

PRESERVE REGION'S CULTURAL

Cultural heritage is the living soul of a region. It embodies the collective memory, traditions, languages, art forms, rituals and values that define the identity of a people. In an age of rapid urbanisation, technological advancement and global cultural homogenisation, preserving regional cultural heritage has become both a responsibility and an urgent necessity.

Every region carries a unique historical and cultural narrative shaped by centuries of human experience. Folk traditions, indigenous languages, music, dance, architecture, crafts and oral histories are not merely relics of the past; they are living expressions that continue to influence social behaviour and community values. When such heritage is neglected or lost, societies risk losing their sense of belonging and continuity.

Modern development, while essential, often poses a serious challenge to cultural preservation. Unplanned urban expansion, commercialisation, environmental degradation and lack of awareness have led to the erosion of traditional lifestyles and historical sites. Younger generations, increasingly influenced by global trends, often drift away from local traditions, viewing them as outdated or irrelevant. This disconnect threatens the survival of cultural practices that have been sustained for generations.

Preserving cultural heritage does not mean resisting progress. Rather, it calls for a balanced approach where development and tradition coexist harmoniously. Governments, educational institutions and cultural organisations must work together to document, protect and promote heritage assets. Restoration of historical monuments, protection of archaeological sites and support for traditional artisans are essential steps in this direction. Equally important is the integration of local history, art and language into educational curricula, enabling young people to understand and appreciate their roots.

Community participation plays a pivotal role in heritage conservation. Local communities are the custodians of cultural knowledge and traditions. Encouraging festivals, folk performances, craft fairs and storytelling traditions helps keep cultural practices alive while also creating opportunities for sustainable livelihoods through cultural tourism. When communities take pride in their heritage, preservation becomes a shared mission rather than an imposed obligation.

The digital age offers new possibilities for cultural preservation. Digitisation of manuscripts, folk music, art forms and oral histories can safeguard them for future generations and make them accessible to a wider audience. Social media and digital platforms can be powerful tools to promote regional culture globally, fostering appreciation and respect beyond geographical boundaries.

Panchayat Advancement Index: Strengthening Data-Driven Decision-Making for rural transformation

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Across India's villages, a silent but powerful shift is underway. From a panchayat in Maharashtra installing CCTV and streetlights after scoring poorly on the "Women-Friendly Panchayat" theme to a village in Gujarat launching rapid sanitation drives after weak scores in the "Clean & Green Panchayat" category, the Panchayat Advancement Index (PAI) is beginning to reshape how grassroots development is planned and delivered. In many Panchayats, gaps noticed in PAI, such as low institutional delivery, poor waste management, or water scarcity, have directly triggered targeted interventions based on PAI scores.

These early use cases indicate a simple but powerful truth - when panchayats can see their strengths and weaknesses clearly, they act faster and more accurately. For decades, rural development in India relied heavily on manual reports, subjective perceptions and political priorities. Today, PAI brings a new model - transparent, data-driven & SDG-aligned, to the heart of rural administration.

Launched by the Ministry of Panchayati Raj, the Panchayat Advancement Index is India's first countrywide framework to measure the progress of Gram Panchayats using objective indicators across critical areas relating to sanitation, health, governance, women's empowerment, infrastructure, environmental sustainability, etc., organised across nine themes of Localisation of Sustainable Development Goals (LSDGs) derived from 17 SDG goals. Logically, the attainment of SDGs at the national level will require actions at the local level where Panchayats can play a pivotal role. In this context, PAI provides an evidence-based mechanism for tracking progress in achieving

the LSDGs and thereby SDGs in rural areas.

The Panchayat Advancement Index (PAI) is computed through a robust, multi-step process using 435 unique local indicators across nine themes. While the Ministry of Panchayati Raj develops the indicator framework in consultation with other Ministries, Departments and State Governments, the actual data is collected by Gram Panchayats and concerned line departments through a common portal, pai.gov.in, at the GP level, which is then validated through several administrative layers, including Gram Sabha verification. The score for each theme is derived from these indicators on a 0-100 scale which, in turn, determine the overall PAI score (0-100), based on which Panchayats are classified into five grades for comparison.

The inaugural survey for the financial year 2022-23 revealed interesting insights: of the 2.16 lakh Panchayats who submitted validated data, none qualified as "Achievers" (scores above 90), 0.3% were "Front Runners" (75-89.99), 35.8% were "Performers" (60-74.99), while a majority of 61.2% were "Aspirants" (40-59.99), and 2.7% were "Beginners" (below 40). States like Gujarat and Telangana topped the chart with the highest number of high-performing panchayats.

Realising its immense potential in strengthening grassroots governance, state governments are disseminating PAI scores among various stakeholders through workshops at block, district and state levels. Panchayats have also started displaying the PAI scorecards outside their offices for transparency and citizen engagement. Discussions on PAI scores is also one of the agenda in the Gram Sabha meetings.

PAI's strength lies in its practical use. Early signals show states like Gujarat using PAI scores for allocating special grants to weak Gram Panchayats to bridge critical gaps. Sikkim has decided to adopt the PAI score as a criterion for allocating perform-

ance grants under its 6th State Finance Commission. Across many states, PAI has become a key tool for evidence-based planning, helping Panchayats identify and prioritise focus areas in their Gram Panchayat Development Plans (GPDs). Karnataka, Tamil Nadu, Sikkim, Chhattisgarh, etc. are converting top-scoring Gram Panchayats as Panchayat Learning Centres, while States like Jharkhand, Bihar, Kerala, Punjab and Rajasthan are selecting such Gram Panchayats for curated exposure visits of PRIs. Several states now link PAI performances with recognition & awards. Maharashtra offers major awards under the Chief Minister's scheme; Sikkim and MP provide financial incentives, whereas Punjab, Jharkhand, UP, Arunachal Pradesh and Tripura felicitate high-scoring Panchayats at state-level events. PAI scores are increasingly embedded in structured training programmes and field workshops.

PAI has converted hard-to-understand social, economic, and environmental indicators into easy-to-understand themes that guides targeted planning and decision-making. Dashboards, scorecards, and digital tools assist in Panchayat-level governance that is based on evidence. However, PAI is still new; its first baseline report covers 2022-23, so there aren't many long-term case studies that show direct, measurable improvements. Due to uneven technical capacity, inadequate understanding of data points and inconsistent reporting systems, data quality varies across regions. Convergence among line departments and PRIs is improving but remains fragmented.

These are not challenges, but opportunities. Learning from this, the Ministry has now simplified the process for PAI 2.0 by reducing the number of unique indicators from 435 to 119, adopting more relevant and refined indicators, and improving workflows, making data collection easier and of

improved quality. The Ministry's clearer operational guidelines and easier processes have led to its adoption by almost all States/UTs, with more than 2.60 lakh panchayats participating in the second round against 2.16 lakh earlier, demonstrating a strong direction. A massive capacity-building programme has also been launched to improve the understanding of the indicators and data points among elected representatives, panchayat functionaries and line department staff.

The transformative potential of PAI cannot be overstated. PAI democratises data, enabling citizens to hold their elected representatives accountable, thereby deepening democratic governance. It promotes transparency and encourages healthy competition among panchayats. As thematic PAI scores are derived from several indicators linked to various sectors, PAI, by design, encourages collaboration among ministries and departments to achieve better development outcomes. What sets the PAI apart is its alignment with the global SDGs and its innovative localisation of these goals (LSDGs) at the village level. The model truly internalises the SDG principles by measuring development through PAI scores, which makes it a unique and potentially global best practice.

In sum, the Panchayat Advancement Index is a landmark initiative that redefines rural governance in India. It is a critical instrument to ensure that India meets its Sustainable Development Goals by 2030 through evidence-based, participatory, and decentralised development planning. As India strives for equitable growth and social justice in its pursuit of Viksit Bharat, the PAI stands as a beacon guiding panchayats from data to development, from insights to real impact.

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Viksit Bharat Young Leaders Dialogue: Unlocking Youth Leadership for Viksit Bharat

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India's growth story will be written by those who are shaping its ideas today. Across the country, young Indians are thinking deeply about how India can grow faster, govern better and become developed by 2047. Their ideas are emerging from campuses and communities, start-ups and sports fields, classrooms and village meetings. The real question is no longer whether the youth have something to contribute, but whether their ideas are given a credible platform to influence the nation's direction. The Viksit Bharat Young Leaders Dialogue (VBLYD) is designed to provide that very platform.

India today is home to the largest youth population in the world. It is therefore but natural that the direction of the nation's future will be shaped not merely by policies or institutions, but by the imagination, conviction and courage of its young citizens. This vast reservoir of Yuva Shakti is far more than a demographic advantage; it is India's greatest national asset, capable of driving innovation, strengthening democracy and propelling the country towards inclusive and sustainable development.

The aspirations of India's young generation are guided by a strong sense of purpose and possibility. Today's youth are not driven solely by person-

al advancement; they are equally motivated by a desire to shoulder responsibility and make a meaningful impact. They seek avenues where their creativity can translate into solutions, their energy into leadership and their ambition into service.

During my time as Youth Affairs and Sports Minister, I have had the opportunity to engage with young Indians in varied settings, on university campuses, in rural districts, at sports arenas and during youth-led community initiatives. What consistently stands out is the seriousness with which young people think about the nation's future. I recall meeting a group of rural youth volunteers who had organised informal learning centres in their villages. With limited resources but strong conviction, they were addressing gaps in education and skill development through locally designed solutions. Their ideas were practical, rooted in ground realities and driven by a clear sense of responsibility. Experiences like these reaffirm a simple truth: when young people are trusted and given space, they do not merely participate, they lead.

Inspired by the Prime Minister Shri Narendra Modi's call from the Red Fort to bring one lakh youth without political backgrounds into public life, the Viksit Bharat Young Leaders Dialogue was launched in January 2025 reimagining the National Youth Festival in an entirely new format. The response was unprecedented. Over 30 lakh young people engaged through the Viksit Bharat Challenge, more than two lakh essays

were submitted, and thousands of youth presented their ideas at the state level. The journey culminated at Bharat Mandapam in New Delhi, where 3,000 youth leaders interacted in a free-flowing dialogue with the Prime Minister, who spent several hours listening to their ideas and inspiring them to lead.

Beyond the numbers, it was the nature of engagement that made the Dialogue truly historic. It recognised, both in letter and spirit, that the voices of India's youth matter in shaping the India of 2047. Young participants were encouraged to think critically about national challenges, propose solutions and align personal ambition with collective purpose, bridging the gap between aspiration and action.

The strength of the Viksit Bharat Young Leaders Dialogue lies not only in its scale, but in its design. Diversity of thought, language, culture and lived experience is embedded into the very structure of the initiative. Youth from urban and rural India, students and professionals, innovators and grassroots leaders come together on a common platform. Multiple stages of engagement ensure that ideas are refined through dialogue and exchange, not filtered out by geography, language or background. In doing so, the Dialogue ensures that every young person who participates has both a voice and a platform to amplify it.

India's youth have always been at the heart of the nation's defining moments, from the freedom struggle to the building of the institutions of an

independent India. At every turning point, young Indians have stepped forward with courage, conviction and a willingness to lead. Today, the nation once again looks to its youth not just for participation, but for leadership and dynamism in co-creating India's growth story. The vision of Viksit Bharat at 2047 goes beyond economic progress alone; it calls for social harmony, environmental responsibility, technological stewardship and inclusive growth. These complex challenges require fresh thinking, adaptability and an ability to embrace the new: qualities that reside strongly in India's Yuva Shakti.

Building on the resounding success of a landmark first edition, VBLYD 2026, scheduled from 9-12 January 2026, signals a decisive leap from a national youth convening to a platform with global resonance. With new initiatives such as Design for Bharat and Tech for Viksit Bharat, and the inclusion of the international Indian youth diaspora, the dialogue expands beyond borders. Yet, at its heart, the mission remains unchanged: to empower young Indians to think boldly, create fearlessly, and lead with conviction.

The scale of this edition underscores the depth of that ambition. More than 50 lakh young people participated in the Viksit Bharat Quiz, the first stage of selection for VBLYD 2026, making it one of the largest youth engagement exercises of its kind. Over four intensive days, participants from every corner of the country will engage with leading

national and global voices, drawing upon practical insights, ideas, and visions that transcend disciplines and geographies.

What truly sets VBLYD 2026 apart, however, is that it gives our Yuva Shakti an opportunity not only to speak, but to be heard. The platform enables young Indians to articulate their ideas, aspirations, and solutions directly to the Prime Minister of India. On 12 January, observed nationwide as National Youth Day in commemoration of Swami Vivekananda, Prime Minister Shri Narendra Modi will personally interact with the youth at Bharat Mandapam, listening to how they imagine, and intend to shape, the future of Bharat.

As India advances towards the centenary of its independence, it demands the engagement of young individuals who possess the courage to imagine boldly and the resolve to translate ideas into meaningful action. More than a platform for dialogue, the Viksit Bharat Young Leaders Dialogue is a movement that calls upon young Indians to lead from the front, confront national challenges, and channel their ambitions towards building a Viksit Bharat.

A Viksit Bharat will be built by those who have the confidence to lead and the commitment to serve. India's youth are ready. The nation must be ready to walk with them.

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Cholesterol Could Power Tomorrow's Electronics

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It may seem unlikely that a molecule most often discussed in health debates could one day be central to the devices that define our digital future. Yet cholesterol, a fat-like substance commonly linked to heart health, is emerging as a surprising candidate in the quest for energy-efficient electronics. Researchers are discovering that cholesterol's unique molecular structure enables it to control the spin of electrons - a quantum property that holds immense promise for the next generation of computing and memory technologies. This emerging field, known as spintronics, could pave the way for devices that operate faster, consume less energy, and work in harmony with biological systems in ways previously thought impossible.

The allure of cholesterol in this context lies in its intrinsic characteristics. At the nanoscale, the molecule exhibits chirality, a form of molecular handedness that allows it to interact differently with electrons based on the orientation of their spin. Combined with its structural flexibility, cholesterol forms ordered assemblies that can be precisely tuned, offering a platform for molecular control that traditional materials struggle to achieve. By integrating cholesterol with selected metal ions, scientists can manipulate how electrons with particular spin orientations move through these assemblies, effectively controlling the flow of quantum information with chemical precision.

This potential has been demonstrated recently by scientists at the Institute of Nano Science and Technology (INST) in



Mohali, an autonomous research institute under India's Department of Science and Technology. Led by Dr. Amit Kumar Mondal, the team has developed cholesterol-based nanomaterials capable of filtering electrons according to their spin orientations by adjusting the type and concentration of embedded metal ions. Rather than relying on external magnetic fields or complex engineering structures, this approach uses chemical modifications to regulate spin behavior, marking a significant conceptual shift in materials design for spintronics.

The capability to control both spin "up" and spin "down" within a single material is particularly notable, because it allows for tunable spin information processing at the molecular level. This chemical tunability offers a simpler, more adaptable route to spin control compared to existing methods, which often require low temperatures or large magnetic fields to maintain performance. In effect, cholesterol trans-

forms from a biological molecule into a customizable quantum material, bridging the worlds of biology and electronics.

The implications of this work extend far beyond laboratory curiosity. As digital infrastructure grows driven by peak demand for artificial intelligence, cloud computing, and 5G connectivity - the energy cost of computing has become a central concern. Data centers alone are estimated to consume a significant share of global electricity, with some reports suggesting consumption levels approaching several percent of total power use. Traditional electronics, based on the movement of electron charge, inevitably lose energy as heat, driving up both operational costs and environmental impact. Spintronics offers a compelling alternative by relying on electron spin rather than charge, which leads to more energy-efficient data processing and storage.

The global market for spintronics reflects this growing interest. Various indus-

try forecasts indicate that the spintronics sector is expanding rapidly, with market valuations projected to grow significantly in the coming decade. Some projections suggest a transformation from a market measured in the low billions today to tens of billions of dollars within the next decade, driven in large part by expanding demand for magnetoresistive random access memory (MRAM) and other spin-based technologies. These technologies promise non-volatile memory that retains data without continuous power, faster access times, and reduced energy consumption compared to conventional memory solutions, making them attractive for data-intensive and edge computing applications.

Cholesterol's emergence as a spin control material aligns with this broader technological shift. While MRAM and related devices are already gaining traction in commercial applications, the addition of biologically derived materials like cholesterol offers fresh opportunities for optimization. The capacity to regulate spin with simple chemical interventions could lead to new classes of devices that are not only more adaptable but also easier to manufacture at scale than some existing spintronic materials. Moreover, as industries increasingly prioritize sustainability, the naturally abundant and biocompatible nature of cholesterol fits well with broader efforts to reduce reliance on resource-intensive materials and processes.

Beyond energy efficiency and performance, cholesterol-based spintronics may also enable deeper integration between electronics and biological systems. Because cholesterol is fundamentally biocompatible, devices built from or incorporating these materials could interface

more naturally with living tissue. This opens possibilities in bioelectronics, where flexible, low-power components could be used in medical sensors, neural interfaces, and wearable health monitors. Such devices could interact with biological signals with minimal interference, creating seamless links between digital systems and the human body.

Cholesterol's spin-selective properties could also have impact outside conventional computing. In chemical processing and pharmaceutical research, the ability to manipulate and separate molecules based on spin could enable high-precision molecular sorting and synthesis, facilitating the production of complex drug compounds or the isolation of specific chemical conformations with unprecedented accuracy. In a future where personalized medicine and targeted therapies become the norm, such capabilities will be increasingly valuable.

Despite its promise, the path to widespread adoption of cholesterol-based spintronic materials is not without challenges. Producing nanoscale assemblies with the exacting quality required for consistent performance remains a technical hurdle, and integrating these materials into existing manufacturing infrastructure will require careful engineering and industry collaboration. Stability over long operational lifetimes, compatibility with silicon-based fabrication processes, and cost-effectiveness are all critical considerations that researchers will need to address as they transition from proof-of-concept studies to real-world applications.

Yet the progress made so far underscores the importance of interdisciplinary innovation. Cholesterol's transformation from a molecule studied primarily in bio-

chemistry and medicine to a potential cornerstone of advanced electronic systems exemplifies how crossing traditional boundaries can yield unexpected insights. As researchers meld principles from biology, materials science, and quantum physics, they are redefining what is possible in electronics and computing.

Looking forward, cholesterol-based spintronic materials hold promise across a wide range of technologies. In computing and memory storage, they could underpin devices that operate with greater speed and lower energy requirements than today's standards. In quantum information systems, their chemical tunability could help overcome some of the stability challenges that currently limit practical quantum computing. In bioelectronics, their biocompatibility could facilitate new forms of human-machine interaction. At the same time, the continued growth of the global spintronics market - driven by demand for energy-efficient memory, sensing, and logic devices - suggests a fertile landscape for these innovations to take root.

In a world increasingly defined by the need for sustainability and performance, cholesterol's unexpected technological potential serves as a reminder that solutions can emerge from the most surprising places. A molecule once known mainly for its role in human health may soon help drive the next generation of electronics, enabling devices that are not only faster and more efficient but also more closely connected with the biological world. As research progresses and new applications are explored, cholesterol could move from being a subject of medical concern to a key ingredient in powering the technologies of tomorrow.

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