minister of Bihar.

The project is unique because of its holistic approach to issues of discrimination and lack of awareness. Key strategies identified early in the project were the need for the capacity building of elected representatives or ward councillors on citizen engagement for gender- and rights-based slum development; awareness generation to empower girls; and promoting community collectivisation. Furthermore, this project is in collaboration with the municipal body, highlighting the value of community-public or local government-multilateral partnership in strengthening the sustainability and scalability potential of such programmes.

The initiative had three main strategies—capacity building of elected representatives; empowerment of women and girls in slums; and improving the health, safety and dignity of sanitation workers and manual scavengers.



Strategy 1: Increasing the Capacities of Elected Representatives/Ward Councillors on Citizen Engagement for Gender- and Rights-Based Slum Development

Under the programme, a two-day training was conducted for 75 elected representatives (ERs) in the first quarter of the year. By combining interactive resources like videos, PowerPoint presentations, and creative learning activities, the training covered their roles, improving urban governance, and legal frameworks. The games were conceptualised with the idea of assessing the current understanding of the ERs on their roles and responsibilities, the Bihar Municipal Act, and the 74th Amendment Act. The strategy involved nurturing ward councillors in executing gender- and rights-based area development with the aim of orienting the ERs to address inclusion issues like stigma and discrimination, and gender- and rights-based slum development.

The Slum Networking Plan aimed at ensuring that the most vulnerable have access to quality services and that slums are transformed as catalysts for positive urban transformation. This activity included the profiling of ERs and slums, the people-centric profiling of slums, and the identification of 10 slums in Patna to be developed as 'model slums'. Model slum development included assessing existing gaps in the slums and listing physical improvement support; providing regular municipal services and beautification; stormwater drainage planning; and building human capital through training and empowering women and youth in slums to contribute to gender- and rights-based development. Furthermore, health camps were organised in slums, providing sexual and reproductive health services, consultation, and guidance, with an emphasis on adolescent girls and women; it reached over 3,000 residents. COVID-19 vaccinations were also provided.

Strategy 2: Women and Girls in Slums Empowered with Assets and Knowledge to Exercise Agency

The programme is present across 50 slums through 100 youth collectives and 50 women collectives, with 15 members in each collective. The aim is to promote engagement and address the challenges faced by young girls and women, including promoting menstrual health and hygiene. The strategy promotes correct knowledge around healthy practices during menstruation by



promoting entrepreneurship on sanitary napkins. The setting up of sanitary napkin packaging units in three slums has paved the way for young girls and women to promote awareness around healthy menstrual practices. The unit is run by 10 women from each collective, with five of them engaged in packaging sanitary napkins while the other five work in awareness generation and the distribution and sale of the products.

However, in the latter stages of the project, there were challenges pertaining to the sale of the sanitary napkins. After the packaging of the sanitary napkins was completed in 2022, it was decided to close two units and shift all packaged materials to one unit. By the end of phase 1, a joint decision was taken by the PMC and UNFPA to close this unit as well and focus all efforts on the sale of the packed sanitary napkins.

The training and establishment of the units was supported by Saral Designs, a Mumbai-based organisation. A scoping study was conducted in three slums to understand menstrual hygiene practices and management. The study served as a baseline for the business development plan for sanitary napkin packaging units in slums. Mobilisation processes for women interested in working in the packaging units was initiated in 20 slums in March 2021, along with the identification of women and girls as Sanginis, who would work in the sale and marketing of products. Of the 200 women and girls who were contacted, 15 expressed their interest in working under the packaging units and in sales and marketing. Saral Designs also facilitated the purchase of machines for the three packaging units.

Strategy 3: Improving the Health, Safety, and Dignity of Sanitation Workers/ Manual Scavengers

Under this strategy, the 'Capacity building of 7000 sanitation workers on health safety and constitutional rights' initiative aimed to raise awareness among sanitation workers about health hazards and human rights. This included developing training modules through videos and flipcharts, the training and capacity building of sanitation workers, conducting training sessions for sanitation workers that covered topics like the health of sanitation workers, the impact of their work and associated health hazards, and safety measures for the collection and handling of waste and COVID-19 waste during the COVID-19



pandemic. It also covered social and community-based issues like child marriage and gender-based violence.

Another initiative under Strategy 3, 'Empowering girls from sanitation worker/manual scavenging community to address health hazards through enterprise promotion', promoted mechanised cleaning for the young women and girls in the sanitation worker community. The aim was to create a pool of women to push the enterprise, equipped with modern and scientific techniques to treat solid and liquid waste in urban areas.

The approach involved training women from the sanitation worker community to provide sanitation services to the PMC and later work as partner agencies. The initiative included forming groups, providing on-the-job trainings, and outlining a business model that provides a base for the financial functioning of the enterprise. Women members of the groups received multiple rounds of training on life skills and the technical aspects of mechanised cleaning, such as motor driving and operation and maintenance of equipment. They were also made aware of government schemes and guidelines as well as the basics of accounting and marketing. These training sessions and technical skills are key to enabling women to be independent and more efficient in the workplace.

In partnership with UNFPA, the PMC launched the government-endorsed 'Women-led enterprise on mechanised cleaning'. Under the initiative, Swachhangani members initiated the work of cleaning sewer holes. They were formed into groups and tagged with their own vehicles. One tipper machine was also attached to each team. Through this initiative, 5,640 sewer holes were cleaned between November 2021 and September 2022. On-the-job training was also provided to the second batch of Swacchangini.

Equity and Empowerment: Progress So Far

In 2021 alone, 75 PMC representatives were trained in addressing gender-based violence and harmful practices. The trainings also highlighted their roles and responsibilities. Further, resource materials were developed on gender and harmful practices for use by ERs.



Between January 2021 and August 2022, over 2,500 women and girls were educated about their rights and entitlements, including sexual and reproductive health and rights (SRHR), and 3,500 women and girls were reached with information on menstrual hygiene (MH). Additionally, within this time period, 5,976 sanitation workers were educated about their constitutional rights and entitlements; and 250 sanitation workers and more than 1,000 women collective members from 50 slums were oriented on issues like SRHR, gender-based violence, child marriage, and menstrual hygiene management. The PMC also provided resources to empower 72 women across 12 groups to undertake mechanised cleaning in urban slums.

The Story of Rani

“When we wear our uniforms, people recognise us and we feel a sense of pride. They say—just look at what these women have achieved and the work they are doing...they have left the men behind.”

Rani Devi, 28, lives with her husband, two children, and parents-in-law in the slum settlement of China Kothi in Patna. A sanitation worker by profession, she has previously worked as a domestic helper, but her daily wages were barely enough to scrape by. When she learned that the Women’s Mechanised Cleaning Cooperative used machines and safety equipment instead of manual labour and was organised by and for women, she was eager to join.

Her colleague Indu Devi, 28, lives with her parents-in-law and three children in the same slum as Rani. After her husband left her in 2016, she provided for her family by working as a domestic helper before she learned about the chance to retrain with the Cooperative.

“My biggest concern was losing my life, especially when I saw the men going underground to scavenge and clean manually. But now with the mechanised programme, women can also do this job, we can do it well, and we can earn our own income.”

Rani said that, in the beginning, people were not supportive and taunted her for cleaning sewers. But she never lost hope. Her hard work has earned her economic and social capital and will help her to send her children to school.



The same people who used to discourage her have now started to respect her determination—some even ask how they can also work under this project.

As one sanitation worker told UNFPA, “By being able to do this job with machines, I can now earn a living, and my children will be able to go to school and have a brighter future.”

New Directions and Conclusion

The revised Self-Employment Scheme for Rehabilitation of Manual Scavengers (SRMS) has provisions for the subsidised purchase by self-help groups of small machines for the mechanised cleaning of sewers and septic tanks. The Patna experience has demonstrated best practices by mainstreaming gender into manual scavenging mechanisation efforts.

The Swachhangini initiative provides a glimmer of hope in the fight against manual scavenging. This initiative, pioneered by the PMC in partnership with UNFPA, addresses a complicated web of issues faced by sanitation workers and manual scavenging communities, particularly women and girls. By fostering economic empowerment, improving health and safety, and championing gender equality, the project aligns to multiple SDGs while reshaping the lives of those who are poor and marginalised.

The initiative focuses on achieving SDG8, which aims to promote sustained, inclusive, and sustainable economic growth; full and productive employment; and decent work for all. It also works towards achieving other SDGs. The initiative’s reach goes beyond the limitations of simple manual scavenging; by acknowledging the interconnectedness of various issues, such as sanitation, health, education, and gender roles, the project strikes at the roots of systemic inequalities.

The Swachhangini initiative’s implementation model emphasises its importance. Collectivism and collaboration are embodied in the creation of women-led groups and their federation into a cooperative society. With this strategy, women have an active role in making decisions that will affect their future.



The focus on education and skill development gives people the confidence to question conventional wisdom and envision a better, more egalitarian future and gain practical knowledge.

The success of the Swachhagini campaign, with over 5,708 sewer holes cleaned and numerous wards benefiting, is a testament to the transformative power of localised, community-based solutions. The project's alignment with the SDGs not only helps the initiative achieve its objectives but also paves the way for long-lasting change in the communities of manual scavengers and sanitation workers. This campaign envisions a future where human dignity, equality, and justice prevail through empowerment, education, and advocacy, indicating that the journey to a better society begins with a single, determined step.

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INDUSTRY, INNOVATION
AND INFRASTRUCTURE



09

Innovating to Build a Low-Carbon Future

United Nations Industrial Development Organization (UNIDO)



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The efficient use of energy will be critical in ensuring that India achieves its climate targets.

At a Glance

- India's energy demand is growing rapidly, while at the same time it has set itself ambitious targets on reducing greenhouse gas (GHG) emissions. Together with the Bureau of Energy Efficiency (BEE), the United Nations Industrial Development Organization (UNIDO) launched the Facility for Low Carbon Technology Deployment (FLCTD) to encourage innovations in energy efficiency.

- The FLCTD set out to unlock India's innovation and entrepreneurial capabilities to fast-track and scale-up the deployment, validation, manufacture, and commercialisation of cleantech innovations with high GHG mitigation potential.
- Dealing with climate change and helping economies with energy transition to net-zero emissions requires collaboration. The FLCTD evolved as a two-pronged approach to identify entrepreneurs who have developed clean or low-carbon technology solutions and provide handholding for its commercialisation.

Mainstreaming High-Impact Cleantech

The Bureau of Energy Efficiency (BEE), the Ministry of Power, Government of India, and the United Nations Industrial Development Organization (UNIDO) conceptualised the Facility for Low Carbon Technology Deployment (FLCTD), and launched it in March 2017, with funding from the Global Environment Facility (GEF). Across the country, FLCTD supports the deployment, validation, and commercialisation of Indian product and process innovations that reduce energy use and greenhouse gas (GHG) emissions. The aim is to put India on the path to a low-carbon economy.

FLCTD has nurtured partnerships and created a network of government and industry initiatives to support practical validation and commercialisation of high-impact cleantech. These partners include: ATAL Innovation Mission, Start Up India, Confederation of Indian Industries (CII), Centre for Policy Research, India Energy Storage Alliance, Intellectap, Sangam Ventures, and Customized Energy Solutions.

Through its Challenge programme, FLCTD had by June 2023, selected 78 cleantech winners and committed over INR23 crore to them for deployment and validation. Twenty-four of these have been successfully completed and validated thus far with an estimated annual energy conservation potential of 1,439 Gigawatt-hours (GWhr) and mitigation potential of over 1 million tonnes of GHG. Meanwhile, 17 innovations have been commercialised.

FLCTD has also supported 67 cleantech start-ups through its accelerator programme. Five of these have since commercialised, while another 30 are in the pre-commercialisation stage.

The FLCTD Way: Tackling Energy Guzzlers

Climate change is already affecting weather patterns globally, causing more frequent extreme weather conditions¹ such as heat waves, droughts, and floods, and retreating glaciers in the Himalayas. The world has recognised the imperative to reduce GHG emissions drastically and ultimately achieve net-zero emissions; India has committed to achieve net-zero by 2070.² With the country's energy demand set to grow annually at around 4 percent, much of it from industry, the efficient use of energy will be critical in ensuring that India achieves its climate targets. As the burning of fossil fuels dominates GHG emissions, the Government of India has been focusing on energy efficiency and the use of renewable energy through initiatives such as the National Mission for Enhanced Energy Efficiency and National Solar Energy Mission. Whilst significant energy savings are possible with currently available commercial products and technologies, further energy savings require cleantech innovations for every energy consuming activity, process, or device.

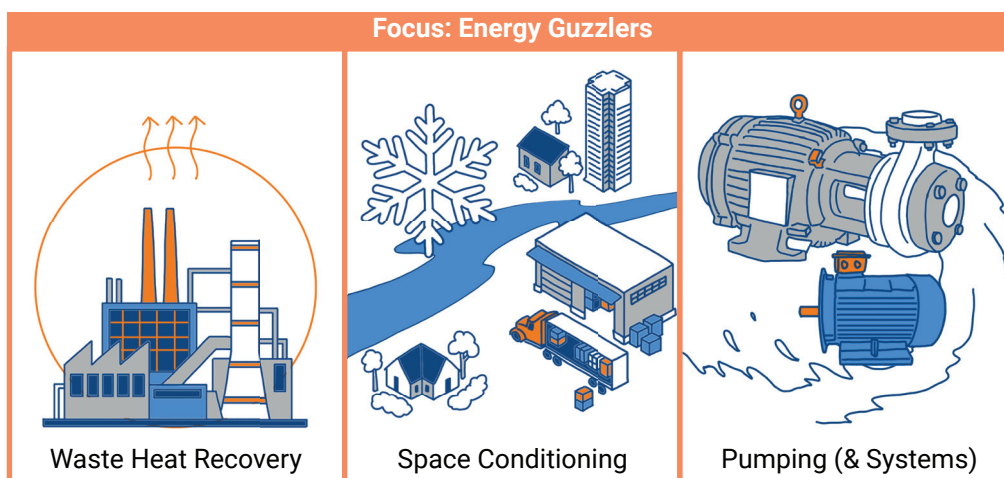
Through its Global Cleantech Innovation Programme (GCIP), implemented during 2013–2018, UNIDO, in cooperation with the Ministry for Micro, Small and Medium Enterprises (MSMEs), supported and mentored more than 80 cleantech start-ups across India. These start-ups covered diverse products, from energy efficient kitchen burners (by Agnisumukh), to energy efficient ceiling fans (by Atomberg), to biodegradable sanitary pads (by Saathi Innovation) and air purification devices (by Chakr Innovation). The GCIP confirmed the diversity and vibrancy of the cleantech start-up sector in India, while laying bare the challenges that innovators face in accessing appropriate industrial demonstration sites for deployment and validation of their innovations. Therefore, FLCTD was designed to identify promising, yet untested, cleantech innovations with significant energy conservation and GHG mitigation potential, and to support these technically and financially for deployment and real-time validation.



Since its inception, FLCTD has focused on select high-energy-consumption industries.

1. **Waste heat recovery.** Significant heat energy is lost to air or water from hot equipment, air, and water. Whilst energy recovery at high temperatures is well-established for boilers and furnaces, heat recovery at lower temperatures from hot motors, compressors, process water, and the like has yet to become common practice.
2. **Water pumping.** Pumps for irrigation and in industry are large energy consumers, and their efficiency is determined by design, operation, and control of the pump and motor.
3. **Space conditioning.** Keeping spaces, such as homes, offices, shops, and cold storages, within a range of pre-set temperatures is energy intensive, and is rapidly expanding with the changes in climate, urbanisation, and lifestyles.

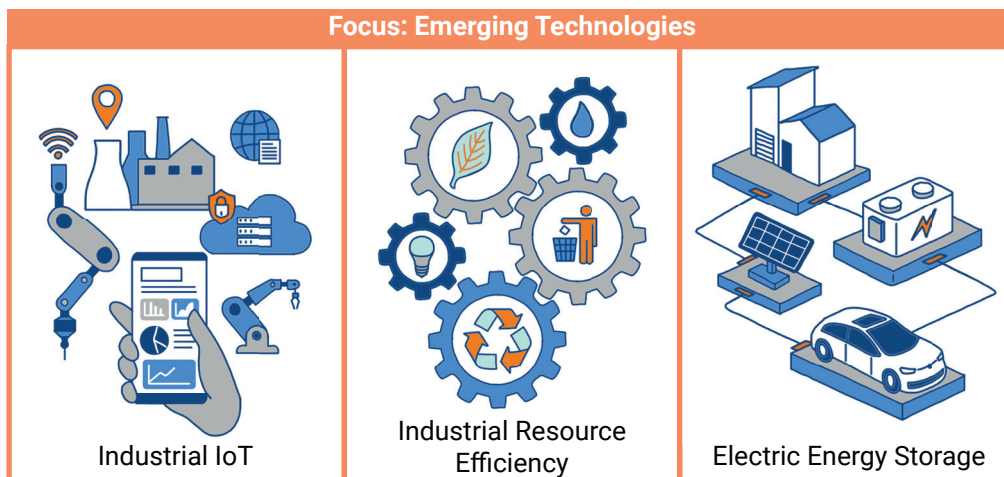
Figure 1. Energy Guzzlers



Three more verticals were later added to FLCTD, which were more focused on expanding technology opportunities:

1. **Battery electric storage.** Sustainable energy transition and electric mobility are contingent on finding efficient ways to store electric energy.
2. **Industrial Internet of Things (IoT).** It allows for more precise and real-time monitoring of process conditions in industries, with significant energy saving potential, particularly for energy-intensive operations.
3. **Industrial resource efficiency.** Energy-use can also be lessened by reducing the materials, water, and other resources used in industrial operations, which brings down energy-use in transport, pumping, heating, cooling, and grinding, among other processes.

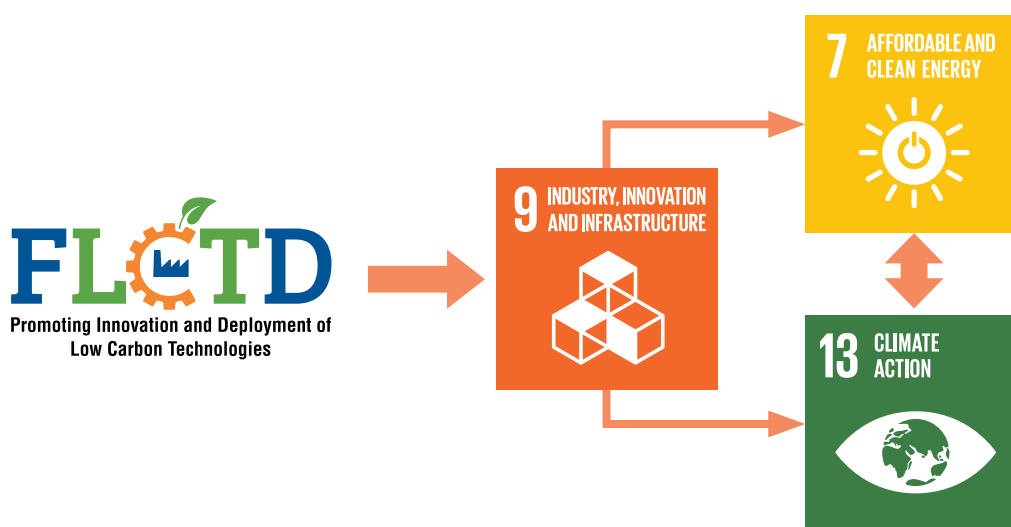
Figure 2. Emerging Technologies



FLCTD as an initiative covers both innovation and industry, and is therefore primarily contributing to Sustainable Development Goal (SDG) 9 on sustainable industry, innovation, and infrastructure, specifically the SDG targets 9.b (domestic technology development, research, and innovation) and 9.4 (adoption of resource-use-efficient and cleaner technology). Moreover, FLCTD contributes to both SDG13 on climate action, specifically 13.3 (improved capacity for climate change mitigation); and SDG7 on sustainable energy, specifically 7.3 (enhanced energy efficiency) and 7.b (expand infrastructure and upgrade technology for sustainable energy services).



Figure 3. The Impact of FLCTD on SDGs



Surmounting Hurdles, Forging Ahead

The principal target group for the FLCTD is cleantech innovators, which include knowledge-based institutions such as Indian institutes of technology and institutes of management, as well as government laboratories, equipment manufacturers and technology vendors, and professional associations and start-ups. FLCTD set out to support these innovators, creating connections to technology experts, business mentors, industry demonstration sites, and financial institutions, which became the secondary target group for the FLCTD.

Upon FLCTD's inception, UNIDO and its partners immediately recognised that the key challenge for the new-born organisation was to identify and encourage innovators and start-ups, and to nominate their solutions for consideration and for potential deployment and validation support. The challenge was also to connect with technology experts for assessment and selection, and with industry partners for the deployment sites. These challenges were dealt with by establishing partnerships and collaborations. The CII, through its Godrej Green Business Centre, was engaged to identify credible businesses and potential industry deployment sites and for the monitoring and validation of the selected

innovations. In parallel, collaborations were established with professional associations and initiatives such as the India Energy Storage Alliance and the Indian Society of Heating, Refrigeration, and Air Conditioning Engineers. FLCTD then undertook roadshows around cities and engaged with local knowledge-based institutions and industry networks.

FLCTD benefited from the government's focus on the development and promotion of the national start-up ecosystem through such initiatives as the Atal Innovation Mission,³ Start Up India Mission,⁴ and AGNII.⁵ FLCTD, through its project partner, Sangam Ventures, engaged with the Start-Up India initiative to reach out to registered start-ups across the country to invite applications to join FLCTD.

As a complementary objective, FLCTD set out to map and facilitate further development of technology transfer networks in the country, with a focus on clean and low-carbon technologies. The Centre for Policy Research at Panjab University, Chandigarh, operating under the Department of Science and Technology, was enlisted to identify and appraise technology transfer offices or their equivalents. An initial stocktake and review identified 25 technology transfer initiatives and an in-depth review was undertaken in 2023 to identify and curate best practices. These institutes included higher education institutions (such as IITs, NITs, public and private universities) and national research laboratories. The study highlighted a diverse range of practices in the structure and functioning of the technology transfer offices in the country—which necessitate the standardisation of definitions and terminologies in practice.

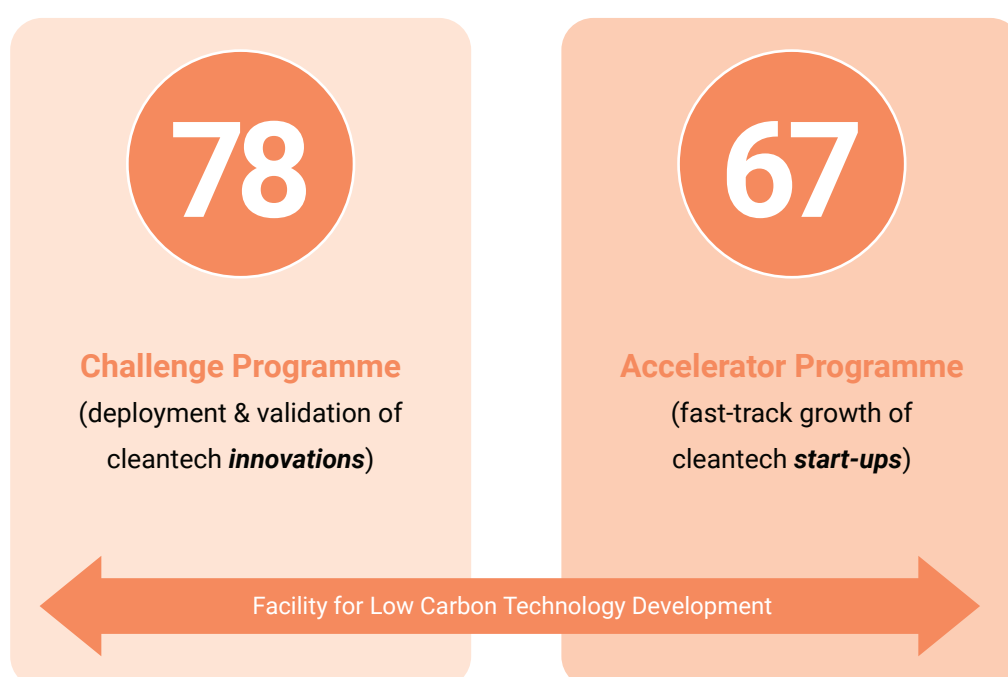
To strengthen and promote technology transfer and commercialisation in the country, the requirement for a foundational training and capacity-building programme was identified. Such a programme would cover critical areas of intellectual property (IP), including technology development, assessment, evaluation, negotiations, and contracting. So far, such training is available only through programmes offered by international organisations such as the World Intellectual Property Organization (WIPO) and Alliance of Technology Transfer Professionals (ATTP).



Implementation, Innovation, Impact

FLCTD has been successful through the synergistic execution of its two main components—a Challenge programme to identify promising early-stage cleantech innovations for deployment and validation, and an Accelerator programme to fast-track growth of cleantech start-ups and the commercialisation of their innovations.

Figure 4. FLCTD Components

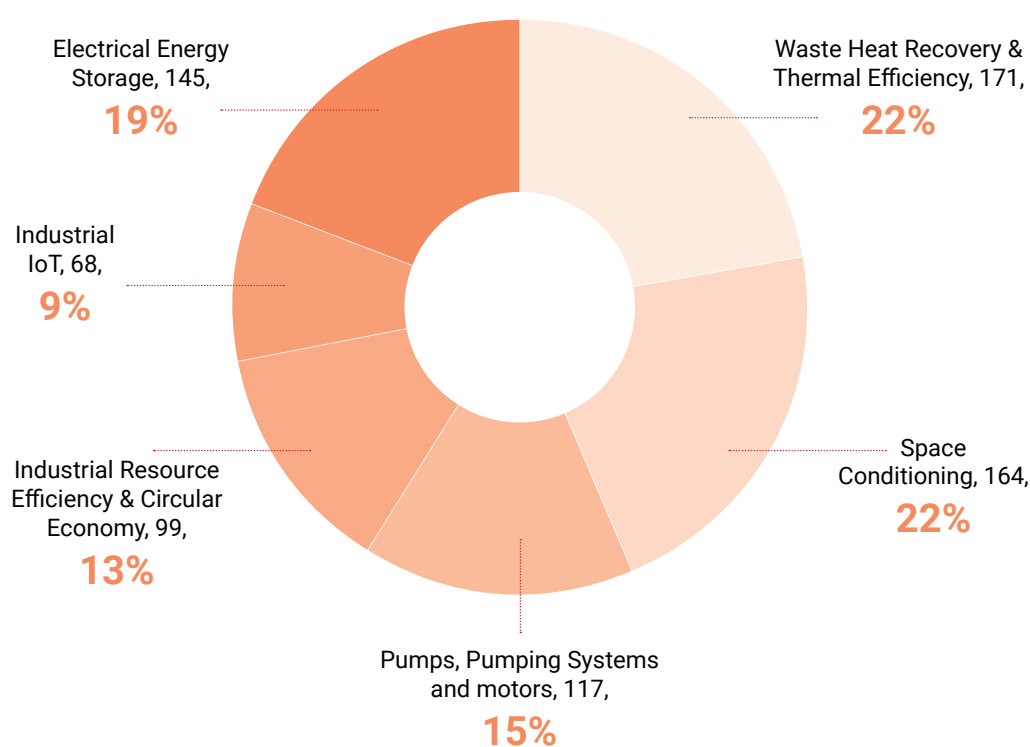


The Challenge Programme

The defining component of FLCTD is its Challenge programme. It operates through open calls for nomination from cleantech innovators who wish to avail technical and financial support from FLCTD. The programme unit then reviews and screens nominations and shortlists the most suitable and promising innovations based on maturity of the innovation, estimated energy savings and emissions reduction, and innovativeness and expected feasibility. Dedicated panels comprising senior technical experts from industry, professional associations, and knowledge-based institutions conduct further detailed technical evaluation and selection and endorse those innovations that

have merit for deployment, referred to as ‘winners.’ Next, the UNIDO–FLCTD programme unit supports the winners in developing a detailed and costed deployment and validation programme and identifying suitable sites. Thereafter, UNIDO grants up to US\$ 50,000 towards the costs of deployment and validation for each winner. The programme unit monitors progress, and through the CII undertakes independent validation of the deployment trials. Many of the trials include multiple locations and involve several rounds of industry negotiation, and then require detailed engineering, construction, and installation.

Figure 5. Breakup of Applications, by Vertical

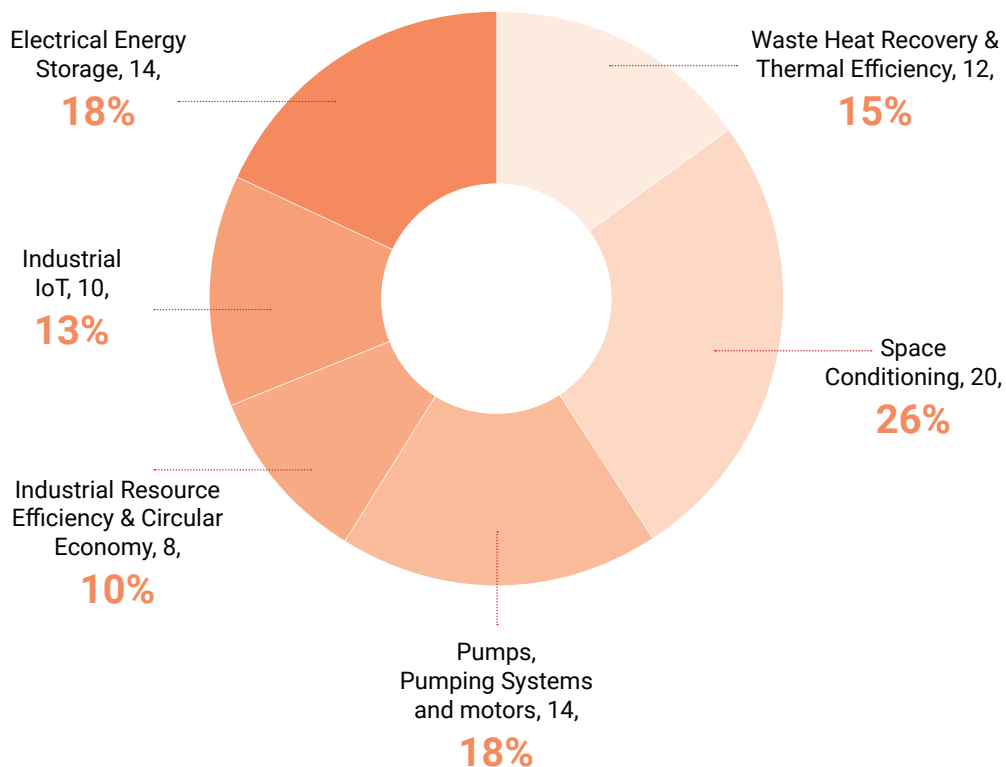


The challenges are conducted in several verticals: technology, waste heat recovery, space conditioning, pumps (including pumping systems and motors), industrial IoT, industrial resource efficiency, and battery storage. By June 2023, FLCTD had completed five rounds of innovation challenges, each covering three or six verticals. This resulted in the selection of 78 winners from 764 nominations.

So far, 24 technology deployments have been completed and validated, 17 of which have been commercialised. These ‘winners’ could already realise 1,439 GWhr energy savings and over 1 million tonne GHG emissions reduction.



Figure 6. Winners in Various Verticals Under FLCTD



Many of the innovations are beneficial beyond just energy savings and GHG mitigation for increased production and incomes, better quality, and reduced food losses. For example:

GreenChill – New Leaf Dynamic Technologies developed a cold storage solution for agriculture and floriculture produce that uses biomass waste as an energy source. The FLCTD project provided support to demonstrate and validate the technology with a banana producers group in Tamil Nadu. This innovation uses farm-waste as fuel and an environment-friendly refrigerant (ammonia) which does not contribute to global warming or ozone depletion. It uses 94-percent less electrical energy compared with a conventional electric refrigeration system with 4 tonnes of refrigeration capacity. In 2021, the company went commercial with the GreenChill technology and raised US\$ 800,000 for expanding operations.

Uravu Labs has developed an atmospheric water generator, which uses solar thermal energy and desiccant material to produce water from humid air. The water generator functions with multiple cycles of absorption and desorption to trap humidity in the air and turn it into premium-quality water for industrial use. Uravu received mentoring support from the FLCTD accelerator programme and subsequently was selected to the annual FLCTD innovation challenge in 2021 in the resource efficiency category for its unique solution to save fast-depleting groundwater. The start-up has a vision of bringing their renewable water technology to both public and private customers, helping reduce the withdrawal of groundwater. The system developed by Uravu is unique for using solar energy or industrial waste-heat and liquid desiccants for its operations, and can be operated in geographic locations having relative humidity of 30 percent, which covers most of India. The FLCTD project provided financial support for the development and trial of a 5-litre-per-day atmospheric water generator and to scale it up to 20 litres per day. In 2022, Uravu raised an additional US\$1.7 million to expand its operations and for commercialisation.

Tan90 is a start-up that has developed fast-charging phase change materials (PCM) and incorporated these into portable cold-storage boxes for perishable goods. Tan90 deployed the thermal storage technology for 20 clients across India during the technology trial under the FLCTD project. During the COVID-19 pandemic, the cold-storage boxes were useful for last-mile delivery of fresh vegetables, horticulture, processed foods, ice cream, and milk, within the temperature range of -12 °C and 20 °C. Tan90 commercialised the cold-storage boxes under the model name Box90. In 2023, Tan90 raised US\$ 1.5 million and expanded its operations from Chennai to Bengaluru, Hyderabad, and Delhi NCR to service customers in these regions.

Kethworks Pvt. Ltd is a start-up that developed a unique portable solar pump which consists of a submersible, 1/3 horsepower pump that weighs 4 kg and is powered by a small, portable 320 photovoltaic (PV) panel. The high efficiency of the pump reduces the size of the solar panels required, thereby reducing the system cost and weight, making it more affordable to farmers. The portable pump delivers 20,000 litres of water per day, enough to cultivate up to 1 acre of land with a variety of crops. The portable pump can be used at any open well or water source with a head of 10–15 metres.



ENCON Thermal Engineers Pvt. Ltd is a manufacturer of high-temperature industrial equipment. Encon developed and manufactured regenerative burners that reduce energy wastage by utilising the high-temperature exhaust from the furnace. The regenerative burners work in pairs, wherein the firing burner utilises the thermal energy stored in the regenerator box for preheating the incoming combustion air. The regenerator box of the second burner acts as a reservoir from which heat is recovered and stored for the next cycle. The regenerative burners installed by ENCON in a commercial forging furnace have delivered fuel savings of up to 35 percent.

Promethean Spenta Technologies Pvt. Ltd is a thermal engineering start-up that designs and manufactures refrigeration systems for cold-storage and milk-chilling applications, with grid or solar power. The system allows milk-chilling at the village point of collection, minimising spoilage while delivering good-quality milk and increased income opportunities for farmers. The milk-can cooling unit, based on thermal storage, consists of a storage unit that can contain up to 6 milk cans—40 litres each. The chiller unit can be run either from grid electricity or a solar photovoltaic system, delivering cooling for up to 12 hours. The stored energy is used to chill the milk can to 4–6 °C for 12–16 hours, without electricity supply. Thus, the system eliminates the requirement for an alternate power backup, such as a diesel generator.

The system validated under the FLCTD uses environment-friendly refrigerant (R449a), having zero ozone depleting potential and global warming potential of 1397.

Accelerator Programme

The complementary accelerator programme for cleantech entrepreneurs was launched in 2019. The programme helps start-ups validate and refine their business strategy for financial and environmental sustainability. Sangam, as the accelerator partner, calls for and reviews applications. Its team of mentors and advisors from industry, incubators, and investors then takes the participants through a structured journey to review and refine customer definition, product offer, target markets, IP rights and licensing, scaling up, and investment strategy. At the end of each cohort, participants pitch before a jury that selects the winner and runners-up.



By June 2023, four accelerator cohorts had been completed with 67 start-ups;⁷ 17 of the accelerator-supported start-ups were led by women. Their innovations dealt with six broad focal areas: industrial low GHG techniques, commercial and residential low GHG techniques, agro and food processing, energy storage techniques, resource efficiency, and digital technologies (including IoT and artificial intelligence). By June 2023, five of these start-ups had already commercialised. They were:

- Greencross Agritec (agro and food processing)
- Irasus Technologies (digital technology)
- LivNSense Technologies (digital technology)
- Panjuri Labs (commercial and residential low GHG technology)
- Uravu Labs (resource efficiency)

Moreover, 12 start-ups that completed the accelerator programme were successful in the challenge programme to qualify for financial support, and technology and innovation mentoring for deployment and validation of their technical innovations.

New Horizons

Thus far, FLCTD has identified shortcomings in technology transfer and commercialisation for indigenous innovations in energy conservation and GHG mitigation, while also finding that dedicated efforts, like its challenge and accelerator programmes, can be successful in unlocking commercialisation for select innovations. Therefore, two complementary future directions are possible:

1. **Improving technology transfer, commercialisation, and networks.** As a starting point, the FLCTD is working towards the formalisation and standardisation of technology transfer through capacity building and professional recognition or accreditation of technology transfer professionals. This can be complemented with broad-based investments in the development of sectoral systems of innovation that connect knowledge-based institutions with industry, government, intermediary organisations, investors, and technical and standardisation institutions.



2. **Expanding and diversifying the challenge and accelerator programmes.**

The programme modalities of FLCTD are not specific to energy conservation, and can be deployed for other innovations beyond the low-carbon ones. For example, these innovations can be in climate change adaptation, the circular economy, water and waste-water management, alternative and safe chemicals, and public health and nutrition. FLCTD has made a modest start with this diversification in its accelerator programme by including bio-plastics and other circular innovation start-ups.

Taken together, these will lead to further innovations and outcomes, which will contribute towards the achievement of SDG9 targets on domestic technology development and the adoption of resource-use-efficient and cleaner technologies. More importantly, the principal effects of the innovations will cut across several other SDGs, as already demonstrated through FLCTD for SDG13 (climate change), SDG7 (sustainable energy), SDG12 [selectively] (sustainable consumption and production), and SDG2 (zero hunger).

Conclusion

SDG9 concerns industry, infrastructure, and innovation as solution providers for the global challenges targeted by the other SDGs. FLCTD showcases the critical importance of innovation and the manufacture of innovative products and technologies to the climate and energy SDGs. Through its highly networked programmatic approach, FLCTD has successfully unlocked innovation and entrepreneurship for manufacturing new products and technologies that can aid in solving the critical challenge of climate change. In doing so, it has demonstrated the added value of a systems approach to innovation and commercialisation in achieving SDG target 9.b on domestic innovation and technology development.

First, the FLCTD accelerator programme, jointly with Startup India, identified entrepreneurs who with their early-stage cleantech and climate-tech start-ups are making available innovative technology solutions to consumers and producers to make sustainable choices.



Second, through the Annual Innovation Challenge, the FLCTD challenge programme provides technical mentoring and financial support to validate the efficacy of the innovation to speed up its commercialisation. Several of these start-ups, post-technology validation and commercialisation have raised funds from investors.

The pathways to energy transition to reach net-zero emissions require new approaches and disruptive innovations across all sectors of the economy, and more urgently in energy generation, industrial production, resource utilisation, clean mobility, and waste management. These sectors require innovative solutions; therefore, to support early-stage technology development and deployment to demonstrate technical and commercial viability to end-users requires a structured approach to accelerate the adoption of innovative technologies. The FLCTD project, with over 130 entrepreneurs and other stakeholders, is instrumental in building a budding cleantech innovations ecosystem in India.

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Endnotes

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REDUCED
INEQUALITIES



10

**Leaving No One Behind:
Advancing Health Equity
Through Disability
Competencies in Medical
Education**

Doctors with Disabilities



Disability rights must be integrated into the medical curriculum to train future health professionals in inclusive, compassionate care.

At a Glance

- Persons with disabilities are entitled to the same level of healthcare as any other person, as aligned to SDG10, yet face a wide range of obstacles in terms of access to health services, assistive technologies, education, employment and social services.
- The lack of awareness, skills, and competencies of health and care professionals regarding the needs of persons with disabilities poses a massive challenge to the provision of universal healthcare.

- Disability competencies must be made integral to the medical curriculum of all healthcare providers; health professionals should receive comprehensive training in compassionate care for individuals with disabilities.

Introduction

The 2011 World Report on Disability by the World Health Organization (WHO) highlights the universality of healthcare needs, including among people with disabilities.¹ However, these populations are twice as likely to experience inadequacies in the skills of healthcare providers, and in health facilities; they are three times more likely to suffer denial of care, and four times more likely to face discrimination in the healthcare system.²

Section 47(1)(b) of the Rights of Persons with Disabilities Act 2016³ prescribes the need to “induct disability as a component for all education courses for school, college, and university teachers, doctors, nurses, paramedical personnel, social welfare officers, rural development officers, ASHA workers, *anganwadi* workers, engineers, architects, other professionals, and community workers.”⁴ Sustainable Development Goal (SDG) 10, target 10.2 states: “By 2030 empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.”⁵

The 2018 *UN Report on Disability* and the SDGs emphasise the significance of incorporating a disability perspective in health services (SDG3) and education (SDG4).⁶ With India’s ratification of the UN Convention on the Rights of Persons with Disabilities (CRPD), the country assumed the responsibility of aligning its domestic laws and policies to the Convention. As a result, the Indian Parliament enacted the Rights of Persons with Disabilities Act (RPDA) in 2016.⁷

Historically, India’s medical curriculum lacked information about the rights of individuals with disabilities. In November 2018, the Medical Commission of India (MCI) published the new competency-based medical education curriculum, but it still did not include anything on disability rights or the importance of principles such as ‘dignity’ related to persons with disabilities. Instead, the curriculum focused only on medical models of disability, i.e., an illness or

disability that is the result of a physical condition. This approach increases the likelihood of medicalising a wide range of human experiences and could result in medical graduates not having a thorough comprehension of the fundamental need for compassionate care for persons with disabilities.

At the same time, the Medical Humanities Group, the University College of Medical Studies at Delhi University, and the Bucksbaum Institute for Medical Excellence at the University of Chicago were preparing a disability competencies curriculum with doctors with disabilities, disability rights activists, and health professional educators. Finally, in 2019, disability competencies were included in India's new undergraduate competency-based curriculum; the regulatory body also recommended the use of the humanities in medicine.

Transforming Disability Education in Healthcare

Dr. Satendra Singh, who has locomotor disability, played a key role in this change. He fought for his rights, as well as those of other medical doctors with disabilities. In 2014, after he was denied the chance to appear for a job interview, he brought the issue of discrimination of doctors with disabilities before the Union Public Service Commission (UPSC). At the time, Dr. Singh, who was already an employed physician with the University College of Medical Sciences (UCMS), was informed that individuals with disabilities were not qualified to serve as teachers in medical colleges. This came as a surprise to him, especially given his notable record throughout his undergraduate and postgraduate studies and as a faculty member at UCMS. After a long battle, in 2014, the Ministry of Health introduced 1,674 specialised central posts for doctors with disabilities.

On 1 March 2019, Dr. Singh filed a complaint before the Chief Commissioner's Office as well as the State Commissioner's office regarding the lack of a disability rights-oriented approach in the new MCI syllabus.



To bridge the gap, the Medical Humanities Group^a developed 27 disability competencies for health professions which derived from live experiences, human rights, and social accountability. First, humanities resources with a long-standing history of examining struggle and diversity were chosen, including narrative and reflection, visual arts, poetry, and forum theatre. Next, appropriate material that could be expected to exemplify the disability competencies and could generate discussions around disability issues were examined.

Of the 27, eight were included in the foundation course of the competency-based curriculum introduced in August 2019. The eight competencies are presented in Table 1, which also highlights their correlation with the five roles of an Indian medical graduate and the competencies defined by accreditation boards in the United States (US) and Canada. The proposed curriculum is in line with the UN's disability guidelines.

Table 1. Disability Competencies and the Five Roles of IMG

Role of an IMG (ACGME Competencies)	NMC Disability Competencies	Predetermined Codes Derived from the Competencies
Clinician (Medical Knowledge; Patient Care) [Medical expert]	<ol style="list-style-type: none"> 1. Describe disability as per the United Nations Convention on the Rights of Persons with Disabilities while demonstrating respect for the differences and capacities of persons with disabilities as part of human diversity and humanity. 2. Compare and contrast medical and social models of disability. 3. Demonstrate a non-discriminatory behaviour towards patients or caregivers with disabilities 	Respect for Diversity

^a Formed by Dr. Satendra Singh along with Navjeevan Singh and Upreet Dhaliwal at UCMS in 2009, it was the first such initiative in a medical institution in India.

Professional (Professionalism) [Professional]	4. Build an understanding on the disability etiquettes while addressing people with disabilities.	Advocacy Non-discrimination
Communicator (Interpersonal and Communication Skills) [Communicator]	5. Demonstrate the use of verbal and non-verbal empathetic communication techniques while communicating with people with disabilities. 6. Advocate social inclusion by raising awareness of the human rights of persons with disabilities.	Dignity Autonomy
Leader (Systems-based practise) [Leader, Collaborator]	7. Have an understanding of accessible healthcare setting for patients with disabilities, including universal design	Dignity Autonomy Social inclusion Disability Rights/ Human Rights Equity/Equal Opportunity Accessibility/ Universal Design
Lifelong learner (Practice-based learning) [Health advocate, Scholar]	8. Demonstrate awareness of the disabilities included in the Rights of Persons with Disabilities Act, 2016	Disability Rights/ Human Rights Advocacy

Source: Singh et al. (2021)⁹



The Model Module

In the framework of the foundation course, a module was designed and implemented for a new cohort of learners. The modules incorporated storytelling, visual arts, poetry, narrative, and forum theatre; a number of the facilitators were medical professionals and persons with disabilities. Additionally, a field visit was used to introduce learners to the idea of universal design. Quantitative and open-ended feedback was taken from learners after module delivery, and reflections were sought after four months. The data demonstrated that the humanities tools employed in the module could facilitate learners' explorations of struggle and oppression as well as the uncovering of discriminatory beliefs. Learners demonstrated a capacity to think outside the norm of 'normality', and demonstrated an awareness of diversity, human dignity, autonomy, disability, social inclusion, equal treatment, and universal design. They acknowledged the biases they had internalised and expressed a desire to promote change. The use of tools from the health humanities helped learners engage with and show an understanding of the social and human rights issues associated with disability. It is important to include conversations by, for, and with persons with disabilities as part of such interventions in developing and delivering disability courses.

The goal was to create a globally relevant disability component in the medical curriculum. "Our proposal was unique because there are currently no disability competencies for healthcare providers to frame in consultation with real stakeholders," says Singh, who consulted extensively on competency-based curriculums from Canada, the United Kingdom (UK), and the US.

In September 2018, along with a colleague, Singh visited the University of Chicago Medical Centre's adult developmental disabilities clinic to interview patients. Kamala Cotts, director of the clinic's internal medicine residency program, collaborated with Singh on the curriculum.

In November 2018, focus group discussions with disabled doctors, medical educationists, and disability rights advocates from across India were conducted by the group to refine the 27 competencies, which cover areas such as accommodating people with disabilities, knowledge of government programmes that could help patients, and how to prevent discrimination. The competencies

could be taught as part of a one-month foundation course at the beginning of the course, spread out through the duration of the course, or be offered as part of one or both one-month electives after the fourth year.

The Process

Singh and his colleagues consulted with the disability sector to develop disability competencies intended to be acquired by healthcare professionals during their training in order to enable them to provide competent care to individuals with disabilities. Developing the competencies was a two-step collaborative process between the faculties of the University of Chicago and the University College of Medical Sciences, Delhi University, between July 2018 and May 2019. Phase I involved an observational visit to an international disability management centre in Chicago, and Phase II involved focus group discussions in Delhi.

The observational visit was conducted in September 2018, covering two disability centers at the University of Chicago, including the Adult Developmental Disabilities Clinic and the Parkinson and Movement Disorders Clinic. During the visit, the participants held conversations with healthcare providers who have experience in managing disabilities as well as medical educators who have published on the topic of disability competencies. They also interacted with patients and caregivers of people with disabilities. Upon the conclusion of the visit, three key stakeholders were identified: disability rights activists, doctors with disabilities, and health profession educators. The goal was set to conduct focus group discussions to arrive at a range of disability competencies based on the five roles^b of a medical graduate in India.

^b These five roles are clinician, communicator, lifelong learner, professional, and leader.



The second phase was the series of focus group discussions (FGD) involving the stakeholders selected through purposive sampling. The Doctors with Disabilities group, comprising doctors from both the private and public sectors with lived experience of disability; disability rights activists representing organisations working in the cross-disability sector and in specialised areas such as physical disabilities, leprosy, autism, thalassemia, learning disabilities, deaf blindness, and mental health; and health profession educators, comprising medical educators teaching in medical institutions.

The FGD guidelines were created on the basis of the experiences gathered during the observational visits in Chicago, discussions, and a review of disability literature. The triggers used to kickstart the discussion included participants' experiences as either patients with disabilities, caregivers, or healthcare providers to patients with disabilities; the barriers faced by patients with disabilities in the healthcare delivery environment; factors that made it easier for healthcare providers to manage patients with disabilities; and participants' expectations from healthcare providers regarding their disability component. To gain a better understanding of participants' views on the development of a curriculum, they were asked to provide their opinion on knowledge, skills, and attitudes during the discussion.

The analysis of the data was a three-step process: first, themes emerging from the FGD were identified using the grounded theory approach; second, a framework approach was developed in which the generated codes were conceptualised as part of the five Indian medical graduate (IMG) roles as prescribed by MCI; and finally, competency statements were framed from the results of a consensus-building exercise between the researchers, duly validated by the FGD participants.

Singh and his colleagues concluded, "Disability Competencies should take into account the five roles that an IMG is expected to perform, as well as the competencies that are outlined by the medical councils of other countries." Table 2 outlines the roles of the IMG that are in line with those expected of medical graduates in the US and Canada.

Table 2: The Five Roles of an IMG and the Competencies Defined by Accreditation Boards in the US and Canada

Five Roles of an IMG	Six ACGME Core Competencies	Seven Physician Roles (CanMEDS) ^c
Clinician	Medical knowledge, patient care, and procedural skills	Medical expert
Leader	Systems-based practice	Collaborator leader
Communicator	Interpersonal and communication skills	Communicator
Lifelong learner	Practice-based learning and improvement	Health advocate, Scholar
Professional	Professionalism	Professional

Source: Adapted from Singh et al. (2020)¹¹

Moreover, the disability competencies developed are compliant with CRPD, RPDA, and the Mental Healthcare Act 2017. Two of the competencies—‘Access to Aids’ and ‘Assistive Technologies and Disability Certification’—find a place in the three-year action agenda of NITI Aayog.^{d,12}

Impact on the SDGs

One of the most important aspects of curriculum development is the representation of real stakeholders. Kronk and colleagues consulted with disability experts to frame nursing competencies in caring for persons with disabilities.¹³ However, disability competencies are often designed without considering the lived experiences of persons with disabilities. Singh and his colleagues believe that people with disabilities are the true experts when it comes to their disabilities, and therefore, they made an effort to involve patients with disabilities and their caregivers. The development of these competencies was the result of consultation with doctors with disabilities, reinforcing the notion that ‘nothing about us, is without us’.

^c Canadian Medical Education Directives for Specialists

^d Planning Commission



Reducing disparities and ensuring that no one is excluded is an essential part of attaining the SDGs. Inequality is a human rights issue, encompassing the right to equality and protection against discrimination, including the right to health. Disability rights are, in essence, human rights. SDG10 aims to “leave no one behind”, targeting the most vulnerable people often overlooked in society. One such group is persons with disabilities, who make up 16 percent of the world’s population.¹⁴ Target 10.3 of the SDGs commits to reducing inequality by eliminating discriminatory laws, policies, and practices concerning persons with disabilities. This commitment is rooted in the Universal Declaration of Human Rights, and the UN CRPD (2006) reaffirms this dedication. While every country should provide quality health services, access to healthcare is often denied to disabled individuals, leading to health disparities.

One of the primary causes of discrimination is the lack of knowledge and understanding of disabilities, disabling conditions, and the requirements and abilities of individuals with disabilities. To address this, disability rights as disability competencies must be integrated into the medical curriculum to train future health professionals in disability-inclusive, compassionate care.

The impact of the teaching module has extended beyond borders, with the National Council on Disability in the US recognising disability competencies and urging influential bodies like the Accreditation Council for Graduate Medical Education (ACGME) and the Liaison Committee on Medical Education to adopt them as ‘mandatory components’. WHO’s *Global Report on Health Equity for Persons with Disabilities 2022* also recognised the intervention, recommending the training of healthcare workers worldwide in disability competencies. Concepts such as universal design and the fundamental human rights of people with disability set by the United Nations Convention on the Rights of Persons with Disabilities supported decision-making and reasonable accommodation, which are now integrated into medical curricula.

The intervention has garnered international recognition and has the potential to bring positive change to healthcare systems worldwide. In India, the disability competencies are now a mandatory part of the MBBS curriculum in all 693 medical colleges across the country. The Indian Nursing Council has also

revised its curriculum to make it competency-based. WHO's *Global Report on Equity for Persons with Disabilities* (2022) has recognised the intervention and recommends the training of healthcare workers in disability competencies.¹⁵

Other than addressing SDG10 (reducing inequalities), this initiative also supports SDG3 (healthy lives and promote well-being for all); SDG4 (Quality education as future health professionals are being taught about human rights model of disability); and SDG17 (India-US partnerships and best practice modules, using patients with disabilities as teachers). Overall, the initiative has had a significant impact, nationally and internationally, in advocating for the inclusion of disability competencies in medical education to ensure equitable care for those with disabilities.

The Way Forward

In alignment with SDG17 (global partnerships), the initiative contributes to capacity building by educating master trainers at various medical universities in India (e.g., the Maharashtra University of Health Sciences) and the US on disability competencies through medical humanities.

Addressing SDG10 is a multifaceted endeavour that requires the integration of disability rights into medical education and the promotion of equal opportunities and compassionate care for marginalised communities. The way forward should include the use of technology to expand the reach of curricula and resources across multiple channels, such as online platforms, online webinars and virtual conferences, to reach a wider audience and share best practices. Success stories must be emphasised, and institutions that have implemented disability competency as part of their curricula be highlighted. Increasing disability competency coverage in medical education is an ongoing, long-term process that necessitates collaboration, advocacy and a dedication to improving the quality of healthcare for persons with disabilities. The work of ensuring equal opportunities and rights for individuals with disabilities is unparalleled.

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SUSTAINABLE CITIES
AND COMMUNITIES



11

The Nurturing Neighbourhoods Challenge: Promoting Young Children-Friendly Indian Cities

World Resources Institute (WRI) India



Creating people-friendly urban environments is crucial to shaping healthy and liveable conditions.

At a Glance

- The Nurturing Neighbourhoods Challenge encourages action towards adoption of an early childhood-centric approach to city planning, design, and management. Prioritising safe and stimulating environments for the healthy development of young children and their caregivers—especially in vulnerable settlements—the project targets SDG 11.7 (to provide universal access to safe, inclusive, and green public spaces for women, children, older persons, and persons with disabilities).

- Through the challenge, the cities are scaling neighbourhood-level interventions by seeking convergence with existing programs, mainstreaming young children's and caregivers' needs in the urban local bodies.
- The programme has influenced a paradigm shift towards responding to the needs of young children by paying greater attention to early childhood development facilities, such as *anganwadis* and primary health centres, while addressing other concerns such as climate change, and adopting a gender-friendly approach to developing safe, accessible, and inclusive neighbourhoods.

Introduction

The three-year Nurturing Neighbourhoods Challenge (NNC) is organised by the Smart Cities Mission of the Ministry of Housing and Urban Affairs (MoHUA), Government of India, in collaboration with the Netherlands-based Bernard van Leer Foundation and with technical support from World Resources Institute (WRI) India. Launched in 2020 as a competition for more than 100 cities across the country, this Challenge is a one-of-a-kind initiative. It aims to incorporate a focus on neighbourhood-level improvements, ensuring healthy early childhood (0 to 5 years) development, into the planning and management of Indian cities. A total of 63 cities applied to the Challenge, preparing strategies for adopting children-friendly approaches and identifying pilot projects. Based on the applications, 25 cities were selected for the cohort stage (Phase 1) that needed the chosen ones to implement their proposals over a seven-month period (March to October 2021). A thorough evaluation of the cities' documentation of Phase 1 was carried out, based on changes implemented on the ground, the quality of proposal, and the status of implementation at the end of seven months. Ten cities were declared winners in January 2022; these are now scaling up interventions as part of Phase 2.

These winners are taking steps towards mainstreaming the 'young children and caregiver-friendly lens'. Each has set up an institutional Nurturing Neighbourhoods Cell, incorporating long-term changes into policies while establishing mechanisms for sustained sources of finance, forming partnerships, and enabling diverse leadership across government and non-government organisations (NGOs), tapping into evidence-based decision-making. Civic engagement has been a key component to gather momentum and generate

a sustained demand for quality public spaces. As of June 2023, more than 150 projects covering 15 hectares of public space have been implemented in different Indian cities. These are estimated to have benefitted over two million residents, including some 200,000 young children.

Rationale and Objectives

Rapid urbanisation in India has resulted in large-scale infrastructure development in cities. While this makes available the necessary facilities to keep a city running efficiently, it does not necessarily help humanise cities. Creating people-friendly urban environments is crucial to shaping healthy and liveable conditions, wherein people of all ages and genders can easily navigate the cities and access quality public spaces, designed for their specific needs.

With over 37 million children under-five living in urban areas across India (Status of children in urban India: Baseline study 2016), an early childhood-centric approach to city planning, design, and management is necessary. These young children require a safe and stimulating environment for healthy growth as 90 percent of brain development occurs by the age of five. The first 1,000 days, from conception to the second birthday, are said to have a crucial and potentially lifelong effect on the growth and development of a child (Baidal et al. 2016). During this period, young children spend most of their time with their caregivers, making it imperative for the urban environment to respond to the needs of children and their caregivers.

A three-year-old who is, on average, 95 cm tall, experiences the world differently from adults (“Length/Height-for-Age,” n.d.). For instance, young children find it difficult to manoeuvre multiple heights; when it comes to automobiles, their view is restricted to vehicle tyres and they end up inhaling greater quantities of exhaust from tailpipes, compared with adults. Their access to the world starts at the neighbourhood level, with their focus confined to nearby streets and spaces in front of their homes, and the immediate facilities that surround their homes, such as parks and schools, which can be independently and easily accessed (Infant, toddler, caregiver-friendly neighbourhood (ITCN) framework and Guidelines 2019).

The Nurturing Neighbourhoods Challenge encourages action towards adoption of an early childhood-centric approach to city planning, design, and management, with a focus on neighbourhood planning and enhancing access to public open spaces and mobility, and early childhood services, underpinned by young-children-centric data that are critical to making informed decisions. This approach ensures a public realm for not just young children, but also for all, irrespective of age and gender. As Enrique Peñalosa, former Mayor of Bogota and a champion of public spaces, once put it, “Children are a kind of indicator species. If we can build a successful city for children, we will have a successful city for all people” (Helen Shwe Hadani et al., 2022).

The Challenge primarily targets SDG 11.7, aiming to provide universal access to safe, inclusive, and green public spaces for women, children, older persons, and persons with disabilities. By prioritising healthy development of young children and focusing on their caregivers—especially in vulnerable settlements—the Challenge seeks to create safe and stimulating environments that support children’s growth and potential, leading to better health outcomes and lifelong benefits.

Approach and Early Challenges

The Nurturing Neighbourhoods Challenge began as a competition among cities, supported by the Government of India. The objective is to help shape a vision for urban development where young children and their caregivers take centrestage. The strategic partnership with the Ministry of Housing and Urban Affairs (MoHUA) facilitated developing an agenda that cities across India can follow.

The format of the Challenge provided smaller Tier-2 and Tier-3 cities with an opportunity to experiment with newer approaches; they received technical support, which they are usually deprived of, to compete with larger cities. This enabled a lot of smaller cities to participate; however, it also meant working with resource-strapped municipalities with limited technical capacities. Simultaneously, as a response to the pandemic, the Government of India started focusing on improving public spaces to ensure social distancing. As part of this initiative, a Placemaking Marathon was conducted; this was leveraged to secure funding and strengthen buy-in for smaller cities that otherwise have constrained resources.

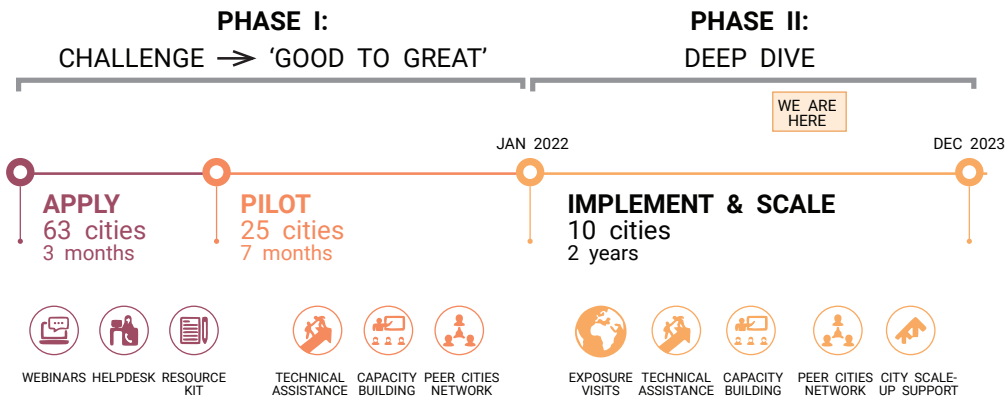
City administrations are mostly engaged with multiple priorities that require constant attention. Keeping this in mind, partnerships with municipal corporations and various departments, such as the Department of Women and Child Development (DWCD), garden/horticulture, and education, and traffic police have also been formed, based on the scale-up strategies of respective cities. City authorities were encouraged to constantly engage with users—neighbourhood residents, families, and young children while also involving many other organisations and individuals with shared interests. This enabled a simultaneous bottom-up approach, wherein the demand from the people was being recognised and addressed by city authorities. This helped establish a larger network of stakeholders, including local leaders and elected representatives, neighbourhood residents, front-line workers, urban development professionals and NGOs, and resident welfare associations (RWAs), for the long-term sustainability of the programme.

Throughout the timeline of the programme, successful implementation of the projects has drawn attention from elected representatives and local leaders. This has led to requests to ensure citywide transformation, instead of focusing on a few neighbourhoods. Creating a citywide scale-up plan has helped in such cases by providing a roadmap anchored on destinations that consider the needs of young children. This also indicates a large-scale transformation, which inspires more officials to be part of the Challenge, facilitating faster implementation.

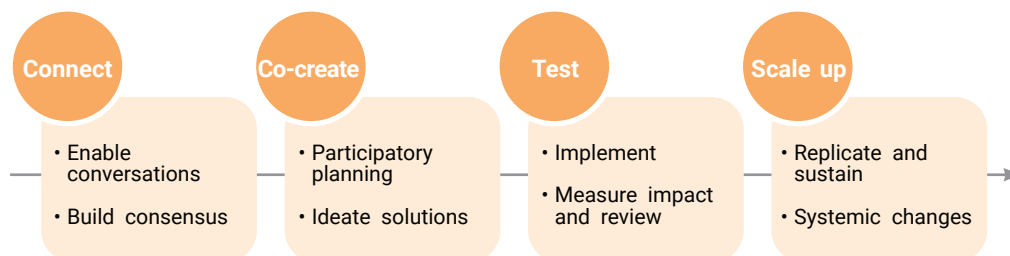
Implementation, Innovation, Impact

The Challenge was conceptualised in two phases—first, to identify the aspiring cities and second, to test their commitment to the idea. The progression was incentivised through incremental access to domestic as well as international peer networking and learning opportunities.

Figure 1: NNC phases and support to cities



Phase I: In the first stage of the Challenge, 25 cohort cities across 15 states received technical assistance and support for capacity-building for seven months to implement trials and pilots, solicit citizen participation, and generate momentum. Cities targeted five pilots in a neighbourhood, focusing on young children and caregivers, and identifying immediate actions and quick wins through temporary trials and low-cost tactical interventions. Following implementation, cities measured the impact of the pilots and collected feedback from citizens while documenting their processes to formulate citywide scale-up strategies with targeted systemic changes.



Process adopted by 25 cohort cities in Phase I. Source: WRI India

Phase II: The ongoing second phase, spanning January 2022 to December 2023, has 10 winning cities across eight states. They are being provided with technical support to become lighthouses for young children- and family-friendly urban development in India. Cities are now adopting inclusive and sustainable scale-up plans to generate a higher footprint of physical improvement with long-term sustenance. City administrations are taking steps to ensure positive behaviour and attitude towards the needs of young children in the public realm through the advocacy of caregivers, service providers, and communities.

Phase II: Top 10 cities - Scaling up



Top 10 Indian cities are working towards becoming flagbearers for young children and family-friendly urban development

Formulating capacity building programs for their staff and stakeholders



Eight strategies adopted by 10 winning cities to become young children- and caregiver-friendly cities

In Phase II, cities are adopting eight strategies to achieve long-term institutional changes:

1. **Replication of projects:** Cities are scaling up by carrying out projects and documenting learnings to create replicable templates for citywide impact and quicker implementation. Some of these include setting up early childhood development (ECD) facilities such as anganwadis, primary health centres (PHCs), and mobile libraries, as part of multipurpose spaces, especially in vulnerable settlements. This has reinvented anganwadis and PHCs to become community spaces for all, even after working hours. Cities are also creating networks of 'play' spaces of various scales and improving transit facilities for better accessibility and comfortable travel. Adhering to the Placemaking Marathon formula to focus on quick wins and less capital-intensive projects with shorter timelines can create considerable impact.
2. **Institutional set-up:** Each of the 10 cities has formed a multisectoral Nurturing Neighbourhood Cell, with dedicated responsibility for anchoring young children-friendly projects and coordinating across departments and agencies, along with conducting periodic monitoring.
3. **Partnerships and diverse leadership:** For the sustained integration of the young children-oriented lens, cities have formed multisectoral partnerships within governments and with non-government agencies, ECD experts, RWAs, and local leaders to collaborate and share responsibilities.

In the land-starved and hilly city of **Kohima**, carving out spaces in each ward for a 'pocket park' is a big challenge. Kohima has forged partnerships with ward panchayats and is conducting community engagement sessions in every ward. This has enabled a co-creation process involving the community and generated crowdfunding for a 'pocket park'.



Ward-level engagement session in Kohima. Source: WRI India

- 4. Capacity building:** More than 70 core officials in the cities have undertaken exposure visits to gain first-hand experience of good practices. Cities are conducting systematic capacity-building sessions for front-line workers and their supervisors, based on the principles of young children and family- friendly interventions, through which more than 2,300 staff members and front-line workers from the 10 cities have been trained. Few key officials have participated in the international study tours and organised programmes to share and learn about the project cases on collaborative platforms. After the visits, these officials are incorporating and testing their learnings through interventions on the ground.

Rourkela has mobilised monthly capacity-building programmes for front-line workers in anganwadis to sensitise them to the importance of outdoor play and use play as a learning aid in their teaching curriculum, converging with the Integrated Child Development Services (ICDS) training.



Monthly capacity-building session at the ICDS centre in Rourkela. Source: WRI India

5. **Civic engagement:** Cities are actively engaging with the community to co-create solutions and generate momentum around young children and family-friendly development. So far, over 6,000 young children and caregivers have been directly involved in the process through campaigns, focused group discussions, engagements, and capacity-building sessions. Cities have also harnessed the power of social media platforms to create awareness about the initiative among larger audiences. Outreach was further augmented through extensive media coverage, including radio, newspaper articles, and op-eds, that allowed participating cities to reach out to wider audiences.

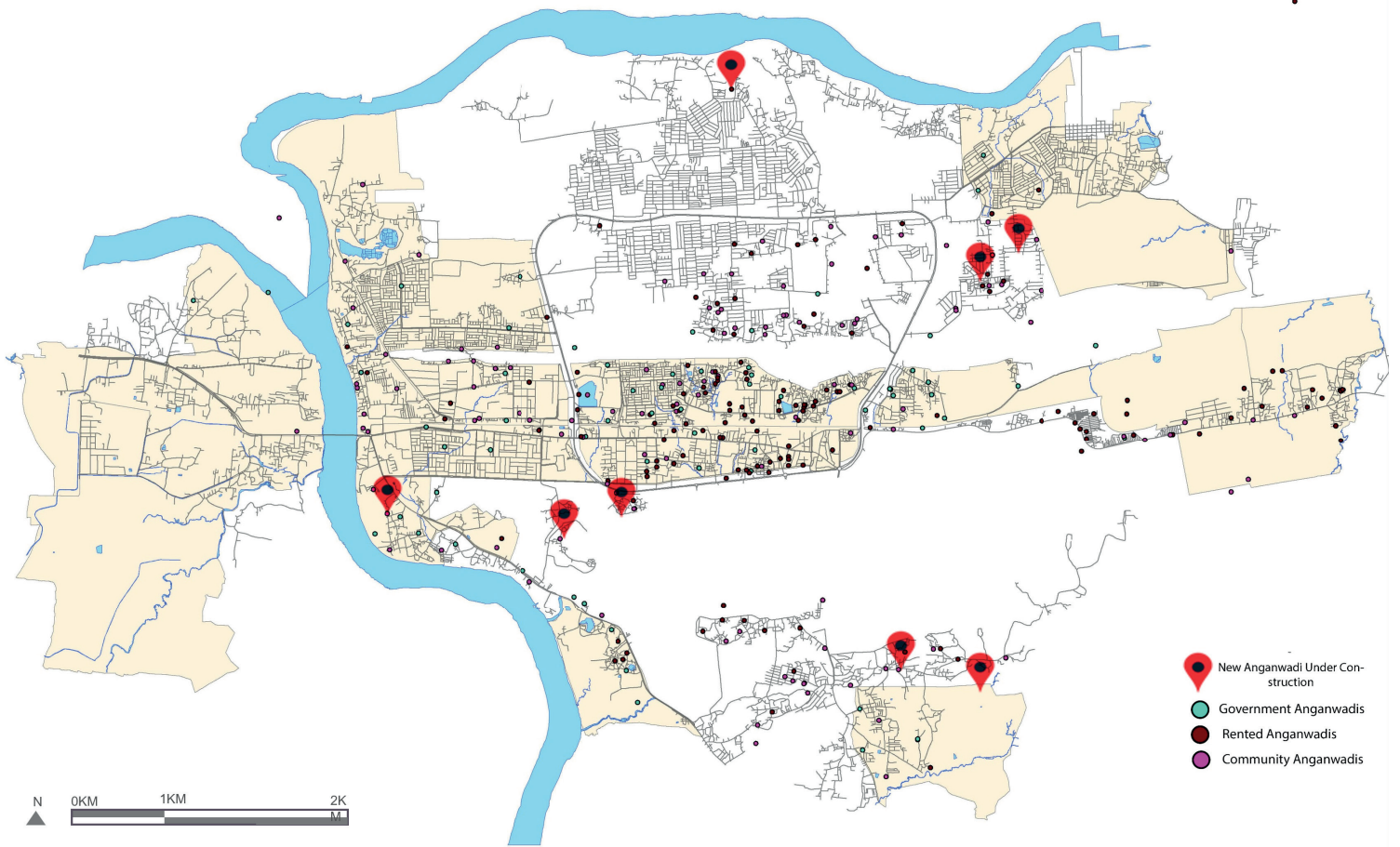
Warangal retrofitted an existing open space with play opportunities for young children and caregivers. To raise awareness about the importance of outdoor play and foster a sense of ownership of the park within the community, an engagement session was conducted, where the community made a pledge to take care of the park.



Community taking the pledge for better usage and upkeep of the park in Warangal. Source: WRI India

- 6. Data-based planning and monitoring and evaluation:** For enabling evidence-based decision-making, a data-based monitoring and evaluation framework has been formulated; it provides guidance on moving counts, intercept surveys, activity mapping, and conducting in-depth interviews at both pre- and post-implementation stages of every project. Cities are also collecting and utilising local and remote geospatial datasets to prioritise their decisions on scaling-up. Across the city, young children and caregiver-oriented data are being mapped to analyse the availability, accessibility, and suitability of young children-centric facilities, public spaces, and all children-oriented destinations in and around residential areas. Cities are prioritising neighbourhoods and projects to address the deficiencies/gaps on the basis of this analysis.

Rourkela leveraged geographic information system (GIS) data to identify vulnerable settlements with limited access to early childhood development (ECD) facilities and public spaces. This helped them prioritise development efforts in these identified areas to bridge the gap in demand and supply, fostering greater inclusion for the vulnerable settlements.



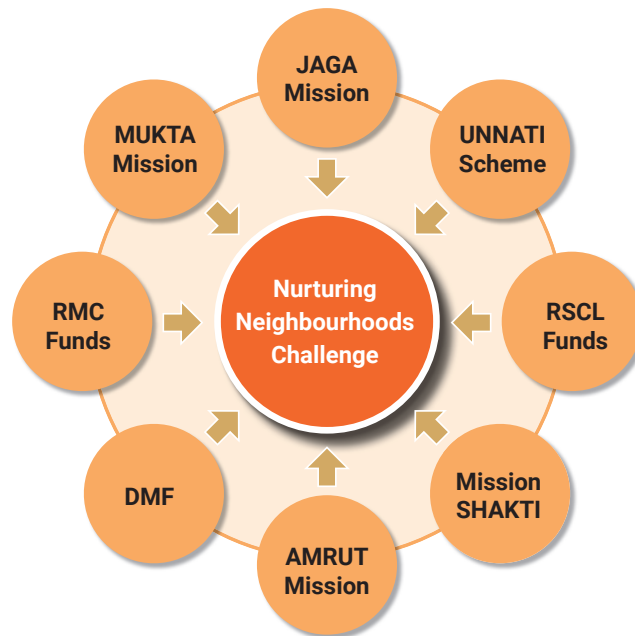
Based on the demand and gap analysis, 10 new anganwadis planned in Rourkela.

In **Karnataka**, the Directorate of Urban Land Transport has amended its checklist of components for the State Urban Transport Fund (SUTF) to include young children and family-specific elements in bus stations and other transit hubs. All transit agencies across Karnataka, seeking funds from SUTF, are thus mandated to implement the guidelines.

7. **Policy changes:** Cities are adopting changes in policies and plans to ensure mainstreaming of the young children and caregiver-friendly lens in the cities' programs and planning processes.
8. **Financial sustainability:** To ensure financial sustenance for scaling up young children-oriented development, cities are formulating convergence of funds through local-, state-, and national-level schemes and missions, and approaching private funds.

In the case of **Warangal**, the city is leveraging the greening fund, which is 10 percent of the municipal budget and includes funds from state schemes, such as *Haritha Haram* and *Pattana Pragathi*. They are converging with other national schemes, such as the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), to translate into action their vision of creating family-friendly, open, and green spaces across the city.

Rourkela is implementing young children and family-friendly interventions by leveraging convergence with local funds, such as Rourkela Municipal Corporation (RMC) and Rourkela Smart City Limited (RSCL), District Mineral Funds (DMF), state schemes, such as JAGA (land titling and slum upgrading programme), MUKTA (*Mukhyamantri Karma Tatpara Abhiyan*), Mission Shakti (women self-help groups), and UNNATI (Urban Transformation Initiative), and national mission AMRUT to provide play spaces and basic services in vulnerable settlements, involving communities, and to build new *anganwadis* across the city.



Convergence with local-, state-, and national-level schemes for scaling up projects under NNC in Rourkela

Apart from the eight strategies, the following are the innovative approaches, adopted by cities, along with emerging case examples:

- Bridging the action-to-intention gap by integrating behaviour change into the urban development process: Long-term sustenance of the young children and family-friendly lens requires moving beyond the physical infrastructure and inducing a positive behaviour change in users as well as in other stakeholders involved. During the Challenge, city authorities started looking at key behaviours to better understand and develop interventions—such as caregivers and young children spending quality time outdoors in public spaces—involving the community and encouraging young children-oriented development within the neighbourhood.

Kochi identified a residual space in a neighbourhood street in Poovath – previously encroached on for parking – to be revamped into a play area for children and caregivers. A series of public engagement sessions was conducted, right from the inception of the project, to understand the needs of the community, thus making them part of the process, while removing parking. This has created a sense of ownership among the community; they have started maintaining the space. The needs-based approach, adopted by the city to design and implement, has resulted in more and more children and caregivers spending time outdoors. This in turn makes for better utilisation of the space.



Before and after the Poovath street transformation in Kochi. Source: WRI India



Regular community engagement in Kochi fostered a sense of ownership among the residents with regard to the transformed Poovath street. Source: Cochin Smart City Development Ltd.



The Surat pavilion displayed a working life-size model of a neighbourhood, featuring access streets, designed with road safety measures, walkable streets, child-friendly facilities, and nature-based play spaces.

Source: Smart Cities Mission, WRI India

- Experiential learning modules to generate awareness for children-friendly neighbourhoods across cities:** The Smart Cities Smart Urbanisation Conference 2022 showcased a life-size neighbourhood model, providing key decision-makers, city officials, and urban practitioners with the opportunity to explore an immersive neighbourhood concept that had been designed to be welcoming, inclusive, and accessible. Such an experiential model helped demonstrate how quick and simple placemaking exercises could transform public spaces.



Setting up the Indore carpentry workshop

- Scaling up production of play opportunities through recycling local materials and setting up a carpentry workshop:** The Indore Smart City Development Limited, the Indore Municipal Corporation, and the Indore Forest Department have jointly set up a carpentry workshop to upcycle excess local wood to mitigate the challenge of meeting expenses. The workshop is providing age-specific, customised play equipment that offers a multisensory experience. The workshop is fast emerging as a play product experimentation centre, setting a benchmark for other cities to emulate.

These strategies have helped facilitate the adoption of children-friendly approaches in the local governments; there are also important learnings with regard to shortcomings and new directions that can be followed.

New Directions

The Smart Cities Mission of the Ministry of Housing and Urban Affairs is conducting placemaking marathons (Placemaking marathon: Azadi Ka Amrit Mahotsav) across the country to promote the re-imagination and transformation of public spaces. Several cities have adopted and are continuing to implement the child-friendly approach. Through adopting long-term changes in policies, cities are incorporating the young children-oriented lens into other programmes and projects. The narrative has expanded to other state- and city-level departments. For example, transit agencies in Karnataka are adopting a young children and family-friendly checklist to audit transit stations and the *Kayakalpa* rating for the PHCs that have been refurbished as part of the Challenge has improved. Although the Nurturing Neighbourhoods Challenge is already working on mainstreaming young children and caregiver-oriented development in Indian cities, the initiative still has a long way to go.

- **Improved accessibility to young children-centric destinations:** The initiative has enabled cities to act on developing public spaces and improving early childhood development facilities that cater to the needs of young children and caregivers. However, there is an underlying opportunity to draw greater attention to an integrated approach by improving the accessibility to these destinations. Neighbourhood streets are the first point of interaction for caregivers when they step out with their children, and provide access to public spaces and ECD facilities. Cities should focus on developing pedestrian-oriented streets, with safe walking experiences and first-/last-mile opportunities.
- **Focused attention to vulnerable settlements:** The Challenge also attempted to highlight vulnerable settlements, where young children and caregivers often have limited access to public spaces and ECD facilities. Cities have been making strides in carving out public spaces in informal settlements and slums, creating a positive impact on their daily lives. However, vulnerable settlements need more focused attention, whereby identification and creation of public spaces can help mitigate the boundaries between informal and formal neighbourhoods, and uplift vulnerable neighbourhoods.

- **Convergence with ongoing programmes and schemes:** Cities have also been leveraging convergence with various national-, state-, and local-level programmes and schemes to tap into funding. Along with convergence, cities can also allocate dedicated funding in municipal budgets for mainstreaming the development of young children- and caregiver-friendly spaces in cities.
- **Institutionalised community engagement:** The programme has helped facilitate continuous engagement with communities. It has created a clustering towards citizen-centric approach. However, institutionalising this in the long term, beyond the programme, in the absence of key officials who were involved in the process, remains a challenge. Therefore, this needs to be taken further across agencies through continuous engagement and continued in the future by creating robust policies and engaging with partners. The engagement should become a culture within the city officials and institutionalised by providing them guidelines and incentives. Involving the community in a formalised way will also help strengthen the network of champions with elected representatives and local leaders, who can help in generating demand and sustaining the paradigm.
- **Partnerships with private stakeholders:** Cities can identify opportunities to establish partnerships with private stakeholders to leverage funding opportunities. They can systematically identify private funding opportunities and mechanisms to bolster capital investment and support for maintenance. This will also facilitate pooling of resources from the community and can be the way forward. For instance, setting up play areas for children in the community after working hours can help in bridging the gap in the availability of resources.

Conclusion

The Nurturing Neighbourhoods Challenge has emerged as a unique, national government-led initiative that brings the young children-oriented lens to the development of Indian cities. The programme has wielded countrywide influence, effecting a paradigm shift in strategic thinking with regard to how cities can respond to the needs of young children while also addressing other emerging concerns such as climate change, and adopting a gender-friendly approach to developing safe, accessible, and inclusive neighbourhoods.

Apart from the primary target of SDG 11.7, the Nurturing Neighbourhoods Challenge contributes to other targets within SDG 11, such as 11.2 (affordable and sustainable transport systems) and 11.6 (reducing environmental impact of cities), by incorporating policy changes for transit vehicles and stations as well as promoting public spaces that support climate action. Furthermore, by catalysing the improvement of anganwadis, the Challenge supports SDG 4.2, which seeks to ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education.

Sustained critical conversations among local governments, communities, and other stakeholders are essential for scaling young children- and caregiver-friendly public spaces and facilities, and for ensuring equitable access to the same. For long-term sustenance of these initiatives, infrastructure and services must be developed alongside softer measures aimed at influencing positive behaviour and developing a sensitive attitude towards the unique needs of young children and their caregivers.

Through the course of the challenge, various processes, adopted by cities, can help in coming up with replicable ideas and templates which can continue to become references for decision-makers and urban practitioners for implementing and scaling up young children-friendly initiatives across the country. This will further enable cities to prioritise the well-being of young children and their caregivers in their urban planning efforts.

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Empowering Cities, Engaging Communities: Data-driven Transformations in Urban Governance

Centre for Urban and Regional Excellence (CURE) and UN-Habitat

City managers and urban local bodies (ULBs) have a remarkable opportunity to foster inclusive growth and transform India's urban landscape through informed and strategic urban governance initiatives. However, ULBs in India continue to face challenges in planning due to the lack of suitable data necessary for effective design and planning. This results in substantial economic losses, estimated to be between US\$330 billion and US\$1,800 billion by 2050.¹ The Centre for Urban and Regional Excellence (CURE), a

Delhi-based not-for-profit development organisation, launched the URBGOV initiative in 2016 to promote inclusive and sustainable development with community participation in India.

The initiative introduced a game-changing approach that empowers communities to contribute data, make informed choices, and participate in decision-making processes. It uses a tech-based platform to integrate community-level data with geographic information systems (GIS)

to facilitate data-driven city planning and management. Bridging the gap between communities and cities to foster inclusive, sustainable, and resilient urban development, URBGOV addresses the challenges urban communities face and contributes to advancing goal 11 (sustainable cities and communities) of the Sustainable Development Goals (SDGs).

An Open-Source Revolution: Transformative Innovations for Inclusive Cities

URBGOV employs open-source software for the low-cost implementation of a user-friendly, scalable, web-based platform. The data collection process leverages a crowd-sourcing application for integrating spatial and non-spatial community and city data through phone usage, streamlining data gathering while ensuring credibility. Moreover, open-source software negates the necessity for highly specialised GIS experts in underserved towns without spatial data. URBGOV collates the geolocation of city infrastructure from ULBs and integrates them with participatory community maps generated from crowd-sourced sectoral data (sanitation, water, waste, and health) to understand availability, access, utilisation, service quality, and trunk infrastructure proximity to implement comprehensive ecosystem solutions for city development.

The initiative operates under two development tracks: the crowd-sourcing mobile application, and the algorithmic design for integration, visualisation, and effective planning by city managers. The mobile application was developed through an extensive participatory process tailored to ensure the inclusion of women and marginalised communities with limited access to hardware and soft skills. The backend algorithm-driven software was developed in collaboration with the East Delhi Municipal Corporation (EDMC) and piloted among the local municipal staff for testing. The software was then expanded to 15 other ULBs in Agra, Noida, Shamli, Ajmer, Muzaffarpur, Rourkela and Dharamshala to validate and standardise the design, enabling a wider implementation for a variety of use cases.

URBGOV's Tech-enabled Triumphs

URBGOV's impact has been far-reaching. Cities have gained a user-friendly, tech-based solution for efficient data collation and resource allocation, while communities now have greater agency in urban planning as enabled by the platform. URBGOV has seen several noteworthy achievements—in the EDMC, it identified 49 community toilets and 51 new locations for construction and repair, benefitting

around 25,000 underserved individuals; in Dharamshala, the mapping of 320 water springs now provides clean drinking water to 500 people; and Rourkela successfully mapped all community toilets and waste stations that benefited 1,200 individuals in four leprosy-affected colonies. Furthermore, URBGOV's integration into Agra's SMART City Plan underscores its growing influence and impact.

URBGOV is a lighthouse initiative showcasing the transformative potential of participatory approaches involving communities and ULBs, and their innovative use of technology. By providing cities with a user-friendly, technology-driven solution for data collation and resource allocation, URBGOV catalyses progress across multiple SDGs. Beyond its primary focus on SDG11, it enhances progress in achieving particular targets under SDG3 (good health and well-being), SDG6 (clean water and sanitation), SDG8 (decent work and economic

growth), and SDG10 (reduced inequalities), leading to broader societal improvements. For example, URBGOV's role in mapping water springs and identifying sanitation facilities has enhanced access to clean drinking water and proper sanitation, which is integral to ensuring healthier lives and well-being, particularly for underserved populations. Efficient planning facilitated by URBGOV creates a conducive environment for economic activities and growth, thereby fostering decent work opportunities for individuals within urban communities. By offering a platform that empowers local communities to actively participate in urban planning, URBGOV democratises the planning process, ensuring inclusivity, and addressing inequalities. URBGOV's inclusive design, simplicity, and adaptability make it a global model for urban governance initiatives, demonstrating the power of local engagement and data-driven decision-making for sustainable development.

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RESPONSIBLE CONSUMPTION
AND PRODUCTION



12

India's Circular Design Challenge: Where Fashion and Sustainability Meet

Reliance Industries Limited and UN In India



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Circular fashion is not a concept adopted from global trends; it means going back to Indian traditions and reconceptualising what sustainability means in the national context.

At a Glance

- India is a global leader in textile production. Amid the global transition to environmentally-conscious practices, R|Elan™ launched the Circular Design Challenge (CDC) in partnership with the UN in India to support the country's mission of becoming a sustainable fashion hub.
- The CDC advocates for the recognition of India's heritage, the relevance of creating fashion labels with social impact, and the necessity of adopting a circular manufacturing model.

- Through an annual competition, the CDC has offered economic support, mentorship, and an exclusive platform to four innovative designers to incorporate circularity into their creative and productive processes. Moreover, it has supported 25 alumni through workshops and networks to gradually transform India's fashion ecosystem.

Introduction

The 2030 Agenda for Sustainable Development calls for all stakeholders, including businesses, to be responsible for advancing the 17 Sustainable Development Goals (SDGs). To promote sustainable consumption and production in the economy, businesses are increasingly developing solutions to transform their operations, strategies, and decision-making processes to ensure a more inclusive and sustainable future.

For instance, in 2018, R|Elan™, a pioneering textile innovation brand under Reliance Industries Limited (RIL), along with the United Nations Environment Programme (UNEP) and Lakmé Fashion Week, launched the first Circular Design Challenge (CDC), aiming to have India lead in advancing SDG12 (ensure sustainable consumption and production patterns).

In its four editions so far, the platform has consistently attracted participants from more than 40 cities in India across the textile value chain. Designers and entrepreneurs showcase products and innovations rooted in the principles of circularity, eliminating waste and pollution, recycling products and materials at their highest value, and regenerating nature to ultimately reduce the negative impact of the textile and fashion industry on the environment.

Since its launch, the CDC has nurtured, mentored, and promoted environmental champions leading circular and innovative collections using sustainable and recycled materials. The programme has received nearly 600 applications from across India in all editions. Since 2022, the CDC's partners have identified and nominated global talent from the UK, Germany, and other countries to participate in the contest. In 2023, the CDC's accomplishments earned R|Elan™ the Sustainability Impact Award, granted by UBS Forums, for its contribution to the future of fashion through its commitment to responsible production within the apparel industry.

The environmental cost of fashion

The CDC fosters innovations to transform the fashion industry. Under current global production practices, a truckload of abandoned textiles is incinerated or dumped in a landfill every second.¹ Meanwhile, on the consumption side, at the beginning of the century, people bought 60 percent less clothes and wore them twice as long as in 2015.²

Between 2005 and 2016, the clothing and textile industry's impact on climate change increased by 35 percent.³ Today, it is responsible for between 2 percent and 8 percent of the world's greenhouse gas emissions.⁴ Moreover, due to the popularisation of polyester, acrylic, and nylon—plastics that comprise 60 percent of all clothing material—textiles now account for approximately 9 percent of annual microplastic pollution in the oceans. Apart from this, the water-intensive stages of fibre production consume around 215 trillion litres of water per year.⁵

The industry, therefore, must undergo a deep transformation. A potential solution is adopting the principles of the circular economy, a system aimed at minimising waste and making the most out of resources. In this context, RIL seeks to make India a global leader in resource utilisation, sustainability, and circular economy adoption. As such, the CDC was conceived to bring India's fashion industry a step closer to ensuring sustainable consumption and production patterns—essentially the spirit of SDG12.

In particular, the CDC supports SDG target 12.2 of efficiently using natural resources by promoting the utilisation of sustainable materials. The project emphasises India's comparative advantages—for instance, that the country is the world's largest producer of organic cotton.⁶ Similarly, the CDC takes into account that India accumulates 8.5 percent of the global textile waste each year, and so works to advance efforts towards SDG target 12.5 by reducing waste generation through recycling and upcycling. It also works towards offering alternatives for the 41 percent of textile waste that does not return to the Indian textile industry through recycling.⁷ These efforts make the CDC a one-of-a-kind, pioneering initiative, promoting thought leadership in sustainability and circularity within the apparel industry and nurturing environmental champions in fashion to make India a global leader in circular design.

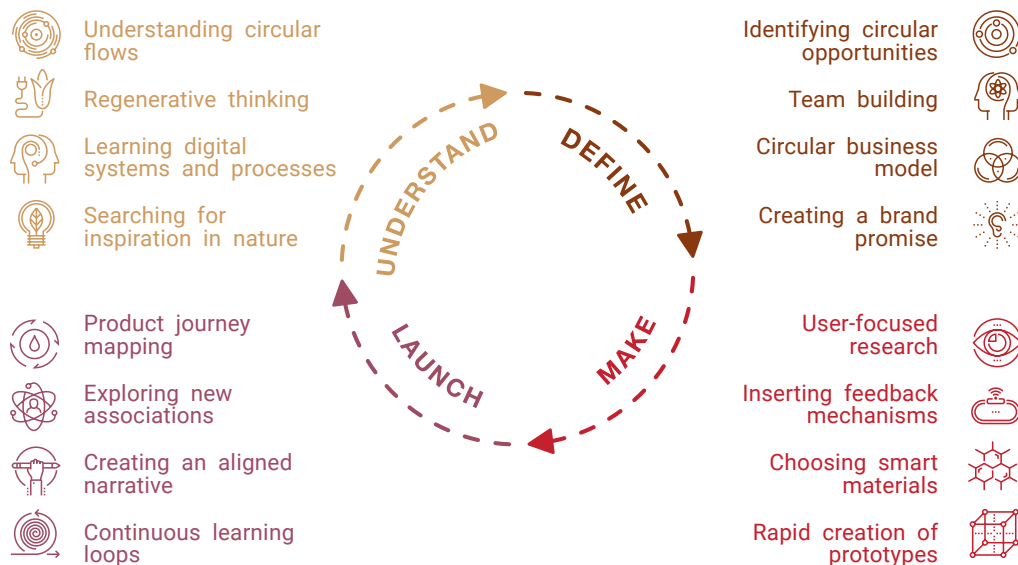
Circularity: The key to long-lasting garments

The CDC's main task has been reconciling sustainable environmental practices with the fashion and textile industry while promoting social and economic development. India is the world's second-largest polyester, silk, and fibre producer.⁸ This domestic industry contributes approximately 2 percent to the country's GDP and represents 11.4 percent of its total exports.⁹ However, the industry also drives environmental degradation. The CDC attempts to bring fashion back to its cultural roots, reminding Indians how garments such as saris were passed down from generation to generation until the piece lost its shape, and the fabric was repurposed to fulfil other household needs.

According to Darshana Gajare, head of sustainability for Lakmé Fashion Week, circular fashion is not a concept adopted from current international trends, but rather it means "going back to Indian traditions and practices, and reconceptualising what sustainability means in the national context, which cannot be understood without celebrating craftsmanship or considering a brand's social impact."¹⁰ This was incorporated into the vision of the CDC and into the evaluation rubrics of the proposals.

The CDC calls for moving away from linear production methods, defining a circular business model, making products that are user-focused with smart materials, and launching the concept to market to gather feedback and evolve.¹¹ As UN Resident Coordinator Shombi Sharp explained to the author, "The innovations we have already seen from the CDC and Sustainable Fashion Day, unlocking circular solutions like sustainable materials, conserving water and converting waste fabric into beautiful clothes, demonstrate that fashion can be a driver of responsible production, consumption and the 2030 Agenda."

Figure 1: Circular Design Methods



Source: *The Circular Design Guide*

However, a major challenge was the knowledge gap that Indian designers experienced in translating circularity into viable business models. The UNEP, a key stakeholder of the programme, had the expertise to teach innovators what it means to create a circular brand—from evaluating the materials to understanding the lifecycle of the products. Moreover, in 2022, the UNEP began offering courses on designing effective communication campaigns for sustainable fashion and using science-based tools and thinking. Similarly, R|Elan™ and Lakmé Fashion Week offered participants networks and extensive resources to grow in the sustainable fashion industry.

Supporting disruptors: Designers who are transforming the fashion industry

Held annually, the CDC functions as a fashion contest that allows the most innovative designers to learn from each other and take their brands to new heights through the support of renowned mentors. To participate, designers apply by filling in a questionnaire about sustainability and circularity in all stages of their creative and productive processes, including their brand’s social impact and their business model’s potential to scale. Each application then goes through a detailed scoring framework to select the semi-finalists. This

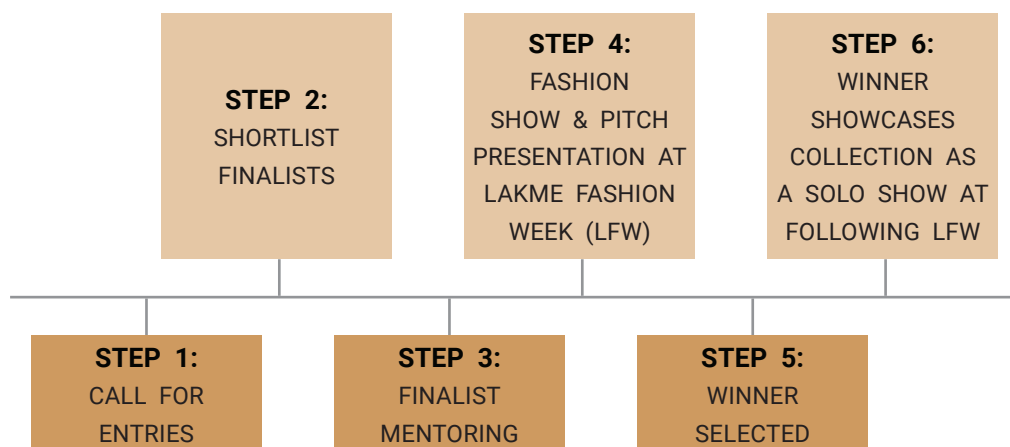
shortlisted group presents to a jury, who subsequently selects between six and eight labels. Finalists are granted the opportunity to pitch their brand to an internationally renowned jury, who evaluate their collections and impact stories. The qualifiers go through about four weeks of mentorship on design, marketing, styling, and communications, conducted by experienced professionals with backgrounds in sustainability and waste. The mentorship provides designers with the expertise to increase their understanding of circularity and its implementation in their brands.

The winning designer receives a cash prize of over US\$18,000, a solo showcase slot at the Lakmé Fashion Week, a stall space in its showroom, as well as six months of mentorships with circular fashion experts such as Pranav Khanna, director of strategic initiatives at LOA Labs and who has extensive experience supporting start-ups in the climate space, and Karishma Shahani Khan, founder of the sustainable and socially conscious clothing label Ka-Sha. For its 2023 edition, the CDC will offer the winner and runner-up a six-month mentorship with Orsola De Castro, an upcyclist, fashion designer, and co-founder of Estethica, a hub for makers and thinkers ready to develop new systems for the fashion world to build sustainable and ethical labels.

Figure 2: The stages of the Circular Design Challenge

PROCESS

The form takes into consideration circular design principals, social impact, UN SDGs and potential for scalability.



CDC winners have demonstrated the talent and innovation present in India and their potential to revolutionise the fashion industry. They embody the sustainable thinking of circularity and the social responsibility to keep pushing India forward, which makes them the ultimate enablers of the challenge's impact on the broader fashion ecosystem.

In its past editions, the CDC has selected four ground-breaking winners that combine fashionable proposals with scalable and environment-friendly innovations and techniques. Their endeavours are detailed as follows:

- **I was a Sari (2019)**

“Winning [the] Circular Design Challenge was a turning point for our brand. Our ecosystem has grown bigger, and we are now working with more partners confidently to reach our potential. We are now playing an active role in the global movement and dialogue on sustainability and circularity.”

-Stefano Funari

'I was a Sari' is an eco-ethical lifestyle fashion brand that collects discarded saris and upcycles and reinvents them into unique pieces.¹² Founder Stefano Funari managed to add value to pre-loved fabrics with work done by women from an underprivileged community in Mumbai who received skills training in embroidery, stitching, pattern-making, and cutting. The brand's innovative approach took them to the UN Environmental Summit in Nairobi. In 2018, the brand also won a spot in the Gucci Equilibrium programme, an incubator that supports nascent brands, and won the Responsible Disruptive Award in Milan in 2019.

After winning the CDC, 'I was a Sari' grew its artisan community from 64 crafters in 2017 to 247 in 2022, going from remunerating 53,372 hours of work to 2,71,000, economically empowering many women in Maharashtra.^a Through the pieces designed and sold, the brand has upcycled 1,164,680 square metres of fabric.

^a Brand's internal report to CDC.

- **Malai (2020)**

“It’s been an amazing experience being a part of Circular Design Challenge. We have had a chance to interact and get to know a lot of likeminded people with very inspiring stories. It’s been an amazing journey for us and I would definitely encourage emerging entrepreneurs to apply.”

- Zuzana Gombosova

Susmith Chempodil and Zuzana Gombosova, the co-founders of Malai Biomaterials Design, found a sustainable alternative to leather while working with local coconut farmers in Kerala. They collected waste coconut water and banana fibre to grow bacterial cellulose and transform it into the vegan leather that they called ‘*malai*’, a nod to the rich cream that garnishes traditional Indian dishes. Their initial business model was limited to being a smart material provider to other labels in the fashion value chain. However, when completing the CDC application, they were pushed to explore the creation of a brand as the challenge requires pitching a product. Through their CDC journey, Chempodil and Gombosova have developed an entire range of accessories, bags, and footwear with a truly circular lifecycle.

- **Bandit (2021)**

“Winning CDC was an absolute game changer. It has not only changed the way we think about how to do business, but also helped with our designs. This is all because of the design mentoring and business mentoring the team had for us. And this went beyond after the challenge was won.”

- Satyajit Vetoskar

On a flight from Goa to Mumbai during the monsoon season, Satyajit Vetoskar thought about the possibilities that tarpaulin (a strong and inexpensive waterproof material often used to cover houses and businesses from the wind and rain) could offer to urban fashion. The material covers homes and commercial establishments across Indian cities during the rainy months, but once the season ends, it is often discarded, contributing to the plastic waste littering the planet.

Through its recycling practices, Vetoskar’s brand Bandit incentivises a new value chain that creates economic opportunities and helps establish procedures to make treated materials easily available in India. Recognising the relevance

of social impact, the brand's fashion pieces are handmade by local women artisans. Besides this, 10 percent of its profits are given to SETHU, a non-governmental organisation that works with children with special needs in Goa. Along with producing beloved fashion items, the brand also manufactures sleeping bags for homeless people.

Bandit has upcycled 1,000 metres of tarpaulin and canvas. Since winning the CDC, the brand has also extended its upcycling skillset into various other materials and products. It repurposes flex, tar, and elements from the transport industry (such as seatbelts) to create ecobags; aircraft aluminium to make fountain pens, jewellery, and watches; and army tent canvases to create shoes. The label has been able to position over 10,000 units in the market.

- **Pieux (2022)**

“CDC gave me the opportunity to learn from the best in the industry. [...] Having a name like CDC associated with the label gives validation that it is a circular sustainable brand. It acts like a certification of sustainability which has a huge respect in the industry.”

-Pratyush Kumar

Pratyush Kumar deconstructed and reconstructed old clothes and discarded carpets to give them an extended life through luxury apparel. His brand, Pieux, works closely with artisans in Uttarakhand and Uttar Pradesh to source discarded materials. As Ektaa Malik writes in *Voice of Fashion*, Pieux puts into practice the Indian *jugaad* approach to problem-solving with limited resources through its innovations, constructing modular pieces like footwear and eyewear for longevity.¹³

Since its inception, Pieux has been able to recycle 1,800 PET bottles and upcycle 130 kilograms of discarded carpet. The brand has sold 18 high-fashion pieces of innovative design. Kumar has even begun conversations with handloom weavers in Jaipur to explore incorporating recycled polybag textiles for his future designs.

The CDC thus leverages promising designers by offering them resources to create world-class collections. Its alumni are often recognised for their disruptive proposals. Consider the case of Fleather, an alternative to leather

made from floral waste invented by Ankit Agarwal, which was awarded by PETA for “Best Innovation in Vegan Fashion.”¹⁴

The CDC’s dedication goes beyond the winners in its commitment to transform the entire industry in India. Finalists are often invited to participate in extensions of the project. In March 2023, while launching its global expansion, the CDC hosted a special showcase by three alumni labels, Chamar, Doodlage, and Iro, that create pieces from industrial leftovers, automotive scraps, and upcycle materials with indigenous craft practices. Alumni designers like Pratyush Kumar, Nece Gene, and Sanah Sharma are also part of projects run by R|Elan™ and Lakmé Fashion Week, such as EarthTree, an initiative that recycles PET bottles collected at Fashion Week to recycle them into limited-edition gift t-shirts. Through its initiatives the CDC bets on supporting the spearheads of the fashion transition to sustainability in India, thereby creating precedents that can be replicated and adopted by clothing labels, and showcasing success stories to inspire upcoming designers.

Towards a global environmental revolution

The CDC’s growth phase during the COVID-19 pandemic deprived some cohorts of face-to-face interaction with mentors and juries. However, the health emergency strengthened the global consciousness to work towards more sustainable practices and truly transform the way we produce and consume. Therefore, the CDC’s new challenge is to continue growing its credibility, making its network more robust by building the right partnerships to transform the fashion ecosystem in India and globally.

There is extensive potential in sustainably connecting and educating all links of the fashion value chain. The CDC has increasingly incentivised consortiums to apply, as having participants with pre-established networks enables wider knowledge transmission and adoption of circular practices.

Similarly, the CDC constantly develops ideas to reach a broader range of designers. For instance, it is exploring the possibility of providing mentorships to conventional fashion labels in the future. Through workshops conducted

under the CDC, existing brands could learn to incorporate circular practices in their processes and gradually transition their production lines to be more climate-conscious while also remaining profitable, driving economic growth in India.

Ultimately, what started as a quest towards end-to-end sustainable manufacture has demonstrated its potential to become a beacon in its niche, fostering thought leadership in the national textile market. This has raised ambitions for collaborations with partners worldwide. Therefore, in 2023, the CDC is expanding globally by including partners from Europe and the Asia-Pacific region. The competition's fifth edition, to be held in October 2023, will include partners from the British Council, the Istituto Marangoni, and the Redress Award.

Including international like-minded organisations will allow the pollination of ideas on sustainability, and the sharing of best practices and knowledge to increase the CDC's impact. For example, the Redress Award, headquartered in Hong Kong, has been working for over a decade to accelerate the transition to a circular fashion industry in Asia. Similarly, Istituto Marangoni is an acclaimed Italian fashion academy (with branches in China, the US, and India) that encourages innovative designers. These partners have joined renowned institutions like the British Council, which supports the CDC in building connections and opening opportunities for designers. As such, 2023 will mark the CDC's outward expansion, and the rise of India as a global leader in sustainable fashion.

Conclusion

The CDC was initially conceived as a small-scale project, helping one designer a year grow their sustainable brand. But its mission has always been of the big picture: contributing to the sustainable transition of the fashion and textile sector.

With its steady growth, the CDC has demonstrated that the labels it fosters directly help the advancement of SDG12 on responsible consumption and production. The winners have proved that it is possible to decouple the

celebration of fashion from resource use and reduce the industry's material footprint. By doing so, the CDC has strengthened one of RIL's missions—promoting sustainable alternatives for materials, processes, and practices in fashion design, and much-needed investment to transition to circular production methods.

The CDC's upcoming edition will open opportunities for knowledge exchange and facilitate the projection of India's interest in sustainability to the world. The goal is to keep expanding the project to the US, countries in Africa, and other geographies while maintaining the mission of helping the ecosystem in India advance and be at the forefront of the fashion and textile revolution.

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CIRCULAR DESIGN CHALLENGE



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CLIMATE
ACTION



13

Mainstreaming Climate and Environment in Decision-Making: The Role of Green Budgeting

The Energy and Resources Institute (TERI)



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Green budgeting incorporates environmental goals into budgeting, ensuring that resources are available for programmes that advance sustainable development.

At a Glance

- ‘Green budgeting’ refers to the use of budget policy-making instruments to support environmental and climate objectives.
- Green budgeting can contribute to the development of strategies for Sustainable Development Goal 13 (SDG13) as well as policy coherence under SDG17 by supporting state and national governments in achieving their environmental objectives.

- It can be a key enabler for sustainable and environment-sensitive budgeting at all levels, helping drive the global shift towards a greener future.

Background

'Green budgeting' is a policy innovation that serves as a planning and self-assessment tool, which can contribute to institutionalising and integrating environmental sustainability into various government initiatives through the annual budgeting process to promote a system-wide approach. Through *ex-ante* planning and *ex-post* reflection, departments/ministries can reorient their goals, schemes, and policies to become more climate- and environmentally sensitive. Following this, government bodies can also assess how much a particular entity contributes to environmental sustainability and plan for future innovations within the existing schemes. The process of conceptualising an approach and a method of green budgeting started at The Energy and Resources Institute (TERI) in 2014. The organisation, with support from the Punjab State Council for Science and Technology, Department of Science, Technology, and Environment, prepared an Action Plan on Green Budgeting for India.

Bihar became the first state in the country to adopt green budgeting in 2020. The green budget was tabled in the State Legislative Assembly after the Budget session. Puducherry became the first federal unit to announce its green budget in Legislative Assembly during the Budget session (Government of Puducherry, 2023). This was followed by the state of Assam. Other states, such as Odisha and Meghalaya, have adopted 'climate budgeting', considered a subset of green budgeting. In a recent development, Puducherry also launched a green budget document, complete with an assessment of the baseline and various schemes (TERI, 2023). This article is based on TERI's experience in green budgeting through technical inputs, meant specifically for the state of Bihar and the Union Territory (UT) of Puducherry.

It has been three years since the launch of Bihar's green budget. During this period, the number of schemes has increased from 103 (FY 2020-2021) to 267 (FY 2021-2022), and further rose to 316 in FY 2022-2023. Puducherry conducted a baseline exercise for FY 2022-2023 and an actual green budgeting exercise for FY 2023-2024. For Puducherry, the baseline year includes 120 schemes while for FY 2023-2024, 134 budget schemes have been identified.



These numbers may indicate that an attempt is being made to mainstream environmental sustainability across various initiatives or activities.

The Challenge of Climate Change

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) states that human-caused climate change has led to widespread adverse impacts and related losses and damages across the globe (IPCC, 2023). India is facing significant environmental challenges, such as air pollution, water scarcity, deforestation, waste management, biodiversity loss, land degradation, and climate change (TERI, 2022). Public spending can have a huge impact on the environment, both beneficial and detrimental. The budget-making process serves as an annual tool not only for allocation of resources, but also for planning. According to the Ministry of Statistics and Programme Implementation (MoSPI) SDG Dashboard, expenses focused on environmental protection accounted for only 0.1 percent of the total government expenditure in India in 2019 (MOSPI 2023a, b). While environmental regulation is the principal responsibility of environment ministries and departments (both at national and subnational levels), their locus standi in the budgetary process is weak as budgetary allocation for them is less, compared with other departments. Therefore, it is essential that environment is mainstreamed across ministries, departments, and sectors.

A growing body of literature views green budgeting as a mainstreaming tool (Bova 2021; GOB 2022; GOP 2023; Petrie 2021; PSCST-TERI 2014; Russel and Benson 2014; Sinha et al. 2014; TERI 2020; TERI 2022; TERI and ADRI 2022; Wilkinson et al. 2008). Insofar as India is concerned, Statement 12 in the Union Budget deals with the 'Allocations for the Welfare of Children' while Statement 13 focuses on 'Gender Budget' (MoF, 2023). The practice of green budgeting is less prevalent, in India and across the globe, than gender budgeting and child budgeting.

Most environmental policy innovation tools have focused on specific areas and on addressing specific issues, such as air pollution, water pollution, waste management, land degradation, biodiversity loss, and climate change. These tools have been largely regulatory and market- and implementation-based. In terms of system-wide planning, the National Action Plan on Climate Change



(NAPCC) and the State-level Action Plan on Climate Change (SAPCC) are the key planning tools. These plans are, however, not prepared periodically. Considering the urgency of responding to environmental issues, periodic planning can be carried out, at least on an annual basis, with requisite implementation and monitoring mechanisms. Considering the need for a periodic planning approach as well as sufficient resources for environmental activities, TERI conceptualised the policy innovation of green budgeting.

Budgets are an essential tool for ensuring policy coherence through mainstreaming sustainable development outcomes in economic policy; these are an important means of implementation. Institutionalising green budgeting can lead to a more proactive mindset among departments to better plan and coordinate within the existing fiscal space. Green budgeting can also facilitate the interdepartmental planning process to better respond to environmental issues. It also fosters transparency and accountability in public spending, ensuring that environmental concerns are adequately considered while planning for various initiatives; and encourages innovations within existing initiatives through the adoption of green technologies and practices. It also helps create opportunities for sustainable businesses, along with green jobs. Green budgeting is a mechanism of budgetary policymaking that can help in systematically mapping and tracking the sources of funds, outlays, expenditures, and policies; this in turn can support coordinated policy design and identification of periodic and continuous finance needs to achieve green objectives, i.e., those related to the climate and environmental dimensions.

Climate change is today widely considered the greatest existential threat for the planet. To address climate change, countries have submitted nationally determined contributions (NDCs) and have also come up with long-term strategies and national plans. Green budgeting addresses not only SDG13, but other SDGs as well. This is one point of differentiation between green budgeting and climate budgeting, wherein green budgeting considers climate budgeting along with addressing other environmental challenges (local and global). Green budgeting is a cross-cutting policy innovation, which has the potential to contribute to at least 14 SDGs (1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, and 15), apart from facilitating policy coherence (SDG17).

Governments are increasingly using or proposing green budgeting to better align their policies to climate and environmental goals in response to transboundary and local environmental concerns (European Commission et al., 2021). The initiative focuses on incorporating climate change measures into state policies through strengthening the institutional capacity for climate adaptation, mitigation, resilience, and climate risk reduction, directly addressing SDG13 that seeks to “take urgent action to combat climate change and its impact”. Green budgeting is directly linked to several objectives and indicators of SDG13, which focuses on climate action. For instance, Target 13.2 urges inclusion of climate change measures in national planning, plans, and policies. By ensuring this, climate-related investments and expenditures are accorded top priority in national budgets. Green budgeting can make this integration easier. By incorporating climate factors into financial decisions, green budgeting becomes essential to achieving the objective of integrating climate and environmental considerations in planning, plans, and policies.

Apart from adding unique budget codes for tagging and tracking—a standard process followed for many issue-based budgeting processes—the approach in green budgeting also involves a mapping exercise regarding themes, activities, and SDGs. The idea behind additional mapping is to strengthen self-assessment and, in the longer term, link the budgeting process to the state indicator framework for the SDGs to understand state-/UT-level performance under relevant SDGs.

Considering the limited understanding of green budgeting, TERI engaged in initiatives to contribute to co-developing a method of green budgeting, along with building capacity in government set-ups for this policy innovation.

The Green Budgeting Approach

As is the case with new policy innovations, there was some hesitancy regarding adoption of the practice, taking into account the additional workload and the resource allocation required to implement and integrate this new concept into existing processes. Lack of knowledge and understanding of the concept itself was a challenge. Many stakeholders grappled with understanding the principles and the process, to begin with; this made it difficult for them to appreciate its importance and relevance. To address this challenge, the TERI team felt that



it was necessary to simplify the concept and minimise the use of jargons in current Western conceptualisations of the approach.

Second, it was important to structure the process by using pro formas. Third, the process had to be made more relatable with examples from child budgeting and gender budgeting. For this, the team also engaged with various departments, making one-on-one presentations for the finance and environment departments, and having departmental meetings, which ultimately led to the creation of pro formas for Bihar and Puducherry. In the case of Puducherry, to improvise over other practices of green budgeting and climate budgeting, a baseline exercise was also undertaken.

Strong political will and commitment from finance, environmental, and other line departments are key. In the case of Bihar, this anchor was found in the *Jal Jeevan Hariyali* initiative, which had a strong bureaucratic and political support. For Puducherry, a climate-vulnerable UT, this anchor was found in the SAPCC process, which was being revised at the time of the initiation of the discussion between TERI and the UT government in 2022.

For Bihar, the finance department took on a high level of ownership for the policy innovation while in the case of Puducherry, this was jointly carried out by the finance and environment departments. The team also sought to build capacity at the state level. In Bihar, the Asian Development Research Institute (ADRI) was the state-level anchor while in Puducherry, it was the Puducherry Climate Change Cell (PCCC), under the Department of Science, Technology, and Environment. Both these entities also liaised with multiple departments during the process.

Method and Process for Green Budgeting

Green budgeting is a policy innovation and involves a seven-step process, as depicted in Figure 1.

Figure 1: Green Budgeting Process



After the initial interaction with various departments, a draft pro forma was circulated; it was finalised after receiving inputs from the departments. Themes and activities were developed and were part of the pro forma. The departments also had to provide budget head-wise justification in the pro forma. The themes and activities varied for Bihar and Puducherry because Puducherry had a coastal component while Bihar had a stronger component with regard to forest and biodiversity.

After the finalisation of the pro forma and the issuance of a circular by the finance department, departments identified schemes that promote environmental



sustainability and collect the corresponding allocation and expenditure data for the fiscal year. With technical facilitation, a unique budget code was identified for each budget head for tagging and tracking.

Case Studies: Puducherry and Bihar

In FY 2023-2024, 15 Puducherry departments selected a number of schemes based on the identified green components. For instance, the electricity department has a component that involves purchasing renewable energy in the form of solar and wind energy. The identified green budget in this scheme amounted to 14.29 percent of the total budget, allocated to the scheme. The scheme further contributes to such themes as renewable energy and climate change mitigation. Similarly, under the Department of Agriculture and Farmers' Welfare, the scheme for crop production and technology has green components in the form of activities that encourage practices which enhance crop productivity while improving water use efficiency, diversifying crops, integrating nutrient management, and utilising bio inputs. The scheme's overall budget contributes 100 percent to the green budget. It also contributes to domains such as water management, sustainable agriculture, sustainable land use, and watershed management.

In another case of green budgeting in Bihar, the Department of Environment, Forest, and Climate Change introduced the rehabilitation of degraded forest programmes that work for conservation of traditional forest land, soil, and water, and sustenance efforts, among other things. Under this scheme, 73.84 lakh saplings were planted in the financial year 2020-2021 to reduce the negative effects of climate change. Another programme in Bihar, *Jal Jeevan Hariyali*, planted 3.89 crore saplings in the financial year 2021-2022. Both schemes address achieving SDG 13 (Target 13.2).

Mapping Activities

The next crucial step in the green budgeting process involved mapping themes, activities, and SDGs to gain a comprehensive understanding of the identified schemes and detect any existing gap. Themes such as pollution abatement, climate adaptation, climate mitigation, research, and waste management, were included on the basis of geographical factors and scheme style. Mapping

activities were categorised as per their green skilling, capacity-building, subsidies, and other relevant factors, making the process more robust. This mapping exercise assessed the current status of policies and programmes, and identified areas, requiring new initiatives.

SDG mapping can play a vital role in showcasing how government initiatives align with the SDG framework. It involves mapping policy documents with the SDGs and the targets, using specific keywords for better alignment. This process can enhance the government's capacity to design, implement, and monitor coherent and integrated policies for sustainable development.

Decision support tools, such as the national indicator frameworks, provided by the Ministry of Statistics and Programme Implementation and the SDG Index, developed by the National Institution for Transforming India (NITI Aayog) (NITI Aayog, 2023), can assist in mapping schemes with the SDGs. These tools provide guidance and frameworks to effectively align schemes with the broader sustainability goals.

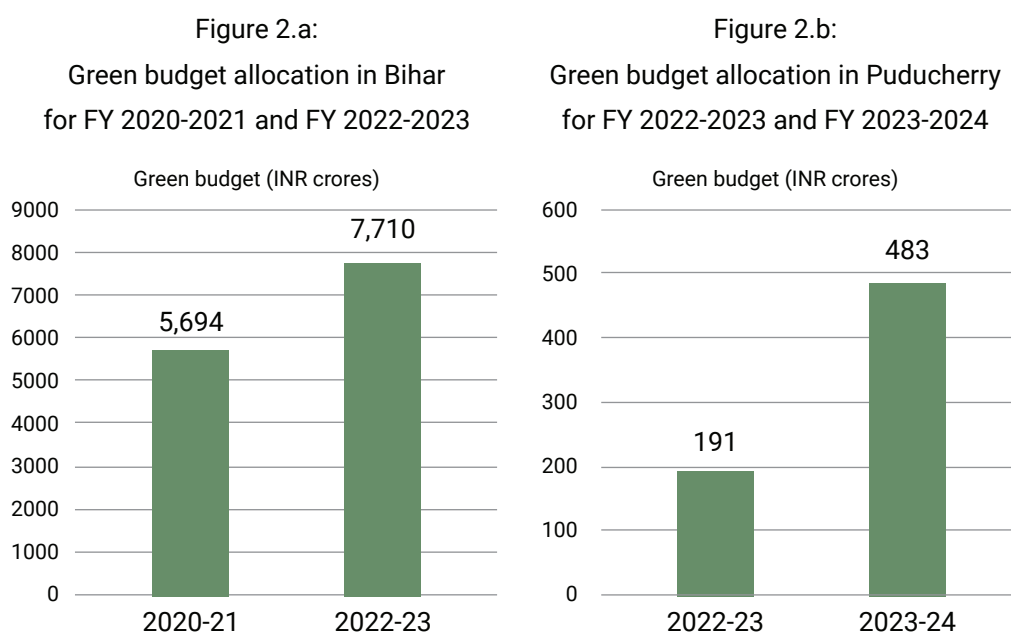
Implementation of green budgeting has shown significant results. In Bihar, the green budget increased from INR 5,694 crores in the FY 2020-2021 to INR 7,710 crores in the FY 2022-2023 (Figure 2.a). The number of schemes in the state also increased from 103 to 316 during the same period. The number of departments participating in the green budgeting process rose from 17 to 19 in the same time frame.

The green budget of Puducherry increased by 153 percent, from INR 191 crores in the baseline year of FY 2022-2023 to INR 483 crores in the FY 2023-2024 (Figure 2.b). In Puducherry, the baseline year had 120 schemes; for FY 2023-2024, 134 budget schemes have been identified. The number of departments participating in the green budgeting process increased from nine departments in the baseline year to 15.

Green budgeting is an evolving concept and once mainstreamed, it can be evaluated to assess the impact of those selected activities and schemes, over the years, on the environment, based on the indicators.



Fig. 2. Green Budget Changes in Bihar and Puducherry



The Way Forward

Even as implementation of green budgeting in India has started making strides, it can be strengthened further. To begin with, data availability and quality need to be bolstered. Improving data collection systems and ensuring accurate and reliable environmental indicators, along with actual expenditure, are key. Second, capacity building and raising awareness among policymakers and budget officers is crucial. Third, establishing mechanisms for departments to share information, best practices, and lessons learnt can enhance the integration of environmental considerations across different sectors. Fourth, incorporating robust monitoring and evaluation mechanisms is necessary. Regular assessment of green budgeting initiatives will help track progress and identify areas that require adjustments or further mobilisation of resources. Last but not least, a peer review mechanism can be established with strengthened public participation and stakeholder engagement.

As green budgeting continues to evolve and adapt to emerging challenges, it is essential to make the reporting process stronger and more comprehensive. Green public procurement is one area that can be included in the process. By integrating green criteria into public procurement policies, governments can promote sustainable consumption and production patterns, and drive the

demand for environment-friendly goods and services. Furthermore, reporting of green budgeting on actual expenditure is crucial. Reporting on actuals provides transparency and accountability by highlighting the actual flow of funds and expenditure on environmental initiatives. This information serves as a baseline for monitoring and evaluation, allowing for comparison of progress over time and facilitation of evidence-based decision-making.

To further advance green budgeting in India, it is necessary to encourage its adoption across the country. This can be achieved through knowledge-sharing platforms, capacity-building programmes, and dissemination of best practices. When new environmental concerns such as biodiversity conservation, circular economy, and sustainable transportation arise, the green budgeting process should adapt and expand its coverage to address these issues effectively.

Through developing a green budgeting portal, TERI aims to document and share knowledge, advocate for change, and catalyse systemic shifts (TERI and ADRI 2023). It is also important to highlight the limitations of this policy innovation. Green budgeting, as a first step, seeks to serve as an accounting tool for reporting on environmentally beneficial and environment-promoting expenditure and policy actions that can help inform stakeholders about who spends (which government department) money on which environment-related activities; how much they spend; and on which aspect they spend. Analysis of only positive expenditures does not tell the full story and at an early stage, a green budget does not evaluate the efficiency of environmental expenditure. The limitations, however, cannot take away the advantages of such an exercise. At present, the practice of green budgeting entails gross budgeting. In the long run, net budgeting can also imply subtracting expenditure regarding environmentally unsustainable budget heads. Moreover, on the revenue side, fiscal instruments, involving green taxes, can be considered.

Green budgeting can serve as a lighthouse initiative by illuminating the path towards sustainable financial practices and inspiring others to follow. Indeed, after Bihar's adoption of green budgeting, other states opted for this policy innovation either in the form of green budgeting or climate budgeting.

In the case of Puducherry, 12 out of 15 departments contributed to SDG13. In Bihar, 11 out of 19 departments contributed to SDG13 through various activities. For Bihar, apart from SDG13, green budgeting was mapped for 11 other SDGs (2, 4, 5, 6, 7, 8, 9, 11, 12, 14, and 15). For Puducherry, it was mapped for 13



other SDGs (1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 14, and 15), in addition to SDG13. Green budgeting is in its initial stages; the primary objective includes departmental sensitisation and self-assessment of the 'green-ness' of existing schemes. Green budgeting helps develop strategies to achieve SDG13 by supporting governments to meet their state and national environmental goals. At the second level, allocations can be mapped against SDG targets and state-specific indicators. At the final level, actual ground-truthing, based on evaluation studies, can be undertaken to understand the impact on the ground. Numerous changes occurring due to climate change have a detrimental impact on people, animals, plants, and microorganisms that are crucial to ecosystem. SDG13 aims to drive adaptation actions and help reduce greenhouse gas emissions that cause climate change.

Through green budgeting, environmental goals are incorporated into the budgeting process, ensuring that public finance resources are available for initiatives and programmes that advance sustainable development and combat climate change. Governments contribute to SDG13 by allocating funds for sustainable infrastructure and climate resilience measures by expressly taking climate change mitigation and adaptation into account when making budgetary decisions. This exercise can encourage departments to adopt a proactive attitude and improve planning, coordination, and synergy within the current fiscal environment. Green budgeting is not a silver bullet, but it is definitely an important tool that can pave the way for a more sustainable and environmentally sensitive approach to budgeting at various levels, thereby contributing to the global transition towards a greener future.

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LeasyScan for Climate-Smart Crop Breeding

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Introduction

Climate change and natural disasters (many of which are amplified by climate change) are having significant, widespread effects on agriculture. The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) collaborates with many organisations in the formulation of agricultural solutions to mitigate the negative consequences of climate change. These include technologies for developing climate-smart crop varieties, such as the phenotyping technology LeasyScan. The promotion of climate-smart agriculture brings the world closer to

SDG13, helping reduce poverty and deaths related to the impacts of global warming on agriculture.

The LeasyScan (LS) platform is currently used by many stakeholders in the agricultural sector, including agronomists, breeders, and genebanks, in the process of breeding resilient crop varieties to enhance agricultural productivity. Used by various national and international organisations, LS helps bridge yield gaps in the most climate-risk prone environments,



especially in the semi-arid regions of South Asia and Africa.

Insights from 3D Scanning Tech

LS was initially developed in 2014. It used a novel 3D scanning technique to generate 3D images through which leaf area development and other crucial parameters could be continuously monitored. These parameters are used to assess the capacity of the plant to thrive in response to various environmental stresses, such as heat, or low nutrient status.¹ LS 2.0 was created in 2021 with the up-to-date scanning technology PlantEye F600, a laser dual scanner that generates 3D images and adds multispectral information,² allowing plant growth and development to be modelled and traits values determined.

Traditional crop breeding relies on manual crop assessment, and identifying a new variety can require the assessment of thousands of potential crop lines. With LS, many specific climate-adaptive crop traits (such as drought or salinity-resistance) can be automatically evaluated more rapidly, accurately and non-destructively for a large number of lines simultaneously. LS has the capability to analyse 4,800

microplots or 20,000–40,000 plants and provide nearly real-time data. ‘Seed-to-data’ turnover³ is approximately 2.5 months, and thus it is comparatively rapid in producing usable data and is one of the largest existing platforms globally.

Impact and Outcomes

The LS platform is an open-service, and in 2023, the LS database will be connected to the global networks according to FAIR data principles⁴ to facilitate further research across the globe.

The platform is already being used by crop breeders to screen legume and cereal crops for adaptations that enhance drought-resistance. This has led to significant yield increases of around 10–20 percent—in the case of chickpea, variety ‘Pusa 372 improved’, leading to an 11-percent increase in yield under moisture stress in Indian trials. In the last eight years, the platform has served over 20 crop breeders working with diverse crops (over 12) in national and international organisations and in both the private and public sector. Gene banks use it to mine for specific plant climate-adaptations. Private businesses have also used it to evaluate crop responses

to agrochemicals much faster than they previously could. Finally, ICRISAT is itself working with plant pathologists to develop rapid, quantitative disease-screening protocols.

This technology has the capability to support stakeholders (including crop breeders, gene banks, seed- and agrochemical-producing companies, plant pathologists, and agronomists) for stabilising and enhancing production in the dry-land tropics and improving the well-being of poverty-threatened farming communities. LS services and data are open-access and thus facilitate further interdisciplinary collaboration.

By providing the means to build resilience to the ramifications of climate change by developing hardier crop varieties, the LS platform can be a crucial factor in the puzzle of climate-resilient agriculture, targeting SDG13. In turn, the platform impacts progress in SDG2 (No Hunger) and SDG15 (Life on Land). The outreach to farmers is indirect, as the outputs from this technology accelerate breeding selection for various climate-adaptive features. Its value lies in that it helps produce the most valuable and portable technology for farmers—that of improved crop seed.

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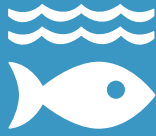
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- ⁴ In 2016, the 'FAIR Guiding Principles for scientific data management and stewardship' were published in *Scientific Data*. The authors intended to provide guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets.



LIFE BELOW
WATER



14

Riders to the Sea: Utilising Tech to Promote Sustainable Fishing

Reliance Foundation



Reliance Foundation not only provides information, but also guides and supports the conversion of information to action.

At a Glance

- The Reliance Foundation Information Services programme delivers, among others, scientific forecast services, training modules, and Potential Fishing Zone advisories, provided by the partnering institutions, in accessible formats through a unique Machli app, WhatsApp messages, text alerts, voice SMS, and a toll-free number to ensure the safety of fishers and support their livelihoods.

- The wide reach of the Reliance Foundation Information Services advisories helps save fishers' lives, protect fishing resources, and curb operational expenses while advancing sustainable fishing methods and raising public awareness on marine conservation. Through these interventions, the programme supports SDG14 that seeks to conserve and sustainably use marine resources.
- Reliance Foundation has brought together myriad organisations to consolidate data needed by fisherfolk, and create powerful informational tools in nine Indian languages and in English. Moreover, it offers feedback options by including hotlines and teleconsultation on its platforms.

Introduction

Reliance Foundation (RF) works along India's mainland coastline, reaching more than 25 percent of the country's active marine fisherfolk families. Since 2012, the Reliance Foundation Information Services (RFIS) has been disseminating tailor-made and value-added information through technology solutions to improve the livelihoods of target groups, and address their safety issues and those of their assets.

Informational services and safety guidance are vital for fisherfolk, who have both the capacity and the willingness to adopt such information. In this context, Reliance Foundation entered the marine fisheries sector in 2012 to fill an information gap. It connects knowledge seekers to knowledge providers, by sharing the right kind of information from the right sources to the right people at the right time. The Machli app, a flagship project of RFIS, has been providing Ocean State Forecast (OSF) and advisories on wind speed and direction, wave height, potential fishing zones, cyclones, and weather-related issues to its target communities. Such information is sourced from the Indian National Centre for Ocean Information Services (INCOIS), an autonomous organisation under the aegis of the Ministry of Earth Sciences, Government of India, for the benefit of the marine fishing communities along the coast of the Indian subcontinent.

Interventions led by RFIS ensure that scientific data are made available to fisherfolk in easily understandable language. These also ensure that early warning advisories reach target audiences on time through various communication channels, such as the Machli app, SMS/WhatsApp alerts,

outbound calls, local cable TV networks, FM radio, and videos and live content on Reliance Foundation's online platforms. Automatic weather announcements have helped reduce information asymmetries. The introduction of a toll-free helpline in 2014, which is regularly used by fisherfolk during critical conditions, has boosted their engagement with information; the helpline has become a no-cost, single point of contact at the national level with the capacity to handle multiple languages.

In 2020, the RFIS programme reached a milestone as it launched Machli, an android application that provides real-time data and informational resources to Indian fishing communities in English, Hindi, and eight regional languages. With these tools, diverse partnerships, and sensitisation workshops, the RFIS programme contributes to sustainable fishing practices to advance India's commitment to achieving SDG14 that seeks to conserve and sustainably use marine resources.

Disseminating Information, Strengthening Coastal Livelihoods

Fishery and aquaculture industries are among the fastest expanding agricultural allied sectors in India, contributing around one percent to the nation's gross domestic product (GDP) and over five percent to agricultural GDP.¹ In FY2022, the export value of fish and fishery products amounted to more than INR 579 billion,² which represents eight percent of global fish production and makes India the third largest producer in the world.³

Marine fisheries are a source of livelihood in the country for about 16 million people at the primary level and for almost double the number along the value chain.⁴ They provide an affordable and rich source of animal protein for the population and contribute to the country's socioeconomic development. Fisherfolk belong to one of the most vulnerable groups among the poor in India and around two-thirds of the traditional fishing families—living in the coastal states and Union Territories, such as Puducherry and Daman and Diu—are below poverty level. Fishing communities have to comply with restrictions for preserving natural resources and with coastal security protocols. Studies reveal that “one percentage point growth in agriculture and allied sectors, like fisheries and forestry, is at least two to three times more effective in reducing poverty than the same magnitude of growth emanating from the non-agricultural sector.”⁵



The motorisation of fishing in the 1950s, followed by its mechanisation in the 1980s, revolutionised the industry by allowing multi-day voyage and expansion of the fishing grounds.⁶ These developments, along with the introduction of satellite technologies, positively impacted export earnings, increasing their value from INR 3.92 crores in the 1960s to INR 12,901.47 crores in 2010.⁷ During the initial stage of this transformative period, there were no marine spatial regulations to prevent fishers from exploiting nearshore waters. Quickly, environmental deterioration decreased marine fish production. In the state of Kerala, for example, production fell from 553,000 metric tonnes in 2010 to 517,000 in 2015.⁸

Given the relevance of the aquaculture sector in India, the government has introduced policies, laws, and programmes to support sustainable practices. For example, in 2015, the Department of Fisheries launched its flagship scheme, Blue Revolution, aimed at ensuring the economic prosperity of fishers through sustainable utilisation of water resources. The programme, working on a budget of INR 2,573 crores, incentivised the adoption of environment-friendly technologies.⁹

The intervention also emphasised the need to have lean fishing periods implemented during the breeding season. Kerala, for example, in 1988 introduced the seasonal fishing ban (SFB) to protect spawners during the monsoons when reproduction rates reach their peak; the practice has since been adopted nationwide.¹⁰ These efforts have also included raising awareness of deleterious practices such as trawling, a method of fishing that involves pulling a fishing net tied to boats through the water, sweeping the entire seabed, including microorganisms, seaweed, and coral which are essential to marine life.¹¹

In 2020, the government further invested INR 20,050 crore in the sector through the *Pradhan Mantri Matsya Sampada Yojana* (PMMSY), a programme dedicated to developing infrastructure, aquatic health management, species diversification, and risk mitigation for marine fishers through the Ocean State Forecast (OSF) and Potential Fishing Zones (PFZs), developed by INCOIS.¹² Despite these commendable efforts, the knowledge produced had to be disseminated to fishing communities across the country in an accessible manner. This is the mission of Reliance Foundation through the Information Services programme—

bridging the knowledge gap between highly scientific tools and fishers in the country to support their livelihoods, increase their profits, and ensure safe practices.

Through the Information Services programme, Reliance Foundation contributes to the achievement of SDG14 (conserve and sustainably use marine resources). Specifically, it promotes Target 14.4 that aims at regulating harvesting, ending overfishing, and preventing illegal and destructive fishing practices by facilitating educational programmes and sensitisation workshops, and raising awareness of ban periods. It also buttresses SDG Target 14.b by providing small-scale fisherfolk with technological and informational access to marine resources.

Bridging the Information Gap: Reliance Foundation's Journey with Fishing Communities

Through its Information Services programme, Reliance Foundation began engaging with fishers from the coastal villages of Andhra Pradesh and Tamil Nadu in August 2012. Data collected in the initial stages showed that most fisherfolk owned keypad phones and very few had access to smartphones. Based on the understanding of the resources available for the communities and their way of accessing information, the collaboration with INCOIS was conceived in October 2012.

INCOIS offers forecasting of surface and subsurface oceanographic parameters at different time scales, useful for people sailing into the sea and for populations living along the coastline.¹³ Additionally, through the PFZ advisories, Reliance Foundation deploys a local, specific tool for precision fishing, sharing satellite-based fishery information from Monday to Saturday, with about 500 fish landing centres covering the entire mainland coastline of India.¹⁴

Reliance Foundation's first challenge involved finding a way to disseminate the information, making it accessible to all 'intervened' communities of diverse literacy levels and ensuring access to modern communication tools. Initially, this was carried out through a voice SMS (outbound calls) to the registered fishermen from Kakinada of Andhra Pradesh and from Nagapattinam and Ramanathapuram of Tamil Nadu, and by providing the personal numbers of RF team members who could address queries regarding the advisories. The



highly technical information, provided in nautical lingo, was translated to match the fisher's traditional unit of measurement; over time, experts were invited to resolve queries.

The project was expanded to other coastal villages, covering 150 of the 1,400 fish landing centres in the country. With this, Reliance Foundation had to also overcome the challenge of providing differentiated information for every fish landing centre, as calculations vary per area and the timings and the practices of every community are distinct. In the next two years, this method proved effective; the number of calls and their duration increased. Consequently, in March 2014, the team introduced a toll-free helpline to offer continuous help to a greater number of fishers.

The technological evolution and the feedback from users have incentivised the team to tackle more information asymmetries. The project has invested resources in making information engaging and compelling, presenting scientific data visually and in traditional formats and diverse languages, providing localised data such as fishing patterns or times, and in a manner accessible to all communities, including those who lack literacy.

Reliance Foundation adopts a holistic approach by not only providing information, but also guiding and supporting the conversion of information to action and decision-making through four linkages: lab-to-land, land-to-lab, land-to-land, and lab-to-lab, wherein 'labs' are the expert or partnering institutions and 'land' refers to livelihood practitioners, such as marine fisherfolk. Moreover, the steady growth in partnerships made Reliance Foundation realise that there were a lot of inputs and institutions that should be brought together, such as the Department of Fisheries, the Central Marine Fisheries Research Institute (CMFRI), the Marine Products Exports Development Authority (MPEDA), the Indian Coast Guard, and the Network for Fish Quality Management and Sustainable Fishing (NETFISH), which are able to generate scientific forecast, various training modules, and information at their laboratories.

Reliance Foundation has taken the initiative to provide scientific forecasting services and training modules in a simplified manner, using easily understandable language. It is disseminating advisories and unifying efforts across the Indian coastline to deliver these services more effectively.

Saving Seas, Empowering Lives: The Impact of Information Services on Fishing Communities

In FY2022-2023, the programme covered the Indian coastline comprehensively: Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Odisha, Puducherry, Tamil Nadu, and West Bengal. The 2023 Annual Outcome Assessment, covering a sample of 977 fishers from eight of the states, showed that the adoption rate for the advisories was above 95 percent for calamity warnings, safety measures, OSF, and GPS training; and it was 90 percent for PFZ. Moreover, 48 percent of the fishers surveyed stated having an association with Reliance Foundation for more than three years. This long-term engagement shows that fisherfolk find the information provided through the Information Services programme useful.¹⁵

These rates have been possible courtesy the diverse approaches that Reliance Foundation has adopted to deliver information. The programme started exclusively with text and voice SMS sent to mobile devices, and local cable TV broadcast; it then incorporated other messaging services which are commonly used and support multiple formats of advisories, to provide alternatives to users. By continuously displaying notifications on a user's phone, the Foundation seeks to make sure that none of the forecasts or alerts goes unnoticed. The information safeguards the lives of fishers, allows them to access safety resources, and reduces destructive fishing practices.

Through interactions with fishers, the organisation has also expanded the implementation of the information services to include other grassroots approaches. In certain communities, for instance, fishers have taken up the role of updating their peers on the information provided by Reliance Foundation through its Information Services programme. Sekar, for example—a fisherman from Tamil Nadu has earned the nickname, 'Friend of Fisherfolk', as he wastes no time in warning his community against rough seas over loudspeakers.¹⁶ This community-based initiative inspired the team to also create small user groups to disseminate information expansively.



Since fisherfolk are interested in engaging with experts over the phone, the Foundation launched the RF Information Services YouTube Channel with 39,600 subscribers to upload videos, showing interviews with knowledgeable personalities and disseminating scientific information.¹⁷

Furthermore, building on the spirit that distinguished the efforts of Reliance Foundation right from the beginning, the services not only provide a unidirectional broadcast, but they also deliver helpline services and teleconsultations to create feedback loops, accommodate fishers' requests, and provide first-hand responses even if they work from land to lab, regularly collecting feedback from those who receive the advisories.

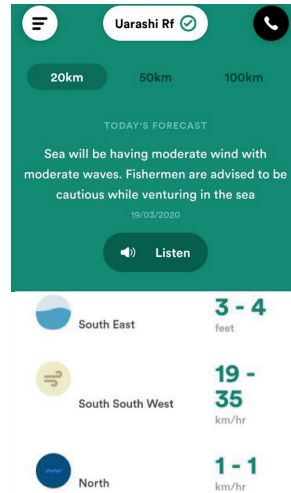
In 2020, to incorporate the newest technological advancements and make the most of the penetration of smartphones, the team developed Machli, an android app that delivers real-time updates to fishers.¹⁸ This product provides OSF information at multiple distances from the coast.

The use of artificial intelligence makes the services highly scalable and easy to incorporate into any platform. Through this technology, the app automatically detects mobile location to minimise user's navigation and prevent technological barriers. Based on the GPS location, the app presents details of the nearest landing centres, within the 500-km radius, from which the fishers concerned can select their landing centre to get the OSF at 20 km, 50 km, and 100 km-deep sea ranges from the shore. Machli also colour-codes the severity of a condition: it makes the top of the screen orange and red when alerts are active. Such visual prompts ensure clear understanding on the part of users, regardless of their literacy levels.

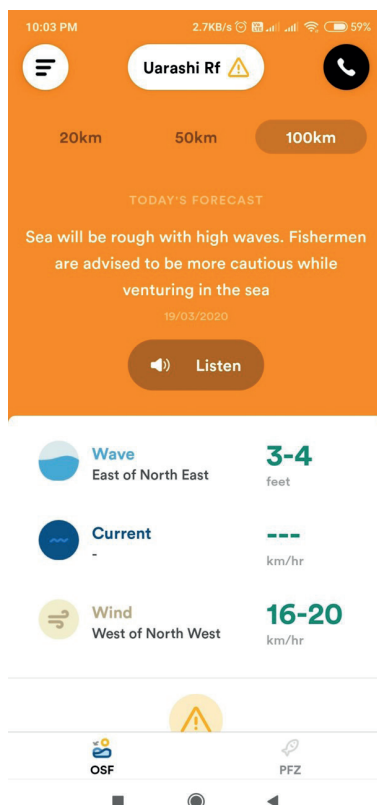
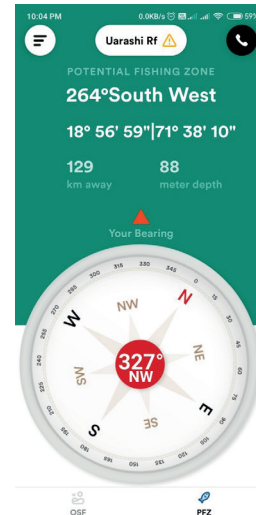
Available in nine Indian languages
Spoken along the Indian
Coast including English



Multi-language audios
assisting the fisherfolk to read
the ocean forecast for their
landing centre of choice



Compass integration
for PFZ

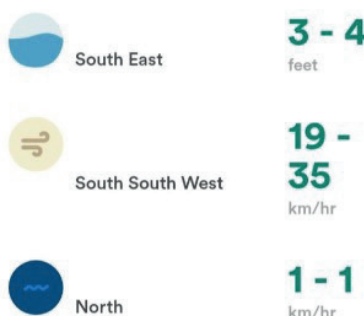


The display turns orange with
an alert sign.



Today's forecast

Hello! INCOIS and Reliance Foundation's Ocean State forecast information for Uarashi Rf fishermen of Mumbai Suburban district. As per INCOIS data, on 19/03/2020, the wind speed per hour is 13 to 17 kilometres per hour with West of North West direction. Wave height can be from 3 to 3 feet. For more information please dial Reliance foundation toll free help line number 18004198800.

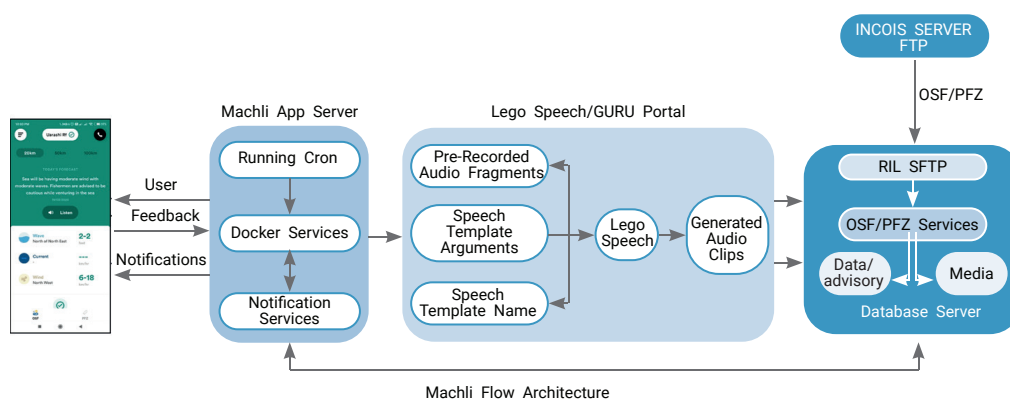


The information is disseminated
through visual images and simplified
way.

The information is
also delivered in
text format.



The application also uses machine learning to convert the data received from INCOIS to text messages and to create audio advisories. These technological improvements offer selective OSF, depending on location and PFZ GPS coordinates, to provide fishers with directions to reach the location of fishing areas. At the same time, the app supports fishers, who migrate seasonally, as it allows them to access all necessary advisories in their native languages, including identification of fish landing centres within a 500-km radius.



Through the information shared, the programme contributes to achieving Target 14.4 that deals with effectively regulating harvesting and ending overfishing and illegal and destructive fishing practices. The PFZ advisories have proved to be effective in reducing resource waste and making fishing more sustainable. As per the National Council of Applied Economic Research (NCAER) report of 2015, the adoption of PFZ reduced diesel consumption for fishing operations. Ultimately, each litre saved through the programme meant a reduction of 2.63 kilograms of carbon dioxide emissions.¹⁹

Similarly, Reliance Foundation's collaboration with the Network for Fish Quality Management and Sustainable Fishing (NETFISH), the Department of Fisheries, the Central Institute of Fisheries Technology (CIFT), and the State Institute of Fisheries Technology assists fishers in adopting sustainable practices. RF provides training in mesh size control and use of the minimum legal size, based on the idea of optimal harvesting strategy, and helps reduce unwanted catch of juvenile animals and smaller species. The Reliance Foundation also uses

modern equipment, such as a fish finder, GPS for reaching the exact location of fish shoals, which helps in avoiding sea hazards, thereby contributing to the protection of the seas and life under water.

Reliance Foundation also protects the marine ecosystem by alerting fishers to the annual trawling ban. According to the 2016 Census Report of the Central Marine Fisheries Research Institute, nearly 26 percent of fishing crafts in India are mechanised and of this, 71.5 percent are trawlers.²⁰ A study conducted after the 25th anniversary of the ban in Kerala shows that there has been a positive impact on fishery yields because of such intervention, reporting an effect on the total marine landings in the state, amounting to 117,000 tonnes per year.²¹

“This year, the 61-day fishing ban period is implemented from April 15 to June 14 on the East Coast and from June 1 to July 31 on the West Coast. This information is important for us. At times, we often miss this and have to face the consequences by paying fines or getting stranded in choppy seas.”

–Ramdas Sandhe, a fisherman from Versova, Mumbai

The Reliance Foundation programme also supports Target 14.b, which aims at “providing access to small-scale artisanal fishers to marine resources and markets”, by educating them on the tools available for safe navigation, offering them instruments to upgrade their livelihood conditions, and facilitating information on governmental programmes. The team assists in coordinating information exchange and contacts among the Indian Coast Guard, the Indian Navy, the Marine Police, state fisheries departments, and local communities during natural disasters to locate missing fishers and their boats and conducting mock drills for coastal communities to better prepare people for high tides and cyclonic weather. As reported by the 2023 Annual Outcome Assessment, 73 percent of the fishers surveyed are finding the adoption of the advisories beneficial when deciding on when to venture out into the sea; 69 percent used them to avoid accidents and 61 percent resorted to them to save their fishing nets and vessels from adverse weather conditions.



“In October 2022, during the Sitrang Cyclone, I saved my life, boat, and operational cost of INR 1.6 lakh by not venturing into the sea for hilsa fishing.”

– Sarbeswar Pramanick, a marine fisherman from Sultanpur village, West Bengal

As per the report, 53 percent used the advisories to avoid no-catch trips and 51 percent resorted to them to save operational costs. Ultimately, the savings on operational costs, such as ice, groceries, labour, and diesel, increased the income of boat owners by three percent.

“Initially, due to sudden changes in sea conditions, I had to take my boat to the shore from midway, which caused loss of fuel, labour, food, and ice that we carried to freeze fish. It usually consumes 50 litres of diesel per round. Now, getting information from the RF helps me to plan my trips. Last year, I did not venture into the sea when I learnt that wind speed was four times higher. This saved about INR 20,000 in fuel cost.”

– Santosh Mohan Dorlekar, a fisher from the Gawde Ambere village in Maharashtra

The 2023 Annual Outcome Assessment’s sample size included 621 wage labourers and 356 boat owners. It stated that, due to the level of accuracy, the adoption of advisories has resulted in a rise in the incomes of boat owners, fixed wage workers, and variable wage labourers by 21 percent, 15 percent, and 23 percent, respectively. Additionally, the programme facilitates communities’ access to high-end navigational tools, such as GPS and satellite phones, by supporting fishers’ applications to governmental subsidies, credits, and insurances. More than 400 fisher families in the East Godavari district have availed government subsidies worth INR 13.91 lakh and created assets worth INR 30.11 lakh.

“We didn’t believe that we would be given government subsidies as we stopped bothering about them after making numerous attempts. When the representatives of the Reliance Foundation approached us, we were apprehensive about filling out the forms. They helped me [and] fellow fishermen in the village in filling out the forms. This helped [me and] three other fishermen receive a 40 percent subsidy to buy engines for boats that cost INR 1.42 lakh each.

– Palleti, a fisher from Andhra Pradesh

Evolution through Feedback: Supporting Fishing Communities

For over a decade now, Reliance Foundation has been working closely with a host of organisations and fishers to integrate information and include the community voices and feedback to offer services that they need. The first lesson that the organisation learnt involved the metamorphic nature of the project. The team had to be willing to evolve with the feedback of fishers to offer a product that accurately supported their livelihood and minimised the impact of their economic activities on oceans.

As such, the team is always striving to make information more accurate, capturing data to select which information needs to be shown to each community. Similarly, efforts to carry out in-depth analyses of user-level and usage-level listening rate as well as call success are being made to evaluate behavioural patterns and provide improved, personalised services, adding value to the technical information offered.

Moreover, the programme wants to increase its reach and scale by addressing consortiums and improving its availability for fishers. To make this possible, the potential of using two-way radios to create chains of information from the shore to boats at sea or of utilising satellite connectivity-based devices to reach fishers all the way to deep sea is being explored.



Moving forward, Reliance Foundation aims to continue strengthening its partnerships in the ecosystem and work on providing end-to-end support to fishing communities. To enhance the programme's impact on SDG Target 14.4, the team seeks to include more information and sensitisation trainings in marine conservation awareness efforts, such as those pertaining to expanding their alerts and resources to prevent illegal fishing practices. Additionally, they have been exploring partnerships to revert soil erosion by supporting coastal bioshields, planting casuarina and other trees on the shores of the oceans, and investing in plant-based solutions to mitigate environmental damage.

Conclusion

The challenge of conserving our planet's largest ecosystem through sustainable practices is a complex one. Fisheries and the aquaculture industries have an unquestionable economic relevance. In India, their contributions to GDP and employment opportunities for millions of people are crucial. However, economic development cannot justify endangering marine life. As the UN Department of Economic and Social Affairs says, "Human well-being, ecosystem integrity, and properly functioning physical processes do not require unperturbed systems, but systems that have not suffered serious or irreversible harm."²²

Dissemination of scientific information and adequate measures can reduce the negative anthropogenic impact on the marine environment. Reliance Foundation is committed to supporting India in its pursuit of achieving SDG14 by providing essential weather-related data. Reliance Foundation also supports SDG1 (no poverty) and SDG Target 1.5, aiming to build the resilience of the poor and those in vulnerable situations. It also works on freshwater inland fisheries advisories, addressing various fish diseases and how to maintain pH level, particularly during heavy rain and cyclone periods, and even conducting water and soil testing camps for inland fisherfolk.

Reliance Foundation has continuously adapted its approach to ensure effective and timely dissemination of information. The introduction of a toll-free helpline and the development of the Machli app have boosted fishers' engagement with

information platforms. The Reliance Foundation Information Services programme has the potential for replicability in other coastal countries in terms of scaling up, integrating essential information on a single platform in diversified local languages covering all the coastal states. Through its Information Services programme, Reliance Foundation ensures fisherfolk's safety, enhances their livelihoods, shares sustainable fishing practices, and promotes government schemes and regulations. The programme's greatest achievements include creating diverse platforms with limitless opportunities to integrate information and become spaces of convergence; bringing together all relevant actors for marine life in India; and providing fisher communities with a network that empowers them to improve their livelihoods while preserving a respectful and sustainable relationship with ocean life.

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The Tide Turners Plastic Challenge

UN Environment Programme

Introduction

From 2000 to 2019, global plastic waste generation more than doubled, the volume reaching 400 million tonnes annually in 2023, according to the OECD's first *Global Plastics Outlook*.²³ Plastic pollution reduces the ability of ecosystems to adapt to climate change, in turn affecting millions of people's livelihoods, food production capabilities, and societal well-being. The Tide Turners Plastic Challenge (TTPC) of the UN Environment Programme (UNEP) is a global initiative and challenge that

educates and engages youth across 50 countries to address plastic pollution, particularly that caused by single-use plastic products (SUPP), which threatens life in oceans and rivers, and on land.

The programme was launched in 2018 and was initiated in 2019 in India. The 5th phase of the TTPC is underway. In India, it has trained over 11,000 mentors, engaged 100 rural communities, and collected a total of 130,186 kg of plastic

for recycling. The World Wide Fund and the Centre for Environment Education are UNEP's TTPC implementing partners in India, and this collaborative approach has been key to its success in the country.

In 2019, 6.1 million tonnes (Mt) of plastic waste leaked into aquatic environments and 1.7 Mt flowed into oceans globally. UNEP created the programme to address this problem and directly tackle SDG14, Target 14.1 through reducing and preventing marine pollution due to plastic debris; additionally, it impacts SDG12 and SDG15.

Execution and Innovation: Gamifying Change to Protect Marine Life

The initiative encourages youth in India between 12 and 35, who can either participate individually or as a group. The initiative sets three levels of challenges for all participants—enhancing their knowledge of the complex issue of plastics, community outreach and advocacy for change, and the implementation of ground-level solutions—which become increasingly complex and meaningful over time. Tasks are set for each level in consultation with the youth, who are the primary stakeholders.

The TTPC is not only pedagogically sound but uses a gamified approach to effect change. The initiative provides a platform and facilitates and challenges the youth to innovate, celebrating their participation. It has rapidly mushroomed into one of the largest ever global youth action against plastics.²⁴

Detailed monitoring and review were undertaken in 2021 to track the outcomes, and in the ongoing Phase 5, the website of the TTPC was updated to include an inbuilt monitoring and review mechanism for each level.

Over the phases, participation has risen from 48,859 to over 550,000 individuals in the current phase, and from an initial eight states to all the states and union territories of India. Many of the participants continue to be part of the programme even after gaining their championship badges.

Impact and Outcomes: Creating an Inclusive and Sustainable Programme

Phase 5 of the programme will conclude in 2025. The focus in this phase is on increasing the footprint of the initiative in rural India and broadening the diversity of participation by extending the training to youth with disabilities.



This phase has seen the participation of youth in traditional collection services, such as ragpickers.

The modality of implementation of the TTPC will shift in the future and aims to

be implemented through national and sub-national entities, as in Delhi and Tamil Nadu. The TTPC initiative aspires to become fully sustainable in the future, led by the various entities that have supported it over the years.

Authors: Gayatri Raghwa and Arpan Singh (UNEP),
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Contributor: Sami Husa (UNRCO)



The Young
Leaders Plastic
Challenge



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LIFE ON
LAND



15

Augmenting Water Conservation Through Commons Restoration: Improving Agricultural Resilience

Foundation for Ecological Security



Despite the urgency of conserving ecological resources, the significance of community forests, pastures and water bodies—or the Commons—in the food system often remains overlooked.

At a Glance

- The Foundation for Ecological Security (FES) works on programmes aimed at ecological restoration, particularly the conservation of land and water resources in India's eco-fragile areas. The aim is to conserve entire landscapes and communities, whether commons, public, or private, thus advancing SDG15 (life on land) objectives.

- FES's strategic approach revolves around three interconnected areas: securing community land rights; promoting collective action for resource management; and ensuring access to resources and finance for restoration action.
- By empowering village institutions and youth with the technological power of the Composite Landscape Assessment and Restoration Tool, FES seeks to restore water bodies, create new ones, and rejuvenate catchment areas through existing programmes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme.
- Under FES's 'Augmenting Conservation of Water for Improving Resilience of Agriculture in Rainfed Areas' initiative in Rajasthan, 258 village institutions were formed to manage natural resources through 984 capacity-building programmes and approximately 33,686 community members were equipped with capacities in various land and water governance aspects.

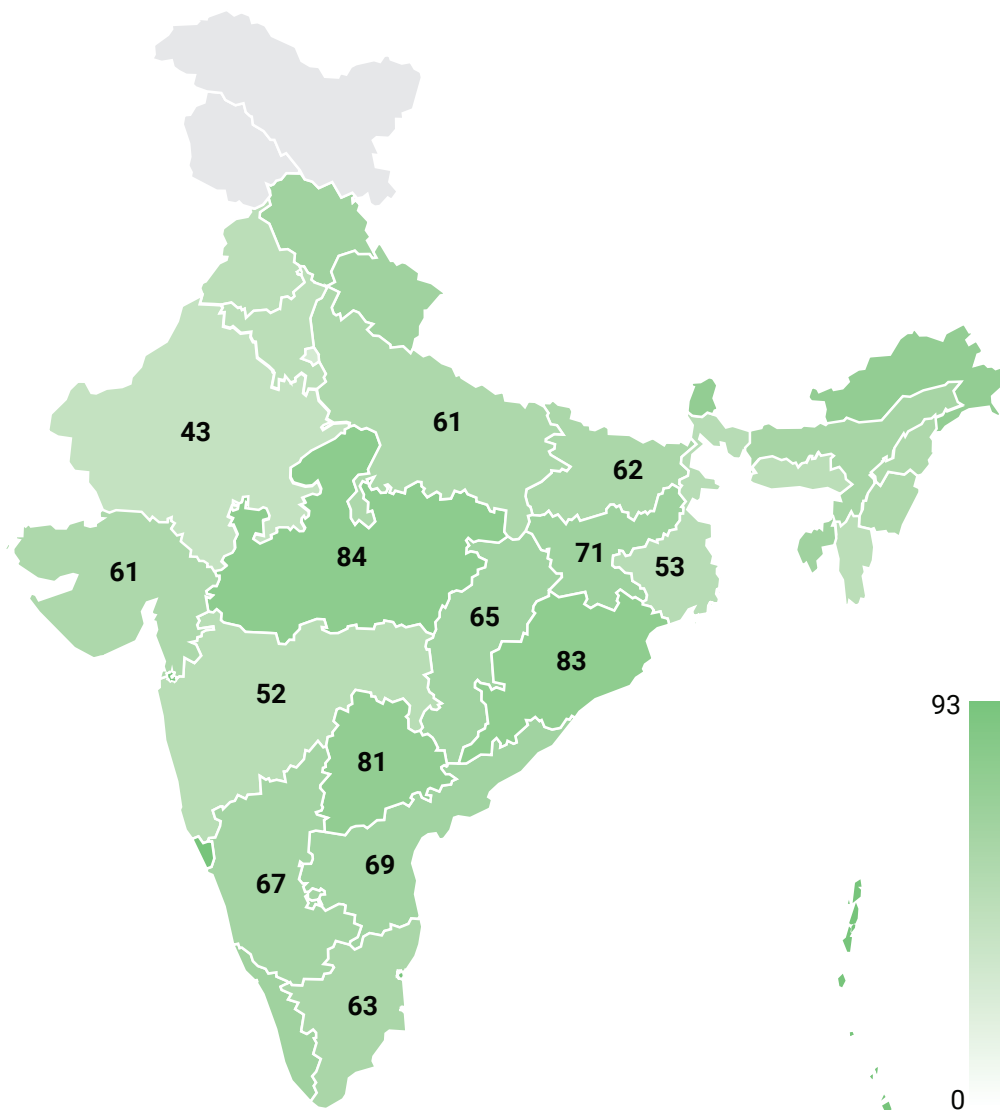
Introduction

As the global population grows, ensuring food security becomes a paramount requirement, in turn making agriculture a key sector for sustainable development. Goal 15 (life on land^a) of the Sustainable Development Goals (SDGs),¹ entails critical objectives that address the urgent need to protect, restore, and sustainably manage terrestrial ecosystems. Central to achieving this goal is recognising the inseparable link between land and water resources and livelihood systems such as agriculture. Promoting practices such as land restoration, efficient irrigation systems, and rainwater harvesting will enhance agricultural productivity and safeguard vital ecosystem services, leading to comprehensive advancements in the objectives of SDG15.

^a SDG15 aims to "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss." See, UNDP, *What are the Sustainable Development Goals?*, https://www.undp.org/sustainable-development-goals/life-on-land?gclid=CjwKCAjwoqGnBhAcEiwAwK-OkcV2eeiZxjaaW949lbxGivv4ArcOrLTGhQ6vw01v_ITurPrqwpIPKBoCmwAQAvD_BwE

Despite the urgency of conserving ecological resources, the significance of shared natural resources such as community forests, pastures and water bodies—collectively, the Commons—in the food system often remains overlooked. Covering a vast expanse of 66.5 million hectares, these lands contribute approximately US\$90.5 billion (about 3 percent) to India’s GDP annually. However, the continued degradation of commons poses significant threats to the rural populations who rely on them for their sustenance and economic well-being.

Impacts on efficient use of water management and % of users in each sources



Source: SDG India Index, NITI Aayog³



The pan-India Foundation for Ecological Security (FES), established in 2001, is focused on ecological restoration, particularly the conservation of land and water resources in the country's eco-fragile, degraded, and marginalised areas. FES emphasises the ecological integrity of entire landscapes and communities by catalysing informed and collaborative action among community institutions, government, NGOs, academia, media and the private sector.

FES's strategic approach to addressing this challenge revolves around three interconnected focus areas: securing community land rights, promoting collective action for responsive and inclusive resource management and governance, and ensuring access to resources and finance for restoration action. By empowering communities to lead the governance and restoration efforts of Commons, FES directly advances several SDGs, including SDG-15, SDG-6 (clean water and sanitation), SDG-10 (reduced inequalities); SDG-2 (zero hunger); and SDG-1 (no poverty).

Since its launch in 2017, FES's 'Augmenting Conservation of Water for Improving Resilience of Agriculture in Rainfed Areas' initiative has significantly encouraged behavioural change towards water conservation and land management. Operating across seven blocks in five districts in Rajasthan, the initiative focuses on land restoration and water conservation through appropriate biophysical measures, securing the community's collective rights on resources, and improved local governance. The initiative achieved impressive outcomes between June 2017 and March 2022, with 258 village institutions formed to manage natural resources. Through 984 capacity-building programmes, approximately 33,686 community members were equipped with capacities in various land and water governance aspects.

Notably, communities established rules for managing water and land resources, including on water sharing, banning bore wells, controlled grazing, and limiting resource extraction. About 14,751 hectares of common land have been brought under community governance, with communities establishing rules and norms for managing resources and undertaking regeneration activities. This has

helped in improving the health and governance of catchments. About 385 water harvesting structures were constructed and renovated through community-led processes, contributing to around 5000 TCM^b recurring recharge. These efforts, coupled with water demand management initiatives, motivated the local communities to embrace changes in crop choices and cropping practices to optimise water usage and conserve the precious resource.

Furthermore, the initiative has empowered several panchayats to lead the conservation and management of common lands, demonstrating the mainstreaming of sustainable practices.

The Rajasthan Experience

The 'Augmenting Conservation of Water for Improving Resilience of Agriculture in Rainfed Areas' programme addresses the critical issue of ecological degradation in Rajasthan, a region characterised by distinct arid and semi-arid climatic conditions. Approximately 66 percent of the area accounts for dryland, and 22 percent of the state's population are below the poverty line.^{c,4} The rural economy relies primarily on rain-fed agriculture, supplemented by animal husbandry, with a significant dependence on common land for fodder, fuelwood, non-timber forest produce, and water requirements.

^b Thousand cubic metres.

^c The poverty line in India is defined as the minimum income level or expenditure required to meet the basic needs of an individual or a household, including food, clothing, shelter, education, and healthcare. The calculation of the poverty line has evolved and is based on various criteria such as calorie consumption, nutritional requirements, and living conditions. The latest available information shows that the poverty line is set at 1,059.42 Indian Rupees per month in rural areas and 1,286 Indian Rupees per month in urban areas. This amount is adjusted periodically to account for inflation and changing economic conditions. For more, see: <https://niti.gov.in/sites/default/files/2023-07/National-Multidimensional-Poverty-Index-2023-Final-17th-July.pdf>

Table 1: Performance on SDG15 in Rajasthan (out of 100), by District

Districts	Forest cover as a percentage of total geographical area (normalised value)	Percentage of area covered under afforestation schemes to the total geographical area (normalised value)	Percentage of area covered under afforestation schemes to the total geographical area (normalised value)	Score
Ajmer	10.55	24.56	100	45.04
Alwar	42.4	42.39	98.16	60.98
Banswara	16.79	50.76	99.18	55.58
Baran	42.96	23.54	99.64	55.38
Barmer	1.66	1.01	100	34.22
Bharatpur	11.93	25.02	100	45.65
Bhilwara	5.14	22.69	98.94	42.26
Bikaner	1.35	0	100	33.78
Bundi	28.57	19.08	100	49.22
Chittorgarh	37.45	48.85	99.54	61.95
Churu	0.25	14.65	100	38.3
Dausa	8.98	76.02	97.11	60.7
Dhaulpur	41.02	100	0	47.01
Dungarpur	23.37	41.79	100	55.05
Ganganagar	1.75	8.93	100	36.89
Hanumangarh	1.48	34.07	100	45.18
Jaipur	13.84	29.39	97.38	46.87

Jaisalmer	1.11	2.74	100	34.62
Jalore	5.32	29.44	100	44.92
Jhalawar	20.11	21.55	98.72	46.79
Jhunjhunu	8.95	58.38	100	55.78
Jodhpur	0	20.32	100	40.11
Karauli	45.51	34.41	100	59.97
Kota	30.63	43.66	96.39	56.89
Nagaur	1.48	13.49	89.82	34.93
Pali	15.93	17.23	100	44.39
Pratapgarh	69.99	71.31	99.51	80.27
Rajsamand	32.66	15.73	100	49.46
S.Madhopur	30.29	60.15	99.16	63.2
Sikar	6.55	45.9	100	50.82
Sirohi	52.31	9.51	100	53.94
Tonk	5.63	29.32	97.53	44.16
Udaipur	70.76	59.34	99.8	76.63
Rajasthan	13.5	23.06	97.35	44.64
Indicator type	Positive	Positive	Negative	

Source: Rajasthan SDG Index 2023⁵

Over the years, the degradation of natural resources coupled with increasing variabilities in rainfall has led to a shift from traditional subsistence practices to a reliance on government assistance and migration for sustenance. The commons, including forests and pastures, once a safety net for the rural poor, are facing neglect due to weak institutional arrangements and unfavourable property rights, resulting in widespread degradation. Moreover, Rajasthan experiences recurrent droughts and relentless groundwater depletion, exacerbating its vulnerability from social and environmental perspectives.

While various water management programmes have been attempted in the state, the FES initiative adopts a distinct and potentially more effective approach. It aims to secure community land rights, promote collective action for resource management and governance, and facilitate access to resources and financing for restoration efforts. FES recognises local communities as the stewards of their resources, building their capacity to govern effectively. The programme acknowledges the complexity of the system, given the interplay between socioeconomic, political, cultural, and biophysical elements, and fosters dialogues with different stakeholders.

Figure 2: FES Strategy



Source: Foundation for Ecological Security

FES aligns its programme with several SDGs. More specifically, by securing tenure over common land and water resources and strengthening collective action for sustainable governance, the programme contributes to Target 15.1 of preserving and rehabilitating both land and water resources in common land. Through its emphasis on preventing and reversing land degradation (Target 15.3) and promoting the use of native plant species (Target 15.5), FES actively contributes to the conservation and preservation of biodiversity.

Furthermore, the initiative aims to eliminate invasive species, such as *Prosopis juliflora*, that can harm local ecosystems and biodiversity (Target 15.8). By ensuring the implementation of sustainable management practices and the sharing of resources through the development of rules and norms for governing common resources (Target 15.6), the programme enhances ecological health and economic opportunities for rural communities, especially women and other disadvantaged groups. By collaborating with government and private entities to provide financial resources for land restoration initiatives (Target 15.B) and

partnering with panchayats to actively involve local communities in restoration efforts (Target 15.9), FES's implementation team empowers communities and promotes inclusive and sustainable development.

By addressing the complex challenges faced by the region, FES envisions a future where local communities determine and move towards desirable land-use practices based on principles of conservation and social justice. Through collective efforts and sustainable governance, FES strives to safeguard the ecological integrity of the commons, improve livelihoods, and create a more resilient and equitable landscape for future generations.

In the heart of Rajasthan's arid landscape, the FES has embraced a holistic approach that intertwines institutions and biophysical resources. The organisation has empowered communities to become guardians of their shared resources through the 'Augmenting Conservation of Water' initiative. The programme focuses on securing tenure over common land and water resources while fostering collective action for sustainable governance. FES has nurtured local stewardship by orchestrating multistakeholder platforms, igniting a shared vision through dialogue and knowledge exchange. By technologically empowering village institutions and passionate youth with the Composite Landscape Assessment and Restoration Tool (CLART),⁶ FES is seeking to restore water bodies, create new ones, and rejuvenate catchment areas, through existing programmes, such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).

Overcoming Early Challenges: Pathways to Sustainable Ecological Restoration

In the early stages of the programme, FES encountered several challenges at the implementation and policy levels. Building a shared vision among communities about the importance of commons and mobilising them for collective action was daunting as claims over commons were contested, and groundwater was perceived as a private resource rather than a common one. To overcome these challenges, FES engaged in participatory exercises such as trendline analysis and experiential learning games for water governance. Repeated meetings with communities and the assistance of *Rajeevika* (Rajasthan Livelihood Mission) volunteers were instrumental in mobilising communities towards collective action.



The lack of explicit norms for convergence between government departments posed challenges at the policy level, leading to delays in obtaining the necessary 'no objection' certificates for asset-building activities. FES addressed this issue by organising repeated deliberations and establishing multistakeholder platforms. These platforms facilitated discussions and negotiations to develop a shared understanding and streamline the convergence process, ensuring smoother coordination between departments.

Engaging panchayats was another critical aspect of the programme, as public investment through the MGNREGS was pivotal for building assets on common land and restoring common lands. However, not all panchayat functionaries were initially aware of the importance of commons protection and the associated legal instruments. To address this, FES organised exposure visits for panchayat functionaries to neighbouring villages or blocks where well-managed commons existed. By observing successful examples of community-led joint land management, the panchayat functionaries gained practical insights on efficient resource management. This exposure raised awareness and led to the active involvement of panchayat stakeholders in the programme.

Overall, these innovative approaches and the continuous engagement with stakeholders allowed FES to overcome early difficulties and pave the way for the successful implementation of the programme. By addressing challenges at the community and policy levels, FES laid a strong foundation for sustainable ecological restoration and empowered communities to be stewards of their shared resources.

Implementation, Innovation, and Impact

The FES programme has made remarkable strides in ecological restoration and sustainable resource management in Rajasthan. The initiative was implemented through four phases:

- (A) **Community mobilisation and identification of community resource persons:** The project's first phase laid the groundwork for community mobilisation, organising and strengthening village institutions and the identification of community resource persons. Faced with the challenge of convincing communities about the importance of commons,

FES employed various participatory tools to ensure comprehensive community mobilisation and build a shared vision. Community-based system dynamics, trendline analysis, experiential learning games for water governance, crop water budgeting tools, and groundwater monitoring tools were some innovative tech solutions integrated into this phase (see Table 2). These tools facilitated collaborative efforts and empowered communities to take charge of their shared resources. As a result, 258 village institutions were organised to manage natural resources, and 984 capacity-building programmes trained around 33,686 community members across various aspects.

Table 2: Phase-1 Tech Interventions

Tools	Objectives
1) Community-based System Dynamics ⁷	A participatory tool that shows how various resources like water, land, soil, agriculture, and livestock interact and impact each other.
2) Trendline Analysis ⁸	A tool that allows communities to represent the changes pictorially/ graphically in a particular resource condition. It provides an opportunity to discuss how different resource usage has changed.
3) Experiential Learning Games for Water Governance ⁹	The groundwater game aims to stimulate self-governance of groundwater use and engage the community to improve the governance of their shared resources. The games reveal the interconnected nature of water and agriculture and foster the idea of water as a shared resource.
4) Crop Water Budgeting Tool ¹⁰	An Android-based tool has been developed to assist communities in managing their surface and groundwater efficiently without further depleting their resources. It assists the communities to balance water demand with recharge through rainfall, stream flows and surface water shortage. Employed as an android-based application, it helps calculate the water balance after quantifying the water recharge and water requirement of the village. If there is a deficit in water availability for the present cropping plan, the community members discuss possible crop changes to avert water deficits. It aims to bring crop choice from an individual decision to collective decision.
5) Groundwater Monitoring Tool ¹¹	An open-source Android tool enables the collection of water level data of wells and its collation on a web platform for easy access by all. It aims to address this major challenge in estimating groundwater resources and helping bridge this gap.

Source: Foundation for Ecological Security



- (B) **Planning and preparing project reports:** The second phase involved planning and preparing detailed project reports in close collaboration with the panchayat. Leveraging existing community awareness, FES initiated the planning process for common land restoration with active participation in *MGNREGS gram sabhas*.^d The introduction of the Composite Landscape Assessment and Restoration Tools marked a crucial technological innovation; this user-friendly Android app-based geographic information system enabled communities to design region-specific soil and water conservation measures based on their unique geo-hydrological characteristics. Integrating technology with community-driven planning expedited the approval process and enhanced on-ground implementation.
- (C) **Implementation:** In this phase, plans outlined in the detailed project reports were implemented. Village institutions took charge of renovating and constructing 385 water harvesting structures, resulting in about 5,000 TCM recurring recharge. Additionally, 14,751 hectares of common land were brought under community governance, ensuring responsible resource management with established rules and norms. Extensive regeneration activities, including planting and seeding, revitalised these lands through various soil and water conservation measures.
- (D) **Impact Assessment:** This phase highlighted the programme's far-reaching effects. It showcased the greater participation of women and marginalised groups in resource planning in village institutions and gram sabhas. Improved water availability for agriculture, livestock, and drinking significantly improved community livelihoods. A study was undertaken to assess the impact of the initiative. The study indicated 40 percent of sample communities evolved rules and regulations for managing water resources, exemplifying responsible and sustainable governance. The shift towards water-efficient crops saved 377 TCM of water in sample villages, emphasising the positive ecological impact of the programme.

^d Gram sabhas are village-level assemblies consisting of all adult members of a village. They serve as the primary forum for wage seekers to voice their concerns, demands, and grievances related to MGNREGS works. Gram sabhas also validate the findings of social audits, ensuring transparency and accountability in the programme.

Community-managed areas showed 58 percent higher standing biomass compared to unmanaged regions, reinforcing the success of community-led resource protection. Furthermore, overall fodder biomass in community-managed land surpassed that of unmanaged common lands by 2.9 times, further validating the programme's sustainable land management practices. The managed sites also exhibited less density of growth of invasive species, such as *Prosopis juliflora*, highlighting the programme's effectiveness in combating environmental challenges.

Technological innovation remained a crucial theme throughout the initiative's implementation, driving its success.

Conclusion

FES has identified a critical gap at the grassroots for resource governance. While water harvesting assets are built through MGNREGS, linking these to livelihoods necessitates coordination between different line departments.^e Addressing this challenge requires continuous engagement with the community, fostering more vital collaboration between different departments to create effective mechanisms for coordinated governance.

FES is already exploring new directions to expand the initiative. FES actively engages with various government partners to underscore the significance of commons and community-led resource management. This proactive approach seeks to influence policy at a broader level and advocate for including sustainable practices that protect and nurture shared resources. By extending its reach to new operational regions, the initiative aims to empower more communities, safeguard additional ecological landscapes, and promote sustainable development.

^e Line departments are core functional units or divisions within an organisation that are directly responsible for carrying out its primary objectives.



Through continuous self-assessment, FES remains committed to refining its strategies and adapting to emerging challenges. By addressing the areas for improvement and embarking on new expansion pathways, the organisation is steadfast in its mission to create a future where communities thrive in harmony with their natural surroundings and the resilience of ecosystems stands firm against the tides of time.

Moving forward, FES envisions a scaling-up of its transformative work through a set of well-defined strategies. The programme seeks to catalyse collaborative action by building a shared and vivid imagination, providing better access to data, knowledge, and assets, and enhancing capacities for sustaining multistakeholder engagement. By strengthening the agency of all actors involved, FES aims to create a shared infrastructure that improves access to vital resources and learning assets, fostering a co-creation environment for innovative solutions and leveraging the existing government architecture to achieve scalability, all through the lessons learnt from experience.

FES recognises the importance of generating evidence, shaping a positive narrative, and employing strategic communication to embed the conservation of the commons as a priority within policies and programmes to garner further public and policy support. Moreover, FES endeavours to foster improved social inclusion by strengthening local networks and collaborating with the government to establish mechanisms that ensure responsiveness and transparency in managing these shared resources.

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FOUNDATION FOR ECOLOGICAL SECURITY





Photo: Siddharth Nair, Palzes Angmo (UNDP)

Harmony in the Heights: The Conservation of Black-Necked Cranes and Ecosystem Resilience in Ladakh's Wetlands

The SECURE Himalaya Initiative

The conservation of black-necked cranes and their ecosystem in the wetlands of Ladakh is central to the SECURE Himalaya initiative under the Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development (Global Wildlife Program), funded by the Global Environment Facility (GEF), the Government of India, and the United Nations Development Programme (UNDP).

The objectives of the project are in tandem with Sustainable Development Goal (SDG) 15—Life on Land—which seeks to protect, restore, and promote the conservation and sustainable use of terrestrial ecosystems. Launched in 2017,¹² the project trains volunteers from local communities in the Mudh village of the Chanthang region in Ladakh to safeguard black-necked crane nests and chicks, with a particular focus on protecting them



from potential dangers posed by the rising canine population, unsustainable tourism, climate change, and increased grazing from livestock herds.

Mapping the Habitats of Black-Necked Cranes

Black-necked cranes, classified as 'Vulnerable' in the International Union for Conservation of Nature (IUCN) Red List, are the only alpine crane species living and breeding in the high-altitude areas of India, China, and Bhutan. With an estimated population of 13,500 birds globally, they play a vital role in Ladakh's wetland ecosystem and hold cultural significance for the local community, who consider the birds to be harbingers of good luck. These birds contribute to sustaining a delicate ecosystem by consuming plants and small insects as part of their diet, thereby contributing to the prevention of eutrophication¹³—a process whereby the excessive growth of plants leads to a reduction in oxygen levels in water, adversely impacting water quality.

To ensure equitable pay for the time and effort of the volunteers in protecting these waterbirds from attendant threats, the UNDP is designing plans for a nest-adoption programme that aims to generate funds through crowdfunding. This will enable a sustainable model for the project and equitably compensate

volunteers for their dedication. The project also intends to classify crucial nesting zones as Biodiversity Heritage Sites in accordance with India's Biological Diversity Act,¹⁴ allowing a legal framework for safeguarding vital wetland ecosystems while respecting traditional and sustainable practices of local communities in their utilisation of these ecosystems.

Prospects and Sustainability

The project led to the formation of the Cha Srungskyob Tsogspa, Birds Conservation Committee.¹⁵ Trained volunteers from the committee take turns to ensure the secure journey of the cranes from the cliffs of Mudh village, where they lay eggs, all the way to the marshes along the banks of the Indus river, where the chicks grow into adults. The efforts of the committee were acknowledged in 2023, when it was shortlisted for the India Biodiversity Awards. The project successfully encapsulates several targets under SDG15: the conservation of mountain ecosystems; protecting biodiversity and reducing the degradation of natural habitats; and the restoration of terrestrial ecosystems. For the local communities, preserving the environment is not solely about volunteering or charity but is deeply ingrained in their cultural identity,

representing a way of life that must be safeguarded, benefitting both people and the planet.

The SECURE Himalaya initiative works to conserve biodiversity, diversify livelihoods, prevent wildlife crime, and build knowledge across eight sites

of high conservation value across Ladakh.¹⁶ It has the potential to be replicated in other regions, such as in the Sangti and Zemithang valleys in Arunachal Pradesh,¹⁷ where black-necked cranes are found during non-breeding periods.

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PEACE, JUSTICE AND
STRONG INSTITUTIONS



16

Mission Buniyaad: A Step Towards Peaceful and Inclusive Institutions

GDi Partners



The project seeks to create a more egalitarian approach to tech, which it believes is most effective when employed to contribute to the upliftment of the underserved.

At a Glance

- Mission Buniyaad uses technology to improve learning outcomes and build stronger institutions. It aims to bridge the learning gap, especially for girls from underserved communities, thereby helping create a more just and peaceful society.
- The project aligns with goal 16 of the Sustainable Development Goals (SDGs) by working to enhance the education system in Rajasthan. Its core objective is to strengthen the system's capacity, enabling it to

facilitate efficient, transparent, and accountable processes to achieve its goals effectively.

- Research has shown that girls who complete higher secondary education and earn an income are less likely experience violence from their intimate partners. Additionally, their risks of child marriage and teen pregnancy are reduced. Therefore, by prioritising the completion of secondary education for girls, the programme actively contributes to the long-term goal of fostering a more peaceful society (target 16.2)

Introduction

Mission Buniyaad, a digital education programme by the Rajasthan government in collaboration with GDi Partners, works to improve the learning outcomes of girl students in the secondary grades through the use of a personalised adaptive learning (PAL) digital learning model. The programme aims to improve the learning outcomes of one million girl students enrolled in public schools across the state through its gendered approach to programme design.

The programme was launched in 2020 with a thorough assessment of the digital education landscape in Rajasthan. The assessment involved on-site investigations, engagement with teachers and administrators, and interactions with the community, thereby ensuring responsive, inclusive, and participatory decision-making at different levels within the programme design, a key feature of target 16.7^a of the Sustainable Development Goals (SDGs). It sought to evaluate the extent of digital integration and readiness within the school system to promote digital learning across the state. Subsequently, a pilot programme was devised and introduced in 62 schools across six districts in Rajasthan. The pilot's impact was assessed through three key aspects: accessibility, equity, and quality.

^a Ensure responsive, inclusive, participatory and representative decision-making at all levels.

^b Data is as per the assessment conducted by Ei.study.

To ensure accessibility, 4,000 tablets were distributed to the schools, benefiting 21,287 girls. To improve the quality of education in these pilot schools, 62 master facilitators were instructed and prepared to address gender and social equity issues in classrooms. The initiative resulted in a 21-percent enhancement in students' learning outcomes.^b The programme has presented compelling proof of technology's capacity to improve education and serve as an empowering tool to enhance learning outcomes and lower drop out rates. Following the pilot's remarkable results, the project's next phase, aiming to expand to 33 districts, has strengthened the state's commitment to leveraging digital infrastructure to address the targets of SDG16 (promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels). This programme can be a lighthouse for other developing countries to broaden and strengthen their educational institutions through technological advances (target 16.8^c).

Rationale and Objective

In recent decades, India has sought to improve access to and quality of education. Some notable interventions include legal frameworks such as the Right to Education, 2009, and the New Education Policy, 2020. However, nearly 13.5 percent of girls in the 15-16 age group and 4.1 percent of girls in the 11-14 age group are still out of school.¹ This can be attributed to an interplay between sociocultural obstacles and the school system's inability to effectively retain students by improving their learning outcomes. Most girls who drop out of school are more likely to experience discrimination at home and in their community.

To help nurture a more peaceful and just society, addressing these sociocultural challenges and ensuring girl students have equitable access to quality education is critical. Despite the constitutional right to equal opportunities, underserved

^c Broaden and strengthen the participation of developing countries in the institutions of global governance.



communities endure the harshest consequences of the education crisis. They often face barriers such as inadequate resources, discrimination, and limited access to quality education, which hinder their ability to participate and prosper in the educational system. In addition, gender disparity disproportionately impacts female students, subjecting them to injustice across economic, social, and psychological dimensions, perpetuating a cycle of inequality.

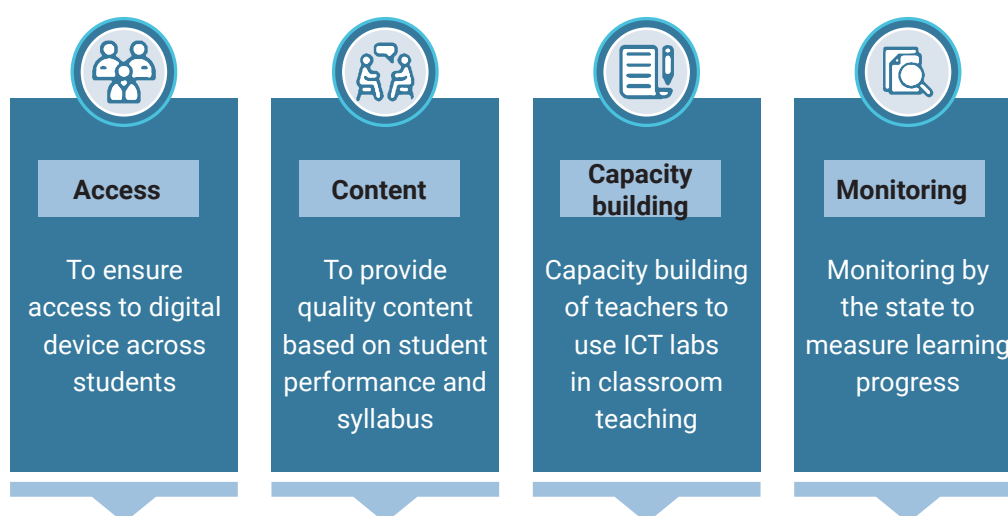
As per a report by GSMA, technology has the potential to solve many challenges related to access, equity, and quality of education.² Although India's edtech sector is rapidly growing, with several new players emerging in recent years, most of these firms operate on a B2C business model wherein they provide edtech content to customers who can avail of the service by paying for it. This often results in a digital 'Matthew effect' of accumulated advantage, meaning "even new, free resources are mainly beneficial to affluent learners with access to networked technology."³ Mission Buniyaad seeks to create a more egalitarian approach towards technology. It essentially believes that technology is most effective when employed to benefit underprivileged communities and contribute to their upliftment. By facilitating access to digital devices through the PAL model tailored for girls, fostering a gender-sensitive educational environment, and implementing a well-structured data-driven monitoring system, Mission Buniyaad aspires to strengthen the institution of school education in Rajasthan—India's largest state in geographical area. Additionally, accounting for internet issues in remote villages and districts, PAL was customised to be usable offline.

Approach and Early Challenges

A number of critical parameters were addressed to strengthen the state's educational institutions for digital learning. This included improving the state's digital infrastructure to support widespread digital learning. The programme also emphasised enhancing the institutional capacity to manage and oversee digital education initiatives effectively. Moreover, efforts were made to promote the adoption of digital education methods, ensuring that educators and students were adequately prepared for the transition. This encompassed the provision of digital tools and resources and training and support for educators to integrate digital technology into teaching effectively. A key facet of the

initiative involved preparing and curating e-learning content and curricula that align with education goals, ensuring that the educational materials were suited for digital delivery methods. This comprehensive approach aimed to strengthen the state's education system in the context of digital education, fostering a more resilient and adaptable learning environment.

Figure 1: Systemic enablement through Mission Buniyaad



Source: GDi Partners

While scaling the programme to cover 33 districts across the state, the Mission Buniyaad team collaborated with various stakeholders within the education ecosystem (SDG target 16.7). This presented numerous learnings based on which the programme was built:

Systemic approach to programme design and implementation: Mission Buniyaad acknowledges that its digital education intervention is not solely focused on the perspectives of schools, students, and teachers. Although students and teachers are the primary beneficiaries of the edtech programme, ensuring its success, longevity, and scalability requires the involvement of additional vital stakeholders. This includes engaging and consulting with principals, educational officers at the block and district levels, and various departments at the state level, all of whom actively participate in its implementation.



Fostering synergies between departments and establishing integrated systems:

During the post-pilot scaling of the programme, efforts are being made to rejuvenate and refurbish state-owned digital infrastructure. Rajasthan currently has more than 10,000 schools with information and communication technology (ICT) labs, but there is no data-backed mechanism to track the status of these facilities, their maintenance, and use. As a key initiative under Mission Buniyaad, the team supports the existing ICT labs to initiate high-quality PAL, which requires enhanced coordination between various government departments to streamline and strengthen this and other edtech programmes in the state. Outdated and unorganised data collection methodologies: Given capacity constraints, obsolete methods are often used for ad-hoc data collection, resulting in a trove of information that fails to represent the current educational landscape accurately. Mission Buniyaad has formulated essential metrics for streamlining the data collection process within the state's ICT department. These metrics serve as a roadmap for making informed decisions regarding the current status, distribution, and utilisation of ICT labs throughout the state and are actively used by state officials.

ICT integration with mainstream subjects: Although ICT resources are available in schools across the state, they have not yet been widely integrated with traditional subject-based teaching. This has resulted in missed opportunities to enhance and enrich teaching and learning experiences. Mission Buniyaad has taken steps to address educational disparity by implementing a personalised and adaptive digital learning platform. This initiative ensures that even the most remote schools in Rajasthan have access to high-quality educational content, even without internet connectivity.

Building a cohort of digitally skilled teachers: Mission Buniyaad prioritises the development of a competent and experienced cohort of teachers and trainers proficient in both digital tools and pedagogical frameworks. By placing teachers at the centre of the programme design and training, they become the catalysts for driving the initiative. This approach ensures the sustainability and scalability of the programme across all ICT-enabled schools in Rajasthan.

Establishing a standardised review and monitoring framework: The state's ICT department currently operates without real-time data on the number of labs, their status, and use. Mission Buniyaad has implemented a batch-processing

data dashboard exclusively for the ICT department, enabling comprehensive oversight of ICT usage and students' learning status. With this system in place, stakeholders can make informed decisions and swiftly address emerging challenges.

Implementation, Innovation, Impact

Missing gaps in Rajasthan's education system were identified through rigorous assessments, based on which a pilot was created. The main idea behind the pilot on tablets was to test the impact of PAL on learning outcomes over a short period. Given the pilot's success (a 21-percent increase in learning outcomes), the focus shifted to more districts in the state by leveraging existing ICT infrastructure.

However, there were some challenges, including limitations on the available infrastructure. In Rajasthan, ICT infrastructure includes Ncomputing, a system in which a single server is connected to as many as 10 screens. This drastically reduces the processing power of devices. Additionally, many schools do not have proper electricity supply or internet connections to use online software. Due to these reasons, the PAL used in tablets could not be used in ICT. After some deliberation, the following criteria were used to identify the schools for the programme's next phase:

- a) The school's annual maintenance contract^d (AMC) is valid for five years on average. Schools with active/valid AMCs were shortlisted to ensure support in potential hardware-related issues.
- b) A school that had at least some proportion of girls in senior secondary classes (Classes 8 to 12).

^d An annual maintenance contract is an agreement made with a service provider to repair and maintain ICT labs within their jurisdiction or responsibility.



Figure 2: Mission Buniyaad Project Timelines

Mission Buniyaad project timelines																
Diagnosis			Design				Pilot in 6 districts			Scale up to 33 districts (on-going)						
Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023
Diagnosis of key issues			Design of Mission Buniyaad				Pilot in 6 districts			Scale-up Plan						
Conduct current-state analysis to understand lay-of the land across state level entities and in pilot districts Align program goals and objectives with the government priorities			Design digital interventions based on the gaps identified during diagnosis phase Strengthening enablers to ensure long term sustainability				Implemented Tab-lab model through Personalised Adaptive Learning in 62 schools Activation of MB Cell in all pilot districts by government officials Capacity building of the state, district and school level officials			Leverage existing computer labs in schools to Implement Mission Buniyaad in all 33 districts of Rajasthan Facilitate in-school learning and tracking usage data Streamline governance at the state, district, block, and school levels implement at-home learning through digital mediums Gender sensitivity in classroom teaching						

Source: GDI Partners

Key strategies during implementation

To cater to the system’s current needs, the technical team started to work on customising PAL to become compatible with ICT labs.

Installation in isolation was not enough. To strengthen an institution, it is essential to focus on the people that make the institution. Teachers who have been instructing using traditional methods are often averse to technology. It was essential to train teachers in using PAL and reassure them and showcase that PAL is meant to support, not replace them. Digi Charcha campaigns were conducted to create awareness of digital literacy. Further, teachers’ capacities were built through various state, district, block, and school-level training sessions. They were taught how to leverage PAL to check their students’ understanding and provide them with the required support. Through a multifaceted approach, the programme has begun to yield positive results, and many teachers who were once wary of technology are now taking the initiative to use PAL for teaching.



Standardisation of vendor management by the department for infrastructure readiness: While surveying ICT labs, the team found that the labs established in different phases^e have different set-up structures with differing terms and conditions of annual maintenance and warranty period. To bring uniformity across these labs, the team suggested ideal ICT lab specifications to consider in further tender releases. The team also noticed that even valid AMCs were not always active. To solve this, in alignment with the government, the Mission Buniyaad team released an order that mandated the activation and utilisation of the ICT labs to promote digital learning. This is evidence of the government's commitment to developing infrastructure to support digital education, ultimately leading to the establishment of resilient and effective institutions.

Empowering state departments through data-driven insights: Mission Buniyaad aims to enhance data transparency and accountability within the system. The dashboard allows officials at every level to gain insights into utilising the available digital infrastructure. This transparency has encouraged many district and block officials to initiate review meetings, enabling them to identify the factors contributing to low usage and acknowledge schools actively embracing digital learning. Additionally, it offers valuable insights into the progress of PAL, usage patterns within specific time frames, and its impact on learning outcomes. This initiative promotes effective governance and accountability in the education system, aligning with the principles of a just and inclusive society.

Augmenting the digital learning at the grassroots by strengthening system capacity across multiple tiers: The on-ground Mission Buniyaad team played a crucial role in this programme, offering essential support in the field. This includes empowering teachers, ensuring the effective implementation of digital education, and collaborating with district and block-level officials to reinforce systems when needed. The involvement of fellows serves to unite diverse stakeholders in advancing the objective of improved digital learning, contributing to the promotion of inclusive and accountable institutions.

^e ICT labs were introduced in government schools in Rajasthan in multiple phases, with the initiative commencing in 2008.



Impact

Mission Buniyaad's impact aligns with the objectives of SDG4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all). It also aspires to extend its influence through direct and indirect pathways by which higher education can contribute towards the core SDG16 fundamentals of peace, justice, and institutions.

The project has successfully brought financing, innovation, and technology under one umbrella to build a more resilient education system in Rajasthan. The project resulted in a positive outlook towards technology by using existing financial investment to provide digital access through innovative means. In cases where schools lack subject teachers or face teacher shortages due to systemic or institutional issues, edtech has proven to be a valuable solution, bridging the gap and serving as a substitute to ensure that students continue to learn. Additionally, students benefiting from PAL have expressed heightened engagement in their education, noting that it has become easier for them to grasp the content. Many girl students said that their enthusiasm for learning has increased since the introduction of PAL.

The impact extends beyond just improved learning outcomes. This project holds aspirations for a brighter future for a young girl from a small village in Rajasthan. This envisioned future includes achieving financial independence and gaining basic dignity and respect, shielding her from the risks of child marriage, teenage pregnancy, or domestic violence. In this vision, her maturity, income level, and education harmoniously work together to provide her with a more secure environment.

Therefore, Mission Buniyaad signifies a dedication to providing equitable opportunities to India's young citizens, especially girls, striving to secure their right to a quality education, affording them the respect they deserve, and establishing a sustainable institution for the future.

New Directions

The existing ICT infrastructure in Rajasthan is nascent, mainly designed considering the basic digital literacy requirements. However, the infrastructure

must be updated to accommodate dynamically changing technology and innovative interventions. Another aspect of the programme is outcome-based funding, where part of the payment to vendors will be defined based on infrastructure setup, and the other part should be based on the utilisation and maintenance of infrastructure. Data-led governance brings transparency to the system in many aspects, including ownership, usage, and success rates. This type of governance will encourage all to perform outcome-driven actions, leading to better results.

Conclusion

Mission Buniyaad highlights that technology can be used to ensure responsive, inclusive, participatory, and representative decision-making at all levels. As this scaling-up phase progresses, it not only benefits the local educational landscape but also serves as a guide to other Indian states and even other developing countries. The programme's success can be a blueprint and inspiration for similar initiatives, shedding light on addressing educational challenges and promoting equitable learning outcomes in diverse contexts.

Mission Buniyaad contributes to SDG16 in several ways, with a particular focus on creating capacities for participation and the development of institutions that are more resilient, responsive, and accountable:

SDG target 16.10:^f By targeting underserved communities and prioritising girls' education, Mission Buniyaad promotes equal access to quality education. The programme addresses educational inequalities, especially in rural areas, by improving learning outcomes and retention rates. Through education, Mission Buniyaad empowers students, particularly girls, by providing them with the knowledge and skills needed for personal development and active social participation. Empowered individuals are more likely to contribute positively to peaceful and just societies.

^f Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.



SDG target 16.7:^g The programme involves community interactions and engagement, fostering a sense of ownership and accountability in education. The participation and representation from parents and government representatives at various levels in the government and community enable this programme to be more holistic.

SDG target 16.6:^h Mission Buniyaad's data-driven monitoring mechanism enhances transparency and accountability in the education system, aligning with SDG16's emphasis on effective, accountable, and transparent institutions.

^g Ensure responsive, inclusive, participatory and representative decision-making at all levels.

^h Develop effective, accountable and transparent institutions at all levels.

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**PARTNERSHIPS
FOR THE GOALS**



17

**India's Exemplary
Development Partnerships
Model: Learnings on SDG17**



Development cooperation offers avenues for innovative financing mechanisms for the SDGs.

At a Glance

- As one of the world's leading figures in South-driven cooperation, India has a model of development partnership characterised by the goal of 'shared prosperity'. India is also emerging as a leader in forging innovative forms of cooperation and partnerships, which the international development cooperation ecosystem should integrate.

- A fundamental factor in robust development partnerships are the sub-national agencies that act as a multiplier of human endeavour, thereby facilitating capital and capacities towards pursuing ambitious goals.
- India's development cooperation model can be boosted by deepening engagement with civil society and other non-state actors towards attaining Agenda 2030. This model can also serve as a template for both south-south and north-south partnerships in the near future.

Introduction

India took the helm of the G20 at a time of a polycrisis, when the world was facing unparalleled geopolitical, geoeconomic, developmental and social challenges.¹ Other factors have stalled the progress on the global development targets: the inconsistent and unequal post-pandemic recovery efforts; supply-chain disruptions as a fallout of the Ukraine crisis; the looming global stagflation;^a and the urgent environmental threats from climate change. As we near the mid-term review of the UN Sustainable Development Goals (SDGs) in September 2023, amidst such daunting global circumstances, our path forward for development stands at a pivotal juncture.

The polycrisis has had devastating impacts on both developed and developing economies, especially on the achievement of the SDGs. According to the OECD, almost “one in eight OECD residents is income poor”, reflecting the developed world's inadequate progress towards poverty reduction.² Meanwhile, the UNDP reported that “a staggering 71 million people all across the world have been experiencing poverty” since the war began in February last year.³ The least developed countries (LDCs), Small Island Developing States (SIDS), and low-income economies have been bearing the disproportionate burden of the multiple crises. The 1.1 billion people of the world's 46 LDCs⁴ have contributed less than 4 percent to the total greenhouse gas (GHG) emissions, yet they suffer the worst impacts of extreme climate-related disasters. Pertinently, these

^a Defined by economists as a combination of economic stagnation and inflation.

economies have also been identified as the hotspots where the fate of the SDG heavily depends upon.⁵ Further, as per a rapid assessment conducted by the United Nations Conference on Trade and Development (UNCTAD) last year, several of the LDCs and the African continent are staring at “heightened financial volatility, sustainable development divestment, mounting trade costs and complex global supply chain reconfigurations.”⁶ The severe shortage of food, fuel and fertilisers can potentially run into the risk of civil unrest and democracy deficit.

Considering the plethora of developmental challenges faced by the LDCs and SIDS—among them, climate change, financing for global public goods, access to basic social protection and security, and digital inequalities—it is agreed that Official Development Assistance (ODA) alone cannot possibly solve all of them.⁷ This is where SDG17 becomes crucial. Giving precedence to the revitalisation of global partnerships for addressing persisting challenges, this Goal calls on all countries, developed and developing alike, to ensure that no one is left behind.⁸ It emphasises on enhancing international support towards targeted capacity-building through different modalities, such as North-South, South-South, and triangular cooperation. As one of the leading South-driven partners in the world, India’s model of development partnerships is characterised by the goal of ‘shared prosperity’ and gives voice to the concerns of the Global South.⁹ Holding the ongoing G20 Presidency gives New Delhi the scope to shepherd the conversation on global development governance. This also offers a solid platform to take up the cause of the vulnerable geographies which have been pushed back in their journey towards realising Agenda 2030.

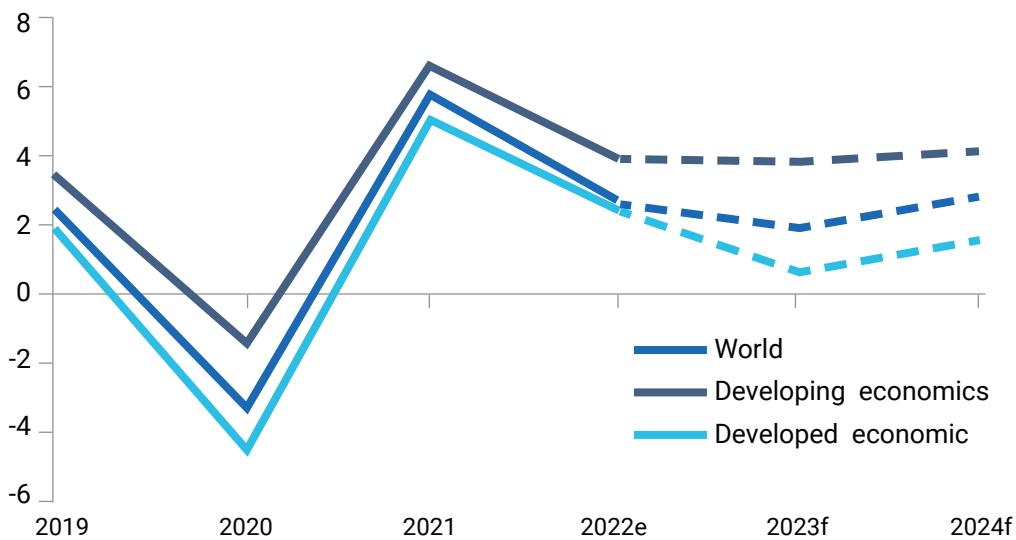
This essay makes two arguments. First, India’s development partnership model is unique in terms of various normative parameters, as compared to those of the traditional donors. More importantly, it is a framework that is more appropriate for the Global South, especially in the context of South-South Cooperation (SSC). Second, right from inception, India’s development cooperation model has been organically embedded in the SDGs—long before the global community made the commitment in 2015. These elements make the Indian development partnership model unique while being potentially replicable in the context of the Global South.



Development Cooperation and Agenda 2030

The ongoing polycrisis has had negative consequences to sustainable development financing. The lack of funding for the SDGs has emerged as a key bottleneck in a world plagued by economic headwinds, heightened uncertain growth outlook, and continued geopolitical tensions. For instance, the UN report, *Financing for Sustainable Development 2023* states that although SDG financing needs are increasing, development finance is unable to keep pace.¹⁰ This could possibly snowball into a massive sustainable-development divide, especially for the vulnerable communities situated in the African region, the LDCs and SIDS. Exacerbating the development divide is the low levels of investment in the developing regions. According to the UN, the world output growth slowed from 5.8 percent in 2021 to 3 percent in 2022.¹¹ Indeed, the 2023 *United Nations World Economic Situation and Prospects* has predicted that global growth will decelerate to 1.9 percent in the current year (Figure 1).

Figure 1: Growth of World Gross Product (in Percentage)



e - estimates, f - forecasts

Source: United Nations, 2023

The pattern is more pronounced for the Global South. As per estimates, developing countries face an annual deficit of US\$ 1.7 trillion in SDG financing, while more than US\$ 4 trillion accounts for the annual gap in closing the SDGs for the world. The LDCs face the worst difficulties. Table 1 illustrates how GDP growth in these countries would need to reach massive heights to meet the required financial investments for achieving SDG targets 8.1, 1.1, and 9.2 by 2030.

Table 1: Cost and required growth for achieving SDGs in LDCs between 2021 and 2030

SDG Target to be achieved during the 2021-2030 period	Required annual average fixed investments	Required annual GDP growth rate to finance the investment
SDG Target 8.1: 7 percent annual GDP growth rate	US462\$ billion	7 percent
SDG Target 1.1: Eradicate extreme poverty	US485\$ billion	At least 9 percent
SDG Target 9.2: Double the share of manufacturing in GDP (a form of structural transformation)	US1,051\$ billion	20 percent

Source: Traeger et al (2021)¹², D'Souza and Jain (2022)¹³

Three crucial factors have aggravated the funding gaps and imperilled the global economy's ability to achieve the SDGs. First, the COVID-19 pandemic and the consequent economic uncertainty. Second, the Russian invasion of Ukraine has disrupted global and regional value chains, created inflationary pressures, drained forex reserves of some smaller economies, and created macroeconomic insecurity. Third, climate change is increasing the financial demands on countries that are having to both adapt to the impacts, and rapidly transition towards cleaner sources of energy to mitigate further warming. New

modes of thinking, institutional mechanisms, innovative financing instruments, and mobilisation processes that allow the flow of funds from the Global North to the Global South are urgently needed.

In this context, development cooperation can offer possible avenues for innovative and flexible financing mechanisms. It can prove to be a strong lever for instilling an integrated approach towards implementation of the SDGs.¹⁴ In fact, the primary role of ODA is to reorient the economies of the beneficiary countries towards meeting their sustainability challenges.¹⁵ Analysts like Fukuda-Parr and McNeil (2019),¹⁶ Chaturvedi et al. (2021),¹⁷ Messner and Scholz (2018),¹⁸ and Mawdsley, Savage and Kim (2014)¹⁹ have over the years reiterated how Agenda 2030 is an important reference framework for development cooperation, which in turn is instrumental for achieving the global common good. Moreover, as per Chaturvedi et al., development partnerships are key in facilitating dialogue amongst actors, resulting in an alignment of ideas for Agenda 2030.

Although historically, the OECD's Development Assistance Committee (DAC) has had de-facto monopoly in framing global aid regimes and development partnerships, a shift has been observed since the 2000s.²⁰ With the rise of South-driven partnerships led primarily by India, China and Brazil, the SSC modality has managed to establish its presence in the global development landscape. Many of these countries are emerging as dominant players and prime movers in establishing large-scale connectivity models, bolstering inclusion at multilateral forums, and fostering diversified partnerships.²¹ The pandemic unlocked the latent potential of international partnerships headed by the Global South.

India, for instance, took the reins in distributing life-saving vaccines in 2021, under its flagship programme *Vaccine Maitri* across its neighbourhood and in Africa, responding to the failure of multilateral institutions to step up to the task.²² Meanwhile, South-led development banks like the New Development Bank offered financial support to the LDCs to tackle the socioeconomic fallout of the health crisis.²³ According to the UN, the pandemic enabled the LDCs to leverage their own SSC structures to coordinate policy responses to

contain the COVID-19 pandemic. For example, Indonesia under SSC provided technical assistance to almost 22 countries training 886 participants during the pandemic.

India's Approach to Development Partnerships

India's approach to development cooperation is different from that of other countries. As observed by experts, its partnership model is organic and needs-based in nature,²⁴ and not driven by any specific policy design. While it is vociferously representing the voice of the South, India's model of development partnerships has been making a mark even before 1947. For instance, in 1946, the Indian interim government invited agricultural scientists from China and Indonesia as part of its capacity-building programmes.²⁵ Underpinned by the spirit of '*Vasudhaiva Kutumbakam*', its partnerships model is demand-driven, respecting the sovereignty of the beneficiary country with no-strings-attached conditionalities (Figure 2).

Figure 2: Indian Ethos of Development



(Source, DevCoopIndia, RIS, 2022)²⁶



India has utilised multiple avenues and instruments for development partnerships that entail grants-in-aid, lines of credit, and capacity building and technical assistance. The use of the instruments and the domains of interventions have varied depending on the priorities of partner recipient nations. In the process, India's development partnership has delved into domains "like culture, energy to engineering, health to housing, IT to infrastructure, sports to science, disaster relief and humanitarian assistance to restoration and preservation of cultural and heritage assets."²⁷

Moreover, India's foreign policy considerations are now progressively being structured around the notion of 'diplomacy for development', as pointed out by External Affairs Minister S. Jaishankar. This 'India Way' of foreign policy fits well for the larger Global South. During the 2021 BRICS Academic Forum in New Delhi, the Indian Foreign Minister underlined the necessity of putting in place "human-centric globalisation" as a hallmark of the post-pandemic world order.²⁸ He stated: "India is a constructive contributor to the efforts to create such an international order by sharing the developmental experience with partner countries in the Global South; undertaking humanitarian assistance and disaster relief operations, particularly during the pandemic; through initiatives such as the International Solar Alliance (ISA) and the Coalition for Disaster Resilient Infrastructure (CDRI); and by acting as a first responder (through Vaccine Maitri) and net security provider in its diplomatic environment." By 2020, India's development cooperation had reached US\$8.7 billion, covering almost 160 countries and training more than 20,000 individuals annually.²⁹

As Chaturvedi (2023) notes, India is emerging as a leader in forging innovative forms of cooperation and partnerships, which the international development cooperation ecosystem should integrate.³⁰ Pertinently, India started its development cooperation model based on capacity building in 1964, much before the UN's Technical Cooperation for Development Cooperation was initiated in 1978. PM Modi's 2018 address at the Parliament of Uganda is important in this regard: "Our development partnership will be guided by your priorities. It will be on terms that will be comfortable for you, that will liberate your potential and not constrain your future... We will build as much local capacity and create as

many local opportunities as possible.”³¹ Through its partnership programmes, India has been expressing solidarity and responsiveness to the priorities of partner countries. As a developing nation itself with limited resources, India has willingly offered its development experience to countries that wished to engage.

However, the country’s Development Partnership Administration (DPA)—its main implementing body for matters related to development cooperation—does not have a separate pillar on the SDGs. Most of its projects on sustainable development have been devised way before the Agenda 2030 came into effect in 2015 (Table 2). These projects came about organically rather than being driven by policy.³² As observed by experts, its development partnerships model is ideal for addressing the present-day challenges because of several factors.³³ Offering low-cost development solutions, India has proved its prowess in capacity-building and transfer of knowledge and technical expertise over the years. This can be a deciding factor for other developing countries looking for a feasible ‘mutually beneficial, no-dependence, and demand-specific’ partnerships.

Table 2: The SDG thread in India’s Development Partnerships over years

Phases	Nature of Cooperation	Country	SDGs
"Phase 1 (1947-1990)	Power Exchange Agreement and establishment of Schools and setting up facilities in Tribhuvan University	Nepal	SDG 7 & SDG 4
	Treaty of Friendship towards infrastructural and ITEC programmes	Myanmar	SDG 9 & SDG 17
	Indira Gandhi Children’s Hospital and training of Afghan bureaucrats, doctors and paramedics under ITEC	Afghanistan	SDG 3 & SDG 17
	LOCs amounting to US\$ 63 million linking Bengal-Assam plains to Phuentsholing, and Phuentsholing to Thimpu and Paro	Bhutan	SDG 9
	Cooperation in capacity building, trade and investment, infrastructure, and ensuring supply of trained teachers	Ethiopia	SDG 17, SDG 9, SDG 3, SDG 8
	Mahatma Gandhi Institute (MGI) promoting cultural cooperation	Mauritius	SDG 4
	2X20 Tripoli West Power Station	Libya	SDG 7

Phase II (1991-2008)	Under the Second phase LOCs programmes, US\$ 640 million towards sugar industry	Ethiopia	SDG 2
	Centre for Demonstration and Promotion of Technologies (CDT)	Cote d'Ivoire	SDG 1, SDG 8, SDG 9
	School Feeding Programme, healthcare facilities, Small Development Project Scheme, initiation of Salma Power Dam	Afghanistan	SDG 4, SDG 1, SDG 3, SDG 7, SDG 2, SDG 17
	Advanced Information Technology Institute-Kofi Annan Centre of Excellence in ICT (AITI-KACE)	Ghana and ECOWAS	SDG 9, SDG 17, SDG 4
	Rajiv Gandhi Science Centre (RGSC)	Mauritius	SDG 4
	Pan-African E-Network Project	Africa	SDG 2, SDG 4
	Barefoot College under ITEC	Sierra Leone	SDG 5, SDG 7
	43 Road Projects, Arun-3 Hydropower Project	Nepal	SDG 11, SDG 7
Phase III (post-2008)	Extended LOCs amounting to US\$ 7,000 million towards 31 connectivity projects, High Impact Community Development Projects	Bangladesh	SDG 11, SDG 17, SDG 4
	Regional Connectivity	Sri Lanka	SDG 11, SDG 9
	IBSA Fund-Healthcare access	Cambodia	SDG 3
	IBSA Fund- Facilitating means of irrigation	Laos	SDG 2
	IBSA Fund-Training in modern agricultural techniques	Timor-Leste	SDG 2, SDG 17
	India-UN Development Partnership Fund	SIDS, LDCs and LLDCs	Covering all the 17 SDGs
	International Solar Alliance (ISA)	Developing nations of Africa and Asia	SDG 7
	Coalition of Disaster Resilient Infrastructure (CDRI)	Asia, Pacific and Oceania	SDG 13, SDG 11
	Vaccine Maitri	Global	SDG 3, SDG 17

Source: Prabhu (2021)³⁴

Further, Chakrabarty (2022) shows that India's development partnership model finds a fit with the five criteria suggested by the UNDESA³⁶ for the reorientation of development cooperation policies for achieving the SDGs. These include: supporting national efforts and specifically focus on the most vulnerable and marginalised groups such as women; scaling up of all forms of development cooperation; utilisation of domestic resources and building up of domestic capacities; adoption of a holistic approach to build-in policy coherence; and engaging local authorities and citizens for monitoring and implementation of the SDGs.

The massive rise in the scale of capacity-building programmes such as ITEC in recent years gives enough empirical evidence that the first three conditionalities are satisfied. In the same mode, a demand-driven model rests on the recipient nation's priorities, with India not playing any role in creating any lopsidedness or impeding policy coherence. Chakrabarty,³⁷ however, argues that there remains scope for improvement in terms of the fifth criteria as far as India is concerned. Indeed, India's development cooperation model can be boosted by deepening the engagement with civil society and other non-state actors.

Sub-national agencies and development partnerships

A fundamental factor in robust development partnerships are the sub-national agencies. Under SDG17, target 17 specifically focuses on "encouraging and promoting effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships gains." Comprising civil society organisations (CSOs), philanthropic bodies, and local development groups, these actors can play a critical role in improving the effectiveness of development cooperation. As a result, this becomes instrumental in delivering the SDGs.³⁸ Over the years, collaboration has proved to be "a critical multiplier of human endeavour" facilitating capital and capacities towards pursuing ambitious goals.³⁹ Given the large and complex challenges faced by the developing world, collaboration enables effective solutions. As observed by a 2020 report released by the Bridgespan Group, there are three underlying motivations for collective action: by leveraging the diverse skills and experiences of different partners, collaboration's total effect can be greater than the sum of its parts; collaboration expands the circle of influence and the impact of individual actors; and it mitigates risk by spreading it across multiple players.⁴⁰

Moreover, they act as an important bridge between the government and the citizens by monitoring official policies and actions, thereby engaging in advocacy, protecting human rights and ensuring accountability of the authorities, private sector and other institutions (Figure 3).⁴¹

The following examples showcase how collaborative action increases the value proposition of their projects:

Set up in 2017 in Maharashtra, the **Village Social Transformation Foundation (VSTF)**^b leverages expertise of its partners to drive the development of rural communities through government schemes and CSR support. It uses a collaborative development approach to build model villages. VSTF is a public-private partnership in nation-building between the Government of Maharashtra and some of India's leading corporations and philanthropic organisations that aims to fill gaps in the development space for greater social capital in rural Maharashtra. From among the partners, for instance, Reliance Foundation came with experience in rural transformation, whereas UNICEF brought their global experience of working on gender issues. Further, corporate partners (Unilever, Deutsche Bank, and Mahindra) leveraged their CSR programmes in the project's target areas.

Project Alliance for Saving Mothers and Newborns (ASMAN): In 2015, Reliance Foundation partnered with Bill & Melinda Gates Foundation, Michael & Susan Dell Foundation (MSDF) India, Tata Trusts and the United States Agency for International Development (USAID) to spearhead Project Alliance for Saving Mothers and Newborns (ASMAN), a pioneering philanthropic collaborative in India. ASMAN's inception coincided with the year the SDGs were introduced in 2015, and it effectively worked towards the spirit of Goal 17 of partnerships through bringing these organisations to leverage their strengths to accelerate reduction in neonatal and maternal mortality.

Project ASMAN improved quality of care provided to mothers and newborns, from the time of admission to discharge—a window with the highest risk of morbidity and mortality. Project ASMAN used an innovative approach by leveraging multiple technology-based healthcare innovations in the states of Rajasthan and Madhya Pradesh to strengthen the capacity of healthcare providers to ensure safe health outcomes for mothers and newborns. Over

^b VSTF is also supported by Axis Bank Foundation, HT Parekh Foundation, JSW Foundation, Hans Foundation, Syngenta, A.T.E. Chandra Foundation, D-Mart, Wildlife Conservation Trust, Rare Enterprises, ENAM, Idea-Vodafone, Tata Trust, Swades Foundation, and the Government of Maharashtra.

7.5 lakhs mothers and newborns were reached through 81 government health facilities since the inception of the programme in 2015. From April 2018 to June 2021, 433,100 cases were detected through the ASMAN app; of these, 165,000 (38 percent) were high-risk.⁴²

10to19 Dasra Adolescents Collaborative:⁴³ The Dasra Collaborative is a partnership between Bank of America, Children’s Investment Fund Foundation, David & Lucile Packard Foundation, Kiawah Trust, Tata Trusts, USAID, Dasra Giving Circle members, CSR organisations, family foundations, and state and central governments. Launched in 2013, the initiative was aimed at improving the health of mothers and children and empowering adolescent girls. The partnership enabled mobilisation of funds, unlocking US\$28 million (INR 197 Cr), and effective implementation of programmes to reach 160,000 adolescents across four states of India. Further, the initiative published 24 adolescent-focused knowledge products to share learnings and best practices and encourage others to contribute to the programme.

Figure 3: Role of Sub-national agencies



Source: *The Bridgespan Group, 2020*⁴⁴

CSOs are important to development cooperation, both as development actors in their own right and as implementing partners. The strengthened global partnerships for achievement of SDG17 are meant to involve all levels of government, the private sector and civil society, among others, in a whole-of-society approach to the SDGs. Further, CSOs play a crucial role in facilitating people’s participation and the pursuit of accountability. India’s development cooperation model has been bolstering the CSOs, through triangular partnerships, in the decades after it achieved independence in 1947. Experts believe that India is keen to utilise the triangular format to “spot innovations by Indian CSOs with a view to sharing them with other countries to tackle similar development challenges and also undertaking broad regional and global initiatives.”⁴⁵

Conclusion

India's development partnership strategy is primarily centred on human needs, emphasising respect, diversity and tackling challenges of sustainable development.

India's contribution in the overall 'development assistance game' may look minuscule in absolute terms. However, this essay argues that India's uniqueness or competitiveness in this game is not in the numbers, but in the unique nature of its development partnership architecture. If one quantifies the qualitative aspects, it may be inferred that the 'transaction cost' of working with India in the development partnership domain is the least. Further, Table 2 suggests that the SDGs have been intuitively incorporated in India's development programmes much before Agenda 2030. The model can serve as a template for both south-south and north-south partnerships towards attaining Agenda 2030.

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After the SDGs: Towards a New Global Development Agenda

THE SUSTAINABLE DEVELOPMENT GOALS (SDGs), a key part of the 2030 Agenda for Sustainable Development, are the defining pillar of current global developmental governance. This volume has discussed some of the achievements and replicable practices that have emerged from India in the context of achieving the SDGs. This chapter explores the Indian development vision in its proclaimed *Amrit Kaal* (2022-2047), and how this vision aspires to augment the global developmental paradigm after 2030, considering 2050 as the terminal year for achieving the new vision.

Development is a continuous process, and achieving the SDGs by 2030 cannot be seen as the endpoint. Just as the SDGs replaced the Millennium Development Goals in 2015, the planet will need a new set of goals in the post-2030 scenario, driven by the human aspirations of progress of civilisations. Can the Amrit Kaal vision be a contributor to this process? What should be the aspirational goals after 2030?

Goals for a Post-SDGs World

The 17 interlinked SDGs encompass a wide range of social, economic, and environmental challenges humankind currently faces. As 2030 approaches, it is imperative to consider what lies beyond the SDGs. The SDGs serve as a foundation, a roadmap for building a more just, equitable, and sustainable world. Looking beyond 2030, the world should aspire to create a holistic and interconnected approach that fosters a truly flourishing global community, focusing on 10 goals:

- **Zero Digital Divide**

It is widely acknowledged that digital technology has emerged as a prime driver supporting the SDGs.¹ However, while digital technology is being increasingly treated as an enabler of SDG achievement, there are no goals for the digital domain in the Agenda 2030 framework. Concerns related to the digital divide loom large. Digital technology is no longer merely an enabler of developmental goals; with 4IR and the digitisation of services, all human endeavours are slated to move to the digital world. The COVID-19 pandemic spurred a sudden spike in global internet usage, with 466 million people using the internet for the first time in 2020;² and the number of internet users and the percentage of internet penetration growing by 7 percent and 6 percent, respectively, between 2021 and 2022.³

However, while the pandemic paved the way for greater digital inclusion, the digital divide remains a challenge. As per 2022 estimates, 2.7 billion people, representing a third of the world, do not have access to the internet, while 53 percent of the global population does not have access to high-speed broadband.⁴ Such global digital exclusion will also lead to the population's exclusion from economic, political, and social benefits over time as more social security benefits and business and job opportunities move onto the digital domain.

- **Strengthening Environmental Stewardship**

The environmental dimension of sustainable development is paramount for the well-being of current and future generations. While the SDGs acknowledge various environmental challenges, it is essential to recognise that achieving these goals is only the beginning of a comprehensive effort to restore and

protect our planet. Post 2030, there will be two targets for which environmental stewardship needs to be strengthened further. The first is related to human survival in the context of climate change. While the SDGs talk of climate action (SDG13), most nations have set their net-zero targets for after 2030. Notably, net zero implies the balance between the quantity of emitted greenhouse gas (GHG) and the amount removed from the atmosphere. This will require a combination of a reduction in and elimination of GHG emissions. Therefore, countries should commit to even more ambitious targets for reducing GHG emissions, transitioning to renewable energy sources, and adopting sustainable urban planning. The Paris Agreement provides a framework for international cooperation in combating climate change, but its effectiveness will rely on renewed commitment and action. The concern of the Global South should be accounted for by following the principles of common but differentiated responsibilities enshrined in the United Nations Framework Convention on Climate Change, thereby upholding the cause of climate justice and equity.

The second target concerns decent human living, acknowledging the importance of natural capital in human life. Achieving net zero is just the beginning. There have been extensive land-use changes from natural and agricultural ecosystems to create linear infrastructure, and the flow regimes of water bodies have also been compromised through large constructions and diversion channels. These have affected some of the basic ecosystem services on which human life, livelihoods, and well-being are inextricably dependent. The overexploitation of nature and depletion of natural resources will hinder future human progress. While the SDGs talk of protecting life on land and life under water (SDG14 and SDG15), the next set of goals should involve aligning human society and life with environmental goals. Therefore, protecting biodiversity, restoring ecosystems, reforestation, habitat preservation, and sustainable fishing practices should not be treated as normative ethical statements emerging from the books of morality, but as selfish human needs for humankind's survival.

- **Creating Shock-Resilient Economies and Societies**

The world has encountered numerous shocks over time, but the frequency has increased in the new millennium. Over the last 23 years, the world has witnessed terrorist attacks, financial crises, economic slumps, trade wars, a pandemic, a supply-chain crisis triggering global stagflation, and the onset of widespread climate change-induced extreme events.

Certain shocks result in systemic risks—they have cascading impacts on the system as a whole through the interactivity of the various parameters making the system. If society is the system, risks that affect society percolate through various sub-systems that may be delineated as the parameters, such as health, transport, environment, telecommunications, economy, polity, and governance. An environmental hazard can threaten the functioning of markets, the stability of macroeconomic conditions (inflation, unsustainable public finances, involuntary unemployment), or political stability (military coup, war, insurgencies), and pose threats to health and human life, property, infrastructure, and the environment.

The COVID-19 pandemic (a health issue), the US's 2007 subprime crisis (a financial issue), the Gulf Wars (geopolitical issues), and even the ongoing Ukraine war, for instance, have had widespread economic, social, geopolitical, and environmental implications.

Such a situation can be termed a 'polycrisis', the convergence of multiple complex problems simultaneously. These convergent problems include uncertain and unequal post-pandemic recovery endeavours, the supply-chain bottlenecks caused by the Ukraine crisis, global stagflation, the outfalls of the trade wars, and the perennial assault of global warming and climate change. All these have combined to put the brakes on work towards achieving the SDGs.

The increase in the number of global systemic shocks caused by both endogenous and exogenous drivers leads to many consequences, spanning demographics, natural ecosystems, technology, social norms, and the economy. These disruptions interact with the interconnected aspects of socio-economic-ecological systems, leading to broader systemic vulnerabilities. As the movement of individuals, commodities, capital, and data accelerates, the nature of these risks becomes increasingly multifaceted and influenced by various factors. This necessitates a comprehensive strategy, one that acknowledges the interconnectedness of hazards, diverse systems, and global influences on risk management frameworks.

One defining characteristic of contemporary shocks is their quick and extensive reach. In an increasingly interconnected world, even localised shocks can have far-reaching impacts across space and time by influencing technological or financial systems, trade channels, human migration, public health, or the natural

environment. Such impacts can even be felt at the global level. Consequently, modern societies are becoming more susceptible to significant risks, especially in their ability to maintain essential services like healthcare, transportation, energy, food and water distribution, communication, and overall safety.

In the future, the likely sources of such systemic shocks are (1) the accelerated movement of people, goods, technology, and information, along with the growing intricacies of the systems within which risks are evaluated and mitigated; (2) the expanding size and density of human populations, activities, and assets; (3) the rapid and wide-ranging alterations in risk conditions, leading to increased uncertainty; (4) the evolving allocation of risk management responsibilities between public and private entities; and (5) changes in societal attitudes and risk perceptions.⁵

As the world moves beyond 2030, the global community needs to create institutions and processes for creating shock-resilient economic and social systems. This implies doubling its efforts to create a just world free from conflicts; strengthening accountable and transparent democratic institutions at global, national, and local levels; establishing rule of law at all levels; creating better early warning systems to combat climate-related disasters; creating social security and food buffer norms and stocks to combat inflationary pressures; creating economic institutions and processes that can signal impending financial and economic risks; creating hedging mechanisms through market-based solutions and insurance to help against various types systemic economic risks; and investing in conflict prevention, mediation, and resolution mechanisms that can help prevent conflicts from escalating and disrupting development progress. All these should be supplemented by combatting corruption and enhancing transparency within governments and institutions to contribute to building a just and equitable society.

- **Promoting Decent Living and Inclusive Economic Prosperity**

Eradicating poverty and ensuring food security are central themes of the SDGs. Beyond 2030, it is important to think of the next stage of collective progress for humanity that will focus on decent living once the fundamental needs are met. At the very outset, this implies that the global community should strive to create social and economic systems that prioritise inclusivity, fairness, and well-being. Well-being refers to quality of life indicators: emotional well-being

(primarily related to the psychological aspects of human health and well-being);⁶ material well-being (well-being associated with satisfaction of material needs including housing, food, health, public services, financial security, recreation, personal goals and values);⁷ social well-being (defined as sharing, developing, and sustaining meaningful relationships in social settings that create a sense of connectedness and belonging, establish cooperation and solidarity, and create relationships of support and mutual understanding);⁸ and physical well-being (that ensures a health quality of life by ensuring access to everything in terms of facilities, knowledge, and awareness to guarantee health and creates overall healthy habits).⁹

To achieve inclusive economic prosperity, there needs to be a transcendental change with contributions from governments and the private sector to address structural inequalities in access to education, healthcare, and economic opportunities. This will require enhancing social safety nets, implementing progressive taxation systems, and nurturing entrepreneurship and innovation in developing nations to foster economic growth and job creation. The private sector needs to be incentivised by governments to invest in projects on human capital that may not have high economic rates of return but will have high social rates of return.¹⁰

- **Narrowing the Developmental Gap Between the Global North and South**

Even after the SDGs are attained, the chasm between the Global North and South will remain. In one sense, this goal is an overarching one subsuming most of the other goals.

The notion of the Global North and Global South, also known as the North-South divide, categorises nations based on their socio-economic and political features—developed countries are considered the Global North (including Asian nations Israel, Japan and South Korea, and Oceanic states Australia and New Zealand), while developing countries form the Global South.

In traditional developmental thinking, being labelled as part of the ‘North’ typically suggests a level of advancement, while the ‘South’ is often associated with underdevelopment. The South is typically characterised by technological shortcomings, political instability, fragmented economies, and dependency on exporting primary goods to the North, which subjects them to volatile price

shifts.¹¹ The developmental disparity between the North and South serves to perpetuate inequality, positioning the South mainly as a supplier of raw materials to more developed nations. In this context, the North is equated with economic prosperity and industrialisation, whereas the South is seen as a collection of previously colonised nations requiring international assistance.

To fully grasp this division, it is first important to understand the meaning of development. *The Dictionary of Human Geography* describes development as the “processes leading to social transformation or as initiatives taken by state and class entities to reshape national economies.”¹² This interpretation necessitates a comprehension of economic development as crucial to dissect the North-South dichotomy. Economic development can be considered a gauge for evaluating progress within a specific economic framework. It involves technological advances, a shift from an agrarian economy to an industrialised one, and an enhancement in the quality of life. Additional criteria that contribute to the understanding of what constitutes a developed nation encompass factors such as life expectancy, educational attainment levels, poverty rates, and employment statistics.

Moreover, in *Regionalism Across the North-South Divide: State Strategies and Globalization*, Jean Grugel identifies three key elements that guide the economic advancement of nations in the Global South: the actions and interactions of the elite at the national and international levels, regional collaboration and integration, and the subsequent global positioning of these states and regions within the world’s political and economic hierarchy.¹³

The Global South’s resilience capacities have always been questioned, whether with respect to economic crisis or climate change, although the pandemic emerged as a great leveller. Developmental disparities in terms of the various indicators (poverty, hunger, education) are visible, making the Global South relatively more vulnerable to shocks than the North. A North-South transfer of finance and technology is important for the Global South to achieve the SDGs and combat climate change, but this will not erase the divisions between the two. The North enjoys a better quality of life due to the countries’ resource extraction and utilisation capacities, existing institutional mechanisms, processes, and practices.

The Global North also sets norms of progress for the South and the world that may not be entirely correct.¹⁴ The Global South is now creating space for its voice in global platforms like the G20, but there is a need to focus on erasing the developmental chasm (in terms of quality of life). For that, the South needs to create adequate enabling factors to reform its institutions, establish best practices, and create processes that are well aligned with its cultural norms and can enhance its life quality.

- **Narrowing the 'Ingenuity Gap'**

Thomas Homer-Dixon classifies 'ingenuity' or the 'production of ideas' as a critical factor of production and in resolving the emerging global challenges of the world.¹⁵ The ingenuity gap, in his thesis, is defined as the critical gap between the demand for actionable and innovative ideas to solve complex challenges and the actual production of those ideas. The world faces multiple challenges that emerge from different directions. These problems converge and intersect, and are inextricably linked and intertwined. Are societies evolving fast enough to combat the challenges of the future? Is the 'production of ideas' progressing at pace with emerging issues or is it entangled with existing complex problems?

There are two ways to look at the 'ingenuity gap' problem. The first is with respect to the gap between the demand and production of 'ideas' (ingenuity) in a particular society. The second is with respect to the disparity between societies or economies in terms of the production of ideas. Such problems can be resolved by upscaling local-level solutions and best practices and allocating more resources on research and development. Another potential solution emerges from the human capital element of development. Brain drain from the Global South to the Global North is a phenomenon that deprives the South of the best of ideas that can emerge to resolve their problems. This requires a holistic development of the Global South in terms of decent living and decent jobs, and narrowing the developmental gap between the North and South such that the latter can retain its talent and attract talent from other nations.

- **Inclusive Knowledge Societies**

Education is a powerful tool for personal growth, societal progress, and global development. While the SDGs highlight the importance of quality education, the post-2030 era demands renewed efforts to create inclusive knowledge

societies. This rests on four pillars: freedom of expression; universal access to information and knowledge; respect for cultural and linguistic diversity; and quality education for all. Quality education—essentially ensuring equitable access to education for all, regardless of gender, socioeconomic background, or geographical location—is covered under Agenda 2030. Therefore, progress towards creating inclusive knowledge societies should entail a more holistic approach than entailed in SDG4.

A rapidly changing world requires knowledge societies that are broad-based and inclusive. Beyond equipping students with traditional academic knowledge, education should emphasise critical thinking, and skills relevant to emerging industries. Integrating technology into education can enhance accessibility and effectiveness, bridging the digital divide that persists in many regions. Moreover, partnerships between governments, private sector entities, and civil society organisations can facilitate the development of innovative educational models tailored to local contexts.

- **Embracing Cultural Diversity**

The interconnectedness of the world through technology and communication has made clear the importance of embracing cultural diversity and fostering global cooperation. Intercultural dialogue and understanding should be promoted to mitigate misunderstandings and conflicts rooted in cultural differences. Respect for diversity should be embedded in policies and programmes, ensuring that marginalised communities have a voice in decision-making processes. Global cooperation, facilitated by institutions, should continue to play a central role in coordinating international efforts and providing a platform for collective action.

- **Global Cooperation for the Visions**

Forging effective global partnerships is extremely important to realise these post-2030 vision. At the very outset, multilateral institutions need to play a central role in coordinating international efforts, ensuring that no country or community is left behind. This may require rethinking and reforms in many of these multilateral institutions to make them more relevant to face the challenges of an uncertain future. These changes cannot remain transactional but must become transcendental. On the other side, multistakeholder engagement needs to be a critical pillar to maximise the effectiveness of the various types of development co-operation for greater common good to

meet the avowed goals. Such engagements need to bring together various institutions, from governments, bilateral and multilateral organisations, civil society, non-governmental organisations, the private sector, politicians, think tanks, academicians, parliamentarians, and representatives from trade unions and industry associations. Further, North-South and South-South finance, know-how, and technology transfer will remain an important driver to achieve the new visions.

- **A Holistic Perspective of the Developmental Vision**

One drawback in the way the SDGs have been pursued is that each has often been treated in a silo, without acknowledging the intersectionality between the 17 goals.¹⁶ This is an important missing link in the development governance discourse (although the SDGs are conceptually interlinked). Learning from this experience, the post-SDGs vision should entail a more holistic approach entailing an intersectionality and consonance between the goals and their trade-offs. An integrated approach towards the post-SDGs vision is important at all levels, from the micro to the global levels.

India's Amrit Kaal

In August 2022, as India completed 75 years of independence, Prime Minister Narendra Modi unveiled the Amrit Kaal (Epoch of Elixir) vision, aimed at shaping India's future by 2047 when the nation celebrates 100 years of independence. The vision involves a comprehensive transformation of the Indian economy over the next 25 years, focusing on rapid economic growth, improved living standards, technological and infrastructural progress, and restoring global faith in the country. The initiative's five pillars, its *panch pran*, are centred on national development, eradicating lingering colonial hangovers, embracing and celebrating its cultural heritage, fostering national unity, and cultivating a sense of civic responsibility among the population.

India's 2023-24 Union Budget serves as the inaugural financial blueprint for Amrit Kaal. The budget is designed to fortify the economic framework, emphasising women's empowerment in a tech-savvy, knowledge-centred New India. It outlines strategies for pursuing environmentally sustainable growth through innovative technologies. The financial allocations aim to benefit every segment of the economy, both micro and macro. The plan sets the stage for the next quarter-century of India's economic trajectory and organises key policies into

seven interconnected sectors, referred to as the *saptrishis* (seven sages). The Amrit Kaal era encompasses a tech-savvy, knowledge-driven economy, fortified by solid public finances and a resilient financial sector. The budget was constructed on three core tenets: first, creating abundant opportunities for the population, particularly the younger generation, to realise their dreams; second, delivering a powerful boost to economic growth and employment; and third, enhancing macroeconomic stability. These key aims are said to hinge on seven foundational principles: (1) inclusive development, (2) reaching the last mile, (3) infrastructure and investment, (4) unleashing the potential, (5) green growth, (6) youth power, and (7) the financial sector. As such, it attempts to cover the gamut of issues that touch upon the fundamental principle on which the SDGs are embedded, and go beyond. Considered deeply, the Amrit Kaal vision attempts to address the irreconcilable development trinity of equity, efficiency, and sustainability.

India's Part in the Post-SDGs Vision

Previous chapters in this volume have already highlighted some success stories in India in the context of creating pathways to achieving the SDGs, and these can be replicated in the Global South. Continuing in the same vein, India, given its rich history, diverse culture, and rapidly growing economy, has the potential to play a significant role in leading the world in the endeavour of building a flourishing global community beyond achieving the SDGs. India's Amrit Kaal vision can provide a replicable framework for other nations to follow, especially in the context of the 10 post-SDGs goals. India has already exhibited leadership in the context of its G20 presidency by emerging as a major voice of the Global South by promoting women-led development, bringing the African landmass into the G20 framework, and emphasising data for development.

Environmental Stewardship: India has been one of the best performers globally in the domain of energy transition. A recent estimate reveals that India is the best performer in terms of climate mitigation among the G20 nations.¹⁷ As one of the world's largest GHGs emitters, India's commitment to achieving carbon neutrality by investing in solar, wind, hydro, and other clean energy technologies can be a powerful example for other nations. India's initiatives, such as the International Solar Alliance, can be further expanded to foster global

collaboration on renewable energy adoption. This transition was particularly evident during the COP26 conference, where India committed to achieving a net zero carbon footprint by 2070.

However, what stands out for the world to follow as a philosophy after the SDGs is the 'Mission LiFE' initiative (Lifestyle for Environment) that aims to inspire citizens to embrace environmentally responsible habits, setting the foundation for India's sustainable economic growth. LiFE appears to be an all-encompassing philosophy that is more accommodative of a developmental philosophy advocating environmental stewardship. Society will delineate its characteristics depending on its needs. While it advocates human living to be aligned with nature, it does not ask societies to sacrifice their own visions and aspirations. This is what makes it a vision that will characterise the post-SDGs world.

Inclusive Growth and Digital Technology: India has been using digital technology to promote inclusive growth. India's *Aadhaar* (unique identity) programme is a replicable model, especially for its utility in providing public services and social security. The massive vaccination exercise in India was enabled digitally, and the *Mudra* scheme has also helped women's financial inclusion, thereby fostering women's entrepreneurship. India is an exemplar in its attempt to foster inclusive economic growth by further bridging the gap between its urban and rural areas. By implementing innovative policies prioritising job creation, micro-entrepreneurship, and small-scale industries, India can demonstrate a model for decent living.

Education and Innovation: India's prowess in the technology sector can be harnessed to promote education and innovation. By expanding digital literacy initiatives, improving online educational resources, and supporting research and development in emerging technologies, India can lead the way in shaping the future of education and knowledge dissemination. Further, the democratic architecture that promotes freedom of expression and the right to knowledge, complemented by the digital domain, can help India emerge as a beacon for the Global South in creating inclusive knowledge societies, and help minimise the ingenuity gap.

Conflict Resolution and Peacebuilding: Given its history and diverse cultural landscape, India can serve as a platform for dialogue and conflict resolution. By leveraging its diplomatic strengths and historical connections, India can lead regional and global efforts to mediate conflicts and promote peaceful coexistence.

Cultural Diplomacy: India's rich cultural heritage can be leveraged to promote intercultural understanding and cooperation. Initiatives that highlight cultural diversity, promote cultural exchange, and celebrate traditional knowledge can set an example of the importance of cultural diplomacy in global relations.

Inclusive Governance and Technology: India can use technology to enhance governance and citizen engagement. By promoting transparency, e-governance, and using digital platforms for public participation, India can demonstrate how technology can empower citizens and promote accountable governance.

Global Health and Well-being: India's experience in dealing with healthcare challenges, especially in densely populated areas, positions it to lead in global health initiatives. Sharing best practices, investing in healthcare infrastructure, and collaborating on disease prevention can contribute to improved global health outcomes. India's exemplary experience during the COVID-19 vaccination drive is a globally replicable model.

Humanitarian Aid and Disaster Response: India's experiences in disaster management can be shared globally. By providing effective disaster response strategies, training, and resources, India can demonstrate the importance of solidarity and mutual support in times of crisis. India's development cooperation model already stands out as a low-cost reflecting a mutually beneficial model driven by partnership, with capacity-building at its core. By uniting voices from the Global South, India can mobilise funding through a model that does not hinge on economic conditionalities but emphasises shared value in pursuing development goals.

Diaspora Engagement: India's extensive diaspora network can be utilised to promote global cooperation. Engaging with the Indian diaspora in various sectors can create a powerful network of knowledge exchange, investment, and cultural exchange.

Conclusion

India possesses an exceptional mix of cultural richness, economic promise, and technological expertise, positioning it as a leader in the global effort to build a flourishing, interconnected community that goes beyond the SDGs. Through audacious and inventive initiatives in renewable energy, financial inclusivity, educational advancement, aligning lifestyle with conservational needs, peacekeeping, and more, India can serve as a global role model, making a substantial contribution to a sustainable and interconnected future for all. By 2050, life will be different and new challenges will emerge, and so new solutions must be devised to minimise the 'ingenuity gap'. While the visions presented in this chapter are aspirational, it is also hoped that through the pathways paved out by the Amrit Kaal vision, India emerges as a global leader in achieving the 10 visions.

Achieving the SDGs by 2030 will mark a significant landmark, showcasing humankind's ability to unite for shared objectives. Yet, this feat is not a destination but rather a foundational step towards an increasingly equitable, sustainable, and interlinked global society. Through enhanced environmental stewardship, the stimulation of inclusive economic growth, the elevation of education and awareness, the nurturing of peace and fairness, and the celebration of cultural diversity and international unity, humankind must strive to establish a thriving worldwide community that cuts across borders and spans generations.

This will not be easy. The obstacles ahead are considerable and call for ongoing commitment, ingenuity, and collective action. The post-2030 pathway will necessitate a synergistic effort from governments, enterprises, civil organisations, and individuals to tackle intricate global dilemmas. Renewed dedication to communal welfare and a common outlook for a promising future can keep humanity on track to transform the aspirations of the SDGs into an attainable reality for everyone.

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Our Approach

Ideas, Innovation, Implementation: India's Journey Towards the SDGs is the fourth publication in a series by Reliance Foundation and Observer Research Foundation about transformations in development and governance. It has been produced in collaboration with the United Nations (UN) in India.

The idea for the publication germinated in May 2023, following the first and second meetings of the G20 Development Working Group in December 2022 and April 2023, respectively. As president of the G20 in 2023, India's leadership in crafting a development agenda focused on the concerns of the Global South has been widely lauded. Moreover, the SDG Summit in September 2023 will mark the completion of the global mid-term review of the 2030 Agenda. The near convergence of the two events convinced us that this was an important moment to begin studying lighthouse cases of efforts in India to achieve the SDGs. We felt that documenting these models and presenting them to a wider audience could help export innovative and

transformational development practices to other underserved regions within India and in other parts of the world.

Accordingly, in June 2023, we began to engage with India-based multilateral agencies and philanthropic and civil society organisations to better understand some of their high-impact SDG-focused initiatives. The UN supported this process by liaising with its network of agencies to identify potential lighthouse initiatives with which UN agencies or their partners had been involved. These conversations led us to the 16 exemplary case studies (SDGs 1–16) showcased in this volume. Each case focuses on a specific SDG, and a separate chapter on SDG 17 (‘partnerships for the goals’) addresses the uniquely effective features of India’s development partnership models at the international and sub-national levels.

Between June and September, we coordinated the research and writing process. In most cases, our partner institutions drafted the chapters assigned to them, given their familiarity with the design and execution of their initiatives. In some cases, writers from Observer Research Foundation or Reliance Foundation supported partners in the writing. In these instances, the primary inputs from partners were supplemented with other information gathered independently from government sources, academic studies, and media reports. We remain grateful to our partners for entrusting us with the details of their initiatives.

Each case study follows a similar format. We begin by introducing the context and aims of the subject lighthouse project. We go on to explore its approach and the early challenges it may have encountered, and then examine in some detail its implementation, the innovations it deployed, and the impact it has had. The pieces conclude with a brief account of the new directions in which the initiatives are expanding, given their successes thus far, and some reflection on what makes the cases exemplars for the development sector.



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The team at Reliance Foundation, led by Jagannatha Kumar and B Srinivasan, spearheaded this initiative that showcases these 17 exemplary case studies that are contributing to the 17 SDGs. Jayashree B and Vanita Sharma were co-editors of the publication; Antara Sengupta and Carla Gomez-Acebo Botin were the associate editors, and they led project management and steered the book's development; and Deepa Tripathi and Taslim Arif supported the printing process.

The team at Observer Research Foundation, led by Samir Saran, helped bring this book to life. Anirban Sarma and Shoba Suri were co-editors and led research and content development; Rahil Miya Shaikh designed the book and made sure that everything is in place; Vinia Mukherjee led the production, and along with Preeti Lourdes John copy-edited the publication; and Tanoubi Ngangom and Shubh Soni supported its launch.

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