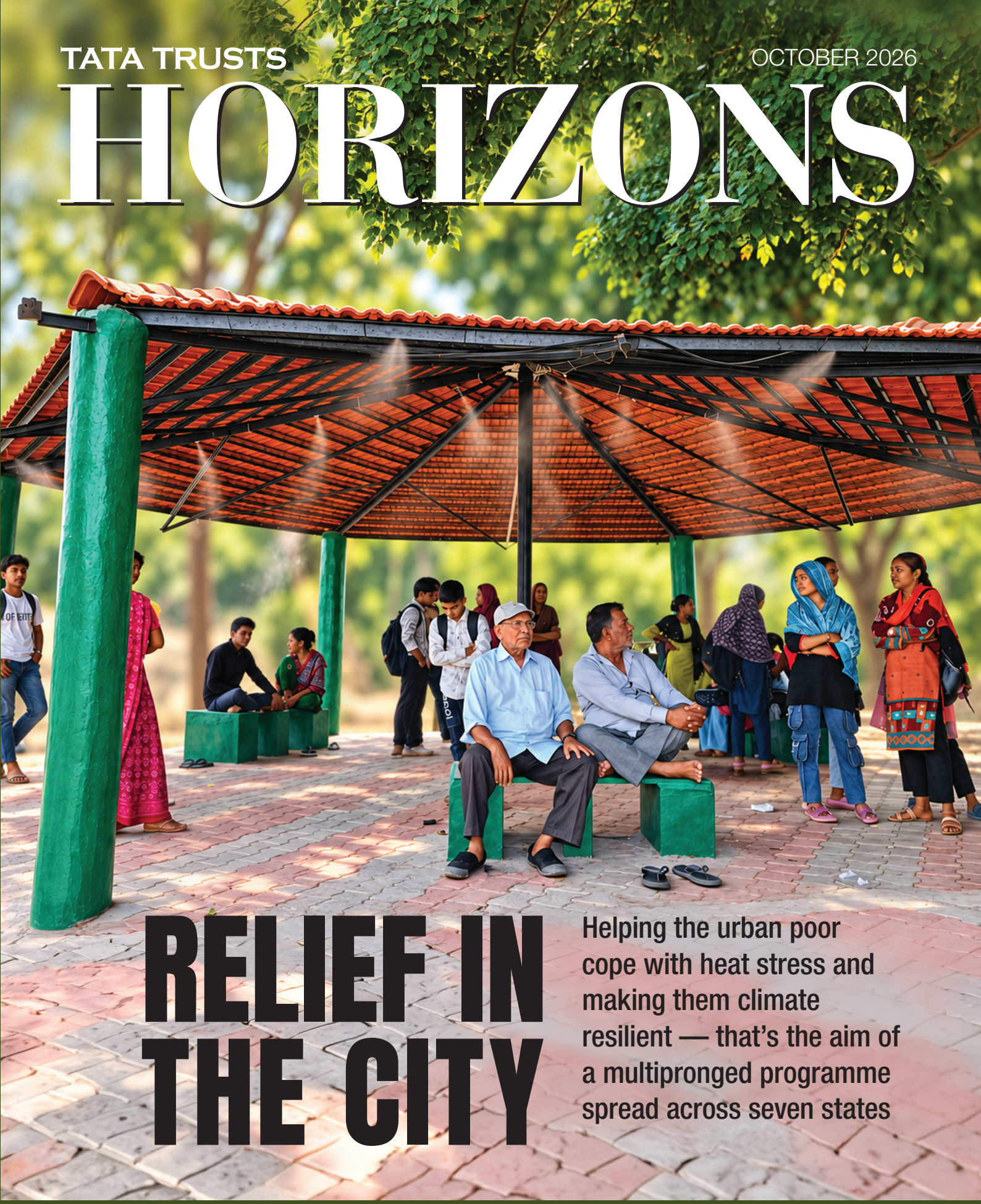
TATA TRUSTS

OCTOBER 2026

HORIZONS



RELIEF IN THE CITY

Helping the urban poor cope with heat stress and making them climate resilient — that's the aim of a multipronged programme spread across seven states

COMMONS GROUND

The sharing of community resources underpins an effort aimed at restoring barren lands

SLIP SLIDING AWAY

Dementia is the focus of a campaign that prioritises awareness and early detection

INTERVIEW

Urban development expert Debolina Kundu on making India's cities and towns more habitable



EDITORIAL

Urban India, with its teeming cities and ever-growing towns, is in the crosshairs of a worsening crisis caused by a confluence of factors: heat stress, the double whammy of flooding and water scarcity, diminishing green cover, and inadequate infrastructure. The malevolent manifestations of climate change can be blamed for much of this, abetted as they are by failings of a very human kind.

The people hit hardest by our urban woes are those least equipped to cope with them — the poor and the marginalised. Our cover story details how a clutch of programmes, supported by the Tata Trusts and implemented by our partners, is easing the burden of working and living for the urban poor. Operational in seven states, these programmes cover heat stress, water availability and, perhaps most importantly, enabling the urban underprivileged to become climate resilient.

India's cities and towns are also the main deal in our interview segment, where Debolina Kundu, director of the New Delhi-based National Institute of Urban Affairs, explains how we can make the country's urban spaces more habitable. Dr Kundu dispels the notion of a rapidly urbanising India, while offering insights on issues ranging from slums to the collective responsibility of citizens (a word that originally meant city-dweller).

Rural India is the focus in this edition's Centre Stage section, which explores how village communities in Rajasthan are restoring their 'commons' — a term that refers to natural and other shared resources — while fuelling systemic change and giving women the agency to make a difference. From Uttarakhand and Himachal Pradesh, we feature a story with women again at the forefront, this time in an animal husbandry effort that is paving the way to financial well-being.

Also in the current edition of *Horizons* are a fellowship initiative that is helping women and children in Karnataka and Bihar secure legal rights and access government schemes, and an excellent Tata Trusts campaign aimed at understanding and managing dementia, a condition that casts a shadow over patients as well as their families. Additionally, we have a piece on the potential of a path-breaking detection tool that diagnoses vector-borne diseases at a lower cost, and a plea on behalf of animals distressed by heatwaves. Unlike us humans, they don't have a voice.

Chistabelle Noronha

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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Dementia is the focus of a campaign that prioritises awareness and early detection to manage a condition that affects patients and families

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Cover image: Citizens shelter at a 'cooling station' in Patan (Gujarat) that provides respite from the heat with overhead sprinklers

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Countering the cost

Enabling the urban poor to become more climate change-resilient is the objective of impactful initiatives seeded by the Tata Trusts and their partners in seven Indian states. By Labonita Ghosh



With their homes too hot during the day, residents of this neighbourhood in Chandrapur's Panchasheel Chowk opt for the outdoors

Rapid urbanisation, disappearing green cover and climate change are making urban India hotter by the day. This, in turn, is affecting people's lives and livelihoods, increasing health risks, reducing productivity, disrupting businesses, and straining infrastructure.

A recently released World Bank report — titled 'A Liveable Future: Tackling Extreme Heat for Jobs and Growth in South Asia's Cities' — warns that temperatures in the subcontinent's urban centres will go up by 2-2.5°C every year.

According to the report, "The burden of extreme heat is also deeply unequal. It falls hardest on people whose homes offer little protection, whose work keeps them outdoors or in poorly cooled spaces, and whose access to reliable cooling, healthcare, and social protection is limited".

This is the story of millions of Indians living and working in informal settlements across the country, with no access to even the most basic facilities, who toil for hours in the open, where heat exposure is the most acute.

As the workforce in urban and semi-urban hubs expands with migration, towns and cities grow upward and outwards to

accommodate the inflow. They end up not only encroaching on green spaces and undermining water bodies, but also using amenities and dwellings made from heat-trapping materials.

These materials absorb solar radiation during the day and release it at night, creating an urban heat island (UHI) effect on top of an already extreme baseline of hot weather.

In 2024, the Tata Trusts launched a programme to help the urban poor who have been rendered vulnerable by increasing heat and water scarcity, unplanned urbanisation and frequent flooding.

Shielding the community

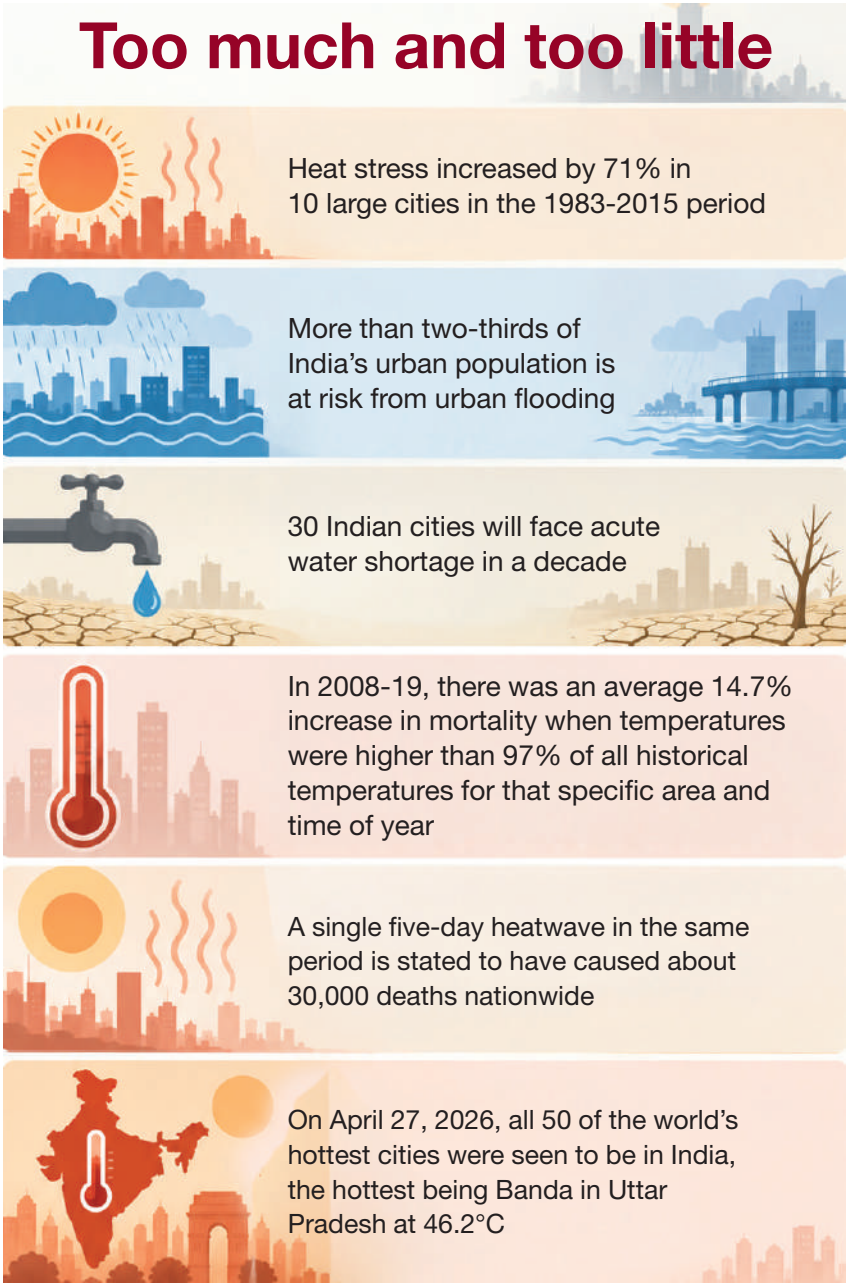
This four-year programme works with economically disadvantaged communities in 25 urban centres across seven states to make them more heat- and climate-resilient.

"Urban poverty in India is multidimensional, and it goes beyond the absence of income," says Shikha Srivastava, who heads the urban poverty alleviation portfolio at the Tata Trusts. "The urban poor endure inadequate housing, limited access to water, sanitation and waste management problems, and exclusion from basic entitlements. These are compounded by challenges unique to urban settings: overcrowding, rising living costs and frequent disasters."

Being engaged in the informal sector, the urban poor also don't have access to the social protections accorded to those who work in the organised sector. As migrants, they often don't have access to public food distribution systems, health schemes or other benefits provided by the government.

"We try to address two kinds of shocks that the urban poor face," says Ms Srivastava. "External shocks, like one-off weather disasters, and regular seasonal events that impact their lives, such as heatwaves, flooding or periods of water stress. Since their work is usually out in the open and often involves long commutes and physical labour, they risk losing income, clientele and days of work to illness.

"We believe in strengthening households through interventions that address extreme weather events, and also by connecting them to government schemes. And we try to bring more women into the workforce by empowering them with care support and skilling opportunities."



Sources: World Bank, Census 2011, AQI.in

Helping hand for the needy

Some of the Tata Trusts' urban poverty alleviation initiatives:

- **Gujarat** — Climate-smart urbanisation and setting pathways for inclusive and resilient urban growth in the district of Patan and Anjar
- **Maharashtra** — Integrated heat and flood mitigation with nature-based solutions for heat stress in Mira Bhayander, Chandrapur (in eastern Maharashtra) and in the districts of Akola, Nanded and Jalgaon; also, enhancing women's livelihoods through an urban care ecosystem in Mumbai
- **Bihar** — Building climate resilience in small towns
- **Uttar Pradesh** — Strengthening urban planning systems in three small towns near the capital of Lucknow
- **Odisha** — Creating liveable habitats for the urban poor in partnership with 10 municipal corporations

"This is critical since women are disproportionately affected by climate change," says Sujata Menon, programme officer, urban poverty alleviation team, with the Trusts. "They are the ones who have to manage the family's health, nutrition, water and eldercare needs."

For instance, women may have to travel long distances to collect water and manage sanitation, tasks that are complicated by climate-induced water scarcities and contamination. In urban slums, their limited access to resources and educational opportunities leaves them ill-equipped to adapt.

With employment mainly in low-paying, informal jobs, women's voices are often inevitably excluded from decision-making processes. The Trusts' programmes try to mobilise them into self-help groups that can seek improvements in their living conditions from civic authorities.

According to the World Bank, the number of Indians residing in urban areas has increased sixfold over the last 60 years (1964-2024). Overcrowding is followed by the predictable collapse of infrastructure and services. Low-income households, already struggling with heat and water stress during the summers, now also have to contend with seasonal calamities like flooding during monsoons.

Urban but rural

As per the 2011 census, India has a total of 7,935 towns. Only 4,041 of these are 'statutory towns', governed by local bodies such as municipal corporations. The 3,894 'census towns' and 1,456 'outgrowths' associated with urban centres are governed as rural entities. And this is where rampant urbanisation is taking place.

"When people migrate from rural areas, they first come to the smallest town near their village, and that's how these towns are growing," says Ms Srivastava. "We need to help these towns set a roadmap while they are transitioning and evolving, so that they can grow in the right way." In fact, the number of tier three and tier four towns is expected to be much more in the next census.

"Metros and bigger cities, with their large populations and well-entrenched infrastructure, offer much less opportunity for a do-over than a small town," says Bharati Bhosale, senior programme manager with the Gujarat Mahila Housing Trust, a partner of the Trusts. "If systematic development is adopted, the effects of climate change will be more controlled and there will be fewer vulnerable groups in our cities."

Whether it's cooling solutions for homes and neighbourhoods, community empowerment against disasters or the inclusive development of new towns, the interconnectedness of various challenges demands integrated action. "You cannot focus on heat resilience and water scarcity without addressing poor waste management and loss of green cover," says Ms Srivastava.

The government response to many of these challenges has, till now, been reactive: providing relief when there has been a need. "But these problems are no longer seasonal," says Ms Srivastava. "These are long-term challenges that require integrated solutions. That's what we will do, going forward." ■

Women show the way

In Patan, a city in Gujarat that is among the hottest in India, women's groups are banding together to battle heat stress



Women wait at a bus stop in Patan where overhead sprinklers keep commuters cool

Taraben Thakur remembers a time when the 80-year-old well in her settlement of Shramjivi in Gujarat's Patan district had so much water you could reach over and touch it. "All we had to do was scoop some out when we needed it," says the 60-year-old, who came to Shramjivi at 10 and has lived there ever since. "Now we have to walk several kilometres every day to fetch water even though the well is just two steps away from our homes."

Over a few decades, as its water level depleted, the well that Ms Thakur and others depended on turned into a giant garbage vat. Last year, following a plan to rejuvenate it, some 50 truckloads of trash were removed from the well and the stone lining was reinforced. "A hydrologist told us that it will take a few monsoons to recharge," adds Ms Thakur.

When it does, the well will not only serve the 40-50 homes built concentrically around it, but an entire neighbourhood that has been facing acute water shortage for years. The households close by have even adopted rooftop rainwater harvesting to further strengthen the water recharge in the well, and other measures for water retention are being explored.

[The well was rejuvenated by removing accumulated waste and addressing structural issues. Following a technical and structural safety assessment, its stone lining was reinforced and rejuvenation work was completed. Water is now reaching the well, although the

thick sand layer is limiting water retention. It is expected to take 2–3 monsoon seasons for the water level to rise and stabilise.]

Shramjivi is one of 74 low-income urban settlements in Patan — a few hours' drive from Ahmedabad — that are suffering from heat stress and related challenges such as water scarcity, air pollution and a disruption in lives and livelihoods. Patan, surrounded by industrial towns like Mehsana, Deesa, Palanpur and Sidhpur, often ranks among the hottest cities in India, with daytime temperatures sometimes touching 45°C.

[According to a World Bank study, 19 districts in Gujarat could become climate change hotspots by 2050, with temperatures expected to rise by 2-2.5°C. That may explain why the Gujarat government has set up a Department of Climate Change and adopted a state-wide climate action plan.]

Getting climate smart

Something needed to be done, and urgently. In 2024, the Tata Trusts joined hands with the Ahmedabad-based Gujarat Mahila Housing Trust (GMHT) to launch the 'climate-smart Patan' initiative, an attempt to offset the effects of heat stress in 10 settlements in the city.

"Our programme strategy is two-fold: addressing climate resilience at both the slum and the city levels in Patan," says Sujata Menon, programme officer, urban poverty alleviation, with the Trusts. "At the slum level, we aim to empower women leaders from the settlements that we work in,



A resident of Bhattiwada in Patan applies white solar reflective index paint to the roof of her house to cool it

equipping them with the capacity to lead climate change interventions within their communities. At the city level, we facilitate the development and execution of climate action plans."

This dual approach ensures that the programme not only fortifies vulnerable slum communities against the potentially devastating effects of climate change but also contributes to overall heat stress reduction.

In Patan, the Trusts and GMHT work primarily with women from slum communities, facilitating their mobilisation into *mahila mandals* (women's community action groups) and nurturing them as change agents by providing the necessary tools and knowledge.

"Gender-responsive interventions are critical to help women in urban slums better cope with the impacts of climate change," explains Ms Menon. "By fostering women's leadership, we want to create a more equitable and inclusive climate resilience strategy, ultimately benefitting women as well as the broader community."

The initiative began with a baseline study of about 1,500 households. "We visited the settlements to assess their challenges and then encouraged the women to map the entire slum, identifying problem areas and possible solutions," says Bharati Bhosale, senior programme manager, GMHT.

Data collected from various state and civic bodies were used to create a slum development plan (SDP) that would form the basis for the Trusts-GMHT programme.

The SDP clearly defines what the community wants to achieve, the activities required during a specified time period, and the resources needed for these to be successful. Women leaders, trained and equipped for the purpose, lead the work charted out in the SDPs, which attempt to address vulnerabilities at the individual, household and settlement levels.

A similar city climate action plan has been adopted for urban Patan, and this includes data related to emissions from three primary sources: stationary, solid waste and transport.

The urban settlements were lacking basic amenities such as water, sanitation, waste



Taraben Thakur of the Shramjivi settlement in Patan checks the 80-year-old well in her neighbourhood that is being rejuvenated to provide an additional source of water

management and paved roads. Many homes did not have toilets and open defecation was common.

"Having lived through and accepted this as their lot for years, the residents did not even know they could ask for improvements," adds Ms Bhosale. "We began by sensitising them through meetings, video shows and documentation to create awareness about the effects of climate change. Then we formed the action groups."

The women got going by coming together to collectively demand solutions, with guidance from GMHT about whom to approach in civic bodies and how.

Soniben Parmar has certainly benefitted from such guidance. When Ms Parmar got married 17 years ago and came to live in Tayarnagar, a settlement in Patan, it was like an abandoned community. "People were leaving because there were no jobs, no roads or civic amenities," she says. "The drains were overflowing and every tree in the area had been cut down because people thought, mistakenly, that their roots were clogging the drains. A little rain and our entire area would get flooded."

Enough was enough

Some years ago, after Ms Parmar had to wade through filthy waist-deep water to a nearby hospital for the birth of her second child, she decided enough was enough. Ms Parmar began gathering women from the 117 households in Tayarnagar to form a committee and petition the local civic body.

After many, many applications and personal appeals to officers, Ms Parmar and her sisterhood now have a paved road, better sanitation and large vats for garbage collection all over the settlement. Adds Ms Parmar's sister-in-law, Kavita: "It wasn't just everyday challenges. The lack of amenities was affecting our livelihoods."

Some 60 women in the settlement, including the Parmars, are engaged in embroidery work that they do from home. The flooding and dirty conditions of the settlement used to deter buyers and contractors.

"During the monsoons we had no work, and contractors would routinely slash our commission, claiming they had to pay to have the garments cleaned once we were done," says Ms Kavita. "That was partly true. We've all experienced instances when floodwater has

come into our homes and ruined the stored garments." That doesn't happen anymore.

In the settlement of Ramnagar II, women have come together to create 'Oxygen Park', a green patch that they hope will help offset the harmful effects of air pollution. Apart from being ringed by industrial hubs, Patan also sees a considerable amount of tourist vehicular traffic because of Rani ki Vav, an 11th-century stepwell that is a UNESCO World Heritage site.

Oxygen Park, reclaimed from a garbage dump, is expected to reduce the urban heat island effect in Ramnagar II and combat air pollution. Working to ensure that are Zeniben Thakur, Jyotsnaben Thakur and Jhumaben Thakur, who tend to the park every afternoon once they are done with their farming duties.



Residents of the Ramnagar II settlement in Patan tend to their Oxygen Park

Forestry to the fore

"We have received extensive training in urban forestry," says 60-year-old Ms Zeniben, "enough to handle everything from weeding, watering and protecting new saplings and trees, to requesting new plants from civic authorities. When the park opens in a few months, the people of Ramnagar II — and all of Patan — will have a place to enjoy some shade and cool."

The three Thakur women, who hail from the same family, have carried their can-do zeal back home too. A few months ago, they finally got streetlights in their settlement after petitioning the local authorities for two years.

While awareness and mobilisation are important, the programme also tackles heat reduction with effective solutions. The first is the use of white paint with a high solar reflective index (SRI) on the roofs to cool houses.

In most settlements under the programme, dwellings are small, sometimes windowless, and generally poorly ventilated. The tin sheets on the roofs created oppressive heat inside and the women, who earn their living from various home-based trades, could not stay in their homes for most of the day.

The solar reflective white paint, which has to be applied in multiple coats on the tin sheet, reduces internal temperatures by about 4-5 degrees. "In Bhattiwada we even got the roof of the local *anganwadi* (childcare centre) painted with solar reflective paint, and now more children are coming there," says Ms Bhosale. "In the Gitanjali settlement, vegetable vendors can now store their surplus at home."

GMHT has worked closely with the forest department to set up 'cooling stations', sitting areas in various parts of the city that are made comfortable by a constant circulation of water by way of overhead sprinklers. This is primarily for the urban poor engaged in work that keeps them outdoors in soaring temperatures.

Today in Patan, some roles have been reversed. Municipal bodies are now approaching women's groups to replicate some of their more successful projects. Civic officials want the women of Ramnagar II to create another Oxygen Park in their area, and have decided to use the solar reflective paint on public buildings.

"Now that we have strengthened the women and the communities, they can resolve, on their own, any issues that may come up," adds Ms Menon. ■

Cooling it down

Residents of Mira Bhayander and Chandrapur in Maharashtra have found relief from urban heatwaves thanks to pinpointed solutions

The women of Shiv Shakti Nagar, a settlement in the Mumbai suburb of Mira Bhayander, didn't like being home much. With their menfolk off to work and their children leaving for school, they would try to finish their household chores before the sun came up, then head to a nearby park. At night, entire families would sleep in the open.

The reason: sweltering conditions inside homes because of the heat-island effect in the Mira Bhayander sprawl, which faces the brunt of rapid and barely planned urbanisation. There has been a 50% increase in built-up areas in this suburb over the past 30 years.

That, coupled with rapidly depleting green cover and changes in building materials, has led to an unbearable rise in temperatures inside homes. Unauthorised construction has worsened matters, with many low-lying areas getting flooded during monsoons because natural drainage systems have been compromised.

Out with the heat

In 2025, the Tata Trusts and the Aga Khan Agency for Habitat (AKAH) launched a programme to provide cooling solutions in Mira Bhayander and Chandrapur — the industrial hub in eastern Maharashtra — to counter extreme heat and build climate resilience.

Working with 200 households in each place — in Shiv Shakti Nagar, Navghar and Mandvi Para in Mira Bhayander, and in Panchasheel Chowk in Chandrapur — the programme starts with hazard mapping to identify heat spots and vulnerable buildings through analyses of temperature data in different neighbourhoods. It then moves to heat mitigation through the adoption of various cooling solutions that reduce temperatures and improve ventilation systems in homes.

The final stage includes flood mitigation and water conservation through the rejuvenation and recharging of wells and other water bodies. Alongside, there's disaster management training for the community to cope better with devastating heatwaves and floods.



Workers secure alufoil panels in a house in Sai Sadan in Mira Bhayander to reduce indoor temperature

"The settlements in Mira Bhayander have dense clusters of homes," says Bigrai Narzari, programme officer, urban inclusion, with the Trusts. "Houses share walls, have low ceilings and very poor ventilation. Roads and pavements here are concretised and the roofs are usually made of asbestos sheets. All of this causes heat to be absorbed and trapped. We decided to retrofit the houses using heat-resilient materials."

Two roofing solutions have been implemented in Mira Bhayander: adding a layer of insulating aluminium foil or woodwool (made from wood shavings) boards to ceilings. Sustainable and low-maintenance, these densely-packed 'under-deck' solutions are installed on the inside of houses, just under the roof, to protect them from Mumbai's rains.



A 'listening workshop' being conducted in Panchasheel Chowk in Chandrapur to understand the community's perceptions of heat and seasonal changes

Comfort on the inside

"There are settlements in Mira Bhayander which are more prone to heat and flood stress," says Abolee Muranjan, programme manager with AKAH. "We started with three of them. Woodwool and alu-foil have provided a 2-5 degrees of reduction in temperatures indoors, but they can only be used in homes that are structurally stable and do not have any water leakage issues." In homes that required forced air circulation, AKAH created ventilation holes in the walls and equipped these with exhaust fans.

The initiative began with frontline workers from the settlement identifying *mahila mandals* (women's cooperatives) to lead the effort. 'Listening workshops' were conducted to understand the challenges and the community's adaptability to these. The locals reckoned they had no option but to live with the heat and flooding. They had tried, unsuccessfully, to find solutions on their own, to little effect.

Rita Sharma, a 44-year-old homemaker from Shiv Shakti Nagar, was more than happy to try out the programme's solutions. Her 300-sq-ft tenement is shared by six people. "The heat was making us constantly sick," says Ms Sharma. "My children would have rashes all over their faces and bodies, and they would frequently get fever."

The Sharmas opted for the alu-foil solution and this has considerably reduced the temperature inside their home, while also making it brighter by reflecting light. "My life is no longer regimented by the heat: waking up early and racing to finish my chores before it starts getting hot," adds Ms Sharma. "Now my kids stay indoors more often, and I can cook, clean and work on my handcrafts business at any time of the day."

Similar is the story of Lakshmi Gupta, a neighbour of the Sharmas, who had a tough time when she moved to Shiv Shakti Nagar two years ago. "I was not at all prepared for the heat and was ill for a month," says the 35-year-old homemaker and tailor. "The house was so hot I had to send my young children to their grandparents every day, and nights were scarcely better." A few months ago, AKAH installed a new woodwool 'ceiling' and Ms Gupta's home has cooled miraculously since.



A member of a technical team speaks to residents of a home in Panchasheel Chowk while assessing indoor heat conditions and possible solutions

The heat aside, conditions in Chandrapur are much different from Mira Bhayander. Dwellings are larger in this district headquarters, which is surrounded by reserve forests. But it still suffers from heat stress, with peak temperatures in the high 40s (it is among the top 10 places in India with the maximum number of 40°C-plus days in a year).

Chandrapur's informal settlements house about 40% of the city's population, some 128,000 people in total. It has been identified as a high-priority area with respect to heat-related illnesses. The city also experiences water scarcity due to overextraction and insufficient recharge. Paradoxically, it also has to cope with flooding during the monsoons.

Three heat-reduction solutions have been implemented by AKAH in 200 homes in Chandrapur, where most dwellings are well ventilated and have cement, tin or galvanised iron sheets as roofs. The concrete homes are now roofed with a layer of China mosaic tiles, which are heatproof and water-resistant. Homes with tin or galvanised-iron roofs receive several coats of solar reflective white paint on the outside and an underdeck layer of mineral wool insulation.

"It was torture"

That's how it is at the home of Mukunda Bawne, a retired security guard. The 75-year-old first arrived in Chandrapur in the 1970s and remembers it to be lush and cool. "But there has been so much construction and industrial activity in the last 10-15 years, this place has become tremendously hot," he says. "It was torture."

Things changed drastically for Mr Bawne. The roof of his 500-sq-ft home is now coated with white solar reflective paint, and a mineral wool insulation layer has been added to the ceiling. "I haven't had such sound sleep in years," he says of his improved living conditions.

Mira Bhayander and Chandrapur highlight a near-catastrophic climate challenge for Maharashtra as a whole. The Climate Vulnerability Index (published by the Council on Energy, Environment and Water) rates it among the five states most at risk from extreme climate events. In the 2023 January-September time span, Maharashtra suffered 106 extreme weather events, which jumped to 142 during the same period in 2024.

Meanwhile, there is one problem that remains to be resolved in both Chandrapur and Mira Bhayander: shortage of water. "Our heat solutions can reduce temperatures substantially, but the main issue will always be about water availability," says Ms Muranjan. "We will soon be introducing permeable grass pavers that will help in water absorption."

The idea is to secure a 20% increase in green surfaces with the use of the grass pavers, alongside a 3-4 mm rise in groundwater levels over five years with the recharge of water bodies.

Homes in these two project areas have already become more habitable with heat reduction solutions. With the increased green cover and water availability, the situation promises to get better for Chandrapur's denizens. ■

On the map and in the loop

As India urbanises, small towns are emerging as critical sites of transition. Yet these towns are often ill-equipped to manage rapid and unplanned urbanisation, facing a host of difficulties in delivering basic services, addressing inequities and preparing for disasters.

A key challenge in low-income settlements in these small towns and semi-urban spreads is the absence of formal, verifiable household addresses. This limits residents' access to essential services. Simultaneously, urban local bodies face constraints in planning, prioritisation and service delivery due to the lack of reliable spatial and infrastructure data.

A Tata Trusts programme in Uttar Pradesh is currently engaged in the spatial mapping of three towns close to Lucknow, the state capital: Mohanlal Ganj, Banthra and Ram Sanehi Ghat. When it's done, every building, home, water body and road in these towns will have a digital address, which means they can be included in urban planning and management.

When the state government launched its Akankshi Nagar Yojana (aspirational cities programme), the aim was to develop small and transitioning towns — taking 100 at a time — that had been left out of larger urban reform initiatives and provide them with better infrastructure and amenities. This is essentially an urban planning and systems strengthening initiative for smaller centres lacking the resources for the rapid and inevitable urbanisation they are caught up in.



A municipal officer speaks to a resident during a visit to a settlement in Banthra near Lucknow to collect data for the spatial mapping exercise

The Trusts have collaborated with an organisation called Shelter Associates to undertake spatial mapping of the three towns. The project maps the urban landscape at a granular level, capturing key infrastructure and public assets. The resulting maps provide authorities with a clearer understanding of what exists on the ground and where gaps in infrastructure and services are.

The programme has also incorporated the DigiPin system introduced by the Department of Posts, which takes the familiar concept of a pin code a step further. While a conventional pin code typically covers an entire neighbourhood or area, a DigiPin provides a precise digital address for a specific location, making it possible to identify individual homes and structures.

This is particularly useful in dense settlements where conventional addresses may not clearly identify a particular household. It can help emergency services locate homes quickly, enable doorstep delivery of goods and services, and make it easier for authorities and service providers to reach households.

"The data has brought insights while also highlighting gaps," says Bigrai Narzari, programme officer, urban inclusion, with the Tata Trusts."Now local bodies have a better idea of where they stand with respect to civic infrastructure in these three towns, and how problems can be addressed in their overall plans." ■



A capacity-building session on grass seeds collection for community members from Teerol village in Rajasthan's Udaipur district

Commons ground

A programme in Rajasthan has ushered in systemic change by restoring barren lands, empowering women and building collective stewardship

Thavaribai Garasiya, a tribal, is in her 50s, has eight children and is a grandmother. A resident of Kundlawas, a village of 180 households nestled beside a forest in Rajasthan's Udaipur district, she would occasionally collect grass and tree seeds from the forest and trade them to a distant shop for petty amounts. Ms Garasiya was selling herself short.

Ms Garasiya's knowledge of the forest was more valuable than she knew. With rain-fed farming and livestock being the chief livelihood sources in rural Rajasthan, native grasses play an important role in retaining groundwater, preventing soil erosion and providing fodder, besides helping maintain biodiversity and sequester carbon.

Three years ago, Ms Garasiya, along with a group of women from Kundlawas, began converting their traditional knowledge of local flora and fauna into a regular source of livelihood. That happened after they joined the 'native grass seeds collection initiative' based in Rajasthan's Aravalli Range.

The initiative was steered by village communities from the Gogunda, Sayra, Jhadol and Phalasia subdivisions of Udaipur, with technical assistance from the Foundation for Ecological Security (FES), a nonprofit based in Anand (Gujarat) that is supported by the Tata Trusts.

The seeds collected are used to regenerate local pastures and to set up seed banks that can be tapped by other villages. Ms Garasiya has been able to use her steady earnings from selling grass seeds to start a plant nursery. "I am not only better

off financially, but I have learned new skills," she says. "This initiative has opened new doors for me."

The grass seeds collection initiative is doing much more than empowering local women through livelihood opportunities. It is the foundation on which Ms Garasiya's community is able to build ecological security, mainly by restoring grazing grounds through the replanting of local species.

The initiative puts stewardship of commons — a term used to describe shared natural and cultural resources — back in the hands of village communities. Crucially, it has engendered systemic policy change.

Launched in 2022-23 and covering 28 villages in Udaipur district, the initiative has led to the collection and storage of tens of thousands of kilos of seeds. The programme is an example of why preserving commons is important. It seeks to restore natural resources like forests, pastures and water bodies that have traditionally been held in 'common ownership' by local communities.

A steady decline

These resources, which are an important source of livelihoods, ecological security and community well-being, have declined steadily over time due to various factors.

To counter the degradation of commons, FES has been backing community institutions for more than two decades in some 70,000 villages across India. Rajasthan has 1.6 million hectares of commons — comprising around 30% of the land in each village — chiefly *charagahs* or *shyamlat* pastures, as they are locally called.

"This is a mainly grassland region and these grasslands are important to sustain village economies," says Vinod Paliwal, district lead in Udaipur for FES.

The widespread degradation of the Aravallis in recent years has affected the grasslands as well. Native grasses like seran *(Sehima nervosum)* and kali lanp *(Heteropogon contortus)* have declined owing to long-term and unsustainable use, widespread invasion of non-native species like *lantana,* and natural factors like soil erosion and water scarcity.

"In landscape everything is connected and grasslands is one of the important parts for the holistic restoration of the larger landscape," says Subrata Singh, executive director at FES *(see interview on page 21)*. Supporting the interlinkages between grasslands,



Fodder being transported on camel back near Kanji Ka Gurha village in Udaipur district



A group of women — they were trained for the task — collect grass seeds in Reechwara village in Udaipur district

agriculture and livestock is crucial in the Rajasthan context.

Sourcing the seeds is an important aspect of the initiative. According to Mr Paliwal, around 5-6kg of seeds are required to replant one hectare of grassland. However, two premier seed institutes — one in Jodhpur, Rajasthan, and another in Jhansi, Madhya Pradesh — had only around 500kg of grass seeds, just enough for a few pilot projects. Seeds available in local markets were of poor quality.

"When we started work here, native grass seeds, which are a primary requirement for restoring degraded commons land, were not available even with private vendors," says Mr Paliwal.

These factors led to discussions about a community-based native grass seed collection and regeneration initiative in the Aravalli hills. The organisation spent nearly three years mobilising the community, strengthening their collective action and building linkages with local civic bodies, governments, nonprofits and market participants before launching the initiative.

Village voice

FES facilitates the establishment of village institutions (VIs) by community members in villages and habitats, who set their own bylaws for ecological restoration. "Securing tenure of the commons is vital since it incentivises the communities to protect and invest for the long term in commons governance and restoration," explains Mr Singh.

The FES team first initiated a dialogue with villages in the Gogunda, Sayra, Jhadol and Phalasia subdivisions of Udaipur district. "There was demand for grass seeds but it took time to convince the villagers to join the initiative," recounts Mr Paliwal.

With support from FES, communities, especially women, mapped healthy commons to identify where native grass seeds could be collected, and degraded ones for restoration efforts.

"Initially, they were extremely sceptical about whether a market exists for native grass seeds. We convinced them to give it a try," says Asha Cholaviya, deputy project officer at FES who works with these communities in Sayra, which includes Kundlawas. "We had to assure the locals they would get compensated at a rate equivalent to what the forest department offered."

Another challenge was that many women did not know how to collect, clean and store the grass seeds. Extensive training programmes and field demonstrations, including

publishing pictorial pamphlets and calendars on different seed varieties and their flowering months, helped the communities to take this ahead.

"When we first started collecting seeds, it was very difficult as the menfolk would mock us and discourage us, saying no one had sold seeds here previously," says Indirabai Garasiya, now an active seed collector. Native grass seeds like kali lanp are thorny, so the women devised a protective clothing cover.

At a broader level, a need was felt to create an ecosystem for the holistic restoration of the landscape. This led to the formation of federations comprising VIs, local civic bodies, government representatives from the agriculture, irrigation and forest departments, other nonprofits, and researchers. "Anyone interested in the development of the landscape can contribute, but the community and community institutions have supremacy," adds Mr Singh.

Collective success

The initiative is now running smoothly. In Kundlawas, for instance, around 30 women collect seeds in two cycles, then clean and store them. The *panchayat* (village council) oversees the collection and sale of seeds, using them partially for local regeneration and selling the remaining to other *panchayats,* nonprofits and the state forest department.

In the first year, the initiative saw 2,500kg of seeds being collected. Then the momentum picked up. "After seeing the women earn money, more people started asking if they could join in," says Mr Paliwal.

Initially, the initiative was supported by FES to buy the seeds. As the engagement grew, linkages were established between the community and *zilla parishads* (district councils), nonprofits and the forest department, all of whom needed the seeds.

Seed collection in Udaipur district increased to 8,000kg in 2023-24 and further to 11,000kg by 2024-25. More than 100 VIs, some 50 self-help groups and two federations are engaged in it today, covering 45,571 acres of commons and 7,223 households. Such success has inspired communities in other districts, Rajsamand and Bhilwara among them, to start grass seed collection initiatives.

The two brightest outcomes of the programme are the systemic change and the empowerment of women it has fostered.

The consistent engagements of communities and FES with local and state bodies led to the establishment of a multilateral task force by the Rajasthan government on commons development. In 2024-25, the government allocated ₹10 million to establish 150 seed banks across the state.

"Normally, seed banks are related to pulses and food crops," explains Mr Paliwal. "This is the first government initiative for a vegetation seed bank that collects local grass and tree seeds and uses them to restore commons."

The 150 seed banks are up and running, including 30 in Udaipur district. Each seed bank is managed by two seed experts, who work under the direction of the local *panchayat*, and monitored by the state's watershed department.

In 2025, the Rajasthan government allocated ₹50,000 to each bank to cover training programmes and salaries of seed experts like Rekhabai Garasiya, who manages the Kundlawas seed bank. Her work includes maintaining records, weighing and storing the seeds, and monitoring for spoilage.

Trained to deliver

"I received four months' training, during which time I learned about different grasses and seed collection," says Ms Rekhabai. Adds Indirabai Garasiya, another seed expert: "Earlier I had to ask my husband for money. Now I earn my own and am able to save."

Financial independence is not the only gain for these women. They get to visit other villages and participate in workshops and the like. "Where once they used to be hesitant, the women now handle everything on their own," says Ms Cholaviya. "They want to learn new things and are constantly thinking about how to enhance their work and implement their ideas."

The women also take pride that their work helps the local ecology. The Kundlawas seed bank is one of the 150 seed banks established and serves eight neighbouring villages and has helped restore once-barren commons in the region. "This is a classic case of bottom-up impact," says Mr Singh, "of communities coming together to bring about systemic change." ■

Aarti Dua

‘Spaces of belonging, identity and dignity’

‘Commons’ is a term that refers to natural, cultural and other shared resources that belong to communities rather than individuals or the government. Among these shared resources are rivers and oceans, forests and fisheries, folk art and community spaces, and they are often critical sources of livelihoods, ecological health and overall well-being.

The Foundation for Ecological Security (FES), a nonprofit based in Anand, Gujarat, and established in 2001, has championed the commons cause by restoring degraded ecosystems and conserving land, forest and water resources through collective action. FES, which is supported by the Tata Trusts in its collaborative ‘promise of commons’ initiative, has touched more than 45 million lives while restoring about 18 million acres of land across India.

Subrata Singh, executive director at FES, talks about how the organisation is seeding and nurturing systemic changes on the ground. *Excerpts from the interview:*



Why is it imperative to restore India’s commons?

Commons are among India’s most valuable yet least recognised national assets. They are much more than forests, pastures or water bodies; they are shared resources shaped by generations of community life, where people and nature have coexisted and evolved together for centuries.

Commons are not only a source of livelihoods and ecological health but also spaces for the poor, spaces of belonging, identity and dignity where communities can participate in decision-making and shape the future of their villages.

India has nearly 205 million acres of commons that support the lives and livelihoods of more than 350 million rural people. The ecosystem services provided by these commons are estimated to have an average economic value of ₹6.6 trillion, the equivalent of around 3.6% of India’s GDP. Yet this contribution remains largely unaccounted for. Forests are particularly critical for tribal communities and their livelihoods, with 40–60% of their annual income coming from forest produce.

These shared resources have steadily declined due to elite capture, land diversion — such as for industrial projects — and the erosion of customary institutions. The consequences of this decline are visible across rural India.

Degraded commons mean poor water security, poorer soils, reduced biodiversity, greater vulnerability to climate extremes and shrinking livelihood opportunities, particularly for women and other marginalised groups. Healthy commons offer one of India’s most powerful pathways to address the interconnected challenges of poverty, equity and climate change.

What does it take to restore these commons?

Restoring commons is not simply about planting trees or constructing



Women collecting grass seeds from pasture land in Solankiyon Ka Gurha village in Rajasthan's Rajsamand district

water-harvesting structures. It is equally about restoring the voice and agency of local communities, as also village institutions, community rights and ecological understanding.

The challenges are largely systemic. Commons often fall across multiple government departments, resulting in fragmented responsibilities. Public investments are not always aligned with community priorities, while weak accountability constrains the implementation of policies. Underlying these challenges is the persistent perception that communities are incapable of governing their own commons.

The 'promise of commons' programme was designed precisely to address these barriers. It strengthens collaboration among communities, governments, civil society organisations, researchers and other stakeholders through multi-actor platforms and coalitions. It invests in capacity building, digital public infrastructure, evidence generation and narrative building while working closely with governments to strengthen policies, programme architectures and implementation systems.

The seed-collection initiative in Rajasthan is an example. The community demonstrated the power of collective action and local stewardship by collecting and reviving native grass species, making seed balls and using them for the restoration of village commons.

This evidence influenced the state government to scale the programme to a few more districts, eventually leading to a dedicated state programme, backed by institutional and capacity-building mechanisms, financial resources and implementation support for the restoration of grasslands.

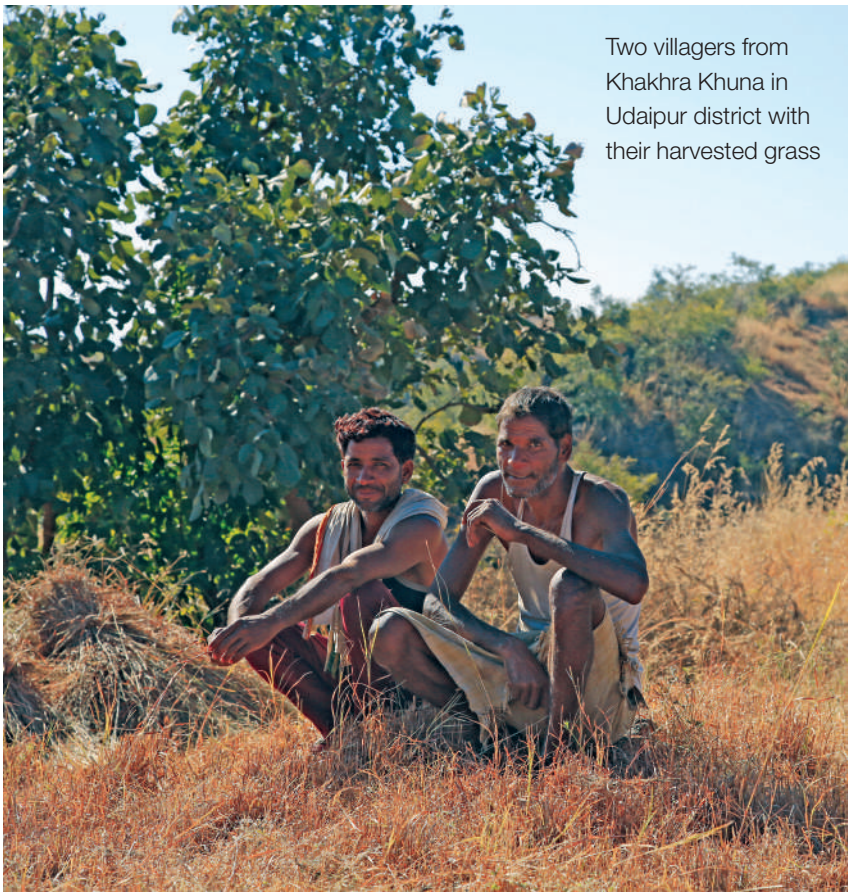
How is FES strengthening the links between agriculture, livestock and commons?

Agriculture, livestock and commons are inseparable components of India's rural production systems. They have co-evolved over centuries as an integrated socioecological system, with each sustaining and reinforcing the other. Promise of commons adopts a landscape approach rather than treating forests, farms, grazing lands and water bodies as separate entities.

We facilitate the formation of multi-actor platforms to collectively address landscape issues, ensuring coordination and convergence. Communities are supported to understand their landscapes, prepare participatory conservation

plans and strengthen institutions at various levels to collectively govern their shared resources.

When generational knowledge and an appreciation of the interlinkages involved are combined with scientific data and tools, communities are able to make informed decisions that enable commons, agriculture and livestock to thrive together. We are seeing encouraging examples of this, like in Rajasthan, where restored village pastures have strengthened agriculture and livestock-based livelihoods.



Two villagers from Khakhra Khuna in Udaipur district with their harvested grass

What changes has promise of commons brought about?

One of the most encouraging changes is that commons are gradually moving from the margins to the mainstream of public discourse and policy. Increasingly, they are being recognised as critical to addressing the interconnected challenges of climate change, social justice and equity, and rural poverty.

One significant development is the recommendation in the latest Economic Survey of India to recognise commons as a distinct land category. This will pave the way for systematic mapping and recording of commons and, eventually, their restoration.

The institutional architecture for the governance of commons has also evolved in states such as Rajasthan, Karnataka and Andhra Pradesh. Commons are finding place in state government programmes and guidelines, and there is a higher allocation of financial resources and capacity-building architecture. There's also a recognition of the need for data-enabled decision-making systems in the governance and restoration of commons.

Collaboration between community institutions, nonprofits, academic and research institutions, and the media has also evolved, both at the landscape and regional levels, to collectively work on commons and interconnected issues such as agriculture, livestock, wildlife and nutrients. Moreover, academic institutions have integrated, specialised courses and curriculum modules on commons.

On the ground, communities across different regions are regaining voice, agency and power as custodians of commons. They are securing rights and restoring their commons, strengthening local institutions, evolving locally agreed rules, and preparing and implementing restoration plans. These efforts are translating into healthier ecosystems, and women are increasingly emerging as leaders in these processes.

Perhaps the most important change is in the mindset. Communities are increasingly being recognised not as beneficiaries of commons conservation but as their primary stewards. *Gram panchayats* [village councils] and local institutions are seen not only as governing bodies but also as custodians of commons.

Since everything is interconnected, the real impact lies in how these changes at multiple levels reinforce one another to create lasting and system-level impact. ■

‘India does not need to copy any one model’

“The real concern,” explains **Debolina Kundu**, “is not that India is urbanising too rapidly, but that the geography and nature of urbanisation are changing faster than our planning and governance systems are adapting.” Addressing concerns of the kind comes naturally to the director of the National Institute of Urban Affairs, India’s leading think tank for research and training in urban development and management.

Dr Kundu, who has more than 30 years of experience in the field of urban development, speaks to *Christabelle Noronha* about the country’s urban and near-urban landscapes and how these can be made more habitable for those living and working there. Excerpts from the interview:

With the rapid and haphazard urbanisation that India is witnessing, what do we need to be worried about?

It is important to understand that India is not urbanising rapidly. The annual growth rate of urbanisation in the country in the 1980s was around 3.9%, and that was the peak since independence. There has been a decline since, suggesting a more gradual transition.

The perception of an “urban explosion” partly reflects the scale of absolute growth rather than an acceleration in urbanisation rate. More important is the changing nature of urban growth. The contribution of natural growth has declined sharply. While rural-to-urban migration remains crucial, it is not the dominant driver. At the same time, urban-to-urban migration has increased.

Settlements are increasingly becoming urban through economic and spatial transformation rather than large-scale population inflows. Many administratively rural settlements are already functionally urban. This means that urbanisation is increasingly taking place beyond the boundaries of formally recognised urban areas. In these transitional areas, planning and governance have not kept pace with physical and economic transformation.

Industrial relocation, limited enforcement of building bylaws and rapid development are creating pressure on infrastructure, housing, basic

“The perception of an ‘urban explosion’ partly reflects the scale of absolute growth rather than an acceleration in the urbanisation rate. More important is the changing nature of urban growth.”



services, transport and the environment. So, the real concern is not that India is urbanising too rapidly, but that the geography and nature of urbanisation are changing faster than our planning and governance systems are adapting.

Do you see any reverse migration happening from urban centres to census towns?

Yes, there are indications of reverse migration and the redistribution of population and economic activity towards smaller urban settlements and peripheral areas. However, it is important to recognise that what we are witnessing is not reverse migration alone, but a broader process of decentralised urban growth.

What about urban development exemplars from around the world, and what can India learn from them?

I think it is important to look at international good practices, but India does not need to copy any one model. We, too, have made considerable

progress. However, there is scope for mutual learning and collaboration: learning from international experience while also sharing good practices emerging from Indian cities and states.

One way of looking at or managing urban development is through a mechanism of urban governance. Different countries have adopted different models, and we need to understand what has worked and what can be adapted in India. Empowered mayors, with clear responsibilities and greater capacity to lead urban development, could be one example.

What are the successes and failures of the Smart Cities Mission?

I think the Mission, for the first time in India, tried to bring digital governance to urban centres. The platform was already created by the Jawaharlal Nehru National Urban Renewal Mission, which started in 2005. Then, between 2005 and 2014, cities got additional central assistance for the first time. That laid the basic ground for the Mission to function.

One important development that happened through the Mission was the creation of 'integrated command and control centres'. And those are functional even today: traffic management, municipal services, streetlights, etc. A lot of urban innovation also happened.

I think there was a lot of disparity in many of these smart cities in terms of absorbing funding and in reforms. One challenge was that, when seen from the perspective of pan-city and area-specific development, there was a skewed funding pattern. Also, the Mission's idea of attracting private engagement and private funding did not happen to the desired extent.

What can be done about the corruption and inefficiency in implementing urban development schemes?

The challenge is often not the lack of schemes, but the implementation gap: delays, fragmented responsibilities, weak project preparation, procurement challenges, limited technical capacity and inadequate monitoring.

Transparency and accountability need to be built into the entire project cycle, from project selection and procurement to implementation, payments, quality monitoring and outcomes. Digital procurement, geo-tagged projects, real-time dashboards, social audits and independent third-party evaluation can reduce discretion and improve accountability.

We also have to strengthen municipal capacity. Cities need professional capabilities in urban planning, engineering, finance, procurement, project management and data systems. Giving urban local bodies greater responsibility without corresponding technical and financial capacity is unlikely to improve outcomes.

There should be a move from expenditure-based monitoring to outcome-based monitoring. The question should not simply be whether funds have been spent, but whether the investment has actually improved water supply, sanitation, mobility, housing, etc. Urban governance is ultimately about converting public money into public value.

"One way of looking at or managing urban development is through a mechanism of urban governance ... Empowered mayors, with clear responsibilities and greater capacity to lead, could be one example."



A slum in Mumbai set against the backdrop of skyscrapers; slums are not just a housing problem, says Dr Kundu

Why do Indian cities struggle to find solutions that eliminate or at least minimise slums?

I would like to put this in a global context. The challenge of slums and informal settlements is not unique to India; it is a manifestation of the broader global housing crisis. The UN-Habitat *World Cities Report 2026* highlights the scale and persistence of the global housing affordability crisis and the growing difficulty cities face in ensuring adequate, affordable and well-located housing for all.

Across countries, rapid urbanisation, rising land and housing costs, inadequate affordable housing supply and inequality are contributing to the persistence and growth of informal settlements. In India, the fundamental reason is that slums are not just a housing problem — they are a symptom of a deep mismatch between the location of jobs, the price of formal housing and the capacity of cities to provide affordable land and housing.

There are five key challenges. First, the economics of slum redevelopment are inherently difficult. India's dominant approach has been to use the value of land to finance redevelopment, where part of the land is used for rehabilitation housing and the remaining is monetised through a free-sale component. This model works only where land values are sufficiently high.

Second, relocation solves the structure but not necessarily the housing problem. Slums are often located close to employment opportunities precisely because formal housing here is unaffordable. When households

are relocated to peripheral locations, they may gain a formal apartment but they lose access to livelihoods, schools, transport and social networks.

Third, we underestimate the complexity of implementation. A slum is rarely a homogeneous settlement with a single landowner and a clearly identifiable set of beneficiaries. There may be multiple landowners, legal disputes, unclear tenure, tenants as well as structure owners, changing eligibility criteria, political contestation, and difficulties in building consensus among residents.

For private developers, these translate into substantial risks. For governments, they translate into long project cycles and escalating costs. The problem is not merely finding a financially viable project; it is managing a highly complex institutional and stakeholder ecosystem.

Fourth, the financial burden of improving existing slums is often underestimated. In-situ upgrading appears simpler because it avoids relocation, but providing infrastructure and improving housing in dense settlements still requires substantial public investment.

Finally, and perhaps most importantly, we have not sufficiently addressed the continuous generation of new informal housing. Even if a city successfully redevelops or upgrades an existing slum, new households will continue to require affordable accommodation if formal rental and ownership housing remain unaffordable.

What can be done to deal with some of the pain points in urban India: pollution, waste management, water availability, housing and the like?

I think all are interlinked. With pollution, for instance, waste management is coming up in a big way, not only in urban but also in rural areas. We have the Solid Waste Management Rules, 2026. It is very important for people functioning at the city and ward levels to understand these rules and to implement them.

City officials as well as citizens have to take responsibility if our cities are to get better. We are trying to set up a behavioural-nudge unit at NIUA, through which we will try to impart training to officials and citizens across the country to make them understand that it is their behaviour that really leads to the different types of urban challenges that people are facing today.

"India has made considerable progress towards achieving the Sustainable Development Goals, and this progress needs to be recognised and built upon."

How can India better align itself to the objectives stated in the United Nations' 2030 Agenda for Sustainable Development?

India has made considerable progress towards achieving the Sustainable Development Goals [SDGs], and this progress needs to be recognised and built upon. SDG 11 is particularly important because sustainable cities are closely connected with many of the other SDGs. We need stronger data systems at the micro level and greater localisation of the SDGs — down to the ground level and, where possible, sub-ward level — so that we can identify where progress is being made and where gaps remain. ■



A dementia risk counselling session for elders in Tiptur in Karnataka's Tumkur district

That fading feeling

Dementia is the focus of a campaign that prioritises awareness, early detection and more to manage a condition that affects patients as much as their families

It took a while for Karuna Guttikonda to have her now 85-year-old father, Sreeram Murthy, screened for dementia. Then, about seven years ago, the retired mechanical engineer began behaving ever more unusually: getting lost on his way home; becoming delusional and disoriented; and, eventually, failing to recognise his children. A screening was inevitable and Mr Murthy was diagnosed with Alzheimer's disease.

"It took us a long time to spot the signs," says Ms Guttikonda, who lives in Gurugram near New Delhi. "My mother lost her vision 20 years ago and my father had been taking care of her; he was such



An enumerator during a survey of the elderly in Hodigere village in Karnataka's Davanagere district

a high-functioning individual." Ms Guttikonda brought her parents from Vijayawada to Gurugram and became their primary carer.

As her father's mental decline progresses, Ms Guttikonda tries to ensure he follows a routine that keeps him from getting confused, and that he engages in what are known as cognitive stimulation exercises. "He is so normal it's hard to tell he has Alzheimer's," adds Ms Guttikonda. "And then there are days when he believes the people he's watching on TV are sitting in his living room."

Ms Guttikonda knows that as her father's brain deteriorates further, he will slowly withdraw into an inner world from which he may never emerge. That is the heartbreaking truth about dementia, an umbrella term for several neurocognitive conditions typically found in people above the age of 60, where progressive mental impairment leads to a general inability to function.

Alzheimer's is among the most recognised of a clutch of conditions under the dementia rubric, which also includes Vascular dementia, Lewy Body dementia and Frontotemporal dementia. All of these together make dementia the seventh-leading cause of death in the world.

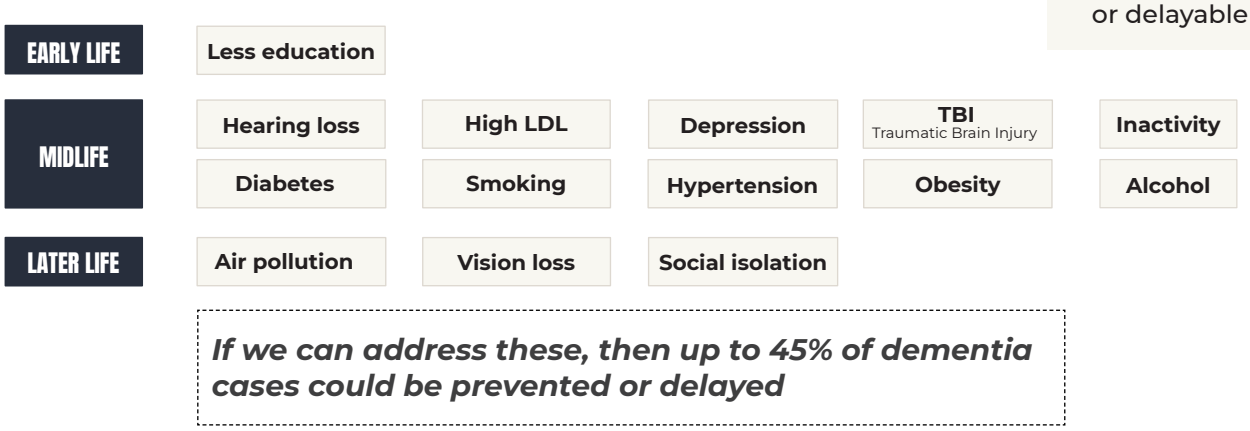
Dementia is a complex condition that is difficult to understand and eludes early diagnosis. It can remain invisible for years, typically being dismissed as an old-age issue. Families tend to seek help and treatment only when the affected person exhibits obviously disruptive and aberrant behaviour.

PREVENTION AND PREVENTABLE RISK FACTORS

Dementia develops slowly over 10-20 years before symptoms appear, giving a wide window to prevent the disease

The 2024 Lancet Commission identified 14 modifiable risk factors across life

UP TO 45% preventable or delayable



Source: Livingston et al, The Lancet Commission on dementia prevention, intervention and care (2024)

By this time the condition would have progressed from moderate to severe, and the critical window for meaningful early intervention may have closed.

Delays in screening and treating dementia often lead to a burden of lifelong care for the families of patients. How, then, does one navigate past dismissal and denial to enable recognition, screening and timely diagnosis?

Campaigning for a cause

A recently-launched Tata Trusts campaign, called *Vajood Rahe Maujood* (May Your Identity Live On) examines exactly this, advocating for early detection to slow down the inevitable neurocognitive degeneration that dementia causes. A study undertaken by the Trusts — based on interactions with experts, caregivers and patients — highlights the condition's consequences: gradual erosion of identity, autonomy and relationships.

"There are three aspects to the campaign," says Mrinalini Singh, manager with the health portfolio at the Trusts. "First, we want to foster awareness so that dementia is not misattributed to old age. Second, with increased awareness we are hoping for an uptick in screening. Finally, there's caregiver sensitisation: attempting to build an ecosystem that will support caregivers who, in Indian families, are inevitably women."

There are many government schemes for the welfare of the elderly but fewer for the caregiver, adds Ms Singh. "Capacity building for formal and informal family caregivers will ensure they are alert to the symptoms of dementia."

Even though India has the highest number of young people in the world today, it also has a demographic chunk that is ageing rapidly. The number of elderly people in the country is currently 153 million, states a United Nations Population Fund study. By 2050, 20% of India's population will be 60 years and above, accounting for a whopping 347 million.

According to a 2023 study published in The Lancet Public Health, an estimated 8.8





A senior citizen (above) undergoes a dementia screening in Tavrekera, a village near Bengaluru; **a dementia screening** for the elderly in Seekari village in the Alluri Sitharama Raju district of Andhra Pradesh

million Indians aged over 60 were living with dementia (a prevalence of about 7.4%). The estimate is likely affected by underdiagnosis and underreporting. A study published in 2023 in Alzheimer's & Dementia Journal indicates that, at the current prevalence, about 16.9 million Indians are projected to have dementia by 2036.

Says Ramani Sundaram, neuroscientist and executive director of Dementia India Alliance, a partner of the Trusts in the programme: "Indians don't give the same importance to mental health as physical health. With a neurodegenerative condition, the person looks 'normal' so families don't bother, until they are inconvenienced by the elder's disruptive behaviour."

Social stigma

The social stigma around mental health and a general apathy about geriatric conditions act as further barriers to early testing. Also, dementia diagnosis is complicated because it involves a multi-step process of elimination, adds Ms Sundaram.

The classic warning signs — loss of recent memory, difficulty in finding the right word, and repetitive questioning — should prompt clinical assessment, but can collectively be considered a cognitive disorder if exhibited over a minimum of six months. At the same time, untreated diabetes, hypertension, vitamin deficiency, thyroid issues, sleep apnoea, head injuries or even depression can present as cognitive decline.

"We have to rule all these things out to treat for dementia," says Ms Sundaram. "We don't have an app or algorithm that will immediately indicate this; it is still a clinician's call." And clinicians, like family, may also misdiagnose dementia symptoms as simply old age.

Studies have found that primary health centres are not equipped to detect cognitive decline, and referrals take place only when

dementia is past the mild stage. Also, in a family situation where other members take over tasks previously handled by the elderly, their decline becomes less apparent.

"According to the pathology of dementia, changes in the brain may start 15-20 years earlier," explains Ms Sundaram. "But the human brain is so resilient it may take 10-12 years for symptoms to appear. Since dementia affects those in their 60s, people should seek assessment if they or their families notice persistent cognitive or functional changes."

The Lancet Commission estimates that that around 45% of dementia cases can potentially be delayed or prevented. "It has identified 14 modifiable risk factors for dementia, categorised into early-, mid- and late-life risks," says Ms Sundaram. "By rating yourself on these risk factors, you can assess your likelihood of getting dementia, and then make lifestyle changes to prevent it."

Early testing remains the key. That's the route Rashmi Sharma (name changed on request) took when she signed up her parents — her 76-year-old mother and her 81-year-old father — for dementia screening. The Ujjain resident discovered they both had the condition, in differing degrees.

Decline and after

"My mother could do only 30% of the assessment tests, while my father couldn't do any," says Ms Sharma. "We realised she was at a less advanced stage, but after my father died in 2024, her decline has accelerated. Today, she has regressed to her childhood and keeps asking to go home to her mother."

Ms Sharma and her sister, their mother's primary caregivers, are struggling with the responsibility. "This has taken an emotional toll on us," says Ms Sharma. "I wish there were proper daycare facilities for dementia or even trained caregiving professionals. If this were any other illness, we would've done everything under the sun to get them better. But with dementia we feel helpless and guilty."



An elder takes a cognitive screening test at Bengaluru's Koramangala Club

Training of caregivers is on the anvil in the initiative. Caregivers need — but rarely get — proper information; peer support; respite from their onerous responsibilities; or allowance to feel resentful, relieved and to grieve without shame.

Dementia caregivers do not just look after their loved ones; they carry the slow heartbreak of watching them disappear, while often losing their own identity, wellbeing and sense of self in the process, says the Trusts study.

"We want to increase the orientation of health caregivers from families, as well as from hospitals, nursing homes and senior living facilities, so their understanding of dementia is sharpened," says Ms Singh. "At the same time, we want to expand our work to include the training and employment of youth to become primary caregivers."

There is a perception that caregiving is not a respectable profession. When that changes, it will bring relief to thousands of families across India who are struggling to help their loved ones — and themselves — cope with the inevitable fading away that dementia induces. ■

Labonita Ghosh

Building bridges to justice and more

The Samvidhaan Fellowship has gone far in enabling vulnerable women and children in Bihar and Karnataka to secure legal rights and access government schemes

For as long as memory stretches, Bihar's Musahar community has struggled to build lives of dignity while battling deep-rooted social prejudice and endemic poverty. Listed as a scheduled caste group and recognised by the state as part of the Mahadalit category, the community is entitled to targeted support through government welfare schemes — to little avail.

For 19 families in Phulwari Sharif, a town in Patna district, the promise of land under the government's Bhumihin Yojana remained trapped in official records. In 2023, they received legal allotments but no measured plots, no demarcated boundaries and no physical possession to turn a paper entitlement into homes, livelihoods or a sense of security.

These Musahars — the word comes



Anand Ranjana (background), a fellow in the programme, leads a community session on domestic violence in Buxar in Bihar

from *mus* (rat) and *ahars* (eaters) in the Bhojpuri language – were not fighting the law; they were caught in the yawning gap between governmental assurance and reality on the ground. With limited knowledge of revenue procedures, they could not claim what was rightfully theirs.

In February 2026, the 19 families received help from Nyaaya, an initiative of the Vidhi Centre for Legal Policy, a think tank and policy research organisation. With support from the Tata Trusts, Nyaaya launched the Samvidhaan Fellowship in Bihar in 2024 to offer legal aid for women and children. Two years on, the Musahars of Phulwari Sharif became a focus point of the effort.

Backing from the Trusts helps enable the Samvidhaan fellows, who are practising lawyers with a keen interest in social justice. Cynthia Mathew is one such fellow and she, along with local NGO partner Manthan, took up the cause of the affected families and pursued the matter with government officials.

From files to fruition

After much back and forth, the allotted land was measured and demarcated, enabling authorities to complete the process of handing over possession. "The outcome was that the families could finally move beyond official files," says Ms Mathew. "They were formally given possession of the land and a long-pending government entitlement came to fruition."

The Samvidhaan Fellowship has been a boon for many others in need. Basawa Prasad, a fellow since February 2026, has become a trusted legal resource in Bengaluru for women facing domestic violence. Working with partner NGOs, he helps these women, who cannot afford legal fees and have nowhere else to turn.

Says Mr Prasad: "Often, these women are under immense pressure from their families to not act against their abusive husbands. We support and guide them. If and when they are ready to take legal action, we provide pro bono services."

There are 26 Samvidhaan fellows in total, and they operate in Bihar and Karnataka, helping people navigate the legal system, follow its complex procedures, and claim what is supposedly guaranteed. At its heart, the Fellowship is built on the idea that access to justice is not only about courts or lawyers, but also about trust, proximity and practical guidance.

The Fellowship functions under Nyaaya, which has built a public-facing ecosystem with an open-access platform that has reached more than 30 million people thus far through digital and in-person activities. The 'Ask Nyaaya'

The fellowship trail

Nyaaya selects talented lawyers for its Samvidhaan Fellowship programme through a wide-ranging outreach effort that includes local newspapers, regional publications, bar associations and community networks.

Beyond legal aptitude, candidates are assessed on their ability to engage with communities, navigate complex real-world problems, exercise ethical judgement, communicate to diverse audiences, and demonstrate initiative and long-term commitment to public-interest law.

"We recognise that lived experience, community trust, and commitment to public service are as valuable as academic credentials," says Anisha Gopi, the programme lead for the Fellowship.

The candidates are expected to meet key criteria to be accepted into the Fellowship: they need knowledge of working at the community level; have at least three years of litigation experience; have expertise in gender rights, child rights, human rights or labour laws; be conversant with social protection schemes and rights; understand grievance-redressal processes; and be proficient in the local language.



A community legal awareness session on child rights in Buxar

helpline gets about 100 questions every month and Nyaaya's online repository offers more than 3,000 legal explainers and guides in English, Hindi and Kannada.

The Fellowship has been designed to plug the gap between need and access. Says Nyaaya's team lead Anisha Gopi: "People may know that a right exists and may still not be able to claim it. They may not know which office to approach, what application to file, how to follow up, or whether a court case is worth the risk. India's justice system assumes literacy, English fluency, proximity to courts and familiarity with procedure. That leaves most citizens unable to claim their rights."

Legally deprived

The numbers in India's convoluted legal landscape are stark. Nearly 80% of Indians qualify for free legal aid, but barely 1% have access to it (the figure is 7.9% for undertrials). Unaware of options, many poor families end up paying for private counsel or not taking legal action at all.

For women and children, adds Ms Gopi, the barriers are more daunting still: stigma, patriarchy, financial dependency and a support system so fragmented that even those who know their rights can fall through the cracks.

This is where the Fellowship comes in. Nyaaya selects practising district-level lawyers as fellows after screening by a panel of experts. The fellows work with partner organisations to support communities that face challenges in accessing the legal system. Through on-ground engagement, structured mentorship, and expert-led training, the programme has built a cadre of legal professionals equipped to enable those in need to access and get justice.

The Fellowship typically runs for one year, with high performers invited to continue for a second year. The fellows receive a fixed monthly stipend and reimbursement for out-of-pocket expenses, including litigation-related costs. "The Fellowship supports us so that we can help those who require legal support but don't have the financial means for it," says Mukesh Paswan, a Patna-based fellow.

The fellows cover a gamut of legal provisions: constitutional law, gender rights, labour rights, land disputes, children's rights, disability-related issues, caste-based cases and others that disproportionately affect vulnerable communities. They are trained in relevant laws, procedures, client counselling and grievance redressal, and they build awareness among communities about rights

and entitlements established under law and government schemes.

Fellows also conduct regular awareness camps to get people to understand their legal options. "This builds trust, making it easier for people to approach us when they need legal aid," says Mr Paswan. "For many families, this makes the justice system less distant and frightening."

Local partnerships with government bodies and NGOs play a key role. Fellows are available through legal helpdesks at public places such as hospitals, universities, and neighbourhoods. In Bihar, for instance, Nyaaya has collaborated with the Bihar Rural Livelihoods Project (BRLP), locally known as Jeevika, to build legal capacity among coordinators who work with 12 million women across the state.

Partner support

In Karnataka, the fellows are present in trusted local spaces such as hospitals and partner NGO centres, which often deal with domestic violence cases. These partner organisations provide an avenue for legal support to women through the fellows.

The Tata Trusts provide more than just financial backing to Nyaaya. "The Trusts' role has gone well past a funding arrangement," says Ms Gopi. "This is a partnership that has enabled Nyaaya to move from a promising idea to a programme with the credibility, systems and stakeholder relationships needed to expand into new states with confidence."

For the Trusts, the partnership fits right in with wider goals on equity, inclusion and access to justice. "The Trusts have, through partner organisations, been engaged for many years in the justice sector to improve outcomes for undertrials, prisoners, victims of crime and marginalised communities," says Anirudh Menon, programme manager, institutions, at the Trusts. "We are committed to strengthening the justice system and supporting reforms aimed at making it more efficient and equitable."



A group of women at a session on dowry prohibition in Motihari in Bihar

The Fellowship's scale is still modest, but its reach is growing. There are 10 fellows in five districts of Bihar and 16 fellows in 10 districts of Karnataka. In less than two years, the fellows have reached out to more than 22,000 women and children, conducted hundreds of legal awareness sessions, counselled clients, supported court cases through pro bono litigation, and worked with community organisations to take justice beyond courtrooms.

With the Trusts' support, Nyaaya is now attempting to further its work with marginalised children, piloting a village adoption model, strengthening juvenile justice processes, expanding legal access points, improving case tracking and formalising partnerships with state legal aid institutions and government departments.

At its heart, the Samvidhaan Fellowship underlines a simple but urgent truth: justice cannot remain confined to courtrooms; it must be accessible to everybody, particularly those on the margins. ■

Aafrin Kidwai



Women farmers from a village in Uttarakhand's Rudraprayag district gather for a meeting

Animal charm

Dairy, goats, and poultry have provided a pathway to financial well-being for more than 62,000 mountain households in Uttarakhand and Himachal Pradesh

Chickens saved Bala Devi and her family from destitution. When the 2013 rains caused intense flooding in large parts of Uttarakhand, the livelihoods of Ms Bala's family and many others were severely disrupted across the state. Seeking to rebuild her life and support her family, she joined a poultry programme supported by Himmotthan Society, an associate organisation of the Tata Trusts. It was a decision that changed her circumstances.

Ms Bala, who hails from Dangala village in the Tehri Garhwal district, began by raising some 450 chickens (in three batches through the year) in her backyard. That fetched her about ₹45,000 a year through the sale of eggs and meat. There has been no looking back for Ms Bala since.

Tehri Garhwal is a region that has been rendered increasingly vulnerable to climate volatility. The topography of the district and its rugged terrain are no help, farm holdings are typically small, and market connectivity is poor. Understanding that communities needed livelihood programmes suited to local conditions, Himmotthan launched the 'Central Himalayan Livestock Initiative' (CHLI) in 2015.

The programme, which has grown to cover 1,200 villages in 14 districts of Uttarakhand and Himachal Pradesh, enables local communities to make a living and enhance their earnings by rearing dairy cattle, goats and poultry.

By providing support – through artificial insemination for breed improvement, access to better feed, and funding to construct animal sheds – CHLI has made all the difference in the lives of some 62,000 mountain households like Ms Bala's.

"CHLI has been able to build sustainable, climate-resilient, women-led livestock livelihoods in some of India's most geographically challenging terrain," says Shashi Bhushan Uniyal, theme lead for livestock initiatives at Himmotthan.



Two women from Nijmula village in Uttarakhand's Chamoli district with fodder for their dairy animals

Phase one of the CHLI initiative, which ended in 2021, touched more than 35,000 rural households. Crucially, it helped craft community institutions such as women-led self-help groups (SHGs) and a network of farmer producer organisations (FPOs).

Beneficiaries were encouraged to start local enterprises: micro-dairies, poultry hatcheries and feedstock supply units. In the five years of phase two, which ended in June 2026, Himmotthan expanded the programme by bringing 27,000 more households into its fold.

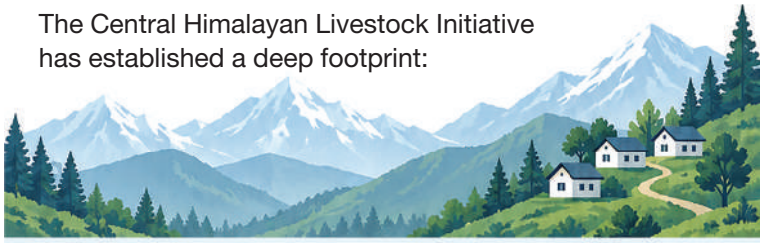
Dairy has been a focal point for the programme. Take Sanju Devi, whose family lives in Churerdhar village in Tehri Garhwal. Ms Sanju rears a buffalo that she purchased with financial support from Himmotthan. When her husband lost his job after the Covid outbreak, the buffalo's daily milk output brought in a much-needed regular income.

The Himmotthan team has worked to convince the community to improve its cattle breeds through artificial insemination. It has also encouraged farmers to come together under FPOs to better market their milk and milk products (see *The going is good with ghee* on page 44).

A recurring challenge in rearing cattle is the labour-intensive task of collecting fodder. "The main load of looking after livestock falls on women, who spend hours every day gathering fodder for their cattle,"

Mountain high

The Central Himalayan Livestock Initiative has established a deep footprint:



It covers **62,000-plus mountain households** in about 1,200 villages across 14 districts of Uttarakhand and Himachal Pradesh

Average annual household income has gone up from **₹65,000** to **₹109,000** over the two phases of the programme

1,800+ self-help groups have been linked with banks and microfinance institutions

25,000+ farmers have adopted improved animal management practices

1,836 livestock-based enterprises have been seeded



Deepa Devi (above) from Rangtoli village in Chamoli district has learned to care for her cattle thanks to CHLI; **backyard poultries** offer a year-round source of income for these women farmers from Bhainsro village in Uttarakhand's Pauri Garhwal district



says Vinod Kothari, Himmotthan's executive director.

To ease this drudgery, CHLI has encouraged fodder cultivation on land near villages. As a result, the average area under fodder cultivation per household has more than doubled. With better fodder availability, a majority of women in the programme have benefitted. "Much of the hard labour associated with cattle rearing has been reduced," adds Mr Kothari.

While dairy is the strongest vertical in CHLI, Himmotthan has also established goat-rearing as a secondary source of livelihood. This has been a boon for Sarojini Devi's family, who own about an acre of difficult-to-cultivate land in Dangala village. Himmotthan backed Ms Sarojini in buying a herd of goats and setting up a goat shed (a goat can be sold for ₹7,000-12,000).

Another change is the shift to semi-



In villages (above) close to Joshimath town in Chamoli district, women dairy farmers rear Badri cattle, a breed indigenous to the Himalayan region; **community resource** persons from CHLI know how to access online resources through smartphones

intensive goat-rearing, which involves more stall feeding. "Households were made aware of the benefits of restricting open grazing and giving feed such as concentrates and mineral mixes," says Shashank Bisht, a veterinarian on the Himmotthan team. "This helps increase the weight of the goats in a shorter time and families are able to earn more."

Poultry, the third component of the livestock intervention, has had its own successes. Most of the poultry-rearing households in the programme have chicken poultry sheds and healthy breeds, which has led to egg productivity doubling in the last five years.

It has not all been smooth sailing, though. "Our biggest challenge with poultry is to reduce the high mortality of day-old chicks during transport from the limited number of hatcheries in the plain areas. We established small hatcheries in





Breed improvement (above) and better feeding practices have helped farmers improve herd health and their income from goat rearing; **a traditional** structure in Joshimath to shelter livestock and store fodder (these come in handy during harsh winters)



the village clusters so that we can distribute more day-old chicks to beneficiary families," explains Rajendra Singh Koshiyari, head of rural upliftment at Himmotthan.

There are commonalities in the livestock interventions. For one, the initiative works to improve overall animal health through breed management, feed practices, weight monitoring and para-veterinary services. The project has developed a cadre of community resource persons — 38 artificial insemination technicians and 21 livestock resource persons — who provide much-needed doorstep services to villagers.

Another thread that runs through the programme is ecological impact. Himmotthan has ensured that more than 5,000 acres of land in the fragile Himalayan ecosystem now has a green



The slopes (above) of Ukhimath in Uttarakhand's Rudraprayag district show why open grazing means hours of labour for women farmers; milk being collected at a centre of the women-run Self Reliant Cooperative in Dharchula in Uttarakhand's Pithoragarh district

cover (through the planting of fodder and high-value crops).

The programme's biggest impact has been in sustaining livelihoods and boosting the financial inclusion of women. Through CHLI, some 1,800 SHGs have been linked with banks and microfinance institutions. More importantly, annual household income has increased from an average of about ₹65,000 in 2015 to ₹109,000 today.

With measurable outcomes achieved so far, the next phase of the initiative will focus on increasing the average income of livestock-rearers by a further 30%. Community collectives such as small enterprises and FPOs will also be strengthened. All said, the future looks set to deliver more for Ms Bala and her fellow villagers. ■



Gayatri Kamath



A member of the Kalpganga farmer producer organisation in Paini village near Joshimath packing the A2 ghee for sale

The going is good with ghee

Joshimath lies about 40km from the temple town of Badrinath in Uttarakhand's Chamoli district. Here, Himmotthan has brought together 250 women farmers from 30 villages under the umbrella of a farmer producer organisation (FPO) called Kalpganga.

The women churn milk at home to make butter and send it to a central processing unit where the butter is converted to ghee — and substantial revenues.

The earnings of the women farmers are based on the quantity of butter they can produce. "The Kalpganga FPO collects butter from my doorstep and pays directly into my bank account," says Damyanti Devi, a Joshimath resident. The shift from selling milk to selling butter has two key advantages: butter does not spoil as quickly as milk and is easier to transport.

Kalpganga was launched in 2022 with corporate social responsibility funding and other support from HDFC Bank. A key move was to train women to adopt best practices in animal health and management, and to learn standardised processes for making and collecting butter.

In 2023, Himmotthan set up a lab in Joshimath for testing butter quality. A year later, Kalpganga achieved a milestone when the KisaanSay food brand, which sources directly from farmers, came on board. It became the first major partner to buy the FPO's ghee (labelled as Himalayan A2 Badri Cow Ghee).

Since its inception, Kalpganga has collected 4,400kg of butter, sold 2,880kg of ghee, and earned about ₹3.4 million. Of this, it has paid out ₹1.9 million as profit to its women members. "Kalpganga FPO has increased my household income. And it has given me an identity as an entrepreneur," says Ms Damyanti. ■



A parakeet affected by heat stress in Delhi this year gets treated

Down in flames

Human beings are not the only victims of India's searing heatwaves; animals suffer even more, and they have no voice to express their distress

Every summer India braces for familiar headlines. Schools shut their doors, hospitals prepare for a surge in heatstroke cases, and weather forecasts warn of temperatures crossing 45°C. Heatwaves have become an accepted feature of our summers, discussed almost exclusively as a human crisis. Yet beneath the glare of this climate emergency lies another tragedy: one that unfolds quietly and unnoticed across our concrete jungles.

A dehydrated ring-necked parakeet plummets out of the sky, landing in a heap on the pavement. Black kites and crested serpent eagles crash mid-flight from heat exhaustion, unable to take off again. A baby rhesus macaque seeks a shaded spot beneath a parked vehicle, seeking relief from the blistering asphalt. A squirrel tumbles from a tree, too dehydrated to hold on.

Every rescue effort by Wildlife SOS's rapid response unit tells the same story. These animals are not victims of chance; they are casualties of an increasingly hostile urban environment. Recent rescue data paints a daunting picture.

In April 2026 alone, our rapid response unit recorded a nearly 40% increase in wildlife rescues across the Delhi national capital region compared with the same month last year. Bird rescues rose by almost



Geeta Seshamani is a wildlife conservationist and the co-founder and secretary of Wildlife SOS

49%, while mammal and reptile rescues also witnessed a significant increase, making it the highest April rescue surge the organisation has ever documented.

May and June were once considered the peak rescue months of summer, but now such rescues are beginning to take place much earlier, reflecting how prolonged and intense heatwaves are reshaping the challenges faced by animals.

For decades, urban development has been designed around human convenience. The result is the creation of urban heat-trapping islands, landscapes where concrete, asphalt and glass absorb and radiate heat for long, even after sunset, pushing temperatures several degrees higher than surrounding green spaces.

For wildlife, our cities have become furnaces. Birds searching for water venture into office buildings, railway stations, parking lots and residential complexes, where reflective glass causes fatal collisions and enclosed spaces leave them trapped. Raptors weakened by dehydration struggle to remain airborne. Owls, squirrels, civets and monkeys seek refuge in increasingly crowded human spaces, while snakes and monitor lizards enter residential neighbourhoods in search of shade and water.



This spotted owlet, who fell from a tree due to dehydration in Agra this June, was rescued and later released in a suitable habitat

Wildlife is not invading our cities. Rather, our expanding cities have steadily consumed the habitats wildlife once depended upon, leaving them with almost no options.

Green cover gone

The lack of concern for what remains of the green cover in our cities is criminal in this context. Every time a tree is felled, an entire world disappears. Birds lose their nests, their young and their roosting places, bats and insects lose their homes, squirrels lose refuge, and countless unseen creatures are displaced overnight.

Heatwaves are now amplifying a crisis that has been decades in the making. Climate change and rapid urbanisation are no longer separate environmental challenges. Together, they have created conditions that push wildlife beyond its physiological limits.

Wildlife SOS veterinarians working on the frontlines of wildlife rescue describe a recurring pattern. Birds rescued during periods of extreme heat frequently arrive severely dehydrated, exhausted and suffering from hyperthermia. Without immediate intervention, many cannot survive. Yet rescue teams also acknowledge an uncomfortable reality: for every animal that reaches a rehabilitation centre, countless others collapse silently, unnoticed and unreported before help can arrive.

Perhaps the most unsettling aspect of these rescues is not their increasing number, but their changing nature. Species once considered resilient to urban environments are now struggling to cope. Tree pies, *bulbuls,* yellow-footed green pigeons, parakeets and black kites, birds that have lived alongside humans for

generations, are approaching their physiological limits. Alongside are more vulnerable species such as owls, peafowl and migratory birds.

Too often, wildlife conservation is viewed as something that belongs inside forests, national parks or protected reserves. But India's biodiversity does not exist only within these boundaries. It thrives in neighbourhood parks, university campuses, roadside trees, wetlands and urban green spaces inside residential colonies, airports and community centres.

As our cities expand, these fragmented habitats become increasingly important, not only for wildlife, but for people as well. The same trees that provide nesting sites for birds also help cool our streets. Wetlands that sustain migratory species also combat and reduce flooding. Green corridors that allow animals to move safely through urban landscapes improve air quality, reduce surface temperatures and make cities more liveable for everyone, not just humans.

Far from charity

Protecting urban biodiversity is not an act of charity towards wildlife; it is a responsibility that ultimately safeguards our own future. This must be seen as self-preservation for the human race.

The long-term solution lies beyond emergency response. It rests in planting and protecting native trees, preserving wetlands, maintaining connected green spaces, designing bird-safe buildings and ensuring that earthen bowls filled with clean water remain available in shaded spaces throughout the summer.

With India having just celebrated Van Mahotsav, it is worth remembering that every native tree planted today helps create cooler cities and healthier habitats for wildlife tomorrow. At Wildlife SOS, our habitat restoration efforts have crossed a milestone: the planting of more than 500,000 trees. As a result, over the years, we have seen degraded landscapes recover, native biodiversity return and ecosystems gradually regain their resilience.

Citizens have an important role to play by preserving mature trees, planting native species and reporting distressed wildlife promptly. Small actions can mean the difference between life and death during extreme heat. The next time a bird collapses from the sky or a monkey seeks shelter beneath a parked car, we should resist seeing it as merely another distress story. Instead, we should recognise it for what it truly is: a message from a burning planet. ■

If you find a wild animal in need of assistance, you can reach out to the Wildlife SOS hotline numbers — Delhi NCR: 9871963535; Agra: 9917109666; Vadodara: 9825011117; Srinagar: 7006692300



This black kite, rescued in Delhi from dehydration, was returned to the wild

Testing it right

A breakthrough detection tool promises plenty in rethinking vector-borne disease diagnosis, particularly for the marginalised



Binita Tunga is the co-founder and chief technology officer of Ameliorate Biotech



Aishwarya Aiyar is a senior associate with the Tata Trusts-supported India Health Fund

Vector-borne diseases (VBDs) represent a significant global health challenge, accounting for about 17% of all infectious diseases and resulting in more than 700,000 deaths annually[1]. In India, dengue, malaria, and chikungunya continue to pose major public health challenges due to the widespread presence of mosquito vectors in both urban and rural settings.

In 2024, India reported 233,519 dengue cases[2] and 240,180 suspected chikungunya cases (17,930 confirmed),[3] while malaria remained a substantial burden with an estimated 2 million cases and several thousand deaths[4], making the country the dominant contributor to the malaria burden in Southeast Asia.

This challenge is no longer limited to tropical or lower-income countries. Shifting temperatures, rainfall and humidity patterns are changing the distribution and seasonality of vector-borne diseases and enabling their spread into new geographies. As dengue, malaria and chikungunya increasingly co-circulate, overlapping symptoms and possible co-infections make clinical differentiation difficult.

Although the diagnosis of individual infections has improved, identifying the cause of acute febrile illness often requires multiple laboratory tests, which can be time-consuming and costly and may delay appropriate care, particularly in settings with limited access to diagnostic testing. This highlights the need for rapid, affordable, point-of-care tools that can detect multiple infections from a single sample, especially in primary care and during surges or outbreaks, when timely information is essential for a prompt clinical and public health response.

ASSURED, developed by Ameliorate Biotech, was designed around this need. It is a rapid, antigen-based, vertical-flow multiplex diagnostic tool that detects dengue, chikungunya and malaria (with species differentiation) from a single whole-blood sample, with results produced in less than 15 minutes.

Triple benefit

By enabling multiple infections to be detected from a single sample — without specialised equipment — ASSURED holds the potential to bring timely diagnosis closer to patients, simplify the diagnostic process and strengthen the ability of health systems to respond quickly to changing disease patterns.

The journey of ASSURED began with a deeply personal experience. The tragic death of a family member due to a missed co-infection led us to ask whether there could be a simpler way to identify multiple vector-borne infections at the same time. Turning that question into a viable diagnostic, however, took years of experimentation and validation.

As scientists transitioning into entrepreneurship, we had to build capabilities beyond our technical expertise while continuing to develop the technology. An early breakthrough came when we won the ELEVATE 100 challenge (instituted by the Karnataka government) in 2018. This



A healthcare worker conducting a community-based assessment in a village in Maharashtra

provided us with grant support to advance the development of ASSURED.

Our initial laboratory work was carried out in our small laboratory, where prototypes were tested with recombinant antigens. These experiments showed promising sensitivities with no cross-reactivity. We then moved to patient samples collected through different laboratories in Bengaluru, comparing our results with reported diagnoses to establish initial proof of concept.

This was followed by a small-scale validation study at a private hospital in Bengaluru — done in 2020-21 and involving 100 samples — which reported 100% sensitivity and 95% specificity.

Subsequently, we focused on generating the clinical evidence required to take ASSURED towards regulatory readiness. Getting a Central Drugs Standard Control Organisation (CDSCO) manufacturing and marketing licence involved several key stages, and generating robust clinical evidence was one of the most critical of these.

With catalytic funding support from the India Health Fund (IHF) and technical mentorship, the clinical performance evaluation was undertaken in 2024-25 at three CDSCO-approved centres. The evaluation was designed to assess the performance of ASSURED across different geographies, populations, disease prevalence and disease severity, generating the evidence needed to support the regulatory review.

ASSURED progressed from an early-stage TRL (technology readiness level) 4/5 towards TRL 7/8, alongside the evidence generation and validation required to move towards regulatory confirmation. IHF also

extended support for the additional testing required for chikungunya.

After nearly eight years of development, we received the CDSCO manufacturing and marketing licence in May 2026, marking an important transition from development and validation towards market introduction. We are now concentrating on the next phase: strengthening manufacturing and distribution capabilities and building industry collaborations that can support scale and enable ASSURED to reach diverse markets and populations, particularly those facing the greatest barriers to timely diagnosis.

From proof to target

For us, regulatory approval is not the end of the journey; it is the point at which the focus shifts from proving the technology works to ensuring that its benefits reach the communities and health systems needing it the most.

For patients, particularly those from low-income and underserved communities, the burden of a vector-borne illness extends beyond the cost of the test itself to travel, lost wages, repeat consultations and investigations, and the consequences of delayed care. A recent study from Gujarat estimated the average total cost of a dengue episode at ₹6,860 and chikungunya at ₹7,000, including medical, non-medical and indirect costs[5].

Against this broader burden, ASSURED's intended price is estimated to be approximately one-tenth of existing diagnostic costs for public health institutions. For health facilities, the ability to detect three infections from a single sample and without specialised equipment could also offer greater flexibility in using existing diagnostic capacity, particularly at the primary-care level.

This becomes even more relevant for communities and health systems facing seasonal surges or outbreaks. With around 64% of India's population residing in rural areas, where households still account for 39.4% of total health expenditure through out-of-pocket spending[6], the ability to bring reliable diagnostics closer to where people live remains an important part of expanding equitable access to care[7].

As climate change influences the distribution and seasonality of vector-borne diseases, the ability to rapidly deploy diagnostic capacity closer to where cases emerge will become increasingly important. In these settings, ASSURED could help distinguish between infections with overlapping clinical presentations, support more timely treatment decisions and provide useful information for public health response.

The value of ASSURED, therefore, extends beyond the price of the kit: it lies in bringing timely diagnostics closer to communities and places that need it the most. By making diagnosis faster, more accessible and easier to deploy, ASSURED has the potential to strengthen frontline care while helping health systems respond more effectively to a changing vector-borne disease landscape. ■

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