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Climate Change Is Stealing India's Sleep — CSR Must Wake Up

Rajesh Tiwari
Publisher
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As India strives towards sustainable development, CSR must evolve from philanthropy to climate adaptation. Protecting a good night's sleep may well become one of the most meaningful investments in the nation's future.

Climate change is no longer just about melting glaciers, rising sea levels or devastating floods. It is now quietly invading one of the most basic pillars of human health—sleep. A new analysis by Climate Central has revealed that climate change has at least doubled heat-related sleep loss in major cities across the world since the early 1970s. India has emerged as one of the global hotspots, with southern states recording among the highest annual sleep losses outside the Middle East.

The findings are alarming. People in cities across Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Telangana lose between 78 and 91 hours of sleep every year because of rising nighttime temperatures. Tamil Nadu alone records nearly eight additional hours of annual sleep loss directly attributable to climate change. Maharashtra, represented by 22 cities in the study, loses more than 76 hours of sleep annually, nearly six hours of which are linked to climate change.

The consequences extend far beyond fatigue. Poor sleep weakens immunity, increases the risk of cardiovascular disease, diabetes and mental health disorders, impairs cognitive performance and reduces workplace productivity. The burden falls disproportionately on the elderly, women, children, low-income households and those without access to cooling. India's dense urban centres, where the heat island effect keeps temperatures elevated even after sunset, are particularly vulnerable.

This is where Corporate Social Responsibility (CSR) can play a transformative role. While CSR has traditionally focused on education, sanitation and healthcare, climate resilience must become an equally important priority. Companies can invest in urban greening, cool-roof programmes, community cooling centres, water bodies restoration and heat-resilient housing in vulnerable neighbourhoods. Supporting research on heat-health, funding public awareness campaigns and helping local bodies develop heat action plans can significantly reduce climate-related health risks.

CSR can also promote climate-smart workplaces by improving ventilation, adopting energy-efficient cooling systems, providing flexible work hours during heatwaves and protecting outdoor workers through hydration and rest facilities. Such investments not only improve employee well-being but also enhance productivity and business resilience.

India's rapid urbanisation and warming climate demand a broader understanding of public health. Sleep loss caused by rising temperatures is an invisible crisis with visible consequences for health, economic output and quality of life. Addressing it requires co-ordinated action by governments, businesses and communities alike. As India strives towards sustainable development, CSR must evolve from philanthropy to climate adaptation. Protecting a good night's sleep may well become one of the most meaningful investments in the nation's future.

CSR can also promote climate-smart workplaces by improving ventilation, adopting energy-efficient cooling systems, providing flexible work hours during heatwaves and protecting outdoor workers through hydration and rest facilities. Businesses can partner with municipal corporations, research institutions and civil society organisations to create scalable models of urban climate resilience. Such investments not only improve employee well-being but also strengthen supply chains, enhance productivity and reinforce long-term business sustainability.

India's rapid urbanisation and warming climate demand a broader understanding of public health. Sleep loss caused by rising temperatures is an invisible crisis with visible consequences for health, economic output and quality of life.

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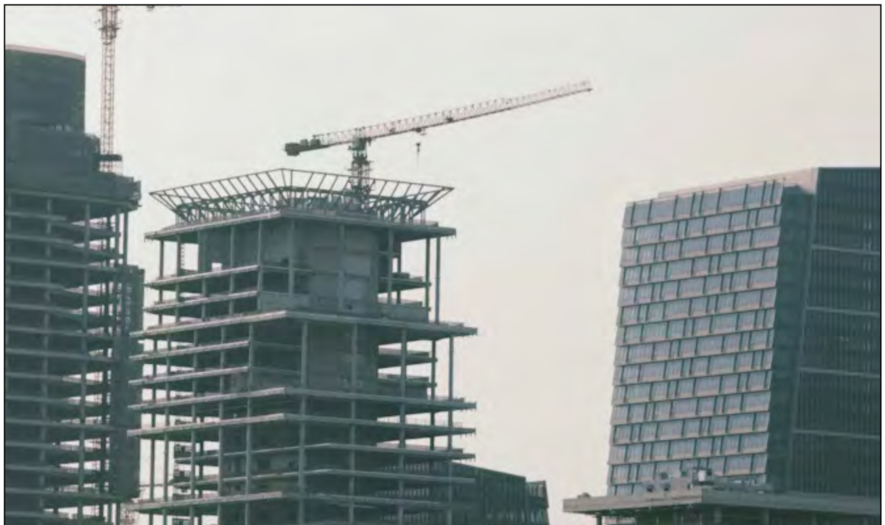

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Editor: Rajesh Tiwari

Mr. Praveen Thampi, Managing Director, Tata Steel Colors, (middle) along Tata Steel Colors team at the launch of the intiative

Tata Steel Colors strengthens Community Connect through the Pandharpur Wari

Demonstrating its commitment to community well-being beyond business, Tata Steel Colors is serving devotees participating in the annual Pandharpur Wari through an outreach programme that will promote awareness and engage communities across key locations along the pilgrimage route.

Celebrated for more than seven centuries, the Pandharpur Wari is a remarkable expression of faith, devotion and collective spirit, bringing together devotees from across Maharashtra. Reinforcing its commitment to the communities it serves, Tata Steel Colors is providing meaningful on-the-ground support to pilgrims along key stretches of the route. The initiative spans four cities and thirteen talukas, including Jejuri, Valhe, Lonand, Phaltan, Malshiras, Velapur and Wakhari. A specially designed van will travel along the route throughout the pilgrimage. The company will distribute essential items to devotees to enhance their comfort throughout their journey. The initiative was formally flagged off by Mr. Praveen Thampi, Managing Director, Tata Steel Colors, marking the commencement of the programme.

Adding a cultural dimension to the initiative, a renowned theatre group will perform Pathnatya (street plays) at prominent locations along the Wari route till the culmination of the procession.

The performances will promote awareness about safe and durable roofing solutions while connecting with rural communities through a culturally familiar medium. The initiative is designed to engage homeowners, farmers and local communities on the importance of quality roofing that delivers long-term value and protection against changing weather conditions. Commenting on the initiative, Ms. Priya Rajesh, Chief of Marketing (CMO), Tata Steel Colors, said, “The Wari is not merely a pilgrimage; it is a living celebration of Maharashtra's cultural heritage and collective identity. At Tata Steel Colors, we believe lasting relationships are built by participating in moments that matter to people. Through this initiative, we celebrate the spirit of the Wari while engaging with communities in a meaningful and culturally resonant way.”

Wockhardt Foundation's Mobile1000 Surpasses 50 Million Patient Interactions, Reinforcing the Role of Mobile Healthcare in India's Last Mile Care

As India continues to strengthen primary healthcare and improve access to essential medical services beyond hospitals, Wockhardt Foundation, the humanitarian arm of Wockhardt Ltd., today announced that its flagship Mobile1000 programme has surpassed 50 million patient interactions across the country. Having crossed the milestone during the first half of 2026, the programme has now recorded 51.1 million patient interactions, reflecting the growing importance of mobile healthcare in improving timely access to primary care for underserved communities.

The milestone comes at a time when India is strengthening its primary healthcare ecosystem through different initiatives, which have expanded to over 1.86 lakh operational centres nationwide. While this has significantly improved access to comprehensive primary healthcare, ensuring timely care for geographically remote and underserved communities remains an ongoing priority. In this context, technology-enabled mobile healthcare models are playing an increasingly important role by complementing the public healthcare system and extending consultations, diagnostics, preventive care and referrals closer to where people live.

Operating through 211 Mobile Medical Units (MMUs) across 21 states, nearly 73 districts and approximately 2,919 villages, Wockhardt Foundation's Mobile1000 has emerged as one of India's largest technology-enabled mobile primary healthcare programmes. Built on the Foundation's ADCR (Awareness, Diagnosis, Cure and Referral) model, the initiative delivers free doctor consultations, essential diagnostics, branded generic medicines, preventive health screenings, community awareness and referrals. Supported by digital patient records and point-of-care diagnostic capabilities, the programme enables early diagnosis, timely treatment and seamless referrals, helping improve access to quality primary healthcare for underserved communities.

Commenting on the milestone, Dr. Huzaifa Khorakiwala, CEO,

Wockhardt Foundation, said, "Reaching 50 million patient interactions reflects the scale of India's need for accessible primary healthcare. Across many parts of the country, delayed diagnosis is often a consequence of distance rather than disease. Mobile healthcare demonstrates that when consultations, diagnostics and referrals are taken closer to communities, healthcare becomes more timely, more preventive and more equitable. As India continues to strengthen its primary healthcare ecosystem, innovative community-based delivery models can play an important role in complementing existing health infrastructure and ensuring that quality healthcare is not determined by geography."

Ajay Somvanshi, Chief Operating Officer, Wockhardt Foundation said, "Improving healthcare access requires long-term collaboration rather than isolated interventions. Governments, healthcare providers, corporate CSR programmes and local communities each have a role to play in strengthening last-mile healthcare delivery. Mobile1000 has shown that partnerships, supported by technology, can improve continuity of care and expand access to primary healthcare at scale. As we move towards our vision of 1,000 Mobile Medical Units, our focus will remain on building stronger collaborations that help more underserved communities access quality healthcare closer to home."

Beyond the milestone, Mobile1000's impact is reflected in thousands of patient journeys across rural India, where timely access to consultations, diagnostics and follow-up care has helped address health concerns before they become more severe. From supporting elderly patients with chronic conditions to enabling early diagnosis and treatment of acute illnesses, the programme demonstrates how bringing primary healthcare closer to communities can improve health outcomes while reducing delays in care.

Building on this milestone, Wockhardt Foundation plans to expand Mobile1000 towards its vision of 1,000 Mobile Medical Units, while strengthening digital diagnostics, telemedicine capabilities and partnerships with governments and corporate CSR organisations to further improve last mile healthcare delivery across rural and urban India.

Texas Instruments India reports 33% rise in women seeking semiconductor career exposure through its WiSH program

With more than 680 women engineering students mentored since its launch, TI India's WiSH program is helping build a stronger pipeline of female talent for India's growing semiconductor industry

Texas Instruments (TI) India has concluded its fifth edition of the Women in Semiconductors and Hardware (WiSH) program, TI India's flagship initiative to inspire, mentor, and accelerate the careers of women engineering students in semiconductors, hardware, and embedded systems. During the program, participants engage in hands-on experiments, technical simulations, lab visits and engineering projects that expose them to real-world semiconductor applications and product development workflows.

Since its inception five years ago, the program has empowered 685 women engineering students through mentorship by TI engineers and facilitated more than 300 internship opportunities, helping create a sustained pipeline of female talent into one of the world's fastest-growing technology sectors. Building on the momentum of previous editions, the 2026 WiSH program recorded a 33% increase in registrations, close to 2,600 applications last year, reflecting growing aspiration among women students across India to pursue semiconductor careers.

"At Texas Instruments, we believe early exposure to industry and mentorship can play an important role in shaping future engineers. While women account for 43% of STEM graduates in India, one of the highest rates globally, they continue to be underrepresented in technical roles," said Arbab Kausar, HR director, Texas Instruments India. "Over the past five years, the WiSH program has helped women engineering students gain practical skills in semiconductor and hardware engineering while building their technical capabilities. The significant increase in registrations this year is encouraging and reflects the growing interest in semiconductor careers among female engineering students across India."

While the program's core architecture remains consistent, the 2026 cohort has been meaningfully strengthened. Pre-work learning modules and streamlined sessions significantly expanded the time participants spent on hands-on problem-solving, brainstorming, and collaborative design thinking. Students continue to engage with TI mentors, former WiSH participants, interns, and early-career engineers, gaining practical insights into what a career in semiconductor engineering truly looks like.

"The WiSH program gave me an opportunity to learn directly from experienced hardware engineers and gain valuable insights into the semiconductor industry," said Ashmita Das, who joined TI India as a digital intern after participating in the WiSH program. "Returning to TI as a summer intern feels like a dream come true and marks the beginning of an exciting new chapter in my journey. Deepening my technical expertise while gaining first-hand experience of working with teams that collaborate, innovate, and drive impactful engineering solutions has been incredibly rewarding."

Through WiSH and its broader talent development initiatives, TI India continues to invest in strengthening the long-term growth of India's semiconductor ecosystem by nurturing the next generation of women engineers.

Taj Palace, New Delhi commits to One Lakh Green Gestures with the launch of The Paathya Green Studio

Reinforcing its commitment to responsible hospitality, the capital's iconic landmark hotel, Taj Palace, New Delhi has launched the Paathya Green Studio, a first-of-its-kind interactive green engagement space that brings together sustainability, community participation and inclusion under Paathya, IHCL's ESG+ framework.

With a commitment to inspiring One Lakh Green Gestures by the end of the year, the Paathya Green Studio at Taj Palace, New Delhi encourages simple, everyday actions that collectively create meaningful environmental impact. Guests, patrons, associates and children are invited to participate by making seed balls or taking home indigenous saplings, carrying the message of Paathya beyond the hotel and into one lakh homes.

Envisioned as a meaningful extension of Taj Palace, New Delhi's recent milestone of surpassing 100,000 followers on social media, the initiative transforms a digital achievement into a lasting movement for environmental stewardship. By converting appreciation into participation, the Paathya Green Studio channels the strength of its growing community into collective action, inspiring One Lakh Green Gestures that extend the philosophy of Paathya well beyond the hotel.

In keeping with Paathya's commitment to creating shared value, the Paathya Green Studio is being led by Nitin, a passionate naturalist on the autism spectrum associated with NGO Hara Jeevan. Deeply connected with nature from an early age, Nitin will guide guests through the studio, sharing his profound knowledge of plants and encouraging meaningful interactions with the natural world. His association reflects Taj Palace, New Delhi's belief that sustainability is strengthened when it is inclusive, creating opportunities that celebrate diverse abilities while fostering deeper connections with the environment.

The launch builds upon Taj Palace, New Delhi's longstanding sustainability journey. The hotel is among the few luxury hotels in India to hold both LEED Platinum and EarthCheck Platinum certifications, reflecting its continued focus on responsible operations and environmental stewardship. Through measurable sustainability initiatives, the hotel has achieved a 73.8% reduction in carbon emissions, a 74.6% reduction in energy consumption, a 72.2% reduction in waste generation, and a 73.8% reduction in air pollutant emissions compared to the previous year. Responsible water stewardship remains central to the hotel's operations, while its in-house water bottling facility eliminates approximately 600,000 single-use plastic bottles every year, preventing nearly six tonnes of plastic waste annually. These initiatives are complemented by several guest-facing programmes under Paathya, including Innergise Green Meetings, which integrates sustainable practices into meetings, conferences and events, demonstrating how conscious choices can become an integral part of luxury hospitality experiences.

Speaking on the occasion, Praydhumna Singh Rathore, General Manager, Taj Palace, New Delhi, said: "At Taj Palace, New Delhi, we believe that hospitality has the power to inspire positive change. The Paathya Green Studio is an extension of that belief, creating a space where every guest can participate in simple actions that collectively make a meaningful difference. Our commitment to One Lakh Green Gestures is about building a movement that extends beyond our hotel into homes and communities. Equally important is the opportunity to make this journey inclusive. With the passion infused by our naturalist Nitin, the studio reflects our belief that environmental responsibility and social inclusion must go hand in hand."

As one of the Capital's leading luxury hotels and convention destinations, Taj Palace, New Delhi continues to embed sustainability into every aspect of the guest experience. Through the Paathya Green Studio, the hotel brings together environmental stewardship, community engagement and inclusive participation, demonstrating that meaningful change begins with one simple green gesture at a time.

Tata Chemicals and Small Animal Hospital, Mumbai Sign MoU to Advance Pet Nutrition and Companion Animal Health

Advancing Pet Health Through Science and Collaboration

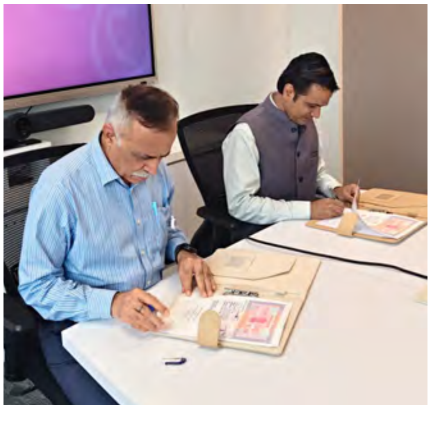
Tata Chemicals Limited (TCL) and the Advanced Veterinary Care Foundation (AVCF), operating as Small Animal Hospital, Mumbai (SAHM), have signed a Memorandum of Understanding (MoU) to collaborate on advancing the science of pet nutrition and companion animal health.

The collaboration reflects a shared commitment to enhancing the well-being of companion animals by combining SAHM's deep clinical expertise and compassionate approach to small animal healthcare with Tata Chemicals' robust capabilities in scientific research, ingredient innovation, and product development.

SCIENCE-LED APPROACH TO EMERGING PET NUTRITION NEEDS

With growing awareness among pet owners about the critical role of nutrition in animal health, TCL and SAHM aim to collaboratively identify unmet needs in pet nutrition and translate these insights into science-based, evidence-driven solutions.

The collaboration will leverage Tata Chemicals' advanced R&D capabilities across ingredient science, prebiotic nutrition, and formulation development, alongside SAHM's frontline clinical expertise and understanding of therapeutic interventions in small animals.



DRIVING BETTER OUTCOMES FOR COMPANION ANIMAL WELL-BEING

Through this partnership, TCL and SAHM seek to contribute to improved digestive health, nutrition, and overall quality of life for companion animals, while addressing the evolving expectations of pet owners for scientifically validated nutrition solutions. The collaboration will

remain firmly anchored in scientific excellence and ethical rigor. Any future testing or validation of developed solutions, if required, will be undertaken independently through accredited veterinary institutions in full compliance with applicable ethical and regulatory standards.

Maj. Gen. (Dr.) Pramod Batra, Head – Hospital Administration & Services, Small Animal Hospital, Mumbai, said:

"At SAHM, we are committed to advancing the standards of care and well-being for companion animals through clinical excellence and compassion. We see this collaboration with Tata Chemicals as an opportunity to contribute our domain expertise towards a structured exchange of knowledge that can inform better nutritional understanding for pets. We look forward to a partnership rooted in science, ethics, and a shared goal of improving animal health outcomes."

Dr. Richard Lobo, Head – Innovation, R&D, Business Excellence and Chief Ethics Counselor, Tata Chemicals Limited, said:

"Our purpose has always been rooted in the belief that science must serve a larger societal good. The collaboration with TATA Small Animal Hospital, Mumbai is an opportunity to extend this enduring philosophy to one of the most needed frontiers of care—the well-being of companion animals, especially those that are rescued and in need of focused attention and care. By bringing together SAHM's clinical excellence with our capabilities in nutrition science, research, and innovation, we aim to build a robust knowledge ecosystem that advances evidence-based solutions for small animal health. Together, we seek to unlock new insights, shape the future of pet nutrition, and contribute to a world where scientific innovation is guided not only by discovery, but also by empathy, responsibility, and the desire to enhance the quality of life for all living beings."

Allianz's CSR Project, Plastic Waste-Free Rivers in Thiruvananthapuram Crosses 1,000-Ton Recovery Milestone

Allianz Services India and Allianz Technology India, the Global Capability Centers (GCCs) of Allianz Group in India, celebrated the landmark achievement as their Plastic Waste-Free Rivers Project – a Corporate Social Responsibility (CSR) initiative, crossed the milestone of recovering over 1,000 tons of plastic waste from Thiruvananthapuram's rivers and waterways over four years, preventing it from reaching the Arabian Sea. This is equivalent to removing 50 million plastic bottles from the city's waterbodies – if kept end-to-end, the bottles would stretch to 12,000 km which exceeds the coastline of India.

During the 1000-Ton recovery milestone announcement of Allianz's CSR initiative 'Plastic Waste-Free Rivers Project Thiruvananthapuram'

The milestone was formally announced at an event held in Thiruvananthapuram, graced by an august gathering of dignitaries such as P.K. Kunhalikutty, Minister for Industries, IT, AI and Startups, Mons Joseph, Minister for Water Resources, K M Shaji, Minister for Local Self Government, V V Rajesh, Mayor of the Corporation of Trivandrum, V Muraleedharan, Member of the Kerala Legislative Assembly (Kazhakoottam constituency), Jison John, MD & CEO, Allianz Services India, Jayant Tulsiani, Branch Head India, Allianz Technology SE.

Since its launch in 2022, This four-year journey has been entirely funded by Allianz Services India and Allianz Technology India, who have together invested more than INR 5 crores (EUR 500,000) from CSR funds in the project.

"Global Capability Centres (GCCs) in Kerala are not merely engines of economic growth – they are responsible corporate citizens who invest in the communities and ecosystems that sustain them. This milestone also reinforces a powerful message to global investors: Kerala's industrial growth is inseparable from its commitment to environmental excellence," said Kunhalikutty.

"What makes the Plastic Waste-Free Rivers Project particularly commendable is its sustained, systematic approach," said Joseph,

"I urge corporates, local bodies, and citizens alike to draw inspiration from this model," he added.

"I call upon our Panchayats, Municipalities, and the Corporation of Thiruvananthapuram to draw inspiration from this model and deepen their collaboration with initiatives of this nature," said Shaji.

"Reaching the 1,000 ton milestone is incredibly meaningful for Allianz – every piece of plastic removed from rivers is one less harming the ocean. It reflects a clear conviction: to protect biodiversity and ocean health, we must act upstream. This is about more than cleanup – it's about lasting change: creating jobs, raising awareness, and transforming how communities manage waste. But we are only at the beginning. Preventing plastic pollution at scale requires deeper collaboration, systemic solutions and long-term commitment – because caring for tomorrow means protecting the ecosystems that sustain life today," said Barbara Karuth-Zelle, Member of the Board of Management (Responsible for Allianz Services and Allianz Technology) and Group COO, Allianz SE.

The Plastic Waste-Free Rivers Project deploys low-cost floating barriers called TrashBooms to intercept plastic waste in rivers and urban waterways. Today, 15 TrashBoom systems operate across critical sites – including Thampanoor thodu, Ulloor thodu, Pattom thodu, Thekkinakara canal, Amayizhanchan thodu, Karamana river, Killi river, Kariyil thodu, and Thettiyar canal – collecting and removing plastic waste daily. Allianz Services India and Allianz Technology India run this initiative in association with NGO partners Thanal Trust and Sustera Foundation, deploying technology from Plastic Fischer, Germany. The project provides local employment and is supported by three Material Recovery Facilities (MRFs) at Injakkal, Venpalavattom and Vallakadavu, managed by Plastic Fischer's team of 23 professionals responsible for recovery, transportation, segregation and shipping. Collected non-recyclable plastic is transported to the Thiruvananthapuram MRFs and subsequently co-processed at the plants of Dalmia Cement (Bharat) Limited in Tamil Nadu, while recyclable plastic is repurposed locally, including into TrashBins now installed at Veli Beach.

Globally, nine million tons of plastic reach the oceans every year. In Thiruvananthapuram, 79% of debris on major water banks is plastic, and the Karamana and Killi rivers have the highest microplastic densities in the region. Without intervention, plastic is projected to outweigh fish in the world's oceans by 2050 – a stark reality that makes this milestone all the more significant.

In 2025, Allianz Services India and Allianz Technology India launched grassroots-level programs in Puthenthope, Kadinamkulam and Veli, in association with NGO partners Thanal Trust and Sustera Foundation, marking a strategic shift towards preventive waste management by extending impact from interception to behaviour change and early intervention. The initiative encourages visitors, local merchants, and residents to dispose of waste responsibly. Employees regularly collaborate with NGO partners to undertake beach cleanup drives and awareness campaigns, while close collaboration with the Corporation of Thiruvananthapuram and the Government of Kerala (Departments of Local Self Government and Water Resources) ensures the initiative complements local governance efforts.

HCLFoundation and UP government to collaborate for sustainable cities

HCLFoundation, which drives the corporate social responsibility agenda of HCLTech in India, signed a Memorandum of Understanding (MoU) with the Urban Development Department, Government of Uttar Pradesh, to further the government's vision of advancing sustainable waste management practices across Hardoi, Prayagraj and Agra in line with the Swachh Bharat Mission.

HCLFoundation and Urban Development Department will collaborate on strategic planning, pilot projects, policy and process reforms and the deployment of IT-enabled solutions to improve waste management systems across the three cities.

In the latest initiative under HCLFoundation's My Clean City program, 10 E-drain carts and 10 E-garbage loaders donated by HCLFoundation to the Hardoi Nagar Palika Parishad were flagged off and three reverse vending machines were unveiled. HCLFoundation has also undertaken city beautification in Hardoi through wall art and plans to develop three markets and three wards in the city as model markets and model wards.

"My Clean City is a citizen-led program aimed at reclaiming urban spaces with a focus on technology inclusion and innovative solutions. This partnership with the Urban Development Department, U.P., will further strengthen our efforts, especially in Agra, Hardoi and Prayagraj—three new cities to which we expanded the program in FY26," said Alok Varma, Project Director, Samuday and My Clean City, HCLFoundation.

Anuj Kumar Jha (IAS), Secretary, Urban Development Department and State Mission Director, Swachh Bharat Mission (Urban), Government of Uttar Pradesh, said, "The Department envisions building cleaner, healthier and sustainable cities across the state through collaborative action. This partnership with HCLFoundation brings together institutional strength and implementation expertise which will help accelerate urban sanitation efforts, strengthen waste management practices, and create innovative models that will inspire urban transformation in Agra, Hardoi and Prayagraj."

World Bank Group Provides New Financing in Support of India's Reform Program to Boost Growth and Jobs

The World Bank's Board of Executive Directors have approved $1.5 billion in financing to support India's structural reforms to boost private sector-led job creation and economic growth under the Boosting Job Creation in the Private Sector Development Policy Financing (DPF) Operation.

The DPF Operation can create job opportunities for the 11 million youth who will be entering the labor market every year over the next two decades.

The DPF Operation builds on many structural reforms undertaken or initiated in recent years, including tax simplification, trade integration, and legislative and regulatory reforms to improve ease of living and the ease of doing business. The operation also supports tax and regulatory reforms that reduce barriers to entrepreneurship, updates to the labor laws to make it easier for women to participate in formal employment, measures to streamline trade and investment regimes, and steps to facilitate capital mobilization. In recent years, economic reforms in India reflect a maturing phase of India's governance, from expanding regulatory frameworks to delivering measurable outcomes with focus on simplifying systems, reducing compliance burdens, and improving predictability for citizens and businesses. From simplified tax regime and Next-Generation GST, expanded and more inclusive MSME definitions, and business compliance, reforms were designed to make everyday economic interactions smoother, faster, and more transparent, strengthening policy certainty and trust in institutions. Collectively, these measures illustrate a governance approach rooted in outcome-driven policymaking, fostering trust, predictability, and long-term economic resilience.

In November 2025, the Government of India laid a strong foundation for a more equitable, transparent, and growth-oriented economy with consolidation of 29 labor laws into four comprehensive Labor Codes to streamline compliance, modernize outdated provisions, and create a simplified, efficient framework that promotes ease of doing business while safeguarding workers' rights and welfare.

According to government estimates—and reflecting the vision of an empowered, prosperous, and Aatmanirbhar Bharat—employment in India has shown remarkable growth rising from 452 million in 2017–18 to 604 million in 2023–24, a net addition of over 150 million jobs in just six years. During the same period, the unemployment rate declined sharply from 6.0% to 3.2%, and around 9 million women entered the regular wage employment, underscoring the Government's emphasis on inclusive and sustained labor empowerment.

The DPF Operation can create job opportunities for the 11 million youth who will be entering the labor market every year over the next two decades.

These steps reaffirm India's commitment to fostering a modern labor ecosystem that empowers both workers and industry, paving the way for inclusive and sustainable growth.

The DPF is aligned with the World Bank Group's Country Partnership Framework (CPF) for India for FY26-31, anchored in the Government of India's Viksit Bharat @2047 vision, which supports improving the enabling environment for firms, mobilizing private investment, and expanding productive job opportunities, particularly for women and youth.

The new operation supports India's reforms in three critical areas: enhancing the business-enabling environment, advancing trade and investment openness, and mobilizing private capital for firm expansion and job creation.

"India is well paced in its reforms agenda to unlock private capital and create jobs in a challenging global context," said Johannes Zutt, World Bank Vice President for South Asia. "By reducing the regulatory burden on firms, expanding market access, and improving access to finance, the operation creates conditions for Indian firms to scale, invest, and hire — directly generating quality jobs across sectors."

"To foster job creation and entrepreneurship, the DPF supports measures to unlock financing particularly for micro, small and medium enterprises, as well as women-owned enterprises and underserved borrowers," said Aurélien Kruse and Laurent Gonnet, task team leaders of the operation. "Improving MSME access to finance, will make firms and workers more resilient to shocks and better able to seize economic opportunities."

The DPF also complements recent investments by the World Bank Group through the International Finance Corporation (IFC) to leverage private capital for MSMEs and to expand credit access for underserved borrowers in rural and semi urban areas, especially women. These include: an equity investment of approximately $97 million in Aditya Birla Capital Limited, a $100 million debt investment in L&T Finance Limited, a debt investment of approximately $150 million in HDB Financial Services, and a $242 million (of which $191 million is private mobilization) to private equity firm Everstone Capital Partners Fund V to support mid-market companies.

Epsilon Carbon Recertified Under Responsible Care®, Reaffirming Its Standing as a Responsible Global Manufacturer

The Indian Chemical Council renews Responsible Care® certification for Epsilon Carbon's sustained commitment to safety, environmental responsibility, and ethical operations

Epsilon Carbon Pvt. Ltd., a leading global manufacturer of carbon black, specialty carbon, and coal tar downstream products has been recertified under the Responsible Care® (RC) program by the Indian Chemical Council (ICC) through March 2029. The recertification covers the company's integrated manufacturing complex in Vijayanagar, Karnataka which is one of India's largest fully backward integrated carbon complex, with a capacity of 215,000 TPA of Carbon Black and 220,000 TPA of Specialty Carbon.

Responsible Care® is the global chemical industry's most comprehensive voluntary initiative, governing the safe and responsible management of chemicals across their entire lifecycle. This has helped the company to build a culture where Responsible Care is no longer a compliance exercise, but is embedded in daily operations, new employee induction, and cross-functional decision-making.

The real-world impact of RC certification extends to market access and customer trust. For any customer accessing a potential supplier, the Responsible Care® certification is accepted as a sufficient global standard, and Epsilon Carbon has been a preferred supplier to various critical industrial manufacturers supported by long-term supply contracts.

Gaurav Mathur, Chief Executive Officer, Epsilon Carbon, said: "We adopted Responsible Care early in our journey, well before it was a norm for a company of our scale. At that time, our focus was on building it right, not doing it quickly. That discipline has shaped our safety culture, our systems, and the trust we have built with global customers and financial partners. As we expand into Odisha and grow our product portfolio, this recertification is a signal that our commitment to responsible operations continues to scale alongside our ambitions."

For Epsilon Carbon's global customers, partners, and financial stakeholders, the recertification provides verified, third-party assurance that operational integrity, from raw material handling through to product dispatch remains a non-negotiable standard, regardless of the scale of the company's growth.

Fixderma Marks UV Safety Month by Empowering Young Minds with Skincare Education at Pehchan NGO

Reinforcing its commitment to preventive skincare and community wellbeing during UV Safety Month, dermatologist-prescribed skincare brand Fixderma conducted an interactive skincare education programme for children and teenagers at Pehchan NGO, encouraging them to develop healthy sun protection habits from an early age.

The initiative focused on introducing young participants to the basics of skin health, helping them understand the impact of everyday sun exposure, the importance of year-round UV protection and the role simple daily skincare habits play in maintaining healthy skin over time. Through interactive discussions and engaging demonstrations, the session encouraged children to view skincare not as a cosmetic practice, but as an essential part of overall health and self-care.

To reinforce these learnings, Fixderma distributed Shadow SPF 50 Gel Kids, its sunscreen specially formulated for children, while demonstrating the correct way to apply sunscreen and explaining how small daily habits can help protect the skin during outdoor activities, school hours and playtime.

The programme concluded with a creative workshop that encouraged children to express what they had learnt in their own unique way. Using paper, colours and their imagination, participants designed sunscreen packaging inspired by the day's session, creating vibrant illustrations, catchy taglines and thoughtful messages promoting sun safety. The activity not only strengthened their understanding of UV protection but also encouraged creativity, collaboration and confident self-expression.

Commenting on the initiative, Shaily Mehrotra, CEO & Co-Founder, Fixderma & FCL, said: "The way children understand health today shapes the habits they carry into adulthood. That is why conversations around skincare and sun protection should begin early, before misconceptions take root and preventive care becomes an afterthought. Through this initiative, we wanted to make skin health easy to understand, engaging and relevant to their everyday lives. What made the experience truly rewarding was seeing the children participate with such curiosity, ask thoughtful questions and express their learning with remarkable creativity. Moments like these remind us that education is most effective when it inspires involvement rather than simply sharing information. At Fixderma, we believe skincare extends beyond products and clinics. It also means creating opportunities for people to learn, build awareness and make informed choices that support their well-being for years to come."

As a dermatologist-led skincare brand, Fixderma believes that preventive skincare begins with education. By taking science-backed skin health awareness beyond clinics and into communities, the brand aims to equip young individuals with practical knowledge that supports informed choices and lifelong healthy habits.

Through initiatives like these, Fixderma continues to strengthen its commitment to community well-being by making skincare education more accessible, encouraging responsible sun-safe practices and inspiring the next generation to prioritise skin health with confidence.

Vedanta Transforms 20 Lakh Lives Through Skills and Livelihoods

Vedanta HZL Zinc Kaushal in Rajasthan

Marking World Youth Skills Day, Vedanta Group, the world's leading metals, oil & gas, critical minerals, power and technology conglomerate, today announced that it has empowered nearly 20 lakh people through its skilling initiatives over the past six years, reinforcing its commitment to building an inclusive and future-ready workforce. Focused on enhancing employability and creating sustainable livelihoods across ages, genders and communities, Vedanta's skilling ecosystem spans vocational and technical training, women-led entrepreneurship, agriculture and farmer capacity building, sports-based skill development, and youth empowerment programmes.

Aligned with the Government of India's Skill India Mission, Kaushal Bharat Abhiyan, and the Ministry of Skill Development and Entrepreneurship's vision of unlocking human capital to drive productivity, employment and entrepreneurship, Vedanta's initiatives are creating pathways to sustainable livelihoods while supporting the nation's long-term economic growth.

Vedanta's skilling philosophy aligned with United Nations Sustainable Development Goal 8 – Decent Work and Economic Growth, follows a holistic approach that nurtures human potential from early childhood to employment and entrepreneurship. By strengthening foundational learning, equipping youth with industry-relevant skills, enabling women with livelihood opportunities and connecting communities to markets and employment, the company is creating an integrated ecosystem that promotes economic self-reliance and inclusive development.

A cornerstone of this approach is Nand Ghar, Vedanta's flagship social impact programme that constitutes modernized anganwadis, which today spans 15,000 modern centres across 17 states. While transforming rural communities through early childhood care, nutrition and pre-primary education, Nand Ghar has also emerged as a powerful platform for women's skill development, entrepreneurship, financial literacy and livelihood generation, enabling greater financial independence and strengthening rural economies.

Complementing these efforts are Vedanta's youth-focused skilling initiatives, which bridge the gap between education and employment through industry-aligned vocational training, technical education and placement support. Since 2016, these initiatives have empowered more than 46,000 youth across the country. Youth are trained across 25 Skill Development Centres across states where Vedanta is present, with women accounting for 51% of trainees, preparing them for careers in manufacturing, digital services, hospitality, entrepreneurship, drone technology and other emerging sectors. Supported by a strong network of nearly 200 placement partners, the programmes have consistently achieved an 80% placement rate, with graduates securing an average annual CTC exceeding ₹2 lakh.

India today has one of the world's youngest populations, yet

Vedanta ESL Skill Training Centre in Jharkhand

only a small proportion of its workforce has received formal vocational training—significantly lower than many developed economies. As industries rapidly evolve with digital technologies, automation and advanced manufacturing, expanding access to industry-relevant skills has become critical to unlocking India's demographic dividend. Vedanta is working alongside government, industry and implementation partners to help bridge this gap by creating employment-ready talent while strengthening local livelihoods and entrepreneurship.

Vedanta's initiatives are implemented in partnership with leading government programmes, including Pradhan Mantri Kaushal Vikas Yojana (PMKVY), PM Vishwakarma, the National Bank for Agriculture and Rural Development (NABARD), the Skill India Impact Bond (SIIB), the Mukhyamantri Kaushal Vikas Yojana (MMKVY), and the Odisha Skill Development Authority (OSDA), along with leading industry and implementation partners, ensuring that skilling remains aligned with evolving workforce requirements and regional aspirations.

Across Vedanta's businesses, region-specific initiatives address local opportunities. Vedanta Aluminium equips youth with vocational and technical skills, Hindustan Zinc strengthens digital and service-sector employability, Vedanta Aluminium's BALCO unit prepares rural youth for careers in advanced manufacturing, while Vedanta Oil & Gas is nurturing future-ready entrepreneurs through enterprise development, drone technology and digital capability-building.

- **Holistic skilling ecosystem spans vocational training, women-led entrepreneurship, agriculture, sports and youth empowerment**
- **46,000+ youth empowered through industry-aligned skilling initiatives since 2016**

The impact of this ecosystem is reflected in the lives it transforms. Coming from an economically marginalised background and overcoming personal adversity, Sarita Sahu from Odisha completed hospitality training through Vedanta's Skill Development Centre and secured employment in the hospitality industry, rebuilding her confidence and achieving financial independence. In Rajasthan, Jitendra Singh, trained through Vedanta Oil & Gas's Skill Development Centre, became a certified drone pilot and entrepreneur, today providing precision agriculture services that are improving farm productivity while creating a sustainable livelihood for himself.

As India advances towards becoming a developed nation, skill development will remain fundamental to driving inclusive growth, productivity and global competitiveness. Through sustained investments in people, strong partnerships and community-led interventions, Vedanta continues to build an ecosystem that transforms learning into livelihoods and potential into prosperity—supporting India's vision of a skilled, self-reliant and future-ready nation.

PepsiCo India and the^delta prize Launch INR 6.5 Crore rapid re.gen Challenge to Accelerate Regenerative Agriculture in India

PepsiCo India, in collaboration with the^delta prize, today launched the rapid re.gen challenge, a nationwide initiative designed to help smallholder farmers adopt regenerative agriculture through practical, scalable solutions that improve soil health, strengthen resilience, and enhance livelihoods. Backed by a prize fund of Rs 6.5 crore, the challenge will support organisations working to make sustainable farming more viable and accessible for farmers across India.

Agriculture in India is increasingly facing challenges linked to declining soil health, rising input costs, and climate uncertainty. While regenerative agriculture offers a proven pathway to improve soil fertility, strengthen farm resilience, and support long-term productivity, many farmers continue to face barriers to adoption, including limited access to resources, technical support, and low-risk implementation models. The rapid re.gen challenge aims to address these gaps by identifying and supporting approaches that can deliver both environmental and economic benefits for farmers.

The challenge invites applications from non-profits, civil society organisations, and other partners working with farming communities. Selected organisations will work with smallholder farmers practising conventional agriculture to test, strengthen, and scale innovative, farmer-centric regenerative agriculture models that improve soil health while helping farmers sustain or increase their incomes. Through these efforts, the challenge aims to reach between 5,000 and 10,000 smallholder farmers across India. Areas of focus include farmer advisory services, natural resource management, agroforestry, efficient input use, market access, and other solutions that contribute to sustainable agricultural growth.

The initiative is a part of PepsiCo India's broader efforts to advance regenerative agriculture and support farming communities across the country. Through programmes focused on soil health, scientific farming practices, farmer capability building, and sustainable agriculture, PepsiCo India works with farmers to strengthen agricultural productivity and long-term resilience. Through the rapid re.gen challenge, the company aims to identify practical solutions that can help accelerate the adoption of regenerative agriculture across diverse farming regions in India.

Yashika Singh, Chief Corporate Affairs Officer and Sustainability Head, PepsiCo India and South Asia, said, "Healthy soil is the foundation of a healthy food system. As an agri-company at heart, we believe that caring for soil is not just an environmental priority but a way of supporting and enriching the lives of the farming communities we work with. At PepsiCo India, regenerative agriculture guides our approach to restoring soil fertility, strengthening water systems, and building long-term resilience in the fields that sustain us. For us, nurturing soil is ultimately about nurturing livelihoods. When the soil is healthy, entire farm ecosystems become stronger, and that is the direction in which we continue to move with our farming partners. Through the rapid re.gen challenge, we look forward to supporting organisations that are helping farmers adopt practical and scalable approaches to improve soil health while strengthening livelihoods."

"For many smallholder farmers, the transition to regenerative agriculture remains difficult despite its long-term benefits. Farmers often face rising input costs, declining soil health, and increasing climate uncertainty, making it harder to take risks and experiment with new approaches. Through the rapid re.gen challenge, we hope to identify and support practical pathways that make this transition more viable for farmers while improving incomes and strengthening resilience," said Kanishka Chatterjee, Managing Director, the^delta prize.

GUIDED BY EMINENT ADVISORS AND VOICES OF CHANGE

- Amitabh Kant, G20 Sherpa; Former CEO, NITI Aayog
- Manoj Ahuja, Former Secretary, Department of Agriculture & Farmers' Welfare, Government of India

- Shri. Hemendra Mathur, Founder, ThinkAg; Venture Partner, Bharat Innovation Fund
- Dr. Ramanjaneyulu GV, Executive Director, Centre for Sustainable Agriculture

The challenge has been shaped through consultations with practitioners, researchers, implementation organisations, and ecosystem leaders. Participating organisations will receive grant funding and access to a network of advisors, mentors, researchers, and institutions that can help strengthen evidence, accelerate learning, and support the scaling of successful regenerative agriculture models.

Applications for the rapid re.gen challenge are now open. You can apply on the link below-

https://rapidregenchallenge.the-delta.org.in/?utm_source=SoMe&utm_medium=LinkedIn&utm_campaign=rapid+re.gen+challenge&utm_term=Shri+Amitabh+Kant

From Dharavi's Potters to Counter-Drone AI, Groww Foundation Backs 35 Young Innovators at IIT Bombay

Groww Foundation, the philanthropic arm of Groww, today announced the first cohort of the INV.ENT program, backing 19 ideas by 35 young innovators at the Indian Institute of Technology Bombay (IIT Bombay). Chosen from nearly 400 submissions across disciplines, the winning ideas range across a marketplace that takes ceramics from Dharavi's potters to customers, a wearable sleeve that coaches physiotherapy patients through their exercises, a platform that turns CO_2 into edible protein and an AI system built to guard critical infrastructure against rogue drones.

The first cohort spans the program's two tracks. 3 student teams have been named the program's inaugural Grand Challenge Fellows and are eligible for milestone-based annual support of up to Rs 25 lakh each. The 16 remaining student teams enter the POC Support Track with a catalytic grant of Rs 30,000 each.

On top of the grant, this cohort will receive mentoring and a 15,000 sqft dedicated space, called Groww Innovation Space, located at IIT Bombay's Desai Sethi School of Entrepreneurship (DSSE). This space will be used to build, test a core assumption, speak to real users and assemble a prototype, thereby allowing a steady influx of new ideas from students into this ongoing program that doesn't come with a submission deadline - just a commitment to fostering fearless innovation.

Across the cohort, the ideas stretch across agri-tech, robotics, climate-tech, assistive-tech, retail, design, edtech, gaming and defence, several leveraging AI and ML to tackle the hitherto unsolved problems. The full portfolio of the selected ideas is at: growwfoundationiitb.org/portfolio

"At Groww Foundation, our mission since day zero has been to empower India's youth with opportunities to learn, build and innovate. INV.ENT is a program born out of that belief," said Kalpana Swaminathan, Head of Groww Foundation. "We see this as a launchpad, the place where young innovators get the mentorship, financial support and trust to take their first real shot, long before the world is watching. We're excited to work closely with this cohort of innovators as they turn their conviction into something real, and we hope to look back one day and call this the starting point for some of India's most impactful builders."

The grants are the entry point of a program that will support over 100 student teams a year, with the strongest ones rewarded the Grand Challenge Fellowship with its larger, milestone-based support.

Reflecting on what the first INV.ENT cohort represents for student innovation at IIT Bombay, Prof. Shireesh Kedare, Director, IIT Bombay, said, "At IIT Bombay, we believe that the distance between an idea and its impact is often determined by whether someone believes in it early enough. Our partnership with Groww Foundation through INV.ENT is built on that shared conviction. Young innovators deserve the freedom, resources, and encouragement to test bold ideas before the world expects results. Together, we are creating an ecosystem where students do not have to wait for permission to build. They can test, fail, learn, and move forward. That is how enduring innovation ecosystems are built."

Mukund and the Team BeBrust, one of the winning teams, shared, "The overall experience of selection has been really helpful in improving our clarity. We understood the caliber of the team. We are now more confident in the innovation of our idea and in our mission, opportunity, and ability to perceive and experiment. We are looking forward to getting a bigger network and being at least one year ahead of our plan."

A review of global fisheries finds worker exploitation is rooted in systemic economic and governance failures rather than isolated abuses.
Image: Xiaoqian Shen, CC BY-SA 3.0, via Unsplash.

LABOUR ABUSE IS SEAFOOD'S HIDDEN COST

Workers' suffering is an integral part of the fisheries system, say four experts.

The most disturbing stories from fishing vessels reach the public as scenes of cruelty. A fisher is trapped at sea for months or years. Wages disappear. Passports are confiscated. A crew member is beaten, denied medical care, and abandoned in a foreign port.

Public blame often centres on an outlaw vessel, an abusive captain, a corrupt company. Then everyone moves on until the next scandal appears. In 2015, the world was shocked by reports of enslaved fishers on Thai vessels. Yet, a decade later, not nearly enough has changed. That is what we found in our recent review of 51 peer-reviewed studies on labour exploitation in global fisheries.

We also found that abuse is not a series of scandals. It is a structural feature of how the global seafood economy operates, driven by overfishing and competitive market pressures, enabled by weak governance and sustained by the strategic use of migrant labour. The solutions that have received the most attention, including ecolabels, certification schemes and voluntary corporate pledges, are still failing many of the workers they claim to protect.

This matters because any solution depends on how the problem is understood.

If labour abuse is treated as an occasional scandal, the response will focus on catching bad actors after harm has already occurred. But if abuse is understood as a structural feature of the seafood economy, then governments, companies, markets, fisheries managers and regional fisheries management organisations (RFMOs) must confront the conditions that make it possible in the first place.

These conditions are not mysterious. Many fishing operations now work under severe economic pressure, with declining catches, rising costs and intense competition pushing vessels to fish farther and longer. At the same time, global markets continue to demand cheap seafood. The pressure to reduce costs is constant and labour is often the easiest cost to push down.

THE MACHINERY OF CONTROL

For workers, the reduction can mean stolen wages, excessive hours, unsafe vessels, poor food, lack of rest, intimidation, debt and limited access to medical care.

For those recruited into fishing away from their home nations, the risks are even greater. Many such migrant fishers enter the sector through brokers or recruitment agencies. Some begin their journeys already in debt. Others sign contracts they cannot fully understand or later discover that the terms have changed. Once at sea, their documents can be confiscated, while their legal statuses, language barriers, and isolation can make leaving almost impossible.

The ocean itself becomes part of the machinery of control. A worker on land may be able to escape an abusive employer. A worker on a distant water fishing vessel cannot just walk away.

This is why the language of modern slavery, while powerful, can also be limiting. It captures the horror of extreme abuse, but it can make exploitation appear rare and exceptional.

Many fishers experience conditions that do not fit the legal definitions of forced labour yet remain deeply coercive. A fisher may not be chained but may still be trapped by debt. They may not be formally imprisoned but may have no realistic way to exit. They may be described as free, while every material condition suggests otherwise.

Recognising this spectrum of abuse allows us to identify and denounce exploitation before it reaches its most extreme form. It also helps to avoid the comforting fiction that only the most egregious cases deserve attention.

ILLEGAL LINKS

Labour abuse and illegal fishing are usually treated as separate policy problems. One is a human rights issue; the other is a fisheries management issue. In practice, they often share the same origins.

A vessel that avoids fisheries rules may also avoid labour rules. Weak monitoring, complex ownership, transhipment at sea, distant operations and poor inspection systems create space for illegal fishing and worker abuse to occur simultaneously.

In some cases, exploited fishers may be forced to participate in illegal practices they did not choose. They then become both victims of abuse and potential targets of enforcement. That is a profound failure of justice.

This means labour protection is not separate from ocean sustainability. A seafood system that exploits workers is more likely to undermine the marine environment. There is no truly sustainable seafood built on human suffering.

GLOBAL BLIND SPOTS

Another important finding from our work is that the world does not know enough about where this labour exploitation is happening.

Much existing research is concentrated in Southeast and East Asia,

The seafood industry has spent years telling the world that sustainability matters. But sustainability does not stop at the waterline. It is not enough to protect fish while ignoring the people who catch them.

> **RFMOs, often criticised for weaknesses in high seas fisheries governance, should stop treating labour as someone else's responsibility. If RFMOs regulate access to fishing, they also have a role in ensuring that access is not built on coercion.**

especially around Thailand, Taiwan, Indonesia, Cambodia, the Philippines, Myanmar and South Korea. This focus is understandable; investigative journalists, civil society groups and researchers have exposed serious abuses in this region. But the danger is that the public begins to imagine labour exploitation as mainly an Asian problem. It is not.

Large parts of the Atlantic, Africa, the Americas, the Indian Ocean and other major fishing regions remain poorly studied in the English-language academic literature, even though research on the Gulf of Guinea shows how illegal fishing can undermine livelihoods, food security and sustainable development.

Some powerful fishing nations and fleets remain remarkably difficult to examine.

This silence is troubling. It means that the geography of research may be shaping the geography of outrage. Academics and journalists watch some regions closely, while labour abuse in others remains hidden in plain sight.

WHO SHOULD TAKE ACTION?

For policymakers, the implication is clear. Labour standards must be built into fisheries governance, not tacked on as a social concern.

Fisheries management must focus on more than fish stocks, catch limits, vessels, gear and trade. A fishery cannot be called well-managed if the people working in it are abused. Port inspections should include safe and confidential ways for fishers to report abuse. Vessel licensing should be tied to labour protections.

RFMOs, often criticised for weaknesses in high seas fisheries governance, should stop treating labour as someone else's responsibility. If RFMOs regulate access to fishing, they also have a role in ensuring that access is not built on coercion.

For companies and buyers, voluntary promises are no longer enough. Too often, seafood companies have invested more energy in tracing fish than in protecting the fishers whose labour brought that fish to market.

Codes of conduct, certification schemes and audits can raise awareness, but they cannot replace binding accountability. Paperwork is not a substitute for protection. The real test is not whether consultants can produce a clean supply chain report. It is whether fishers are paid, safe, heard and able to leave abusive work without punishment.

For journalists and civil society, the challenge is about framing. Individual stories remain essential. They give the public a human face to a hidden crisis. But those stories should not end with a profile of the outlaw of the week. They should ask: what conditions made the abuse possible? Who profited from it? Which rules failed? Which markets rewarded it? Which inspection systems missed it?

Most importantly, fishers themselves must be placed at the centre of reform. Much more than just victims, they are workers, rights holders, organisers, knowledge holders and witnesses to the daily realities of the sea. Policies designed without their voices will continue to miss the structures and processes that shape their exploitation.

The seafood industry has spent years telling the world that sustainability matters. But sustainability does not stop at the waterline. It is not enough to protect fish while ignoring the people who catch them. It is not enough to celebrate responsible seafood while tolerating stolen wages, fear, injury and abandonment.

The next time a labour abuse story emerges from a fishing vessel, we should not treat it as an isolated tragedy. We should treat it as evidence of a wider system that has resisted change.

HOW ASIA MUST RETHINK THE WAY IT BUILDS

Floods, blackouts and overstretched transport systems are exposing a deeper challenge. Across Asia, governments and investors are beginning to write a new playbook, one that moves beyond incremental fixes towards structural transformation, writes **Taejun Kang**

Asia's infrastructure was largely planned and built during decades of relative climate stability, steady population growth and predictable energy demand. But today, these assumptions are shifting — and faster than most governments previously planned for.

The challenge is no longer simply about building more. It is about building differently — with stronger project preparation, clearer risk allocation, more resilient financing structures, and deeper collaboration between the public and private sectors.

Infrastructure Asia inks four memorandums of understanding, showcases over US$16 billion in regional infrastructure opportunities across South and Southeast Asia

One of the main drivers behind this rethink of infrastructure planning is the increasingly severe impacts of climate change.

When three tropical cyclones converged with the Northeast monsoon across Southeast and South Asia in November 2025, it killed more than 1,300 people and inflicted losses exceeding US$20 billion.

At the same time, extreme heatwaves expected in India this year during the summer months puts increasing numbers of residents at risk of heat stroke. El Nino, a climate pattern caused by unusually warm waters in the tropical Pacific that disrupts weather worldwide, is expected to cause lower rainfall and hotter temperatures in Asia this year.

This has a mounting economic impact. India lost an estimated 247 billion potential labour hours in 2024, with the informal sector and small business owners amongst those most affected.

These numbers reinforce Asia's position as among the most climate-vulnerable regions on Earth, accounting for more than three-quarters of the global population living in low-elevation coastal zones and at risk of sea level rise.

Climate events such as these point to something fundamental — many

A man pushing a wagon through a flooded-street in Kolkata, West Bengal, India.
Image: Dibakar Roy/Unsplash

systems were built around assumptions that no longer hold.

INCREASED ENERGY DEMAND

Energy demand is also quickly increasing, and in more concentrated bursts, than many systems were designed to accommodate.

Data centres, electric vehicles (EV) manufacturing facilities and green industrial parks are expected to add more than 100 terawatt-hours (TWh) of electricity demand across Southeast Asia by 2030, with artificial intelligence (AI)-related computing accelerating the timeline. Dale Hardcastle, Partner at Bain & Company and co-author of the firm's Southeast Asia's Green Economy Report 2026, argues this is fundamentally reshaping where the bottleneck now sits.

"Historically, infrastructure investment in Southeast Asia has focused on generation capacity. Today, the critical question is increasingly whether power can be delivered reliably, affordably, and quickly enough to strategic demand centres." he said. "Time-to-power is becoming a major determinant of investment allocation."

Strategic industries, such as advanced manufacturing, AI infrastructure, industrial clusters, can move from investment commitment to operation in one to three years. Yet transmission upgrades and grid interconnections often take far longer.

Dale sees this forcing a rethink of what infrastructure is actually for.

"Infrastructure is no longer viewed only as a supporting utility layer — it is becoming a direct lever of competitiveness to attract investment into the country," he said.

Countries that plan reactively, expanding capacity after demand has already arrived, risk falling behind those that build ahead of it.

AMBITION COUPLED WITH EARLY MOVES

Across Asia, governments have set ambitious targets that signal a desire to build infrastructure not just faster, but differently.

Countries like Vietnam, India, and the Philippines have committed to significant expansions in renewable capacity, with India targeting 500 gigawatts and several members of the Association of Southeast Asian Nations (Asean) pledging to raise the share of renewables in their electricity mix as part of broader climate commitments.

Elevated train passing through a bustling Jakarta cityscape with modern buildings.
Image: Arief santras/Pexels

On transport, there is growing emphasis on mass transit and rail connectivity — from Indonesia's expanding urban rail network to Bangladesh's newly completed Padma Bridge Rail Link, which has dramatically improved rail access between Dhaka and the southwest while strengthening regional connectivity — reflecting a shift away from road-centric development models that have long dominated the region.

Early policy moves are beginning to give these ambitions greater shape and direction.

The Philippines Department of Energy, for example, has announced a 10-year Green Energy Auction Programme aimed at scaling up the share of renewables in the country's power mix. The programme is significant because it represents a more systematic and market-oriented approach to scaling up renewables than the ad-hoc project approvals that characterised earlier years.

Vietnam has also directed provinces to design infrastructure that is adapted to seasonal flooding, rather than suppressing or redirecting water flows. This represents a significant conceptual shift, as it also means converting land previously used for rice cultivation to aquaculture or left as wetlands, with implications for local politics and livelihoods. This has resulted in projects such as mangrove restoration programmes along the Ca Mau coastline as a form of coastal protection infrastructure, as well as the Can Tho urban flood resilience project.

Lavan Thiru, executive director at Infrastructure Asia, a Singapore-based agency that facilitates sustainable infrastructure investment and project development across Asia, is cautiously optimistic about the growth of the sustainable infrastructure sector in Asia.

"The pipeline of regional infrastructure projects has grown substantially over the past decade. We have observed regional governments approach projects in the transport, energy and circularity sectors with renewed vigour, and a strong interest in getting these projects off the ground," he said. While Asia is moving in the right direction, challenges remain in translating ambition to project implementation.

"Pressure on local governments expected to deliver such infrastructure has also grown in parallel. The gap between project ambition and delivery capacity is widening," Lavan opined.

Across the region, this rethinking is beginning to translate into concrete actions, though financing gaps remain in the way.

Expansive aerial shot of a construction site with cranes and building foundations in Dong Nai, Vietnam. *Image: Toàn BDS/Pexels*

ADDRESSING THE BANKABILITY CHALLENGE

The Asian Development Bank (ADB) estimates Asean needs approximately US$184 billion in infrastructure investment annually through 2030. This means that Southeast Asia's energy investments alone would need to more than double from current levels to meet stated climate and development goals. But by most measures, the gap is not narrowing.

The frustrating reality, as Deven Chhaya, partner and head of infrastructure advisory at KPMG Singapore, sees it is that capital is not the constraint.

"In today's environment, the challenge is less about the availability of capital and more about the availability of investable, bankable projects. There is significant capital ready to be deployed — from institutional investors, development finance and private capital — but it is competing for a relatively small pool of projects with clear risk allocation and predictable long-term cash flows."

What keeps projects out of that pool, Chhaya argues, is not risk itself but the inability to price it reliably across long time horizons.

"Investors are looking for resilience in revenues, clarity in policy frameworks and alignment between long-term investment horizons and shorter regulatory cycles. Where regulatory uncertainty or contract instability exists, it becomes difficult to price risk appropriately over a 20- to 30-year investment horizon."

The solution, in his view, requires governments to do more of the structural preparation work upfront.

"Governments can play a catalytic role by professionalising project preparation, standardising structures, strengthening demand forecasting and creating repeatable project archetypes that improve investor confidence," he said. "Strategic use of public balance sheets, including risk-sharing or first-loss mechanisms, can also crowd in private capital particularly where the social value of projects is high."

Infrastructure Asia was established to help shift more regional infrastructure projects towards better bankability. As a project facilitation office set up by the Singapore government to support Asia's social and economic growth through sustainable infrastructure development, it works closely with governments and project developers across the region.

The Philippines' North-South Commuter Railway, a 147-kilometre elevated line that will eventually serve up to one million passengers a day, is one of the clearest recent illustrations of what that work looks like.

Investors are looking for resilience in revenues, clarity in policy frameworks and alignment between long-term investment horizons and shorter regulatory cycles. Where regulatory uncertainty or contract instability exists, it becomes difficult to price risk appropriately over a 20- to 30-year investment horizon.

Construction projects in Quezon City, Metro Manila, Philippines. *Image: Rey Melvin Caraan/Unsplash*

Infrastructure Asia worked with the Philippines' Department of Transportation ahead of the tender, running a market sounding exercise in Singapore to test deal terms with private sector players before formal documents were finalised.

"The whole idea is to soft test the market, so that when the tender comes out, there will be a good consortium of players from everywhere around the world who are able to participate," said Lavan.

The resulting contract uses an availability-based payment model, under which the government pays the operator for delivering reliable train services, rather than requiring the private sector to take on ridership uncertainty for a brand-new line. The Philippines is also seeking an US$800 million partial credit guarantee from the ADB as a payment backstop.

"Public-private partnerships have increasingly become crucial in Asia's infrastructure development, accelerating advancement and encouraging cooperation between public and private entities. Infrastructure Asia plays a critical role in enhancing regional cooperation to catalyse more bankable projects in Asia," Lavan added.

SHARED EXPERIENCE

Structural reform and better-designed projects can only be delivered if the officials responsible for implementing them have the skills to do so. This is where knowledge sharing and the exchange of experiences become necessary.

Infrastructure Asia enables such exchanges by bringing together governments, investors, multilateral institutions and industry stakeholders to address these issues at a level of ambition commensurate with the challenge through the Asia Infrastructure Forum (AIF). The 2026 edition, themed "Bold Actions for a Sustainable Asia", brought together more than 800 participants across the infrastructure value chain, and featured more than 15 projects with an estimated combined value of over US$16billion.

Beyond AIF, Infrastructure Asia's capacity building programme, the Growing Infrastructure Course, in partnership with the Singapore Management University and the World Bank Group, has trained more than 500 regional government officials with a deliberate focus on what private sector participation requires in practice for infrastructure projects.

THE COORDINATION CHALLENGE

The final obstacle is one that no single government can solve on its own. Many of the region's biggest infrastructure opportunities require systems that work across borders, but the frameworks governing them remain largely national.

Bain & Company's Dale identifies this as the region's most structurally difficult challenge to solve.

"Many of the region's biggest infrastructure opportunities increasingly depend on cross-border systems — whether power interconnection, EV supply chains, logistics corridors or industrial networks.

"However, standards, regulations, financing structures, and approval processes are still largely organised at the national level. This creates friction for projects that require coordinated regional build-out and scale."

The result, he argues, is a misalignment between where the investment opportunity lies and where the enabling conditions are in place.

"Capital is increasingly concentrated in markets and corridors where governments are coordinating infrastructure, policy, and industrial development together."

For the region's most ambitious cross-border projects, that coordination is still more aspiration than reality. Understanding where the gap sits is one thing. Closing it requires a different kind of work — the hard, unglamorous process of restructuring how individual projects are designed, de-risked and brought to market.

It is work that the region can no longer afford to defer.

(Source: https://www.eco-business.com/news/how-asia-must-rethink-the-way-it-builds/)

EXTREME HEAT COSTING POOR WOMEN WORKERS OVER US$57 BILLION IN EARNINGS A YEAR

A major new report from Heat Resilience Action (HERA) launched at the London Climate Action Week, reveals that extreme heat is emerging as one of the most underestimated threats to economic development world-wide, hammering city economies, overwhelming health systems, and falling hardest on women working on the frontlines of a hotter world. The report, Counting the Cost of Heat: The Case for Urgent Solutions for Cities, draws on global and regional evidence and grounds it in detailed economic modelling of four cities chosen for their sharply different climates and heat profiles: Ahmedabad in India, Bangkok in Thailand, Monterrey in Mexico, and Freetown in Sierra Leone.

Across the four modelled cities, heat already drains as much as 4 to 8 per cent of city GDP in an average year and claims more than 1,000 lives. At the global level, informal sector women who bear a disproportionate burden lose an estimated US$57 billion in earnings each year to extreme heat (which represents 4-11 per cent of their wages). Without targeted action, those impacts are projected to intensify three- to fivefold by 2050, driven by climate change, rapid urbanisation, and ageing populations.

"Extreme heat is draining growth, health, and equality, not a distant climate risk," said Kathy Baughman McLeod, CEO of HERA. "The evidence in this report is unambiguous. Heat is taking a major toll on the women most exposed and least able to escape it, and it is quietly scarring the economies of cities that can least afford the loss. But the same evidence shows us the way out. The solutions exist, they are affordable, and they work."

HEAT IS HAMMERING WOMEN'S HEALTH AND LIVELIHOODS

The report makes clear that the burden of extreme heat is not shared evenly. Women, especially the estimated 740 million who work in the informal sector globally, face the highest exposure and the least protection.

Key findings include:

- Informal sector women in every region but the US and Europe lose an estimated US$57 billion in earnings each year to extreme heat. Many women workers make as little as US$3 per day.
- Heat accounts for a larger share of women's mortality than men's, up to 20 per cent, driven by a combination of physiological factors and the social and economic conditions that increase women's exposure and reduce their capacity to adapt.
- The damage ripples outward. Women reinvest up to 90 per cent of their income back into their families and communities, so when heat cuts their earnings, spending on children's education, nutrition, and healthcare falls with it. In Bangkok, extreme heat reduces women's annual spending on their children by US$500.
- These individual losses do not stay individual. In Bangkok, heat-driven productivity losses reduce the city's GDP by an average of 4 per cent a year, the equivalent of the city government's entire budget, and as much as 8 per cent in an unusually hot year. In Freetown, extreme heat raises the average household debt-to-income ratio by 3 per cent annually, crowding out investment in education and entrepreneurship.
- In Monterrey alone, heat-related pre-term births are expected to more than triple over the next 25 years.
- In the cities analyzed, women suffer heat-driven annual productivity losses ranging from about 3 per cent in Monterrey to 11 per cent in Bangkok. Because they already earn less than men – from 66 per cent less in Freetown to 4 per cent less in Bangkok – even modest productivity losses translate into a greater proportional hit to household income, leaving fewer resources to fall back on.
- Across the cities in this analysis, working women are consistently more likely than working men to be employed informally, reaching as high as 91 per cent of employed women in Freetown (compared to 83 per cent of employed men

THE DANGER DOES NOT END WHEN THE SUN GOES DOWN

The report highlights that rising nighttime temperatures, which in many cities are climbing faster than daytime highs, are a critical and often overlooked driver of illness and death. Hot nights deny the body any respite, and together with compound heatwaves they account for 85 per cent of heat-related mortality. The risk falls hardest on lower-income residents living in homes built from heat-trapping materials like corrugated iron and tin, a reality sharply felt in Freetown.

AFFORDABLE SOLUTIONS THAT PAY FOR THEMSELVES

Despite the scale of the threat, the report's central message is one of opportunity. A representative portfolio of low-cost interventions, including Heat Response Plans, urban green space, cool roofs, labour protections, and heat insurance, could reduce heat-related mortality by more than 36 per cent by 2050 in the cities analysed.

Crucially, these measures deliver exceptional value for money:

- Heat Response Plans generate returns of between 12 and 90 times their cost, making them among the most cost-effective public health investments available.
- Cool roofs lower indoor temperatures by 2 to 7°C (3.6 to 12.6°F) from the day they are installed, protecting the low-income households at greatest indoor risk.
- Heat-related income loss insurance, designed for the poorest informal workers who fall outside formal protections, could reduce informal sector women's earnings losses by over 40 per cent by 2050.

The report stresses that these returns depend on inclusive design. Standard heat responses too often miss the people who need them most: early warning systems rely on phone ownership and literacy, cooling centres assume mobility and free time, and labour protections rarely reach the unregulated informal sector. Tailoring interventions to account for this protects the most exposed residents and maximises the return on every dollar spent.

"We cannot keep designing heat responses as though everyone experiences heat the same way," said Baughman McLeod. "When solutions are built with women in the informal sector, not just for them, they save more lives and protect more income per dollar than any blanket approach. That is the case for action, and it is a case decision-makers, employers, and investors can no longer afford to ignore."

A GLOBAL TOOL FOR PRACTITIONERS

The report is paired with HERA's first-of-its-kind tool, designed to help policymakers, practitioners, and development partners understand the impacts of extreme heat and evaluate the case for adaptation.

The tool is global: it lets users see how heat affects mortality and economic output in 11,408 cities across 190 countries, well beyond the four featured in the report, and explore how these impacts could evolve through 2050. Users can also compare the costs and benefits of different adaptation measures to find those with the greatest returns and access practical frameworks for explaining how heat affects people and economies.

The report draws on the most comprehensive evidence to date of heat's impacts on women, integrating climate projections, health and labour productivity modelling, gender-disaggregated economic analysis, and qualitative evidence from informal women workers, alongside city-specific case studies of those most affected, from how heat disrupts their sleep to how it spoils the wares they sell.

This analysis closes by setting out four urgent priorities: developing sustainable financing models, building deeper partnerships across sectors and levels of government, investing in better evidence on women-centred heat impacts, and closing the awareness gap through heat literacy. The case for action is clear, the document concludes, and the window for building heat resilience is narrowing.

HERA (Heat Resilience Action) is a global adaptation NGO dedicated to protecting the health, income, and dignity of women on the frontlines of extreme heat. HERA partners with local organisations, bringing expertise, capacity, and resources to co-design and deliver practical, scalable solutions for a hotter world.

(Source: https://www.eco-business.com/press-releases/extreme-heat-costing-poor-women-workers-over-us57-billion-in-earnings-a-year/)

Scientists warn that funding cuts and shrinking monitoring networks are creating dangerous gaps in ocean observations, undermining efforts to track climate change, forecast weather and protect marine ecosystems. *Image: NOAA, CC BY-SA 3.0, viaFlickr*

‘WE REALLY ARE GOING BLIND’: SCIENTISTS WARN WORLD LOSING SIGHT OF THE OCEAN

Trump administration dismantling of sensor system worth US$368 million is latest blow to information gathering vital to protecting the marine environment and global climate, reports **Daniel Cressey**, Dialogue Earth

At a moment scientists most need to understand what is happening in the ocean, some of the systems built to observe it are being switched off or allowed to shrink. Last month, it was revealed that the US government under President Donald Trump was shutting down much of a high-tech network of ocean monitoring equipment that cost US$368 million. The agency responsible said it was just tweaking the “scope of its support” – but the scientific community has reacted with outrage.

The fear among researchers is that this is not an isolated loss, but part of a much wider problem. The ocean is central to understanding the world, and where it is headed. Yet the long-term systems to observe it are increasingly vulnerable.

This means gaps in understanding the carbon cycle and global warming. It means a lack of knowledge in weather predictions and fisheries. Communities that need this information could suffer.

“We are really going blind in terms of how we understand the ocean, how we see the ocean and how we can advance the protection of the ocean,” says Karina von Schuckmann, who works on ocean science and policy at Mercator Ocean International, a non-profit dedicated to digital oceanography.

Von Schuckmann is also co-chair of the scientific committee for the Starfish Barometer, an annual report on the state of the ocean. Alongside warming waters, plastic pollution, species loss and other pressures, this year’s release lists a less-publicised threat: “Major in-situ ocean observing systems are shrinking [and] reducing ocean protection capacity.”

BLOWN OUT OF THE WATER

In May, US government agency the National Science Foundation said it was undertaking a “major descoping” of the Ocean Observatories Initiative. This collection of over 900 sensors, spread over five sites in the Pacific and the Atlantic, includes moored equipment and autonomous underwater vehicles and gliders. These arrays monitor temperature, pressure, CO2, pH and other properties of the ocean.

Now, four of them are set to be removed over the next 15 months, with some equipment already being pulled out of the Pacific.

"Walking away from a USD-368-million investment in a state-of-the-art system, a feat of engineering already paid for by the American people, is absolutely myopic," said Chris Robbins, associate director of scientific initiatives at the Ocean Conservancy NGO.

In a post on Facebook, oceanographer Dawn Wright, chief scientist at geographic information company Esri, was even blunter: "Screaming with rage and frustration at this stupidity and lawlessness but NOT giving up!"

A National Science Foundation spokesperson told Dialogue Earth by email that it was "not cancelling the Ocean Observatories Initiative" but "planned to adjust the scope of its support for select elements".

The dismantling of the initiative follows numerous moves by the US administration under Donald Trump to shutter, defund or otherwise limit scientific research on climate change-related issues. This has included slashing grant funding and attempting to shutter influential climate lab the National Center for Atmospheric Research in Colorado.

But, even if there is less drama attached, this is not just a US problem. Wider ocean observations also appear to be becoming scarcer, with UK and other European countries' funding under pressure, researchers told Dialogue Earth.

TEMPERATURES UP, OBSERVATIONS DOWN

The Starfish Barometer offers an overview of the current state of the ocean by bringing together published, peer-reviewed science. It notes that in 2025 there were an estimated 120,000 in-situ observations on the physical and chemical state of the ocean, largely driven by autonomous monitoring via systems such as drifting buoys.

> **The cuts in the US will have repercussions for global ocean science… The rest of the world needs to pick up the shortfall. The problem is that in real-terms, cuts are being made in many countries.**
>
> **–HELEN FINDLAY**
> Oceanographer, Plymouth Marine Laboratory

While autonomous systems are doing well, the authors note that major monitoring networks including moored buoys and observations from research ships have declined since the pandemic, driven down by constrained budgets and a shortage of experienced staff, "reflecting broader constraints on ocean science capacity."

The cuts by the US administration are playing a part in this broader predicament. The team cites a warning from 2025 by several scientists that disruptions in US federal funding and research are undermining science and multilateral cooperation.

This, the second iteration of the Starfish Barometer, is the first to include numbers on ocean observations, said Marina Lévy, an oceanographer at the French National Centre for Scientific Research (CNRS) who chairs the Starfish scientific committee along with von Schuckmann.

Acknowledging widespread concerns over the US cuts, she added there are already signs that observations are shrinking globally.

"The question is: how is this going to evolve in future? Observing the ocean is key to being able to protect it," she said.

Helen Findlay, a biological oceanographer at the Plymouth Marine Laboratory, said the report matches her experiences.

Measurements of carbon dioxide at the ocean surface have declined in recent years with the community blaming a lack of funding from European countries, she said, and this is leading to problems with calculating the global carbon budget, meaning human-caused emissions balanced against those taken up by the sea and land. In the UK there has also been a decline in real-terms funding of long-term observing systems – with no increases in budgets to reflect inflation or rising costs, she added.

"Routine, long-term observations are not 'sexy' science that are easy to find funding for. Trying to continue a long-term observatory when you have to apply for funding every three or five years, in an increasingly competitive market, is tough," Findlay told Dialogue Earth.

"The cuts in the US will have repercussions for global ocean science… The rest of the world needs to pick up the shortfall. The problem is that in real-terms, cuts are being made in many countries."

That is the danger now facing ocean science, across the world. The ocean is absorbing heat, carbon and risk on a planetary scale. If the systems that track those changes are weakened, the loss will be felt far beyond science: in weather forecasts, fisheries, climate calculations and the protection of communities that depend on the sea.

(Source: https://www.eco-business.com/news/we-really-are-going-blind-scientists-warn-world-losing-sight-of-the-ocean/)

CHRISTIAN MEDICAL COLLEGE (CMC) VELLORE & IIITH DEVELOP - BANDHUCARE

A MULTILINGUAL AI COMPANION FOR CANCER PATIENTS

A multi-partner consortium led by Christian Medical College (CMC) Vellore, in collaboration with IIIT Hyderabad's Language Technologies Research Centre (LTRC), is developing BandhuCare – a multilingual AI companion that answers patients' queries in their own language, captures their symptoms through natural conversations, and helps clinicians understand what happens between hospital visits.

Between Appointments: A Desi Digital Companion Who's Got The Patient's Back

Is this side effect expected, or should I be worried? Can I eat normally again? Why is my throat still burning? Will my voice return? "These are questions that we hear every single day," says Dr. Balu Krishna, Prof. and Head of Radiation and Oncology, Unit II at CMC, Vellore. But these are also questions that patients sometimes forget to ask, are too overwhelmed to ask or questions that can't fit into a 10-minute consultation. While it is the reality of an overburdened healthcare system that leaves little room for prolonged conversations, the result is an invisible information gap – one that affects not just treatment, but the quality of life that follows. "There is an additional layer of a language barrier that exists with information modules existing only in English, which are again accessible only to a few, and this leads to unsafe care practices," he says.

BandhuCare seeks to bridge this gap through a multi-lingual AI-powered patient engagement platform designed specifically for cancer care. Bandhu means companion. And that's precisely what the team hopes the technology will become.

BandhuCare is the latest outcome of a long-standing partnership between Christian Medical College (CMC), Vellore and IIIT Hyderabad's

Language Technologies Research Centre (LTRC) – a collaboration that began not with AI chatbots, but with a much simpler problem of translating patient information and consent forms into Indian languages.

AN ASSOCIATION THAT HAS EVOLVED WITH TECH

The partnership began when CMC approached IIIT-H for help in translating patient information sheets and consent documents into Indian languages. For hospitals serving patients from across the country, communicating complex medical information in a patient's own language had long been a challenge. At the same time, for researchers at LTRC, it was an opportunity to develop language technologies in a real-world setting. "We realised there was tremendous scope for language technology to make a difference in healthcare in India, a domain previously unexplored," says Prof. Dipti Misra Sharma, who has been heading machine translation efforts at IIIT-H for decades.

The collaboration eventually grew into a formal MoU. While CMC provided domain expertise and anonymised medical data, IIIT-H developed machine translation technologies that could be refined using continuous feedback from clinicians. Over the years, that relationship has evolved alongside advances in language AI. "What started as machine translation with VaidyaDesk, an internal multilingual translation interface that allows hospitals to translate patient-facing documents, gradually expanded into multilingual patient communication, clinical decision support and conversational AI, laying the foundation for BandhuCare," explains Prof. Sharma.

A CHATBOT ROOTED IN CLINICAL CARE

Unlike consumer AI assistants that answer virtually anything, BandhuCare emerged after years of working closely with oncology patients and understanding where healthcare delivery quietly breaks down, not during diagnosis or treatment, but between hospital visits.

Dr. Hannah Mary Thomas, scientist, researcher and lead for the QIRAIL (Quantitative Imaging Research and AI Lab) at CMC, specialising in Medical Imaging, Radiomics, and Clinical Data Science, who has spent two decades bringing emerging technologies into clinical practice, has witnessed this challenge firsthand. "My work has always been about adapting existing technology so that it becomes part of routine clinical care". From introducing PET imaging into everyday diagnostics to building AI models for medical imaging, Dr. Thomas' focus has remained the same: to translate innovation into something clinicians can actually use.

While Large Language Models are powerful, in the healthcare domain, confidence without correctness can be dangerous. BandhuCare tackles this problem using Retrieval-Augmented Generation (RAG). Rather than trawling through the internet, the AI answers questions only from information carefully curated and verified by clinicians. "Suppose a patient asks: "When will my voice come back?", the answer comes not from generic online advice, but from hospital-approved clinical guidance specific to head and neck cancer patients undergoing radiation therapy. Plus, a second AI layer performs an additional safety check. Before any response reaches the patient, it verifies whether the answer genuinely comes from the approved medical knowledge base. If not, the system flags it instead of presenting potentially misleading information," explains Dr. Thomas underscoring the safeguards in place in an era where AI hallucinations remain a significant concern. Prof. Dipti adds, "The philosophy is simple: BandhuCare isn't designed to diagnose diseases or recommend treatments. It exists to answer routine questions, explain symptoms patients commonly experience, and guide them back to their healthcare team whenever clinical intervention is needed."

THE PROBLEM WITH PAPER AND MEMORY

Modern cancer care increasingly relies on Patient Reported Outcome Measures (PROMs) – structured questionnaires for general cancer, supplemented by disease-specific modules to capture the exact symptom burden, physical function, and emotional well-being. Questions range from general questions, such as, Do you need to stay in a bed or a chair during the day? Or have you had a lack of appetite?, to more disease-specific such as those for head and neck cancers that ask patients about symptoms such as pain, swallowing difficulty, fatigue or dryness of the mouth. Patients rate these experiences on a 4-point scale (Not at all, A little, Quite a bit, Very much) for the past week. The goal is simple: to understand how patients are actually doing between hospital visits. "The reality is much more complex," says Dr. Thomas. Patients are often asked to recall symptoms over several weeks. "How was your pain during the last three weeks? But human memory isn't built that way. A particularly painful episode from the previous day often overshadows everything else," she says.

This phenomenon, known as recall bias, means clinicians may receive an incomplete picture of how treatment is progressing. BandhuCare replaces these rigid forms with something far more natural. Instead of ticking boxes, patients simply have a conversation. Rather than asking someone to rate pain on a numerical scale, the app asks questions the way another person would. Did you have pain today? Was it manageable, or was it very severe? Behind the scenes, the AI converts these conversational responses into the standard clinical scores doctors need. "Patients type or speak naturally. And doctors receive structured medical data. Both sides get exactly what they need," explains Dr. Thomas.

JOURNALING BETWEEN APPOINTMENTS

"Of course, not every concern fits into a questionnaire," admits Dr. Balu, adding that some experiences may be deeply personal while others seem too minor to mention until they become serious. BandhuCare introduces journaling to capture these everyday experiences. Patients can note simple diary entries such as: Today I vomited three times. My mouth felt extremely dry. I couldn't swallow properly. And these entries could even be in the form of voice notes. Over time, the app creates a summary of everything that happened between hospital visits. Instead of trying to remember weeks of symptoms during a brief consultation, patients arrive with a clear record. Clinicians, in turn, gain valuable context before the appointment even begins.

CONSENT – BUT MAKE IT MEANINGFUL

One of BandhuCare's most innovative ideas circles back to one of the initial problems that the IIIT-H and CMC partnership began with. It concerns informed consent. In healthcare, patients often sign consent forms without fully understanding what they're agreeing to. BandhuCare proposes an interactive Consent Agent. Instead of presenting dense legal documents, the system explains consent in simple language and checks comprehension before asking patients to proceed. It's a small change with potentially profound implications for patient autonomy. "Consenting is often just a formality. We want to make it an active conversation," notes Dr. Thomas.

SPEAKING THE SAME TONGUE – LITERALLY

Another problem that BandhuCare tackles is that of supporting India's linguistic diversity. Most medical information sheets are written in English, filled with technical terminology that many patients neither read nor understand. The platform currently supports eight Indian languages, allowing patients to ask questions through text or voice in the language they are most comfortable with. Responses are delivered both as speech and as written text. This flexibility is especially important for head and neck cancer patients. "Radiation therapy often affects speech with some patients temporarily losing their voice," explains Dr. Balu. Additionally, there are others who may not be comfortable typing. For them, caregivers can step in and interact with the app on the patient's behalf. "We don't want patients adapting to technology. We want technology adapting to patients," affirms Dr. Thomas.

FROM DOCTORAL RESEARCH TO A STARTUP

This multilingual capability is powered by HimangY (HIndustani Machini ANuvaad TechnologY), a consortium project for Indian language machine translation developed under the Government of India's Bhashini programme. Among the technologies contributing to HimangY is Bhashaverse, the multilingual machine translation platform developed by IIIT-H researcher Vandan Mujadia during his PhD. His doctoral research focused on speech-to-speech machine translation for Indian languages, with the vision of enabling people speaking different languages to communicate seamlessly using AI. That work not only became part of the HimangY initiative but also laid the technological foundation for BandhuCare and later evolved into the startup Raven AI. Named after Reva, a monicker for the Narmada river, the startup was founded to take these language technologies into the real world, with BandhuCare becoming one of its first healthcare applications. "Just as a river flows and gives life to many, we want AI to reach and benefit millions of Indians, irrespective of their language," says Mujadia, adding, "We always felt that research should go beyond papers and reach actual users. Productizing the technology gave us an opportunity to test it on real problems and create tangible impact."

BandhuCare was awarded the prestigious IndiaAI-NCG CATCH Grant for Cancer 2026 at the AI Impact Summit in Delhi.

"BandhuCare is a real-world use case of that research," continues Mujadia. "We use multilingual AI to translate between Indian languages and English, breaking language barriers in healthcare through both voice and text." Today, Bhashaverse supports 36 Indian languages through both speech-to-text and text-to-text translation. "The chatbot and Bhashaverse perform complementary roles," explains Mujadia. "The large language model understands the patient's question and generates answers based only on verified healthcare information, while Bhashaverse allows patients to interact with the system in whichever Indian language they are most comfortable using." When a patient asks a question in Telugu, Tamil, Hindi or another supported language, Bhashaverse translates it into English for the large language model, which retrieves a clinically validated response before the answer is translated back into the patient's preferred language.

But the collaboration revealed something conventional evaluation metrics couldn't. While the translations were accurate, they however just didn't sound like how people actually speak. "Our models produced excellent Hindi, but it was textbook Hindi. Patients wanted their Hindi," remarks Prof. Sharma. That insight has led the LTRC team to fine-tune HimangY further so responses sound conversational rather than overly formal – a critical last-mile challenge for multilingual healthcare AI.

HELPING DOCS TOO

The platform isn't designed only for patients. It also supports clinicians working under severe time constraints. Instead of reading lengthy notes, doctors receive concise summaries of patient journals along with automatically generated PROM scores. If most entries revolve around swallowing difficulties, they

The LTRC team at IIIT-H

immediately know where to focus the consultation. If repeated questions concern nutrition, patients can be referred to dietitians. If conversations indicate emotional distress or concerns about body image, psychologists can be involved earlier. "We want to ensure that technology doesn't replace the clinician but instead help make every minute count," explains Dr. Thomas.

MULTI-PARTNER CONSORTIUM

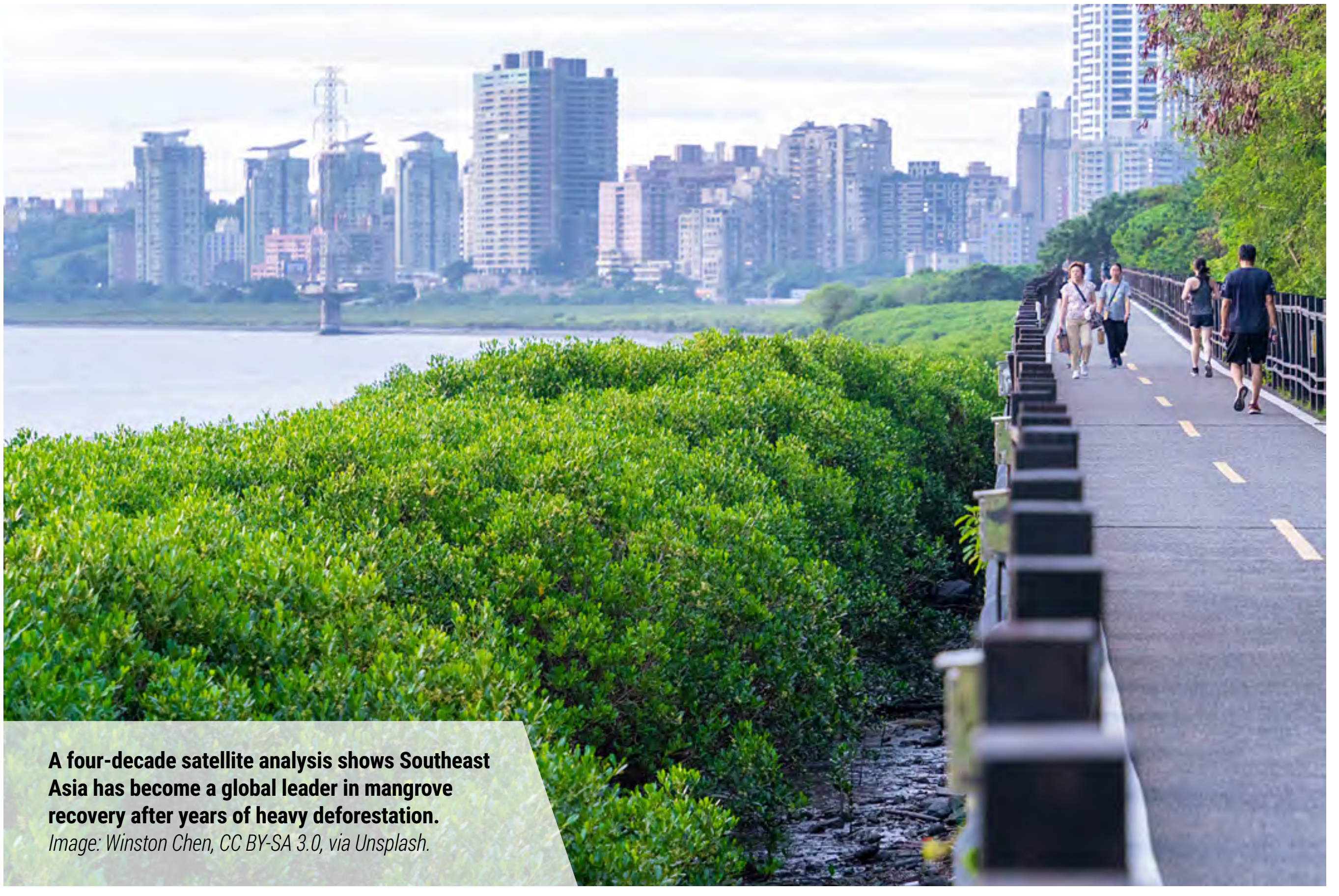
The consortium brings together clinical expertise from CMC Vellore, AI and language technologies from IIIT-H's Language Technologies Research Centre, startup partner Revan AI, AIIMS Guwahati as an external clinical collaborator, and patient advocacy organisation, PatientsEngage that ensures patient voices remain central to development. It is an apt model of translational research where clinicians, language technologists, entrepreneurs and patients have shaped the platform together from the outset.

REAL-WORLD IMPACT

The project has already crossed an important milestone. Supported by the National Cancer Grid and META's India AI initiative, BandhuCare has reached Technology Readiness Level 5, with ethics approvals in place for clinical pilot studies involving patients.

The next phase, which is the pilot study on real cancer patients and specifically head and neck cancer patients, is perhaps the most important. At CMC Vellore, head and neck cancers constitute one of the largest cancer burdens, giving clinicians deep expertise and years of experience in understanding not just the disease, but the long-term challenges patients face after treatment. It was within this clinical setting that the need for a solution like BandhuCare first became impossible to ignore. Radiation therapy for head and neck cancers often leaves patients dealing with swallowing difficulties, persistent dry mouth, changes in speech, dental complications and even altered facial appearance. These side effects can linger long after treatment ends, affecting confidence, relationships and the simple pleasures of daily life. "We've realised that survivorship itself is an unaddressed problem," says Dr. Thomas.

The clinical team wants to understand not just whether the technology works, but whether patients trust it, understand it, and genuinely find it helpful. Only then can it expand to other cancers – and eventually to chronic diseases such as diabetes, cardiovascular conditions and dialysis care.



A four-decade satellite analysis shows Southeast Asia has become a global leader in mangrove recovery after years of heavy deforestation.
Image: Winston Chen, CC BY-SA 3.0, via Unsplash.

MANGROVES ARE MAKING A COMEBACK IN SOUTHEAST ASIA: STUDY

After decades of decline, Southeast Asia is now driving global mangrove recovery, although protecting remaining old-growth forests remains critical, writes **Naina Rao**, Mongabay.com

For decades, Southeast Asia was the global epicentre of mangrove deforestation, but a recent study reveals a dramatic reversal: Since 2010, the region has transitioned from a net loss to a net gain in mangroves, making it a primary contributor to a global mangrove rebound.

The study, which analysed 40 years of satellite data, found that Southeast Asia accounted for nearly 60 per cent of global mangrove losses between the 1980s and 2010.

The region saw its highest rates of mangrove loss between 1990 and 2005. Since 2010, however, mangrove cover in the region has expanded, according to the study: Between 2010 and 2023, Southeast Asia accounted for roughly 43 per cent of global mangrove gain.

"Southeast Asia was a hotspot for deforestation and degradation in the late 1990s and 2000s," study co-author Zhen Zhang told Mongabay in a video call. "But after 2010, we see some very hopeful signals. It's a good story."

The transition in Southeast Asia is mainly due to shifts in mangrove cover in Indonesia and Myanmar, the study found.

In Indonesia, the expansion of the agricultural industry and the construction of aquaculture ponds had been the major drivers of mangrove deforestation in the country, Zhang said. Yet, the world's most mangrove-rich nation stopped seeing steep declines in its mangrove forest area after 2005.

Meanwhile, Myanmar, historically the most severely deforested major mangrove country, has seen a 10 per cent increase in area covered by mangrove since 2010, according to the study.

"While some mangroves are still being lost, this could make them a rare conservation success story and an important source of optimism for climate action," study co-author Daniel Friess from Tulane University, US, said in a press release.

Mangroves are critical ecosystems for carbon storage and protection against extreme weather such as storms and cyclones.

> **While some mangroves are still being lost, this could make them a rare conservation success story and an important source of optimism for climate action.**
>
> –DANIEL FRIESS
> Researcher, Tulane University

Zhang said strengthened legal protections, increased public awareness of the importance of mangroves following disasters such as the 2004 Indian Ocean tsunami, and the intrinsic resilience of the trees themselves are likely reasons for Southeast Asia's conservation success.

In particular, mangrove trees are good at naturally recolonising available habitats, such as abandoned aquaculture ponds, the study's authors write. They highlighted Indonesia's Mahakam Delta as an example where mangroves are regenerating in areas that were historically deforested for shrimp ponds. "These abandoned ponds actually provide a very suitable place for mangroves to recover," Zhang said.

Despite the gains, the study said that newly established mangrove forests are not yet functional equivalents to the ancient stands, groups of mangrove trees, they have replaced. Younger trees have underdeveloped root systems, making them more vulnerable to extreme weather, and they require decades to match the carbon storage capacity of mature forests.

"The most immediate and effective way to protect mangroves is to stop deforestation," Zhang said.

This story was published with permission from Mongabay.com.

(Source: https://www.eco-business.com/news/mangroves-are-making-a-comeback-in-southeast-asia-study/)

FUEL POLICY HAS BEEN FRAMED AROUND THE WRONG DEBATE

Policymakers are expected to choose between cleaner fuels and affordable fuels, between higher environmental standards and energy security, or between supply resilience and GHG emissions reduction, says **Asian Clean Fuels Association**

Recent geopolitical events have pushed energy security back to the top of the policy agenda. Governments are once again asking how to protect fuel supplies from geopolitical shocks, supply chain disruptions and growing market uncertainty.

It is the right question – but perhaps not the only one.

Too often, fuel policy is discussed as a series of trade-offs. Policymakers are expected to choose between cleaner fuels and affordable fuels, between higher environmental standards and energy security, or between supply resilience and GHG emissions reduction.

Recent articles by the Asian Clean Fuels Association (ACFA) and SGS INSPIREExplored this issue from different perspectives. In Will the Harmonisation of Fuel Specifications Help Reduce Supply Disruptions?, ACFA examined how harmonised fuel specifications can strengthen fuel supply resilience through greater product interchangeability and regional cooperation.

Similarly, in Standardise to Stabilise – How Fuel Quality Harmonisation Can Future-Proof ASEAN's Energy Supply, SGS explored how harmonised fuel quality can contribute to a more resilient and sustainable energy future for the region. Together, these perspectives reinforce an important message: fuel policy should not be developed around competing objectives. Rather, it can be designed to deliver multiple outcomes simultaneously.

Fuel specifications are a good example.

Traditionally, fuel standards have been viewed primarily as an environmental policy instrument. Cleaner fuels reduce harmful pollutants, improve urban air quality and allow modern vehicle technologies to perform as intended. These benefits remain fundamental and should not be overlooked.

However, fuel specifications also shape something far less frequently discussed: market resilience.

Every unique fuel specification narrows the range of accessible fuel sources. Variability in fuel quality can also cause safety and performance issues, which may impact fungibility across borders. Conversely, greater alignment of fuel specifications can expand procurement options, improve regional cooperation and provide governments with greater flexibility during extensive periods of supply disruption.

Therefore, fuel quality and energy security should not be considered as separate policy discussions because, increasingly, they are influenced by the same decisions.

This does not suggest that every country should adopt identical fuel standards. ACFA's recent analysis demonstrates that there is no universal model. Local refining capacity, vehicle fleet composition, infrastructure readiness and national policy priorities, including affordability of fuel subsidies, will always shape the most appropriate pathway. In some cases, additional requirements – including biofuel mandates – may even reduce supply flexibility if they unnecessarily limit sourcing options.

Successful fuel policy should therefore not be measured against a single objective. It should be evaluated on its ability to improve energy security, strengthen supply resilience, support cleaner transport and remain practical for implementation.

The point is not that every country should harmonise its fuel specifications, but that each fuel policy decision should be assessed against a broader set of objectives than is often the case today.

A policy that improves emissions but limits fuel availability has repercussions. Equally, a policy that strengthens supply security while delaying improvements in fuel quality will directly and immediately impact the environment and public health.

Successful fuel policy should therefore not be measured against a single objective. It should be evaluated on its ability to improve energy security, strengthen supply resilience, support cleaner transport and remain practical for implementation. This is a tough balancing act for both the private and public sectors.

As global fuel markets evolve, refining capacity shifts across regions and transport technologies continue to diversify, fuel specifications will influence far more than emissions performance. They will increasingly determine how resilient fuel markets remain during future disruptions and how quickly countries can respond when supply chains come under pressure.

If we continue to approach fuel quality, supply resilience and environmental performance as separate conversations, we risk overlooking solutions that can advance all three together. Collaboration across industry and policymakers is key to ensure consumer needs are all-roundly well addressed.

(Source: https://www.eco-business.com/press-releases/fuel-policy-has-been-framed-around-the-wrong-debate/)

75% OF SOUTHEAST ASIA'S FUTURE RENEWABLE ENERGY'S GENERATION CAPACITY UNDER THREAT

HOWEVER, US$82 BILLION IN LOSSES CAN BE CIRCUMVENTED

Targeted investment in climate resilience could help Asean members mitigate up to US$82 billion in potential losses to renewable energy infrastructure, according to a new energy resilience report by Zurich Insurance.

The report finds that of the 1,380 existing and future renewable energy generation sites across Asean (excluding Timor Leste), 75 per cent of the total capacity is projected to face severe climate risk exposure by 2030, putting approximately US$165 billion in renewable energy assets at risk across the region.

Zurich's analysis shows that resilience must be built into the region's clean energy growth from the outset. An upfront investment of approximately US$13 billion in resilience measures would reduce the forecast financial exposure from climate events by 40 per cent to 50 per cent, delivering an estimated 6.5x return on investment.

The findings highlight a major opportunity for governments, investors, developers and insurers to protect the region's clean energy build-out as climate hazards intensify.

Southeast Asia is entering the largest clean energy build-out in its history. Countries in the region are targeting renewable energy to account for 45 per cent of installed power capacity by 2030, up from 33 per cent today, as part of the Asean energy plan. Achieving these goals will require clean energy investment to reach around US$190 billion by 2035 – roughly five times current levels.

The financial case for early action is clear: By embedding resilience into planning, financing, design and construction, Asean can reduce future losses, improve insurability and bankability, and strengthen the long-term reliability of its clean energy transition.

Mark Fletcher, Head of Zurich Resilience Solutions, Asia Pacific, Zurich Insurance, said: "Southeast Asia has a clear opportunity to protect the value of its clean energy transition before losses materialise. Our analysis shows that targeted resilience investment can significantly reduce future climate-related losses, while also improving the insurability, bankability and long-term performance of renewable energy assets. Embedding climate resilience into planning, design, procurement, financing and operations from the start is critical to ensuring the region's renewable energy build-out delivers reliable power and durable long-term returns."

The report sets out five practical actions to help governments, investors, developers and operators move from risk identification to resilience investment:

- **Make climate risk screening mandatory at planning and permitting:** Forward-looking climate screening should become a standard requirement for site selection, project approval and permitting. Historical baselines are no longer sufficient for assets expected to operate into the 2050s and beyond. Early screening also allows resilience measures to be introduced when costs are lower and design flexibility is greatest.
- **Stress-test the highest-risk assets first:** With 75 per cent of assessed renewable energy capacity projected to sit in Categories 4 and 5 by 2030, Zurich recommends prioritising the most exposed projects for multi-hazard stress-testing. This can help quantify potential losses, identify the dominant risk drivers and create a clear investment roadmap for resilience action.
- **Build hazard-specific resilience into procurement:** Long-term resilience is often determined before an asset is built. Zurich recommends embedding requirements such as wind loading, hail resistance, flood elevation, drainage, fire protection, corrosion resistance and redundancy into design and procurement standards, rather than treating them as optional upgrades.
- **Treat system resilience as part of asset resilience:** Renewable energy assets depend on the wider network around them, including grid infrastructure, interconnection, access roads, water systems, communications and emergency response. Zurich recommends extending resilience planning beyond the project boundary to support faster recovery after severe climate events.
- **Use resilience quantification to unlock capital:** Resilience can be translated into financial terms. By showing how upfront design investment can reduce value at risk, improve insurability and strengthen bankability, asset owners and developers can create a stronger basis for engagement with lenders, insurers and investors.

The recommendations are grounded in Zurich's analysis of the

Southeast Asia is entering the largest clean energy build-out in its history. Countries in the region are targeting renewable energy to account for 45 per cent of installed power capacity by 2030, up from 33 per cent today, as part of the Asean energy plan.

scale, concentration and nature of climate exposure across the region's renewable energy pipeline.

THE SCALE OF EXPOSURE UNDERLINES THE NEED FOR ACTION

Zurich's analysis shows that while resilience investment can materially reduce future losses, the scale of exposure across Southeast Asia's renewable energy pipeline is significant and growing.

- **US$165 billion in renewable assets is exposed:** Zurich's analysis estimates that approximately US$165 billion in renewable energy infrastructure across Southeast Asia could be at risk without effective resilience measures.
- **Exposure is widespread and intensifying:** By 2030, 75 per cent of the region's pipeline generation capacity, approximately 181,000 MW, enough to power 180 million households for a year, to is projected to sit in the top two risk bands, Category 4 and 5.
- **Four hazards pose critical risks:** Wind, flooding, hail and tornadoes rank as "very high" risk hazards across the report, each linked directly to material loss mechanisms, including civil works damage, substation failure, module degradation and compromised turbine structures.
- **Solar carries the most pronounced near-term exposure:** With 731 sites generating 117,884 MW, solar represents the largest technology in Zurich's data set. By 2030, 80 per cent of solar sites are projected to fall into Category 4 and 5 risk.

Amar Rahman, Global Head Sustainability & Climate Solutions, Zurich Insurance added: "The science is clear that physical climate risks are not a distant consideration for renewable energy infrastructure. These are long-life assets that will be exposed to a range of extreme weather events, from water stress, heat and flooding to hail and extreme wind. Forward-looking climate data gives asset owners and investors a clearer view of dominant risks, potential losses and where resilience investment can have the greatest impact on revenues."

RESILIENCE MUST BE BUILT IN FROM THE START

Zurich's analysis shows that resilience measures are most effective when embedded during the design and construction phase, when engineering flexibility is greatest and costs are lower. Beyond reducing physical damage, resilient assets are also easier to insure, easier to finance and better positioned to deliver reliable long-term performance.

Zurich modelled a project scenario to demonstrate the value of early resilience action. Without resilience measures in place, a severe hail event could cause damage estimated at approximately 90 per cent, resulting in an estimated maximum loss (EML) of approximately US$178.5 million in property damage, with significant additional business interruption exposure and a recovery period of up to 21 months. The addition of a single-axis tracker system with an automated hail stow function could materially reduce that exposure, improving both insurability and bankability. This level of resilience can directly influence insurer appetite, lender confidence and the long-term performance assumptions underpinning renewable energy projects.

Tulsi Naidu, Chief Executive Officer, Asia Pacific, Zurich Insurance added: "Resilience is most effective when it is engineered into a project from the start, rather than retrofitted after a loss has occurred. For renewable energy developers, this is increasingly becoming a bankability and insurability issue. Projects that can demonstrate how risk has been assessed, quantified and reduced will be better positioned to attract capital, secure insurance capacity and deliver reliable long-term performance."

As Asean accelerates its clean energy build-out, resilience must become a core part of how renewable energy projects are planned, financed, insured and operated. The quality of project development will matter as much as the quantity of capacity installed. Embedding resilience from the start will be critical to protecting asset values, maintaining insurability and ensuring the region's energy transition delivers reliable power and durable long-term returns.

> **Resilience is most effective when it is engineered into a project from the start, rather than retrofitted after a loss has occurred. For renewable energy developers, this is increasingly becoming a bankability and insurability issue.**

(Source: https://www.eco-business.com/press-releases/75-of-southeast-asias-future-renewable-energys-generation-capacity-under-threat-but-us82-billion-in-losses-can-be-circumvented/)

The FAO recently released its State of World Fisheries and Aquaculture (SOFIA) report, a biennial collection of data that policymakers, scientists and civil society groups rely on.
Image: Paul Einerhand, CC BY-SA 3.0, via Unsplash.

SEAFOOD TRADE NEARLY EQUALS MEAT TRADE WORLDWIDE, FAO FINDS

The report projects continued growth in aquatic animal production from both fisheries and aquaculture, but warns that achieving it sustainably and equitably will require greater investment, effective governance and continued innovation.

Rapid aquaculture growth has pushed farmed aquatic animal production to more than 100 million metric tons per year for the first time ever, boosting the trade value of all aquatic animal products almost to parity with the trade value of land-produced meat.

That's according to the latest "The State of World Fisheries and Aquaculture" (SOFIA) report from the United Nations Food and Agriculture Organization (FAO). The 2026 installment of the report, a biennial collection of data that outlines FAO's vision for the fishing and aquaculture sectors, was released June 16 at the 11th Our Ocean Conference in Mombasa, Kenya.

"The [aquaculture] sector is evolving very rapidly," Manuel Barange, director of the FAO's Fisheries and Aquaculture Division, told Mongabay. "It's now achieving levels that fisheries never did. And that is positive because there's no doubt about it that we're going to be 10 billion in just a couple of decades or three. And everyone has a right to food."

> **There are still too many fisheries around the world that are not sustainably exploited. It's very easy to just blame illegal fishing, as many people do, and illegal fishing is a problem. But actually, the biggest problem is insufficient management of fisheries.**
>
> –MANUEL BARANGE
> Director, Food and Agriculture Organization Fisheries and Aquaculture Division

CONNECTING SCIENCE AND POLICY

SOFIA is "one of the most authoritative reports we have," Paul Orina, director general of the Kenya Marine and Fisheries Research Institute, said at a Mombasa press conference to launch the report. Its value lies in how it "connects science with policy," he said.

The FAO has been giving policymakers, scientists and civil society a deep dive into the global fisheries and aquaculture sectors since 1995, with SOFIA 2026 bringing in data through 2024. The flagship report reviews FAO and broader UN statistics, including those FAO has been collecting on around 500 fish stocks globally since 1974. It provides data, analysis and projections that inform decision-making internationally, and documents measurable progress of FAO's Blue Transformation. This road map for meeting the UN's Sustainable Development Goal 14 (SDG 14), Life Below Water, by 2030, was launched in 2021. It aims to improve the social, economic and environmental sustainability of aquatic foods, and to feed more people more equitably despite growing challenges from climate change, pollution and biodiversity degradation.

KEY TAKEAWAYS FROM SOFIA 2026

Total global fisheries and aquaculture production, including algae as well as animal products, hit a record-breaking 235 million metric tons in 2024, the report said. Aquatic food systems employ a steady 65 million people directly, and more than 40 per cent of humans rely on aquatic foods for at least 20 per cent of their protein intake, according to SOFIA 2026.

Average global availability of aquatic foods for human consumption now stands at more than 21 kilograms (46 pounds) a year per person, up from 20.7 kg (45.6 lbs) in the previous SOFIA, published in 2024. But this ranges from just 9.1 kg (20 lbs) in Africa to 26.3 kg (58 lbs) in Asia. The report calls for targeted policies to ensure growth translates into more equitable access and improved food security.

The global trade value of farmed and fished finfish, crustaceans and mollusks reached US$183.1 billion, according to the report. This is only about 1 per cent less than the US$185.3 billion trade in beef, pork and chicken, it noted.

The report valued aquaculture at US$391 billion at farm gate (straight from producers), up more than 8 per cent on the valuation given in the previous SOFIA. Asia continues to dominate the aquaculture sector, producing around 89 per cent of all farmed aquatic animals and 92 per cent of total aquaculture products, but 47 countries now produce more through aquaculture than through capture, or wild, fisheries.

Wild-caught fish tipped the scales at a stable 92 million metric tons in 2024, the report said, which is within the 86 to 94 million metric ton range it's held since the late 1980s.

Previous SOFIAs have included data for around 500 fish stocks. SOFIA 2026 drew on data from 2,665 fish stocks, covering an estimated 70 per cent of the global total. The dramatic rise is mostly the result of the disaggregation of stocks that were formerly assessed as single units, Barange said.

For instance, there are 12 Mediterranean, or European, hake (Merluccius merluccius) stocks that previously were aggregated and counted as one, but are now assessed separately. Now, data on each stock is published individually to give countries information relevant to their own sustainable policy development.

WORK NEEDED TO REACH SUSTAINABLE MANAGEMENT

The share of sustainably fished stocks declined to 62.4 per cent, a 2.1 per cent reduction since the 2024 SOFIA report, which continued a long-term trend. The remaining 37.6 per cent of stocks are "overfished."

"There are still too many fisheries around the world that are not sustainably exploited," Barange said. "It's very easy to just blame illegal fishing, as many people do, and illegal fishing is a problem. But actually, the biggest problem is insufficient management of fisheries."

FAO estimated that, by volume, 72.6 per cent of the capture fisheries landings assessed in 2023 were from "sustainably fished stocks." SOFIA 2026 attributed this to more effective management of larger, more productive stocks than of low-value stocks.

High-value, high-yield stocks like those of various tuna species attract investment in management, including stock assessment, because they are lucrative, Barange said. While low-value stocks, such as Senegalese sardinella (genus Sardinella), would be "financially crippling" to set up management for.

"It's clear that sustainable, science-based management of fisheries works," Laura McDearis, US program director of the Marine Stewardship Council, a UK-based seafood certification nonprofit, told Mongabay in an emailed statement. This "cause for hope" highlighted by SOFIA 2026 is tempered by the report's "stark warning" that overfishing remains a major global issue, she added.

There is currently no agreed index for measuring the ecological sustainability of aquaculture. But it, too, needs to be managed sustainably, Barange said, highlighting FAO's Guidelines for Sustainable Aquaculture.

Inland aquaculture is dominated by finfish at almost 89 per cent, while molluscs make up the biggest share of marine aquaculture at almost 53 per cent, the report found.

Many farmed aquatic animals, such as salmon and shrimp, are typically fed products that include wild-caught fish, which drives overfishing, damaging biodiversity and the livelihoods of small-scale fishers. The waste from fish farms can also pollute waterways, and overcrowding promotes disease that can devastate local aquatic life. Farming molluscs is usually less damaging. Done right, it can even improve water quality, according to a 2026 Fisheries Research study.

Aquaculture and fisheries must both be managed responsibly to maintain the health of the ecosystems people rely on for the benefits of aquatic products. "But the continued success of blue foods needs more than this," Chris Ninnes, CEO of the Netherlands-based Aquaculture Stewardship Council, which oversees independent certification of farmed seafood products that pass environmental, social and labour standards, told Mongabay.

SOFIA 2026 puts improved and equitable livelihoods at the heart of a successful blue transition, he noted, but there must be recognition that fishers and farmers "are the pathway to success" to sustainably produce aquatic food.

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FUTURE PROJECTIONS

SOFIA 2026 forecasted that aquatic animal production from fisheries and aquaculture will grow to 214 million metric tons by 2034, but suggested the growth rate will likely slow between now and then. Aquaculture will continue to drive growth, especially in Africa, while fisheries are likely to rebound slightly to 95 million metric tons.

Sustainable development of both sectors is achievable, the report said. But it warned that without sufficient investment, effective governance and innovation "growth will outpace equity and sustainability."

Climate change will likely cause some fish stocks to move further toward the poles, the report noted, which may redistribute fishing opportunities. SOFIA 2026 called for integrated fisheries management adaptation measures to mitigate impacts on regions most likely to suffer reduced stocks.

"Perhaps the biggest message in this report is that there are solutions out there that are working. It's not just about problems," Barange said.

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Source: https://www.eco-business.com/news/seafood-trade-nearly-equals-meat-trade-worldwide-fao-finds/

Scientists say the new panel aims to provide governments with independent, practical guidance to accelerate fossil fuel phaseout and shape national energy transition roadmaps.
Image: UNclimatechange, CC BY-SA 3.0, via Flickr.

INSIDE THE ENERGY TRANSITION'S NEW SCIENTIFIC ADVICE PANEL

Launched at Colombia's fossil fuel phaseout summit, the SPGET faces multiple challenges as it races to deliver in time for COP31, writes **Fermín Koop**, Dialogue Earth

A new scientific panel dedicated to the energy transition aims to put fossil fuel phaseout roadmaps at the heart of climate policy. Announced in April at the inaugural Transition Away conference in Santa Marta, Colombia, the panel will produce regular technical reports to guide governments in accelerating the shift to clean sources of energy.

A group of leading energy scientists from around the world is beginning to define the panel's structure and organisation. But many unanswered questions remain: how will it deliver useful information in the required timeframe? How will it balance the competing needs of nations? And will it really be able to play a significant role in addressing the climate crisis?

WHO WILL BE ON THE SCIENCE PANEL AND HOW IS IT STRUCTURED?

The idea for an independent science panel first came from André Corrêa do Lago, who in 2025 presided over the UN Framework Convention on Climate Change's most recent major summit, COP30 in Brazil.

Do Lago asked the environmental scientists Carlos Nobre, from Brazil, and Johan Rockström, from Sweden, to envision what it could look like. They then presented their suggestions in Santa Marta, introducing the three co-chairs and four working groups. This became the Science Panel for the Global Energy Transition (SPGET).

The panel is chaired by Ottmar Edenhofer, who directs the Potsdam Institute in Germany, Gilberto Jannuzzi, a researcher at the State University of Campinas (Unicamp) in Brazil, and Vera Songwe, a development finance expert from Cameroon.

About 80 scientists will form working groups across four key areas: transition pathways, technological solutions, policies and finance.

> **Many countries are not interested in phasing out quickly. Our ambition has to accommodate the timing and the resources we have – but without compromising the quality of the output.**
>
> –GILBERTO JANNUZZI
> Researcher, State University of Campinas

Jannuzzi and Songwe told Dialogue Earth that some of these scientists have already been invited. One aim has been to cultivate balance in terms of both gender and geography.

"We want to gather researchers from the Global South and the Global North and produce applicable knowledge to help decision-makers put their energy transition roadmaps into practice," Jannuzzi said. "Some countries need technical guidance on how to accelerate their energy transition, and we can help them with our shared knowledge."

They are actively seeking funding from donors for the panel, which will have its secretariat in São Paulo.

WHAT WILL THE SCIENCE PANEL FOR THE GLOBAL ENERGY TRANSITION DO?

At COP30, more than 80 countries called for a roadmap to phase out fossil fuels. Two years earlier, COP28 had climaxed with an agreement to "transition away from fossil fuels" but no detail on how. While the development of a roadmap did not make it into the final text of COP30, the Brazilian presidency agreed to continue working on this beyond the conference. A global roadmap is now expected to be unveiled in November, at COP31.

Simultaneously, the 57 nations represented at the Transition Away conference have agreed to develop national phaseout roadmaps. So far, France is the only country to have published one. Colombia's is being drafted.

The SPGET will provide scientific analysis to support both efforts. The first report, likely a global policy brief, will be presented at COP31 in November in Türkiye.

Unofficially, this work had already begun. About 400 academics participated in Santa Marta at a science pre-conference, where they presented a report with global recommendations for the energy transition. These include: banning new fossil fuel infrastructure and retraining associated workers, phasing out fossil fuel subsidies and banning advertising related to the industry, and reducing financing costs for renewable sources of energy.

"There is consensus on the general features that a just energy transition should have," Paola Yanguas Parra, policy advisor at the International Institute for Sustainable Development (IISD), told Dialogue Earth. "Academia can give an important direction to the political process of the roadmaps, first with Santa Marta and now with the science panel."

Antonio Hill, a just energy transition adviser for the Natural Resource Governance Institute (NRGI), agreed: "The panel can be a good complement to the international architecture that has emerged to support the roadmaps since COP30. But it won't change the scenario by itself; a lot more needs to happen, particularly on government actions."

How will the SPGET interact with governments and other panels?

The world's leading climate science body, the Intergovernmental Panel on Climate Change (IPCC), requires countries to approve each of its reports. This has led to a politically disputed process, with some countries trying to weaken the recommendations. To avoid this, the SPGET will not go through a governmental approval process.

The panel will still engage with governments, Jannuzzi and Songwe said, and focus areas will even be guided by them. "Our reports will be demand-driven," Songwe told Dialogue Earth. "This might be from local, regional or national governments but also from requests coming in from the private sector and civil society."

Hill said the panel should tread carefully in how it engages with governments: "There needs to be a space where governments can explore without being pressured to commit. Avoiding a prescriptive approach makes sense. The ideal relationship would be for governments to develop enough trust to link the panel's contributions to their policies."

Songwe said the panel will not duplicate or replicate work already done by the IPCC or other bodies such as the International Energy Agency (IEA): "We are here to find what the optimal transition pathways are and provide guidance to stakeholders. And also to highlight the importance of why the transition has to be made, showing the cost of inaction."

The overall objective will be to help countries create and apply their roadmaps, giving them tools to boost electrification, ensure the transition is done in a just and equitable way, and to make the roadmaps feasible and applicable, Jannuzzi said.

The members of the four working groups will meet regularly, likely every month, to produce their reports. When doing so, they will be advised by non-governmental stakeholders, such as the private sector and Indigenous representatives. This will be complemented by a board of trustees, who will have oversight of the whole process, as well as external reviewers.

> **The overall objective will be to help countries create and apply their roadmaps, giving them tools to boost electrification, ensure the transition is done in a just and equitable way, and to make the roadmaps feasible and applicable.**

WHAT ARE THE CHALLENGES?

The panel wants to be "much faster" than the IPCC, Jannuzzi said. It can take between five and seven years for the IPCC's assessment reports to be completed: "Our process has to be sound, credible and quick. We are very aware of the timing." This will not affect the quality of the reports, Jannuzzi and Songwe said.

But Yanguas Parra, while supportive of the initiative, noted that producing rigorous scientific work takes time: "If it's done well, there could be strong results. If not, it could end up undermining the science rather than strengthening it."

Funding is another open question. Jannuzzi acknowledged the panel is still in its early stages, and that "nothing happens if we don't have enough funding." Songwe confirmed that a funding gap needs to be closed. The panel is seeking contributions from governments, as well as from philanthropic foundations and other donors.

Yanguas Parra warned that scientists from the Global South could end up contributing to panel work without being paid – on top of heavy teaching loads – compared with counterparts at well-resourced northern universities. This could potentially skew both the panel's independence and the balance of its geographical spread.

Then there is the question of whether governments will listen. Hill welcomed the panel as a useful addition to the international architecture that has emerged around transition roadmaps since COP30. But he was also cautious about its limits.

Jannuzzi acknowledged that, at COP30, the energy transition was effectively sidelined because "many countries are not interested in phasing out quickly." The panel will be operating in that political environment: producing transition reports for governments that remain seemingly ambivalent.

"Our ambition has to accommodate the timing and the resources we have – but without compromising the quality of the output," Jannuzzi said.

The first test will come at COP31 in Türkiye this November, when the Science Panel for the Global Energy Transition files its inaugural report.

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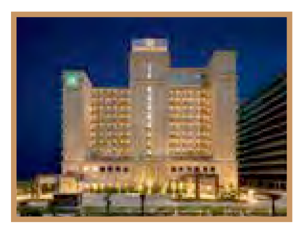

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