TATA TRUSTS

APRIL 2025

HORIZONS

PILLARS OF SUPPORT

Backing institutions striving for the public good has been a tradition with the Tata Trusts

SISTERHOOD HIGH

A Deutsche Bank-Tata Trusts collaboration in Rajasthan has been an enabler for women farmers

CLASS ADVANTAGE

Rural schools are at the heart of an effort to enhance learning outcomes in Jharkhand and Odisha

INTERVIEW

Dr Sudeep Gupta, director of the Tata Memorial Centre, on how to cope with India's cancer burden

EDITORIAL

Precedence provides perspective, and prescience as well. Long before the term 'corporate social responsibility' became a constant — a mantra perhaps characterised by the chanting of it as much as adherence to the values enshrined within — there were business enterprises that truly believed in the nobility of what constitutes public good. The Tata group has been, and continues to be, one such enterprise.

Ever since Jamsetji Tata, the founder of the group, established the JN Tata Endowment for the Higher Education of Indians in 1892, the Tatas have nurtured a culture of sharing and caring that is unique in the context of this country. The first of the Tata Trusts, the JN Tata Endowment, marked the beginning of a 133-year journey of nation-building and community welfare, the genesis of a legacy that defines the Tata group and its endeavours.

A critical element of the Tata commitment to India and Indians has been the creation and support of institutions and organisations dedicated to worthy causes. Our cover story explores newer facets of this commitment while focusing on four recent examples: the collaboration with the central government's Ministry of Skill Development and Entrepreneurship to launch the Tata Indian Institute of Skills; the setting up of the Centre for Brain Research and financial backing for the Centre for Neuroscience, both of these at the Indian Institute of Science in Bengaluru; and, not least, the partnership with the New Delhi-based think tank, Carnegie India.

This edition of *Horizons* features two stories from thematic areas that the Tata Trusts have concentrated much attention on: education and livelihoods. There's the effort to enhance learning outcomes for primary and secondary school students in Jharkhand and Odisha, and a programme in eastern Uttar Pradesh that has delivered an income boost to 6,500-plus farmers. In a similar vein is the collaboration with Deutsche Bank in rural Rajasthan to provide a leg up to women tilling the land.

There's more as well: our Chairman Noel Tata reflecting on the achievements of his predecessor, Ratan Tata, as a philanthropist; a compelling interview with Dr Sudeep Gupta, director of the Tata Memorial Centre; and the Tata Trusts' chief executive Siddharth Sharma on what India can do to develop its skilling ecosystem. To round it off, we have a pictorial rendering of the outstanding work Antaran, the crafts-themed livelihoods initiative, has been doing to help artisans in the handloom sector.

Chiselabelle Naronha

We hope you will help us make Horizons *better with your valuable feedback. Please do write to us at horizons@tatatrusts.org.*

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Trainees from the Indian Institute of Skills-Mumbai during a visit to drone manufacturer ideaForge's facility in Navi Mumbai

Backing the brightest

The Tata Trusts have a long and storied legacy of supporting the creation of outstanding centres of learning and knowledge, among them the Indian Institute of Science (IISc), the Tata Institute of Fundamental Research and the Tata Institute of Social Sciences.

Our cover story showcases newer facets of the Trusts' enduring commitment to building and backing high-quality institutions and organisations that can further the cause of India and its people.

First, a collaboration with the central government's Ministry of Skill Development and Entrepreneurship to establish the Tata Indian Institute of Skills. Second, the setting up of the Centre for Brain Research in IISc. Third, supporting the Centre for Neuroscience, also a part of IISc, and finally, partnering the New Delhi-based think tank Carnegie India. By Labonita Ghosh

Stemming the fading

The Centre for Brain Research has set its mind and resources on understanding how dementia and its variants can be predicted and managed

Ballabgarh, a town in Faridabad district of Haryana, is not exactly a major tourist attraction. Its origins as a small princely state that played a role in India's independence struggle may not be common knowledge. But for some mental health professionals, Ballabgarh holds far greater significance.

In 1996, a study was conducted among Ballabgarh's largely rural population — there were 5,000 respondents — to understand the extent to which those examined suffered from brain-related conditions such as dementia. (The idea behind the study was to select a rural cohort from India and one from the United States, and compare the two.)

According to the findings, 1.36% of respondents above the age of 55 had dementia, while 1.07% in the 65 years-plus category had Alzheimer's disease. This study is perhaps the first-ever record of these disorders in India, at a time when age-related neurodegenerative conditions and mental health issues were not even understood, let alone researched; cognitive decline was simply attributed to old age.

Fast forward to the present and studying the brain has become imperative to unlock physical and mental health secrets. That was the context for the Tata Trusts, back in 2015, to collaborate with the Centre for Brain Research (CBR) at the Indian Institute of Science in Bengaluru and launch the Tata Longitudinal Study of Aging (TLSA). The intent: to comprehend how the brain ages and if the onset of disorders such as dementia can be predicted well ahead.

Minimising the burden

Established with a generous endowment from the Pratiksha Trust — cofounded by Kris Gopalakrishnan and Sudha Gopalakrishnan — CBR is committed to research, innovation and engagement aimed at minimising the burden of dementia and associated neurodegenerative disorders, thereby improving the quality of life of the affected.

"Our goal is to study the aging brain, focusing on both healthy and pathological aging," says KVS Hari, CBR's director. "As we age the brain, like any other organ, experiences a reduction in its performance.

A graduate student at the Centre for Brain Research prepares for a genome-sequencing experiment

Neurodegenerative conditions accelerate this decline and lead to more severe cognitive impairments. When that happens interventions, through lifestyle changes or pharmacological solutions, become necessary. Yet despite the growing impact of brain disorders, we often hear more about deaths from heart attacks, lung infections or kidney failure than from conditions affecting the brain."

According to the World Health Organization, brain disorders are now the sixth leading cause of death globally, in a list that includes heart ailments,

diabetes and hypertension. And the numbers are only going up.

"If the 1996 study found that about 1% of elderly people suffered from dementia, today that number is likely to be 7-8%," adds Prof Hari. "We are living longer today, which takes a toll on our bodies and our brains, giving diseases more time to take hold."

Dementia is a blanket term that covers a range of neurodegenerative conditions involving memory loss, decline in cognitive function and reasoning, and behavioural changes that interfere with daily life. About 70% of people with dementia may have Alzheimer's disease, while a smaller percentage have conditions such as Parkinson's, vascular dementia and Lewy body dementia.

CBR's mission is to develop biomarkers for the early detection of dementia, alongside approaches to prevent, postpone, or manage it. The transitional phase between normal age-related cognitive decline and more serious conditions like dementia is called 'mild cognitive impairment' (MCI) or pre-dementia.

Slip sliding slowly

This is characterised by noticeable changes in memory or other cognitive functions but not severe enough to adversely affect daily life. "If you are able to detect MCI in time, you may be able to halt or even reverse the cognitive impairment," says Prof Hari.

To find solutions it is essential to, first, figure out exactly what the prevalence of brain disorders is in the Indian population. Since the aging brain has not been studied much in the country, CBR recognised the need to start by collecting data through research studies focused on elderly subjects.

The Tata Trusts-supported TLSA brings together volunteers, aged 45 and above and with no known neurological conditions. This longitudinal observational study then carries out multimodal assessments (clinical, cognitive, genetic, etc.) on the subjects over a

Participants at a yoga session held in Bengaluru as part of an awareness initiative during World Alzheimer's Month

15- to 20-year period to better understand risk factors (and protective factors) for dementia.

If predictive patterns for the onset and progression of dementia can be found, then suitably effective interventions — such as trying to inhibit it with drugs, the most common option — can be created.

The TLSA cohort, all Bengaluru residents, are required to visit CBR once a year for blood work, scans and tests that relate to visual, aural and motor abilities; cognitive and spatial acuity; gait analysis; etc. These parameters are recorded annually and changes, if any, are tracked.

Working with a geriatric cluster such as this brings its own problems. Many participants drop out, either because of infirmity or death or a reluctance to come in for follow-ups. Since the study aims to collect and analyse longitudinal data from at least 1,000 participants, the team seeks new volunteers to replace the dropouts.

Prevent or delay

TLSA is currently in its second phase, where findings from the first phase are being compiled and a pilot multimodal trial has been launched to assess if non-pharmacological and lifestyle-based interventions can help prevent or delay the neurocognitive disorders associated with aging.

The success of TLSA has led the CBR team to launch a similar study in rural Karnataka in a largely agrarian community in Srinivaspura in Kolar district. Called CBR-Srinivaspura Aging Neuro Senescence and Cognition (CBR-SANSCOG), the study began in January 2018 and currently has nearly 10,000 subjects in the 45+ age group. Srinivaspura was picked for its proximity to Bengaluru — it is about 100km away — so that the CBR team could visit and collect data easily. As a significant proportion of this rural population has been engaged in mango farming over several generations, there is little urban migration, making it ideal for a 15- to 20-year study. A large number of endogamous marriages also presents a unique gene pool distinct from the cosmopolitan makeup of urban areas.

"The number of aging studies done in rural, community-based

An optometrist conducts a test to detect dementia

The dimensions of dementia

- **7.4%** — Prevalence of dementia in the Indian population in the 60+ age group
- **9.03%** — Dementia in women
- **5.77%** — Dementia in men
- **8.35%** — Prevalence of dementia in rural areas
- **5.34%** — Prevalence of dementia in urban areas
- **319 million** — Expected size of India's elderly by 2050

Source: Prevalence of dementia in India: National and state estimates from a nationwide study published in the journal of the Alzheimer's Association in December 2022

populations across the world is limited," says Jonas S Sundarakumar, assistant professor and principal investigator of the CBR-SANSCOG study. "Most studies on aging and dementia are conducted among urban populations, with predominantly hospital or clinic-based subjects. These do not provide an accurate picture of community-level conditions and risks."

Dr Sundarakumar adds that with rural populations the focus has to be on preventive strategies, while identifying signs of cognitive decline and dementia as early as possible, and then crafting appropriate interventions.

Straightforward strategies

"Simple, cost-effective strategies, like lifestyle changes, addressing nutritional deficiencies and promoting social connectedness, may go a long way in reducing dementia risk, and may be better suited for large-scale implementation in rural communities," says Dr Sundarakumar.

India requires scalable and affordable solutions for MCIs. "Even testing must be reasonably priced and provided at primary healthcare centres," says Prof Hari. "Once we understand the patterns [of disorders], we will know which tests and interventions may be effective and how we can design them to detect and treat MCIs among a larger number of people."

The data being collected by CBR will certainly help in this regard. "India-specific data is needed to, first, validate the findings of similar studies conducted elsewhere in the world and, second, to understand the genetic differences between populations," says Prof Hari. "An intervention that has been successful elsewhere may not work for our population because our lifestyle, diet and social conditions are different. We may have to adapt and modify."

Clinical and cognitive assessments of elderly participants are at the core of CBR's longitudinal studies of aging

While longitudinal studies take decades, CBR has started parallel lines of investigation with animal models and other in-vitro approaches. "Mouse models have been in use for a long time, but we have decided to go a step further by using human stem cell models," says Ravi Muddashetty, associate professor at CBR. "We want the results to be as close to humans as possible so that we create stem cell models from selected participants using information and test results collected from our cohort subjects."

A team of geneticists and computational biologists works with neurobiologists to create these highly personalised stem cells, taking data from each volunteer in the urban and rural groupings.

"We get a lot of information about family history, clinical background, etc from each participant and we use this, along with genome sequencing data, to select subjects for stem cell generation," says Prof Muddashetty. "Stem cell models are valuable in dementia research as they allow us to mimic the disease conditions and, therefore, enable studying the disease mechanisms and testing potential therapies in a controlled environment."

Dementia is not an individual disease. It affects families and sometimes even entire communities because people with the condition often require caregivers. "With people living longer now, a growing proportion of the population will inevitably be affected by dementia," says Prof Hari. "Today we may be a demographically young country but in 20 years, when our population is older, dementia will become a significant problem. We need to address the issue with a sense of urgency — and that we have yet to recognise." ■

Matters of the mind

Comprehending how the human brain functions — that's the quest for the Centre for Neuroscience

What makes some people better and faster readers than others? Turns out this relates to a part of our brain called the 'visual word form area'. When we look at a set of words, this area helps us make sense of them by responding to the words we know, but not to scripts and words of unknown languages.

"The prevalent belief is that when you look at a word there are specific neurons in your brain that respond only to that word, and not to the individual letters that make up the word," says SP Arun, professor and chair at the Centre for Neuroscience (CNS), which is a part of the Indian Institute of Science, Bengaluru. Neurons are the basic functional units of the nervous system, and the brain has some 86 billion of them.

When Prof Arun and his team decided to test this hypothesis about reading ability with an extensive study, they discovered quite the opposite. "We found that fluent readers — among adults and children — can actually separate letters in a word," he says. "This is exactly the opposite of what was previously believed."

Efficient reading is not about detecting the combination of letters but, instead, about separating them, adds Prof Arun, and this has far-reaching implications. Among other things, it can help us understand — and perhaps find a solution for — conditions such as dyslexia. That solution could be a specific sort of training that may help people with the disorder read better.

A fundamental curiosity

"There has always been a fundamental curiosity about how the brain works," says Prof Arun. "We are often surprised by a lot of our actions, and we cannot always know why we behave in a certain way." The answer to that — and much more — lies in neuroscience, the study of the brain.

To expand, neuroscience is the study of the intricate web of billions of neurons in the brain and their connections to one another, called synapses, which 'fire up' and create 'impulses' that cause us to act and think in certain ways. CNS was set up in 2009 to pursue the very basic purpose of finding out how our brains work.

Neuroscience is a relatively young discipline. "The first discoveries in neuroscience came about in the late 1800s," says Prof Arun. "Compare that with physics, where the first discoveries took place much earlier."

The advantage here is that neuroscience, as a relatively new field, presents great opportunities for research and pathbreaking findings with practical applications. For example, discoveries in neuroscience thought to be irrelevant 10-15 years ago are being adopted into modern-day medical practice.

CNS has been supported by the Tata Trusts with grants from 2014-15 to 2019-20 that have enabled it to undertake a host of studies — including one on the aging brain — and create state-of-the-art laboratory facilities to further research.

Understanding the brain better will unlock our knowledge about

many conundrums. How do our senses (sight, sound and touch) work? What is emotion and cognition, and how does seeing a happy face, as opposed to an angry one, make us react? How does reward or punishment shape our attitude towards certain tasks? How do we act based on certain 'impulses'? And much more.

Importantly, knowing how the brain functions will also help us diagnose, treat and perhaps even cure brain disorders, which constitute a considerable disease burden in India today (about 30 million Indians suffer from neurological disorders).

Associate professor Sridharan Devarajan and his team at CNS are currently studying an important aspect of the brain related to attention and decision-making. "We investigate the idea of attention by looking at how different regions and networks in the brain allow us to focus on some things and exclude others," he explains. "Sometimes people feel they have made a 'wrong' decision. We want to know why that happens and why the brain makes us commit to certain choices."

One study in their laboratory brings together 25 carefully selected test subjects and trains them to carry out complex attention tasks. Knowing more about attention provides insights into the classic 'cocktail party problem': how we are able to hold a conversation even in the middle of a party. This happens because our brain picks up on, and integrates, auditory and visual clues from those we are speaking to and filters out the background noise. "The brain has a remarkable ability to separate the relevant from the irrelevant," says Prof Devarajan, "and that is what comprises attention."

That poses several questions. Why does the brain create these filters and how does it decide what is relevant? How much attention can the brain pay to a certain thing? This ability to filter, adds Prof Devarajan, is both a blessing and a curse. While it enables us to respond efficiently to stimuli in a certain circumstance, it allows us to focus on them only one at a time.

A student at the Centre for Neuroscience runs a test on a subject to induce oscillations in the brain's visual areas; these oscillations can indicate the onset of cognitive disorders such as Alzheimer's disease

Multitasking make-believe

That means people who claim to be multitaskers are actually just rotating their attention between one task and another, doing them serially rather than simultaneously. "There is little evidence that people can do two completely novel tasks without paying attention to both," says Prof Devarajan. Only heavily practiced tasks can be carried out on autopilot, so to speak.

Another CNS study looks at whether brain signal-based training can be used to improve attention. Brain signals indicate when somebody is alert and when they are not. So test subjects whose brain signals are being measured in real-time can be informed when their attention is flagging, and this helps them become more attentive.

The brain's ability to give more attention to one thing over another often creates a 'bottleneck'. This then becomes a major component of decision-making: we make choices based on what the brain tells us is more important, which implies that attention and decision-making are closely linked.

Associate professor Deepak Nair and his team are trying to understand the brain from the

point of view of connectivity: the synapses that exist at the junction of neural cells meeting and the signals or messages that are passed through these synapses.

For a long time scientists thought of synapses as tiny machines, about a millionth of a metre in size, that contain everything needed for neurons to communicate. Inside these synapses there are specialised regions that carefully control the transmission of signals from one neuron to another. If something goes wrong — like changes in these signals or a weakening of their structure — it can lead to diseases like Alzheimer's.

"We want to understand how a healthy synapse functions and what happens when diseases begin to develop," says Prof Nair. Over the past decade, researchers at CNS and other institutions have redefined the basic understanding of synapses, revealing that they contain tiny 'nanomachines' that are 10–20 times smaller than the synapse itself. These nanomachines are essential for brain health and play a key role in the development of diseases.

Real-world applications

Research at CNS is undertaken not just for scientific discovery but also with an eye towards real-world applications. Prof Devarajan's team, which has found a link between attention and eye movements, has been approached by automobile companies to design algorithms based on which wearable devices can be created to alert car drivers if their attention is flagging.

Such a device can potentially track brain activity, eye movements or even measure the temperature of the face to warn the driver if he or she is dozing off at the wheel or becoming less mindful of the road.

There are other possibilities for technology of this kind. A similar device can be used to alert students in a classroom when their attention is lagging. "There is a lot of interest among startups that want to create wearables — which can be attached to a cap or behind your ear — to track your attention and send a signal to your phone that lets you know how alert you are," says Prof Devarajan.

Prof Nair and his team's study of synapses can help in creating mechanisms that mimic the brain's neural activities. These 'neuromorphic devices', as they are called, can aid people with neurodegenerative diseases — caused by the loss of neurons or a shutting down of synapses — to build and form new circuits and connections.

"Say you have a stroke and want to regain the full extent of your movements," says Prof Nair. "You may require neuromorphic or advanced electronic devices that will send appropriate signals to the brain to reactivate your motor abilities."

People with impaired hearing or speech, or even those rendered blind by damage to their optic nerve, could try to restore their senses through neuropathic intervention. "Depending on the kind of damage, if a signal can be 'collected' from the optic nerve and sent to a certain part of the brain, it might help," explains Prof Nair.

Brain gain

Fields of study at CNS

- Visual perception and recognition
- Neurobiology of learning and memory
- Neural basis of skill learning
- Cognitive and computational neuroscience of motor control
- Interactions between emotion, motivation and cognition
- Neurobiology of pain and itch
- Brain development
- Attention and decision-making
- Brain oscillations
- Molecular organisation of synapses

Since its establishment at IISc in its centenary year in 2009, CNS has brought together a dedicated group of researchers who have advanced fundamental research toward real-world applications, supported by public funding and charitable grants. Though still in its early stages, CNS serves as a model of how targeted research efforts, unified under one umbrella, can drive meaningful progress in this field.

With a discipline like neuroscience, solving a challenge today may indeed open up possible remedies for future problems. "It may look like there is no point in doing something now, but basic research often leads to profound discoveries that have a huge impact later," adds Prof Arun.

That's the very philosophy that, like the synapses, fires up CNS. ■

Trainees at the Institute of Skills-Mumbai's electric vehicles laboratory

Learning muscle

The Tata Indian Institute of Skills is collaborating with the central government's Ministry of Skill Development and Entrepreneurship to give employability a shot in the arm

Shruti Bagla had never heard about the Tata Indian Institute of Skills (Tata IIS) until the outreach team from the institute visited her college in Aurangabad in Maharashtra a year ago.

"I started researching them online and found some extraordinary courses," says the 20-year-old. "After I had received my diploma in engineering and telecommunications, I was struggling to figure out what to do. The course in industrial automation was what I needed to build on my electronics background."

Ms Bagla's friends were sceptical and tried to dissuade her from joining the Indian Institute of Skills (IIS)-Mumbai. "They felt it was just another institute where I would waste time being 'taught' a skill but never actually learn one," says Ms Bagla, "that I was better off opting for a campus placement that would get me a job right away. They were wrong."

That's because IIS-Mumbai offers plenty of skills training, including hands-on learning. Classroom lessons are combined with practicals — using the latest and best of equipment and technologies — and there are frequent field trips to companies where trainees can see the industrial and real-world applications of what they study.

"We learn faster and better because of this," says Ms Bagla, who recently graduated from IIS-Mumbai with a certificate in industrial automation fundamentals, and has secured a job as junior engineer with one of India's leading aluminium manufacturing enterprises.

Tata IIS was formed in 2020 to establish two centres of skilling excellence: IIS-Ahmedabad and

IIS-Mumbai, both of which offer world-class learning and facilities.

Born out of a collaboration between the Indian government's Ministry of Skill Development and Entrepreneurship (MSDE) and the Tata Trusts, IIS offers highly specialised and future-facing courses in industrial automation robotics, computer numerical control, robotic welding, 3D printing, electric vehicles and hospitality.

Matching the biggies

The Institute aims to cater to the manufacturing sector as well as other emerging businesses. "The institutes emerged from Prime Minister Narendra Modi's vision to make India the skills capital of the world," says the organisation's chief executive, Sabyasachi Das. "The intent is to create international quality skills training institutions which, over time, can match the stature of an Indian Institute of Technology or an Indian Institute of Management."

Skills are a government priority. There is a big push with the 'Make in India' initiative to have well-trained personnel to fulfil the growing needs of the Indian economy. Also, Tata IIS and others like it can ease a problem highlighted in a McKinsey & Co report, which predicted that India could face a potential skill gap of 85-90 million by 2030.

The National Skill Development Corporation found that in 2022 the demand for skilled workers in the manufacturing sector had touched 109 million, but supply was at about 80 million. While India has a substantial working-age population, there is also growing unemployment because companies and factories cannot find enough skilled talent.

"[Human resources development for youth] can only happen if we are able to align it with the needs of industry," says MSDE Secretary Atul Tiwari. "The Tata group and the Tata Trusts have undertaken to partner with the government in creating these Institutes. We hope that it will be possible for others to come forward in this manner so that we can create skilled people for our industry, whether in manufacturing or services."

A focus on skilling is imperative if India wants to become a global manufacturing powerhouse. "There are many sectors across manufacturing, construction, retail, finance and hospitality that have a large skilling requirement," says Mr Das. "And manufacturing itself is changing, with a lot of automation and robotics being incorporated into processes, not just by large corporations but by smaller companies and the vendor ecosystem as well."

Smaller organisations struggle to compete because of their lack of technical capabilities and capital expenditure requirements. Tata IIS can help with the capabilities component.

Sectors such as electronics, electric vehicles, defence and semiconductors — or any that the government is providing production-linked incentive schemes for — will also gain

IIS courses

ADVANCED MANUFACTURING

- Industrial automation fundamentals
- Advanced industrial automation and robotics
- Additive manufacturing
- Advanced arc-welding techniques

ELECTRIC VEHICLES

- EV 2-wheeler and 3-wheeler technicians
- EV battery specialist

HOSPITALITY

- Certificate in professional cooking
- Certificate in core housekeeping

NUMBER OF GRADUATES

86 — Ahmedabad campus
77 — Mumbai campus

importance in the years to come. "You have to be forward-looking if you want to create an international-standard organisation," says Mr Das.

The Tata IIS campuses in Mumbai and Ahmedabad have been complemented by a third Institute set up by the Indian government in Kanpur. "We have an agreement with the government that by year five we should have 5,000 graduates from each of our two institutes," says Mr Das. "We would like to do larger numbers in future, perhaps through a hub-and-spoke model, with these two campuses being supported by smaller centres." This could then translate into aspirants from tier 2, 3 and 4 cities having access to quality skills training.

Perfect opportunities

That means people like Kaushal Trivedi, an electrical engineer from Gandhinagar in Gujarat. Mr Trivedi was keen to learn more about electric vehicles (EVs) after writing a paper on EV charging during his master's programme. "I searched for courses that would help me expand my knowledge, particularly in EV batteries and charging technologies," he says, "and I found the perfect opportunity at IIS-Ahmedabad."

Gaining knowledge about EV batteries has helped Mr Trivedi develop a deep understanding of EVs in general. "The education I received has not only enhanced my technical abilities but also prepared me to succeed in a dynamic, ever-changing world," adds Mr Trivedi, now a trainer at IIS-Ahmedabad.

The Tata IIS curriculum plugs into that very world by seeking inputs from those who will benefit: companies. The courses have been designed taking their advice on what works and what does not and, more importantly, what they require in terms of skilled labour.

"Companies typically struggle to find trained people at the entry level," explains Nidhi Goyal, executive vice president at Tata IIS. "Our focus in designing our first six courses was to look at entry-level needs and select skills that are required in large numbers and also involve a degree of complexity."

If defence, space or healthcare picks up as a sector, Tata IIS will identify the skills gap there and step up to fill it. That's the objective, but finding trainers for nascent or emerging sectors has been a challenge.

Getting the skilling equation right has been a priority for Tata IIS. Says Ms Goyal: "Finding the right trainers and ensuring that they deliver with a strong focus on hands-on learning, with some of the most advanced equipment in the world, is the differentiator for Tata IIS. We operate in small batches to ensure a good machine-to-trainee ratio."

Vibhuti Nath is an example of the sort of trainer the Institutes have on board. Mr Nath joined IIS-Mumbai in August 2022 as a trainer with the advanced automation and robotics and the advanced arc welding techniques courses. He has 17 years of industry experience, having started as a robotics engineer in 2007.

"Over these last 17 years I have only seen the demand for robotics engineers increasing," he says. "India is moving towards industrial automation but the number of people required to operate the robots is not growing at the pace it should. Demand outstrips supply, so finding a job in manufacturing will not be difficult right now." That's great news for the trainees since Tata IIS also organises placements.

Employable and more

"Our motive is to give our students sufficient skills so that they become significantly employable," says Mr Nath. Of the first-ever batch that graduated from Mumbai and Ahmedabad — a total of 163 students — about 70% have found good jobs and some 25% have had multiple offers.

Tata IIS is now looking to broaden its horizons. "From batch three or four, we will be trying, with the help of the government, to place our students abroad," says Mr Das. "We also want to invite students from Africa and our neighbouring countries to come and train at our Institutes."

Tata IIS is also set to be of help for wannabe entrepreneurs among their graduates. The Institutes' core purpose is to provide high-quality skills training with the objective of improving livelihoods. Adding to its lustre is the fact that it is a not-for-profit entity and that it contributes to India's strategic requirements. ■

Carnegie India's 'young ambassadors' with S Jaishankar, India's external affairs minister, at the 8th Global Technology Summit held in New Delhi in 2023

Policy pointers

New Delhi-based think tank Carnegie India has been supported by the Tata Trusts in its effort to demystify geopolitics, regulation and technology

Talent can come from anywhere; it is not just the preserve of urban denizens. But what usually happens in India is that professionals from towns and smaller cities often get overlooked by recruiters scouting for employees. They inevitably have to move to metros to find fulfilling jobs.

It's even harder if your heart is set on public policy and global affairs and you are based far away from the nearest seat of government. In 2023, the New Delhi-based think tank Carnegie India set about helping fix this with its 'young ambassadors program' (YAP), which is aimed at finding and fostering the country's next generation of policymakers.

The program invites applicants from beyond India's metropolitan areas — tier 2 and tier 3 cities that may be disconnected from the national and international economic network — to join Carnegie India and be trained in the policymaking vocation. Carnegie India got going with the initiative after receiving a second grant from the Tata Trusts, a partner since 2016.

"We thought the best use of the grant from the Tata Trusts would be to build capacity for a wider public policy community outside Carnegie India," says the organisation's director, Rudra Chaudhuri. "That's how our young ambassadors program came about."

Mr Chaudhuri feels not enough attention is given to public policy training in India, though the need for it has grown exponentially in the last decade given the country's growing significance in global politics.

Different from the traditional government affairs space, public policymaking needs more people who understand technology and regulation as well as societal and government concerns. Importantly,

it can serve as a bridge between one entity and another, the government and industry, for instance.

Carnegie India felt that it was time to broaden the scope of the traditional talent pool and specifically keep a lookout for qualified individuals in towns and smaller cities.

Fresh perspectives are crucial for the work that Carnegie India does, which is about providing independent analyses of the country's pressing challenges and the rising role of India in the world. This is seen through the lens of three specific and interrelated areas: technology and society, the political economy, and security studies.

As a report by the organisation states, "Led by Indian experts with decades of policy experience, Carnegie India engages with governments, policymakers, academics, students, industries, practitioners, and civil society to provide insightful and fresh analysis" on the challenges facing India as it navigates its place in the world order.

Founded in 2016, Carnegie India has three inter-operable teams. The political economy team focuses on industrial policy, trade, and other issues related to economic growth.

The security studies team looks at, among other things, the various aspects of Indo-China relations: the border question, the line of control between the two countries and the action taken there, and how to prevent flashpoints on either side. Carnegie India has incorporated its research on the India-Pakistan

Shankar Maruwada, chief executive of EkStep Foundation, at a Carnegie India event in Bengaluru in 2024

border into an open-source dashboard that its stakeholders can draw upon.

Another area that the security studies team researches is military indigenisation. Specifically, this relates to dual-use technologies that various startups and small and medium enterprises (SMEs) have invested in that can have civilian and military applications.

Deep-tech bent

The largest team at Carnegie India focuses on deep technology, including work on data, biotechnology, artificial intelligence (AI), semiconductors, space, export controls, digital public infrastructure, etc. "We've got a variety of verticals because we felt that there was a real need for policies — and serious thinking — about deep technology issues," adds Mr Chaudhuri.

Although Carnegie India is a part of the global Carnegie Endowment for International Peace network, it operates on its own, legally and financially, in India. Most of the research it generates by way of studies, papers and the like is circulated at global conferences and roundtables.

Carnegie India has a lean and diversely experienced team of 25 individuals and there are a further 170 scholars from the global network who contribute in different ways. Its cohort of nonresident scholars includes former foreign secretaries, ambassadors, entrepreneurs and industry leaders who work on particular projects.

Then there is a large network of experts from around the world that Carnegie India can draw upon. These are collaborators who pitch in with expertise in areas outside the realm of its in-house researchers and among them are civil servants and business leaders who can share policy-relevant insights as part of Carnegie India's 'practitioner series' of papers and articles.

"We are often asked who Carnegie India's audience is," says Surya Valliappan Krishna, associate director, projects and operations. "The answer is: everyone. To qualify that further, we are about informing policymakers of the policy choices available to them."

Of all its projects, Carnegie India's work in three spheres has been impactful: digital public infrastructure (DPI); the initiative on critical and emerging technology (iCET), which falls within the larger ambit of Indian-

American technology cooperation; and artificial intelligence.

DPI refers to the digital systems and services provided by the public sector to facilitate and enhance the functioning of a digital economy. In India it includes the creation of digital identity systems, payment programmes, public services and information offered on e-governance portals, infrastructure to store and manage data securely, and broadband connectivity.

"We have convened different meetings on DPI and digital public goods since 2016," says Mr Chaudhuri, who leads the work in this space. "The biggest is the Global Technology Summit, of which eight have been held, all co-hosted with [India's] Ministry of External Affairs (MEA)."

The iCET combo

With iCET, a bit of background. In May 2022, Prime Minister Narendra Modi and then American President Joe Biden announced iCET. Co-led by India's National Security Council Secretariat and the US National Security Council, the idea was to bring together stakeholders on both sides, and from different domains, to ascertain areas of technology cooperation between the two countries.

Carnegie India was invited to shape the agenda for iCET. "At that point, the nodal agency was trying to look at things from both the Indian and American sides and approached us to ideate on what a possible agenda could be," says Konark Bhandari, a fellow in the technology and society programme.

A few weeks later, Carnegie India brought together a diverse set of stakeholders — government representatives, academics, venture capitalists, companies and startups — for discussions on the pain points, and prospects, for India's cooperation with the US.

Carnegie India has traditionally worked on data governance and privacy, primarily relating to cross-border data flows and the issues around that. Adds Mr Bhandari: "We're looking increasingly at strategic tech, which includes semiconductors, and industrial policy around that; space policy, export controls and emerging tech, which relates to biosafety, and security practices to shape the AI regulatory landscape."

While the use of AI has become commonplace, policies and a regulatory framework to govern it are still getting firmed up. More than anything, the risks associated with the use of AI need to be identified and mitigated, and that's where Carnegie India has played a significant role.

"We hold brainstorming sessions with key players [in the AI space] that are private, closed-door discussions where the objective is to garner ideas from the ecosystem," says Shatakratu Sahu, a senior research analyst and program manager with the technology and society program who co-leads the AI vertical at Carnegie India.

With the Indian government allocating ₹100 billion (10,000 crore) for its AI mission, there is an imperative to understand what this is all about. Mr Sahu says that at a meeting in the Carnegie India office on compute AI, which comprises about half the mission budget, the attendees realised they had to first demystify the concept.

Collaborative research is at the heart of Carnegie India's efforts in specialised areas such as AI. If matters are beyond the capability of its in-house scholars, the think tank seeks out domain experts. Discussions usually cover the transformative power of AI and its evolution, guardrails for developing responsible use, regulatory approaches, the impact of the technology on skilling and employment, and its military applications.

The Carnegie India team has published a paper on AI regulation and plans to do more research in the field. For instance, a recent article on 'AI safety institutes' was much appreciated by the Indian government, which is looking to set up a safety body and may draw on the organisation's findings. ■

The Carnegie India spread

- **200+ research** publications
- **Three primary areas** of study (technology and society; political economy; security studies)
- **Over 300 speakers** across eight editions of the global technology summit, with participants from 20+ countries

A life rooted in empathy

Ratan Tata's achievements as a philanthropist were born of his compassion and essential humaneness. By Noel Tata

Ratan Tata as a visionary business leader, a titan of industry and as a champion of free and fair enterprise is a personality more than familiar to the world.

Relatively less known is Ratan Tata the philanthropist, both in his individual capacity and as the head of the Tata Trusts — an institution with a rich heritage of contributing to our country, our communities and people in need.

As the torchbearer of the Tatas, Ratan was acutely aware of his responsibility in sustaining the values and principles of the group. And in enriching the legacy of those who had preceded him. This is a legacy rooted in the welfare and well-being of the land we live in and in the people we call our own.

In an interview in 2006, RNT said "India is still a developing country, one burdened with enormous inequities. It is our duty to play whatever role we can, in whichever way we can, to diminish those disparities. This is the guiding principle for all of us at Tata. The Tata ethos demands no less."

In both his professional and personal life, Ratan was benevolent, ethical and compassionate. He was always available to provide counsel and guidance to those who sought it. He had that rare ability to identify the cause of a problem and he was sharp and versatile in finding a way to resolve that problem.

Not least, RNT was a voracious and eclectic reader, with a deep understanding of a wide range of subjects. He had a fine understanding of technology and how it could be deployed to advantage.

The considerate capitalism that RNT believed in was best espoused in his stewardship — and transformation — of the Tata group of businesses during a period of unprecedented change.

It was also expressed in telling fashion after he stepped down as chairman of the Tata Sons in 2012. This was when he set his mind on recasting the operations, objectives and purpose of the Tata Trusts.

It was not a straightforward undertaking, given that the Tata Trusts are among India's largest and most impactful philanthropic organisations.

Ratan believed that the Trusts needed to be enhanced. He believed that the moment had come to take a fresh look at the manner and scope of the philanthropic grants the Trusts were making.

He wanted the Trusts to go beyond being just a "supplier of finances". He wanted them to become creative, effective and technology-oriented while pursuing social sector solutions.

Not least, he wanted the Trusts to play a substantive role in policymaking, in advocacy, in influencing and defining India's social development pathway.

As with every endeavour he undertook, Ratan gave it his all as the Trusts shifted their

approach to achieve a reframed set of goals.

Yes, the Trusts would continue to help ease personal hardships. But they would, alongside, take a broader view when crafting their philanthropic initiatives.

His logic here was anchored in the overarching aim of doing the greatest good for the greatest number of people.

RNT believed that we should be sensitive when it comes to funding the treatment of someone with, say, cancer or other medical problems.

But he felt the time has come for us to also be concerned with more meaningful ways of channelling our funds, towards, for instance, cancer research or the development of a malaria vaccine.

He said: "I believe we can make a substantial difference through large projects that serve humankind."

He set the tone for a number of the sizeable initiatives that the Tata Trusts have got involved with over the past decade — in education, health, nutrition, water and sanitation, and livelihoods.

Ratan also realised the criticality of partnerships in programmes that demand complementary capabilities. This was in the context of enlisting civil society but, more importantly, with the central government and with state governments.

It is this line of thinking that has led to the Trusts collaborating with a range of organisations and institutions to realise shared objectives.

Ratan never spoke about it but his empathy for every human being is what got him involved when natural disasters devastated regions and communities, when the Covid pandemic claimed lives and livelihoods, and in the aftermath of the terror attack in Mumbai in 2008.

The impermanence and fragility of our existence is a reality all of us have to come to terms with at some point. What stays in

memory is the imprint we leave behind. What endures is how we conducted ourselves with the world and those who — by chance or destiny — came to be linked to us.

Our remembrances of Ratan Tata reflect his remarkable accomplishments and his essential humaneness. ■

This is the transcript of the speech that Noel Tata, Chairman of the Tata Trusts, delivered on December 28, 2024, at the National Centre for the Performing Arts, Mumbai, to commemorate Ratan Tata on his birth anniversary.

Contributing to a higher cause

Humility is Dr Sudeep Gupta's middle name. That's the personal. As for professional attributes, the director of the Tata Memorial Centre (TMC), Mumbai, has plenty to distinguish himself as one of India's foremost figures in the field of oncology. That includes global recognition as a clinical researcher and well-honed expertise in breast and gynaecological cancers.

An alumnus of the All India Institute of Medical Sciences, New Delhi, Dr Gupta has been with TMC since 2001. In this interview with Christabelle Noronha, he speaks about India's burgeoning cancer burden, what can be done to cope with it, and how he manages the stress of battling a disease as implacable as any. Excerpts:

India's cancer burden is getting heavier with every passing year and our public health system is ill-equipped to cope with the crisis. How can we, as a country, do better in handling this emergency?

India's cancer burden is growing every year and there are two reasons for it: some cancers are becoming more prevalent and, importantly, our population is increasing and growing older. Life expectancy at the time of India's independence was 32 years; today it is 70 years. People surviving to an old enough age are at risk of developing cancers and cardiovascular diseases. There are about 1.4-1.5 million new cancer cases in India every year. This is expected to increase to 2.1 million new cases in the next 15 years.

More than 850,000 patients die of cancer every year in our country, or about two-thirds of those diagnosed with the disease. We need a multi-pronged strategy to handle this burden better. In terms of service, we need to open and strengthen existing tertiary healthcare facilities for cancer care. By tertiary facilities I mean those in the public sector, because India already has some of the best private-sector hospitals in the world for all diseases, not just cancer. The problem is that an overwhelming majority of our population cannot access those hospitals due to financial reasons.

Health being a public good and a concern of the state, we must ensure that government health facilities have all the components of cancer care available. We must either strengthen whatever exists or open new facilities in a way that cancer care is 'distributed'. Everything should not be concentrated in a few regions or locations.

India has adequate — or, at least, not grossly inadequate — medical care facilities, including for cancer. But their distribution is not uniform, with much of it concentrated in urban centres. Over the past 15 years, TMC has taken steps to set up a hub-and-spoke model for cancer care. It has nine hospitals in six states and two more are being set up.

India also has regional cancer centres that are, in government parlance, called tertiary cancer care centres, and we have not-for-profit institutions and charitable hospitals dedicated to cancer care. All of these can be woven into a coherent whole in a way that public sector cancer care can be delivered in a hub-and-spoke model, in a distributed manner, all over India.

Are people from some regions more prone to cancer than others?

People everywhere are prone to cancer. The big divide we refer to is between urban and rural areas. In urban India the incidence of cancer is 110-150 new cases per 100,000 population per year; in rural India the number is 50-60 per 100,000 population. This suggests that people residing in rural locations are less susceptible to cancer.

The urban-rural divide is also significant for some cancer conditions, such as breast cancer. In Mumbai, the incidence of breast cancer among women is about 35 new cases per 100,000 population per year, while in rural India it is approximately one-third of this. Conversely, cervical cancer is more common in rural India.

Does your research indicate why cancer incidence is higher in one place than another?

The precise reasons are not known. Most of the variation could be lifestyle-related; some hereditary and genetic factors are also responsible but that's a small proportion. The biggest factor contributing to cancer incidence is lifestyle, which has to do with food, exercise, obesity, smoking and tobacco use, alcohol use, hygiene and infections. These factors determine which cancer could occur and in which part of the body.

With breast cancer — my area of interest — the reasons relate to having the first child at an older age, having fewer children, less breastfeeding, obesity and deficient physical activity, alcohol consumption, breast density and the hereditary component.

But cervix cancer incidence in Mumbai is currently at about eight cases per 100,000 population per year, down from 23 per 100,000 in 1976. The decline in cervical cancer incidence in Mumbai and almost all other parts of India happened in the pre-vaccine era, when population-level screening was not implemented. Although the precise reasons are unknown, it is likely that improved hygiene and nutrition, changing reproductive patterns, and adoption of safe sexual practices could have contributed.

TMC is an exception in more ways than one. But replicating such institutional excellence in the public health sector has been a struggle. Why so?

That's a good question, and I don't know if it has an objective answer. TMC has an 84-year legacy and it was created by pioneers, including the Tatas, who wanted to inculcate a culture of excellence. When we set up other centres, we try to replicate the 'Tata culture' in terms of skilled and hardworking staff dedicated to patient welfare.

All institutions are products of the circumstances in which they are born. Since your question is specifically about public-sector healthcare institutions, I can give you the example of AIIMS, Delhi, where I trained. AIIMS was set up to be a model of healthcare research and education for the rest of India, and it has served that mission admirably.

"In urban India the incidence of cancer is 110-150 new cases per 100,000 population per year; in rural India the number is 50-60 per 100,000. This suggests that people residing in rural locations are less susceptible..."

Cancer diagnosis and treatment are big business in India, especially in urban centres. How effective can private healthcare organisations be in the context, particularly when it comes to regulations and oversight?

I think private healthcare organisations have come of age in India. They provide good quality care to patients from a certain strata of society. Many of them are run like a business, which I suppose is how they were created. That said, I think regulation needs to be strengthened in India.

The modern practice of medicine, particularly in cancer, is not opinion-based. Just because Dr Sudeep Gupta thinks a certain treatment is good doesn't mean that it should be given. Medical care today is evidence-

Dr Gupta with Prime Minister Narendra Modi at the 'Quad Cancer Moonshot' event held in Wilmington (Delaware, USA) in September 2024

based, which means that investigators have conducted studies and clinical research and figured out various lines of treatment in terms of what should be recommended and to whom.

Public-private collaboration is of the essence in cancer care. Is enough of this happening in India, and in what manner can this be enhanced?

Some of it is happening, but not enough. The National Cancer Grid, a public-private collaboration of more than 30 organisations, includes many private healthcare entities. Corporate social responsibility donations given to public sector organisations also demonstrate the importance of public-private partnerships.

At TMC, the Tata Trusts are, of course, a vital partner, but there are several other organisations and numerous other donors who have partnered with us to create capacity and infrastructure. In this context, I would like to say that the Tata Trusts and the Tata group are a beacon of hope in India.

The 'distributed care' care model that the Tata Trusts have been working with — where the endeavour is to provide cancer patients with care and treatment closer to their homes — has delivered promising results. What's your view of the model, and can it be extended to cover the entire country?

I think it's a fantastic example of how to deliver cancer diagnoses and treatment. Those are the operative words. When you have an ailment (not just cancer) and have to travel [in Mumbai] from Parel to Bandra, you feel inconvenienced. Imagine, then, the plight of those with serious illnesses who have to travel thousands of kilometres or live away from home for prolonged periods. It is simply not acceptable.

The hub-and-spoke model I referred to earlier is one way of providing

distributed cancer care. I think this needs to be extended to cover the entire country. It is up to Indian society, including the government and non-government organisations, to make this happen.

Treatment for cancer means making difficult choices and many a time this is fraught with pitfalls. How do you go about making these choices?

Sometimes there is no straightforward path. For example, if there is a patient who has experienced cancer relapses three times in a year, then on the fourth occasion there is a choice about whether to continue treatment or focus on symptom control and give that patient a better quality of life. There are many such dilemmas, and we require a high level of expertise and empathy to navigate them.

If you had a wish list to improve cancer care and treatment in India, what would be on it?

First, to create more public-sector hospitals that will treat cancer in an evidence-based manner. Second, adequate provision of trained experts and other personnel to deliver that treatment. Third, adequate infrastructure for public healthcare facilities. And fourth, better compliance with existing guidelines for cancer care.

Finally, and critically, accessibility to treatment in terms of affording its cost. In the last few years, several new and expensive treatments and drugs have been discovered. Some of them are quite effective but are beyond the means of most of our population. The idea, then, is to find a way by which some of these treatments can be made accessible to a large proportion of our population.

It is said that cancer specialists have to live with stress and anguish to a greater degree than doctors in other disciplines. How do you manage?

I don't know whether cancer specialists have to live with more or less stress, but, yes, there is an element of anguish because cancer claims a large number of lives. I think all doctors have their ways of coping with this.

I always emphasise to my colleagues that we should never become robotic or deadened in our feelings. When we are confronted with so much suffering and death every day of our lives, our brains may switch off. We must not allow this to happen.

Everybody has coping mechanisms. Some doctors listen to music, some paint or watch movies. Since childhood, I have been fond of classical literature. I also watch old-time movies with my children and that helps.

"When we are confronted with so much suffering and death every day of our lives, our brains may switch off. We must not allow this to happen."

Are your children inclined to follow in your footsteps?

They are not. But if I were given a chance to start over, I would become an oncologist once again. It's a personal choice. ■

Ravita Devi, a farmer from Suratpura village in Dausa district, fertilises her field with slurry from the biogas unit she now owns

Creating a climate for smart farming

A Deutsche Bank-Tata Trusts collaboration is enabling a sisterhood of farmers in Rajasthan's Dausa district find their feet and their place in the world

Dausa district in Rajasthan falls in the semiarid eastern plains of the state and is characterised by an agriculture-dependent economy. That comes with a chunk of problems: landholding sizes decreasing over successive generations, ever-depleting groundwater resources, and the increasing cost of electricity for irrigation and to draw water through borewells.

With average rainfall in the range of 550-600 mm per year, groundwater is the only source of irrigation for farmers seeking a second crop. The electricity expenses involved are daunting, as also the infrequency of supply. When there is no electricity during the day, farmers stay up nights to operate the pumps and regulate the water flow. Too much water, or too little, could harm the crops.

There was another problem: a crop killer called white grub. This pest attacks the roots of plants and eats them from the bottom up. Relentless and difficult to contain, white grub has been a widespread menace in Dausa.

Groundnuts, largely grown in the monsoon season and, therefore, requiring

less of borewell irrigation, is a profitable cash crop in the region, but this was getting affected due to the white grub peril. That forced farmers to give up on groundnuts and shift to less remunerative crops such as *bajra* (pearl millet). Worse, some farmers were letting their land go fallow. That would change.

In 2023, the Centre for microFinance (CmF), an associate organisation of the Tata Trusts, introduced a climate-smart agriculture programme for local farmers, focusing on water security and agriculture. This three-year initiative is supported by Deutsche Bank and is expected to benefit an exclusive sisterhood of at least 3,000, all of them women farmers from Dausa.

Shimla Devi from Nirjharna village in Lalsot in Dausa district with vegetables that are cultivated using micro-irrigation systems

CULTIVATING SUCCESS

1,700+ households covered in 30 villages

30-40% water savings for farmers

1,000+ farmers have adopted micro-irrigation measures

450+ acres of land brought under micro-irrigation cultivation

₹20,000-40,000 increase in average annual farmer incomes

Sustainability of the environment and sustainability of income for the women farmers are the objectives here, says Malika Srivastava, regional manager with the Tata Trusts. "In the context of environment sustainability, the Tata Trusts have been focusing on climate-smart agriculture across many geographies. In Dausa the programme is designed to help women farmers adopt produce-enhancing technologies while also reducing the use of chemical fertilisers."

The majority of Dausa's farmers own about one hectare of agricultural land, so it is imperative to nourish the land and maximise output. In the mix to achieve this are micro-irrigation systems; biogas units in homes to provide safe and clean fuel for cooking; biogas slurry as high-quality organic fertiliser; and a package of practices that farmers are educated about.

Weathering the water challenge

Overcoming the water shortage challenge is one of the key elements of the initiative. Secure that and increases in agricultural yield and, consequently, household incomes are guaranteed. There's more to it. The water table in Dausa's Lalsot region is reportedly dropping by 10 feet every year. By introducing sprinklers the farmers already use 30-40% less water than previously.

Ravita Devi, a farmer from Suratpura village in Lalsot, says her sprinkler systems and home-based biogas unit have been a boon. "Earlier, when we irrigated our fields by flooding them, we would have to channel the water through large plastic pipes," she says. "That meant physically carrying these heavy pipes to the field, setting them up and connecting them to an electric pump that would draw water from the ground." Not only was this

backbreaking work, it also required high maintenance. The sprinkler system has eased Ms Ravita's burden.

As has the biogas unit installed in her home, one of about 100 that have been set up by CmF in the area. These units, which come with a biodigester reactor and an attached stove, generate cooking gas from dung cakes and organic waste. Households like Ms Ravita's that used to buy LPG cylinders for cooking no longer require those. "I needed a new LPG cylinder once every two months, or sooner if we had guests over," says Ms Ravita. "Now all our cooking is done using the biogas unit (though I keep an LPG cylinder for emergencies)."

The biogas unit, when operated, produces a slurry that can be used as a fertiliser for crops. Earlier, farmers used mainly chemical fertilisers, which were not only expensive but also compromised soil quality over time. Now they employ the slurry, a natural fertiliser, to improve the quality of crops as well as soil health.

As an experiment, Ms Ravita decided to use the slurry on a small portion of her field, while another was reinforced with chemical fertilisers. "I could actually see the difference; there was a noticeable improvement in the crops that had been nourished with the slurry."

Practices such as seed treatment and using yellow sticky traps (pheromone traps) to determine infestation levels have led to a reduction in the use of cost-heavy and health-harming insecticides. Cutting costs in the process has helped Ms Ravita up her income to about ₹83,000 a year.

Shital Devi of Salagrampura village, also in Lalsot, says she is grateful to learn new farming techniques. Her large family — husband, two children and in-laws — once subsisted on mustard, wheat and pearl millet. Ms Shital wanted to grow groundnuts and vegetables, but just couldn't manage it. Then, at a farmer meeting hosted by CmF, she got to know about trellis gardening (growing vegetables vertically on a frame), how and where to purchase better seeds and cast them correctly, and about micro-irrigation systems.

Lali Devi of Nirjharna village does her cooking on a biogas stove

"I couldn't grow the crops I wanted to because of the water issue," says Ms Shital, "but now, with a sprinkler in my field, I'm planning to start cultivating groundnuts. Next year I'll have a drip-irrigation system as well and I'm sure growing vegetables will become a lot easier." With better water management and more lucrative produce, Ms Shital's annual household income has increased by almost ₹20,000.

Fuelling income rise

"On average, households adopting these measures have seen their annual incomes go up by between ₹20,000 and ₹40,000," says Himadri Banerjee, manager, livelihood programmes, at CmF.

Linking farmers to the market is an important part of the programme. "If we can get farmers to practice climate-resilient farming using less harmful pesticides and more biomicrobial inputs, then we also have to help them with market linkages," says Ms Srivastava.

In October 2023, the women farmers

Kesanta Devi from Ugariyawas village in Lalsot with the biogas unit she depends on

were supported to set up their own farmer producer company, called the Lalsot Krishijivi Agri Producer Company Limited (LKAPCL). It has 480 women members who are shareholders and is managed by an all-women board of directors. LKAPCL's mandate includes furthering the cause of climate-smart agriculture by bringing more women farmers into the fold, enabling the procurement of farm produce and finding new markets that offer better prices.

Money to count on

Ms Shital, a member of the LKAPCL board, says this has been a helpful initiative. "Earlier, our husbands or other male members of the family would take the produce to the market and sell it," she says. "We never knew how much we made because they handled all the money. Today we buy the produce from women farmers at a fair price or connect them to more lucrative markets. We not only grow our own crops but also sell them ourselves, which gives us some control over our finances."

To ensure that members have a stake and sense of ownership, LKAPCL encourages its women farmers to contribute about 20% of the costs of every initiative they undertake. To supplement member incomes, LKAPCL has – with support from Deutsche Bank – set up an oil-press machine that processes mustard into oil (there are plans to expand to groundnut oil in the future). It has also set up a phosphate-rich organic manure production unit to produce bio-fertilisers.

The outcomes are positive. "Our recommended agricultural practices have been adopted by more than 800 women farmers," says Mr Banerjee. "This integration of agritech with traditional farming methods has led to a 20-25% increase in productivity." That includes a 20-25% increase in oilseed and vegetable production and a 10% increase in pulses. Micro-irrigation has also led to a considerable reduction in water use.

In its first year the programme has reached more than 1,700 households – well above the target of 1,000 – across 30 villages. "We have had great success," says Mr Banerjee. "We have provided solutions to the most basic of challenges faced by the local farmers." As Ms Ravita adds, "Now everyone wants to sign on." ■

By Labonita Ghosh

‘The softer impact is far more significant’

Ruchi Khemka believes the real and long–term benefits of social development efforts — building community ownership and enabling families to live and eat better — often don’t make it to any report. But that, says the corporate social responsibility (CSR) head of Deutsche Bank Group in India, is at the heart of her company’s partnership with the Tata Trusts for the women–centric agriculture programme in Rajasthan’s Dausa district.

How did Deutsche Bank’s partnership with the Tata Trusts come about?
When the Tata Trusts and their on-ground partner, Centre for microFinance (CmF), approached us with this programme proposal for Dausa district, it aligned perfectly with our CSR environment objectives. The programme appealed to us for several reasons. First, it focuses on the adoption of climate-smart agricultural practices. Second, it empowers women farmers and, third, it incorporates community ownership and a co-funding model that ensures sustainability.

In what ways has the collaboration with CmF enriched the programme?
We collaborated with CmF in 2023-24, launching a pilot project to empower 1,000 women farmers to adopt climate-smart agricultural practices. In 2024-25, we renewed the project to support another 1,000 women farmers across 40 villages.

Some significant results from the first year include the adoption of micro-irrigation measures that have reduced groundwater consumption by 30-40%. The sprinkler irrigation method has been particularly successful, with 679 sprinklers installed in the first year.

The installation of 100 biogas systems has improved waste management, created a sustainable energy source and provided an organic fertiliser on the side. Farmers using the biogas slurry save up to ₹2,000 every two months on fertiliser costs. Increased crop yields, thanks to enhanced agricultural and irrigation practices from the first year, have not only boosted farmer incomes but also led to the establishment of a mustard oil processing unit.

The formation of a farmer producer entity, the Lalsot Krishijivi Agri Producer Company Limited (LKAPCL), in October last year with 480 women farmers joining as shareholders, has played a crucial role in furthering the initiative’s goals. It has had a four-fold impact: Empowering and establishing women farmers as leaders; fostering financial independence and promoting gender equality; providing them access to quality products; and facilitating direct market linkages.

How does this programme align with Deutsche Bank’s CSR strategy and goals?
As part of our CSR strategy, we are committed to reducing carbon dioxide and greenhouse gas emissions. This programme directly contributes to carbon emission reduction while also enhancing the income of women farmers.

Through our partnership with

CmF, we train women farmers in climate-smart agricultural practices, including water budgeting, micro-irrigation, cultivation methods, biofertilisers and biogas plants. The project also improves soil quality and farmland productivity, establishing sustainable supply chains and increasing rural household incomes.

One of the project's strengths is complete community participation, ownership, and co-funding of each initiative, ensuring that it is embraced from the outset as the entire community is involved in the decision-making process. Agricultural and institution-building activities are integrated and this cements community engagement and sustainability. Additionally, it creates shared assets such as storage facilities and processing units that are managed by the community.

What have been the outcomes and how do you feel about them?

It's been a year-and-a-half since we embarked on this partnership and the results have been outstanding. At the end of the first year, we wanted to assess the programme to see if we could invest in it for a second and third year. We have found that there has been a direct increase in income in the community. The biogas plants we have been able to install have created savings for the family while also providing quality manure for crops, which has led to more financial gains.

While these are outcomes you can call out, there is a softer impact as well. The women farmers are empowered and have a voice in the family as earning members. They have more income in hand, which means the family is eating better and living healthier lives. In the long term, this additional income has ensured that the families are no longer struggling to make ends meet, that they can send their children to school instead of putting them to work.

Members of the all-women farmer producer company in Lalsot at a meeting

What takeaways from this programme could be applied to other (and future) CSR projects undertaken by Deutsche Bank?

This project has demonstrated the importance of a clear vision and aligned execution. The impact achieved in just one year highlights what can be accomplished with strong community participation.

As a corporate citizen, Deutsche Bank plays an active role in helping build equitable and inclusive communities. This includes supporting projects that help communities become more climate-resilient, and our collaboration with CmF aligns perfectly with our environmental goals. We aim to expand and scale the programme to reach many more households, villages and women farmers.

The goal for each intervention is for the communities to eventually adopt and implement good practices independently, becoming leaders in their region and training women farmers in neighbouring villages.

I believe the core of a successful programme is when you are able to exit it and let it run on its own. Over time, if we are able to create more farmer producer companies and they can micro-fund the work of future farmers in new programme areas – that would be a desirable outcome.

On a personal level, what has been the most rewarding aspect of leading this initiative?

The most rewarding aspect is the irreversible change we bring to the lives of rural people. The project not only has a strong environmental impact, but it also empowers women-led rural households, resulting in increased income and strengthening their role in uplifting their families and the broader community. ■

Sunita Saraka from Badamatkabadi village in Odisha's Rayagada district checks her son's exercise book

Learning fillip

Rural schools are at the centre of an effort to enhance learning outcomes for primary and secondary students in Jharkhand and Odisha

Sunita Saraka used to find it difficult to get her children to school. "They were not interested in studies and we had to pressure them to attend classes," says Ms Saraka, whose children study at the government-run upper primary school in Badamatkabadi village in Odisha's Rayagada district.

That's not an unfamiliar story in rural India's government-run schools, which face a morass of challenges: teacher shortages, large class sizes, antiquated learning methods and more. The hardest hit here are children from marginalised communities who depend on government schools for their education.

Collectives for Integrated Livelihood Initiatives (CInI), an associate organisation of the Tata Trusts, set out to help remedy this situation back in 2012, when it launched a three-year initiative aimed at enhancing primary and secondary education.

The CInI effort kicked off in Jharkhand's Khunti district. Called the school and community-based quality improvement programme (SCQuIP), the objective was to find the best way to support children who do not speak Hindi, the medium of instruction.

In Jharkhand, the CInI team realised that children who spoke local dialects such as Mundari or Sadri found it difficult to understand the learning material in Hindi. SCQuIP aimed to bridge this learning gap through remedial centres that helped children with their curriculum.

The programme began delivering results within a year. In 2013, the percentage of students passing reached 87%, significantly higher than the district average of 64%. Across all subjects, marked improvements were seen in a survey of 1,300 students from classes II and III.

"My children have benefitted a lot,"

Parwati Xaxa from Karra village in the Khunti district of Jharkhand takes time out to help her daughter with her homework

The Kolibri connection

Back in 2019, Collectives for Integrated Livelihood Initiatives (CInI) piloted the use of the Kolibri platform, an open-source educational system specially designed to provide offline access to a wide range of quality, open-licensed educational content in low-resource environments such as rural communities or schools without WiFi.

The Kolibri platform was first used in 15 schools in Jharkhand's Khunti district and benefitted more than 1,100 students. The platform offers a range of educational resources, including learning exercises, videos, audio files and documents, all of these publicly accessible. Educators can select content that aligns with the local curriculum or meets the specific needs of their students.

A key feature is the coach dashboard, which enables teachers to create exams, assign learning exercises and provide tailored support through differentiated instruction based on each student's progress, history and goals.

An important part of the platform is the use of computer tablets in learning. The tablets give students access to digital learning and teachers proactively use digital content to improve learning outcomes. ■

says Parwati Xaxa, parent of a class VI student from Karra village in Khunti. "My daughter is now a member of the school's *bal sansad* (children's parliament) and she is doing good work. Her art has improved and she is eager to learn."

That's the SCQuIP touch, enabling students to become more articulate and confident in their academic pursuits.

Apart from the positive changes in the learning outcomes of students, there has been a stark improvement in facets like punctuality, discipline, regularity and leadership skills.

Community connect

The good work done has been much appreciated and it has sparked greater community involvement. Interestingly, the increased participation of parents and community members has had a ripple effect on teachers, while upping student enrolment and retention in schools.

SCQuIP's demonstrated success has led to it being expanded to eight districts in Jharkhand. It was also introduced in three districts of Odisha, where the goal was to improve the education quality and learning outcomes for underprivileged children.

Since 2015, the programme has reached about 250,000 children in schools and *anganwadis* (childcare centres) across Jharkhand and Odisha. In Jharkhand, the project is being implemented in collaboration with the Jharkhand Education Project Council, while in Odisha it is being operated in collaboration with the state government's District Education Department.

SCQuIP follows a three-pronged approach: a learning improvement programme, improvement in the overall school environment, and community and system strengthening.

The key objectives are to improve classroom teaching and learning processes,

A class in progress at the Ichak government school in the Latehar district of Jharkhand

particularly in foundational literacy and numeracy, science and maths; enhance the overall learning environment in schools to create a more conducive atmosphere; strengthen school systems and leadership; and foster greater ownership of schools by school management committees (SMC) and the local community.

At the school level the programme works to create a vibrant atmosphere, with engaging morning assemblies, a colourful, print-rich environment in class, and well-stocked libraries. The effort goes beyond academics to place a strong emphasis on co-curricular activities. One initiative, for instance, involves students and community members working together to establish kitchen gardens in schools.

Creative expression is encouraged through arts and crafts, while library programmes have storytelling sessions to spark a love for reading and improve language skills. The *bal sansad* initiative works to build leadership, decision-making, teamwork and problem-solving abilities in students.

Going beyond rote learning has been a boon for the children. "My children now go to school willingly," says Ms Saraka. "This summer they enjoyed a programme that kept them engaged in project work and learning activities, particularly in maths and languages."

Capacity building is a key component in SCQuIP, which focuses on strengthening the academic system by providing training at subdistrict levels through resource centres and at district institutes of education and training. The resource centres help in training government teachers, *anganwadi* workers and support staff.

Fostering employment

Teachers and support staff are typically hired from the village community. Local stakeholders, such as *panchayat* (village council) members, are actively involved in need assessments and resource allocation. By recruiting from within the community, the initiative fosters employment. The idea is that local educators will be able to make education more relatable for students.

Teachers and *anganwadi* workers are trained to make classroom sessions more engaging, especially in key learning areas such as foundational literacy and numeracy. "Literacy and numeracy are being integrated into daily activities with

Sahib Alam, a teacher at the upper middle school in Machhbhandar in Jharkhand's East Singhbhum district, with his students

REACHING IN AND OUT

SCHOOLS
Jharkhand: 1,764
Odisha: 1,149

CHILDREN
Jharkhand: 195,108
Odisha: 62,045

TEACHERS
Jharkhand: 3,824
Odisha: 487

children and through playful learning," explains Sahib Alam, an assistant teacher at the upper middle school in Machhbhandar in Jharkhand's East Singhbhum district. Technology plays a key role in the success of this initiative *(see* The Kolibri connection *on page 34)*.

The CInI team also works to strengthen SMCs so that there is a greater degree of community ownership in how their children learn. Committee members are made aware of their responsibilities vis- -vis student attendance, learning outcomes, identifying out-of-school children, child rights, health and wellness, etc. They are also guided in school infrastructure work (fencing, creating kitchen gardens, etc).

The community-based approach helps in tackling student absenteeism, low levels of teacher motivation and high pupil-teacher ratios. Community support has also encouraged teachers to take greater ownership of their students' learning.

With SCQuIP showing impressive results, CInI plans to push the programme further. "Thanks to this initiative, children are learning through games and enjoying the process. Their attendance has also improved," says Asha Devi, an SMC vice president at the Ichak government middle school in Jharkhand's Latehar district. ■

By Poorva Chavan

It's nutty on the ground

Geeta Devi and her husband, Tilak Ram, at their groundnut farm in Vishambharpur village in Shravasti district

More than 6,500 farmers in Uttar Pradesh have secured an income boost through climate-resilient groundnut agriculture

For thousands of farmers with small landholdings in eastern Uttar Pradesh, the summer months from March to June — known as the Zaid cropping season — are mostly unproductive. Water availability is limited and farmlands typically lie fallow until the monsoon sowing season starts in July. Now this once-barren period has been turned into a window of opportunity by an initiative nested in the Tata Trusts' agriculture portfolio.

Growing groundnuts as a summer crop is the change that has happened and it covers 6,658 farmers in around 50 villages in the districts of Bahraich, Shravasti and Balrampur in eastern Uttar Pradesh. The objective is to reach a further 20,000 farmers over the next three years through grassroots NGO partners and, eventually, more than 100,000 in some 500 villages.

The groundnut farming effort is a pilot project that comes under the wide-ranging Sujalam Sufalam programme, which incorporates multiple facets: creating community institutions; enhancing water conservation; developing agriculture entrepreneurs, collaborating with industry stakeholders; and providing farming security through crop insurance and credit options.

Sujalam Sufalam is being implemented by the Tata Trusts in eastern Uttar Pradesh with the support of three NGOs. It embodies a comprehensive approach to sustainable farming practices, with the aim of transforming the agricultural landscape by doubling farm incomes.

Launched in 2019, Sujalam Sufalam covers 500 villages in Bahraich, Shravasti, and Balrampur, reaching 100,000-plus households and integrating a wide range of agricultural practices, including innovative cropping patterns, irrigation techniques, high-quality seeds, high-value crops, mechanisation, and market linkages, alongside the formation of farmer producer organisations.

But why groundnuts? The reasons are clear. Extensively used in edible oil production, groundnuts are a high-value produce with good market demand. And there's no lack of expertise in India when it comes to groundnut farming, given that the country, with an annual output of more than 10 million tonnes, is the second-largest producer of groundnuts in the world (after China).

Groundnut is the ideal intercrop. It is relatively easy to cultivate even in semiarid conditions and it fixes atmospheric nitrogen directly into the soil, improving fertility and enhancing crop yields. Moreover, groundnuts are easy to store and sell in the market.

"The continuous improvement of seed varieties and adoption of better farming practices have made groundnuts an ideal crop for sustainable farming systems," says Chitore Guha Sarkar, who heads the 'climate-smart agricultural livelihoods development' portfolio under the rural uplift theme of the Tata Trusts. "On the one hand, it boosts the income of farmers and, on the other, it attempts to help reduce India's deficit in edible oils."

High on potential

The potential for groundnut cultivation in eastern Uttar Pradesh is high. Two rivers — the Ghagra and the Rapti — flow through what is known as the Tarai belt, supplementing a 20-foot-deep water table that supports agricultural activity for most of the year. The sandy loam, with highly fertile soil, makes this an ideal land for groundnuts to flourish with the right scientific practices.

The three-year groundnut initiative started in October 2022 under the 'climate-smart agriculture and livestock' thrust of the Trusts and has been planned in accordance with livelihood parameters arrived at by NITI Aayog, the Indian government's public policy think tank.

Integrating agricultural advancements with grassroots conditions, the initiative engages directly with farmers and other stakeholders, while encouraging capacity building among local communities.

To foster the shift to groundnut, the Trusts team first set out to understand the local farming community. The farmers here predominantly grow sugarcane and paddy during the Kharif season (which commences with the onset of monsoon) and lentils, rapeseed and mustard as winter crops in the Rabi season.

"There was potential to cultivate groundnut concurrently with sugarcane by utilising the inter-row space between sugarcane saplings and harvesting the groundnut crop in 80-90 days, before

Peanut propulsion

Patna Ghusiyari village in eastern Uttar Pradesh's Bahraich district has set itself a goal — to be nationally recognised as a source for high-quality groundnut seeds. A farmer producer group, comprising 13 farmer members, has been trained in the production of seeds of three groundnut varieties: TG-37A, TLG-45 and TG-51.

The farmers were trained by Muktisadan Basu, a former director of the public-sector Indian Council of Agricultural Research, on best practices in groundnut seed production. They have learned to use a decorticator machine that enables them to separate seeds from the groundnut pod. The seeds are then treated to be ready for sowing.

The farmers were shown how to prepare soil beds so that the entire field could be irrigated evenly. Farmers also learned that an additional crop — okra, for instance — could be sown on the soil-bed boundaries. This vegetable became a nutritional dietary input for the families of the farmers.

With support from the Tata Trusts team, the 13 farmers produced 20.60 quintals of groundnut seeds in just 2.2 acres of land. The group sold the seeds through their Udhyami Mahila Producer Company and the new seed varieties are now being supplied to farmers of 10 neighbouring villages. ■

the sugarcane gains in height," explains Mr Guha Sarkar.

Groundnut being a bulky seed crop, it was a challenge for farmers in the region to get quality seeds. The Zaid season opened up a unique opportunity to develop seed hubs that could cover this gap while earning a premium over the normal commodity price when sold as seeds to farmers.

In early 2022, the Trusts team made a modest beginning, engaging with 10 farmers and supplying them with high-quality seeds. Muktisadan Basu, a former director of the public-sector Indian Council of Agricultural Research, was contracted to help drive the project by extensively training the project team members as well as mobilising village-level workers, the last-mile community resource.

The seed chosen for the pilot was of the DH-86 variety, a climate-tolerant semi-spread type — which does not take up too much space — developed by the Directorate of Groundnut Research, which operates under the central government's Ministry of Agriculture.

About 20kg each of groundnut seeds were sown in the Rehra, Sadar and Sriduttganj regions of eastern Uttar Pradesh and the results were encouraging. The first crop was cut three months after sowing, yielding a harvest of 450-520kg per acre. "Considering the prevailing minimum support price of ₹6,000+ per quintal (100kg), this translated into an additional income of at least ₹27,000 per acre for the farmer," says Mr Guha Sarkar.

The success of DH-86 led the team to explore further. Discussions with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, led to the securing of varieties with high oleic oil content — Girnar 4 and Girnar 5 — for pilot adaptation evaluation trials.

"This has been envisaged as an idea where communities will be able to increase value-addition and incomes by developing a secure production line for high oleic oil groundnut seeds," says Mr Guha Sarkar. "This also offers a healthier option to local farming communities."

Members of the Narayan family with their groundnut harvest in Rehra Bazar in Balrampur district

From the adaptation pilots, the Girnar 4 harvested in November 2023 was also a success, registering yields of 428 to 572 kg per acre (though the seeds were received quite late). The project then expanded to trials of four more seed varieties of groundnut with 39 farmers.

Tested and tried

The seed trials were meant to identify the most suitable seed for the climatic, geographic and environmental conditions in eastern Uttar Pradesh. This was to ensure maximum compatibility and production output. The varieties tested showed no disease throughout the process from sowing to harvesting. Yields and production were satisfactory and all the seeds showed positive results in terms of improved soil fertility.

The final selection was narrowed down to the TG-45 variety. It emerged as the preferred choice of farmers because it generated high yields and the larger size fetched a better price in the market.

Buoyed by the success of the trial project, the Trusts team has now expanded the adoption of groundnut farming to the Rehra, Sadar and Tulsipur regions. The Trusts team is supporting the farmers by purchasing agricultural machinery and arranging seeds from the International Crops Research Institute for Semi-Arid Tropics and the Bangladesh Rural Advancement Committee.

Farmer communities have been engaged with and encouraged to adopt groundnut cultivation. To ensure sustainability and build a local ecosystem for quality seeds, the team has trained farmers to establish seed production clusters *(see* Peanut propulsion *on page 38)*.

The expectation is that the groundnut farming venture will provide a much-needed boost to small-farm households and help hedge against climate risks and volatility in wheat and paddy prices. The way things are going, that expectation is on track to being met on a larger scale. ■

By Kishore Rathod

Gudiya gets growing

For Gudiya Devi, a woman farmer from Badago village in the Tulsipur region of eastern Uttar Pradesh, the adoption of groundnut cultivation has been transformational.

Ms Gudiya's three-acre plot of agricultural land is the main source of livelihood for her nine-member family. Before joining the project, her family grew paddy and wheat, along with some sugarcane as a cash crop. Poor irrigation meant yields were never up to expectations.

In 2020 Ms Gudiya joined the Sujalam Sufalam programme, which was being implemented in her village by its *pani sansthan* (water organisation). She learned about ways to use less water in farming and also cottoned on to the benefits of planting high-value crops.

Ms Gudiya's family was initially reluctant to shift away from their traditional practices. She managed to convince her husband and, as a trial, they planted an onion crop on raised beds in a small area of their field.

"We got almost double the yield compared with the traditional method and we used a lesser quantity of water," says Ms Gudiya. "This boosted our confidence and my family became more accepting of the idea of planting new crops and adopting new methods."

In February 2024, during a meeting of the village farming group, Ms Gudiya heard about sowing groundnut as an intercrop with sugarcane. This time when she returned home to explain the benefits of groundnut farming, her family was more willing to listen.

Gudiya Devi at her farm in Badago village in Tulsipur

At the end of the month, the family sowed the TG-37 variety of groundnut, planting the oilseed between two lines of sugarcane. In June Ms Gudiya and her family found themselves with a rich harvest of 210 kg of groundnut from just a quarter of an acre of land. Even after keeping back sufficient seeds for the next sowing season, Ms Gudiya earned ₹10,500 from the crop.

Ms Gudiya's story of high-yield groundnut cultivation and her consequent earnings jump spread quickly, within her village and beyond, encouraging more farmers to go with groundnuts. ■

THREAD BY THREAD

Thüjosalü Chakhesang weaving at her home in Diezephe village in Nagaland's Chümoukedima district

Antaran, the crafts-themed livelihoods initiative of the Tata Trusts, has been helping weave a revitalisation of India's wide and varied handloom sector for six years. The initiative now covers 244 villages in six handloom hubs in four states — Nalbari and Namrup in Assam, Gopalpur and Maniabhandha in Odisha, Venkatagiri in Andhra Pradesh, and Dimapur in Nagaland.

The Antaran effort is centred on enhancing the livelihoods of artisans, and it is also about preserving a rich cultural tradition rooted in different parts of the country. Antaran is involved in a spread of activities aimed at enabling its artisans to flourish, from skill development and design inputs to improving market linkages.

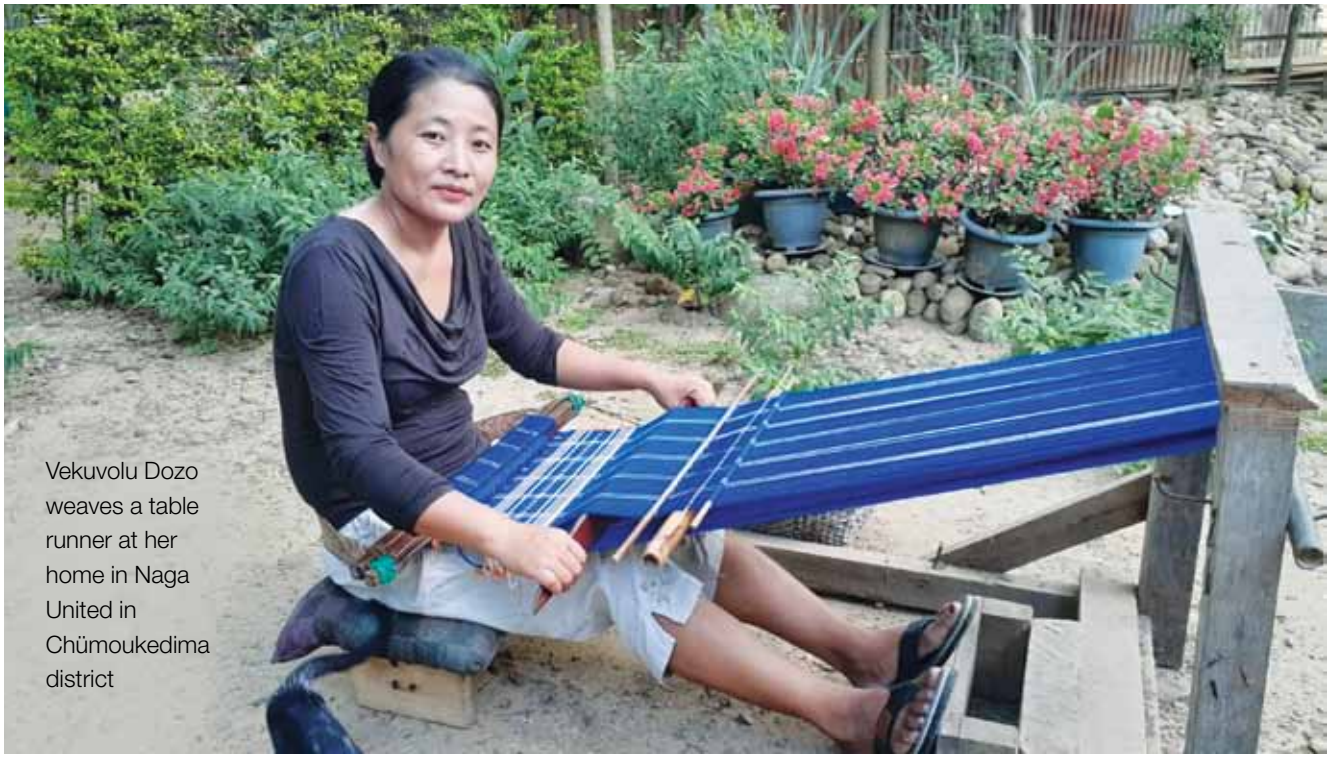
Antaran has reached more than 3,700 artisans, nearly 2,500 of them women. These artisans learn about design and business and are encouraged to become self-employed or entrepreneurs (there are some 300 artisan entrepreneurs in the programme).

(clockwise from above) **Kabita Nath** from Rampur village in Assam's Nalbari district drying the natural-dyed yarns that enrich her handloom weaves; **Runuma Begum** of Chinadi village in Nalbari now has a weaving shed donated to her through Antaran; **artisan-entrepreneur** Geeta Haloi from Daulashal in Nalbari winds bobbins along with her son, who helps run her business.

(above) **Nagaland artisans** Khunietalu Medeo (extreme left) from Phusachodu village in Phek district and Anitoli Sumi (second from right) from Sunito village in Dimapur district with buyers at an exhibition in New Delhi; (left) **artisan entrepreneur** Acilu Vero (third from left) and her associates at work in Phughi village in Phek district.

(clockwise from top left) **Attired in** a traditional tussar sari, artisan Sumati Das celebrates Diwali at the Antaran centre in Gopalpur in Odisha; **Sashi Das** boils silkworm cocoons as part of the process to extract tussar yarn (to be used by her artisan-entrepreneur son, Ullash, to weave tussar fabrics from their home in Jajpur village in Gopalpur); **Basanti Chand**, also from Gopalpur, winds yarn in preparation for weaving; **Gopalpur-based** Kartika Sur, who trained as a micro-entrepreneur at Antaran, is making waves with his tussar creations.

(clockwise from top left) **Eswaramma Gunturu**, based in Venkatagiri in Andhra Pradesh's Tirupati district, is the matriarch of her family enterprise; **Perneti Lakshmi**, also from Venkatagiri, is an associate weaver with Antaran; **Suryamani Chand**, based in Gopalpur in Odisha, enrolled in Antaran's artisan entrepreneurship programme and now runs 10 looms; **70-year-old** Donthu Ramesh, who hails from Vekatagiri, returned to weaving a couple of years ago on the urging of famed weaver Patnam Subramanyam.



Vekuvolu Dozo weaves a table runner at her home in Naga United in Chümoukedima district

‘I feel I can master any design now’

Vekuvolu Dozo, winner of the Indian government’s ‘national handloom award’, has made the most of opportunities provided by Antaran to weavers around the country

“I never imagined I would receive such a great honour. It was a moment of great happiness and pride for me,” recalls Vekuvolu Dozo of that day in August 2024 when she received the ‘national handloom award’ from India’s vice president, Jagdeep Dhankhar, at New Delhi’s Vigyan Bhavan.

Ms Dozo — affectionately known as Veku — was honoured by the Indian government’s Ministry of Textiles during the 10th ‘national handloom day’ event, a celebration to preserve and promote traditional weaving. And that’s where Ms Dozo, an expert in the art of Nagaland hand-weaving, has played a dazzling role, not least when she represented her state at the Namaste France Festival hosted by the Indian embassy in Paris in 2023.

“You will see a traditional touch in my work but the motifs are contemporary,” says Ms Dozo, who showcased her signature home furnishings at the Paris show.

Lending a hand to Ms Dozo on her journey to national and international recognition has been Antaran, the crafts-based livelihoods programme of the Tata Trusts. Seeded in 2018, Antaran has infused fresh life into some of India’s diverse handloom traditions while working with more than 3,700 artisans, the majority of them women, in handloom hubs in Odisha, Assam, Nagaland and Andhra Pradesh.

The 42-year-old Ms Dozo joined

Antaran in 2019 as a relative newcomer to the world of weaves. Her maiden effort at the loom was when she was 18, learning from her aunt to weave the customary Naga shawl for her soon-to-be husband. "It was my first attempt and not a very fine one," she says.

After marrying at 19, Ms Dozo followed her husband to Uttar Pradesh to engage in missionary work. Weaving took a backseat until the family moved back home to Naga United village near Dimapur in 2019. That's when Ms Dozo, while caring for her family of four, joined Antaran.

The Antaran training was a revelation for the inherently talented Ms Dozo. "I learned so much, from basic measurements to understanding different yarns to marketing," she says. "I was once given a very difficult design, which I named dragonfly, and I worked nonstop on it for four days. I've now reached a stage where I feel I can master any design."

Feeling at home

The association with Antaran proved to be a boon for artisans like Ms Dozo, particularly during the Covid pandemic, when they marketed their products online. Ms Dozo took the business lessons to heart and has since built up her own home furnishings label, Viko Ethnic, which has an ever-expanding product portfolio.

Ms Dozo's designs are tailored to satisfy the demands of dissimilar customer segments. For instance, she exhibits brightly coloured products in Delhi but tones down the palette for buyers in Bengaluru. "It's important to understand the culture and preferences of buyers," says Ms Dozo, who has a team of six women in her home workshop and farms out orders to a network of about 30 women weavers.

Products from Ms Dozo's handloom stable are sold across India and to customers from abroad as well. Till two years ago, her order size was below ₹50,000 a year; today it exceeds ₹250,000 and her order book is full for the months ahead. "My profit hasn't grown as much since I share the proceeds with my weavers," she says.

Ms Dozo showcases a Chakhesang shawl woven with her signature mix of non-traditional colours and contemporary motifs

Ms Dozo continues to think big. "I want a larger workspace as I get a lot of interns from fashion schools. I need more room for them and for storing yarn. I also want to open a shop to showcase my creations." Meanwhile, there's the continuous need for marketing and publicity, among other reasons to counter increasing competition from machine-made copies of Naga handlooms.

Ms Dozo and her compatriots are confident that they can count on Antaran, which has concentrated on strengthening India's crafts ecosystem through multiple endeavours. The overarching objective is to make India's crafts heritage a pathway to secure sustainable livelihoods. ■

By Aarti Dua

This painter-to-be, seen here at a training centre in Sirohi in Rajasthan, was part of the 'skill mitra' programme, a grassroots initiative by the Tata Trusts that reached out to youngsters in backward areas

How **skilling** can drive the economy, bridge gender gap

Skilling begets progress — to bridge India's skills gap and develop a more mature ecosystem that prioritises not just opportunities today but also a secure means of livelihood tomorrow, the path ahead is marked by several critical steps

Siddharth Sharma is the chief executive officer of the Tata Trusts

Today, India stands at a pivotal juncture – our nation forms the world's fifth largest economy with tremendous scope for unparalleled growth, but also with a pressing need for enhanced employability.

With a vision of Viksit Bharat for India@2047 to strive towards, we must reckon with how to skill today's youth to bridge the unemployment-employability gap while shaping nation-building and progress.

The Union budget 2024-25 echoed the interim budget's focus on 'yuva' as one of four major groups to support. Highlighting a welcome package of five schemes facilitating employment and skilling for 41

million youth over a five-year period, with ₹1.48 trillion allocated for education, employment, and skilling, today's announcements bode well for the future of our youth, given the government's emphasis on skill development.

The barriers faced by the workforce are immense: nearly 73% of workers aged 15-59 years did not receive any formal or informal vocational or technical training, according to the Periodic Labour Force Survey 2022-23. With India's demographic dividend expected to peak around 2041 and the working-age population forecast to shrink, we must seize the current window of opportunity to harness the potential of India's labour force and fuel economic growth.

In parallel, we must leave no young person behind, and ensure that the fruits of skilling initiatives are also reaped by women, whose labour force participation has been historically low. By introducing initiatives to this end, the budget indicates a positive way forward. Empowering women is not just a social good but also an economic imperative. In fact, a Barclays report indicates that ensuring that women account for half the new workforce created by 2030 is critical for India to attain an 8% GDP growth rate.

Skilling begets progress — to bridge India's skills gap and develop a more mature ecosystem that prioritises not just opportunities today but also a secure means of livelihood tomorrow, the path ahead is marked by several critical steps.

One is to bolster institutional support, reaffirmed by the budget's emphasis on upgrading industrial training institutes. With the mission of advancing a future-ready workforce, training institutions can equip youth with skills to succeed in the 21st century. Through the Indian Institute of Skills, established in collaboration with the Government of India's Ministry of Skill Development and Entrepreneurship and the Tata Trusts, we strive to make this goal a reality.

Trainees at the Indian Institute of Skills-Ahmedabad, set up as a partnership between the Indian government's Ministry of Skill Development and Entrepreneurship and the Tata Trusts

By offering highly specialised trainings based on industry demand, across artificial intelligence, data analytics, digital manufacturing and more, for instance, we hope to gear students up for success.

The product of a unique collaborative endeavour, we expect that this institute, albeit at a nascent stage currently, can serve as a model spurring the rise of similar institutions that develop carefully curated courses to meet evolving work requirements and support gainful employment, particularly for those with unrealised potential who dropped out of the education system. It puts them back in the driver's seat — endowing them with the tools and training needed to retain meaningful, fulfilling jobs.

To strengthen the skilling ecosystem, the active involvement of public and private players, and a strong industry-

This youngster has come through a skilling initiative supported by the Tata Trusts

academia connect, is also vital. This, in turn, can enhance skilling infrastructure, augment the number of trainers available, and scale the reach of meaningful programmes and government schemes to far-flung parts of the country.

Reinvigorating pioneering schemes, such as Skill India, National Policy for Skill Development and Entrepreneurship 2015 — an update to which is anticipated — Pradhan Mantri Kaushal Vikas Yojana, among others, can also strengthen the investment in vocational education, training, and entrepreneurial support.

Further, conducting a thorough nationwide research and analysis of the factors behind unemployment and specific gaps in education and skilling might offer a constructive framework for the road ahead.

Transformative financing solutions, including impact bonds such as the Skill India Impact Bond, can also serve as a catalyst heralding progress. As a first-of-its-kind approach, this tool was designed to offer training and employment opportunities. It can drive a paradigm shift—from primarily government or CSR donor-funded programmes to a model drawing in greater impact investment, including from the private sector.

With aspirations for long-term skilling outcomes, it helps overcome a demand-supply mismatch, ensuring that people are trained with the right skills for the right job. These also offer promising solutions for young women — who record high rates of enrollment.

As Malcolm X once said, "Education is the passport to the future, for tomorrow belongs to those who prepare for it today." India's journey towards realising its potential as a skilled nation may be riddled with obstacles, but the progress being made is promising. This is marked by ambitious schemes, innovative approaches, and collaborative efforts to sow the seeds of change and move India's youth many steps closer to livelihood opportunities, laying a foundation for India's development. ■

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