विज्ञान एवं
प्रौद्योगिकी मंत्रालय
MINISTRY OF
SCIENCE AND
TECHNOLOGY
सत्यमेव जयते

DST Technology Enabling Centre · University of Ladakh

Unlocking Potential, Igniting Innovation

DEPARTMENT OF SCIENCE & TECHNOLOGY · GOVT. OF INDIA

TEC Newsletter

Technology Enabling Centre, University of Ladakh

VOLUME
04
NOVEMBER 2026

Special Edition released at the 3rd Programme Advisory Group (PAG) Meeting · Leh Campus · 13 November 2026



ABOUT TEC-UoL

An ecosystem for technology in the Himalayas

The Technology Enabling Centre (TEC), University of Ladakh, is one of a national network of Technology Enabling Centres established by the Department of Science and Technology (DST), Government of India. It acts as a bridge between technology sources — research institutes, universities, innovators and industry — and end-users in Ladakh: identifying region-specific problem statements, sourcing appropriate and de-risked technologies, facilitating their transfer and adoption, strengthening the local innovation ecosystem, and enabling commercialisation.

TEC-UoL AT A GLANCE

09
technologies at various stages of development, validation and transfer

13
formal industry and institutional connects

3
patent filings (2 filed, 1 in pipeline)

16
regional technology gaps mapped in 2026

WHERE WE FOCUS

Agriculture & post-harvest
Storage, drying and shelf-life for apricot and vegetables.

Wildlife monitoring
AI camera networks that reduce human–wildlife conflict.

Disaster resilience
Early warning for floods, landslides and black ice.

Energy & enterprise
Off-grid solar systems and support for local start-ups.

> *“Ladakh faces problems for which no technology is being developed elsewhere in the country — extreme cold, isolation, thin cellular coverage. Our work starts from those problems.*

01 · LEAD STORY · WILDLIFE & TECHNOLOGY

AI-based Brown Bear Intrusion Detection System launched by the Hon'ble Lieutenant Governor of Ladakh

Wildlife Week Celebration 2026 · Protected Forest Park, Choglamsar, Leh · 7 October 2026



A night-time AI detection of a Himalayan brown bear at a field site, with the confidence score marked in green.

The Hon'ble Lieutenant Governor of Ladakh, **Shri Vinai Kumar Saxena**, launched an **AI-powered Brown Bear Intrusion Detection System** on 7 October 2026 during the Wildlife Week Celebration 2026 at Leh. The system has been developed by the **University of Ladakh, Kargil Campus**, with technical and developmental support from the **Technology Enabling Centre (TEC), University of Ladakh** and **iHUB DivyaSampark, IIT Roorkee**, to provide real-time alerts and strengthen the protection of communities and wildlife in areas prone to human–bear conflict. The product was launched digitally, at the click of a button, through a launch system built by TEC.

The launch took place in the presence of **Shri Ashish Kundra**, Chief Secretary, UT Ladakh; **Prof. Saket Kushwaha**, Hon'ble Vice-Chancellor, University of Ladakh; **Shri Rajesh S (IFS)**, Chief Wildlife Warden; and senior officials of the UT Administration and the Department of Forest, Ecology and Environment. The Lieutenant Governor praised the University for directing its academic research towards technology tailored to the region's environmental and geographical challenges.

WHY IT MATTERS

Himalayan brown bears increasingly raid crops, livestock pens and settlements in the Kargil and Zanskar regions. Existing measures are largely reactive and give communities no early warning of a bear's presence. The new system detects intrusions as they happen and alerts both residents and authorities in time for them to respond.

HOW THE SYSTEM WORKS

- **Edge AI and deep learning:** intelligent computing devices installed at field locations continuously monitor sensitive corridors, using computer-vision models to detect brown bears in real time.
- **Active tracking:** integrated Pan-Tilt-Zoom (PTZ) cameras automatically lock on to a detected bear and follow its movement.
- **Field-tested accuracy:** the system has reached **Technology Readiness Level 6 (TRL 6)** and recorded night-time detection accuracy of **more than 85 per cent** in field operations.

- **Automated alerts:** on confirming an intrusion, the system sends alerts and live visuals to residents, wildlife officials and guards through the **UoL WildWatch** app and backend, as well as WhatsApp and Telegram. Detection images are archived centrally for retraining the model.
- **Off-grid reliability:** field stations run on solar panel arrays with intelligent battery management, so they operate where grid power is unavailable or unreliable.

TEC-UOL'S ROLE

The system was first developed under the iHUB spoke of IIT Roorkee, but its original design depended on batteries and inverters to run AC-powered equipment, which made field deployment impractical. TEC-UoL **re-engineered the system to run entirely on DC solar power**, off-grid and without inverters; moved it into a splash-proof field enclosure; advanced it from **TRL 4 to TRL 6**; integrated the AI model with the UoL WildWatch backend; and **filed a patent (Application No. 202611007306)**. The Centre continues to maintain and monitor the field units.

IN THE FIELD

Capt. Vikram Batra Transit Camp, Drass
First deployment; under active monitoring

BRO Camp, Shargole
Recorded a real brown-bear intrusion in live conditions

Tashistondey, Rangdum, Zanskar
Installed at the request of WWF after the launch

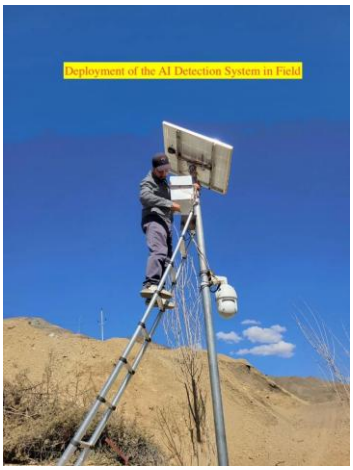
THE WAY FORWARD

TEC-UoL will work towards the formal transfer of the technology to the Wildlife Department, UT Ladakh, for wider deployment across bear-conflict zones. The design can also be adapted to other Himalayan regions, such as Jammu & Kashmir and Sikkim, with minor terrain-specific changes.

EVENT INFORMATION	
Date	7 October 2026
Time	2:00 PM
Venue	Protected Forest Park, Choglamsar, Leh, Ladakh – 194104
Developed by	University of Ladakh (Kargil Campus) with TEC-UoL and iHUB DivyaSampark, IIT Roorkee



The Hon'ble Lieutenant Governor launches the system at the Wildlife Week Celebration 2026.



A solar-powered detection unit being installed in the field.



Ladakh

The Earth News | 3
FRIDAY 9 OCTOBER 2026 | LEH

In Social

@FIREFURYCORPS Guarding The Skies At High Altitude ɪɴLt Gen Madanraj Pande, GOC #FireAndFuryCorps, witnessed firing of the AD Weapon System by Vyomari Vidhwansak Brigade at Field Firing Range to assess operational preparedness and equipment readiness.The GOC commended all ranks for their professionalism and high state of combat readiness. The firing demonstrated the formation's capability to maintain effective air defence preparedness in challenging high-altitude terrain.#IndianArmy #ArmyAirDefence

In Numbers

49

49: TB FreeAtleast 49 Gram Panchayats in Leh have achieved TB-free status, while Kargil has screened over 20,000 people under its TB detection drive, as JOSH teams step up grassroots screening and awareness across Ladakh.

TERRITORIAL ARMY India's Territorial Army was officially inaugurated on this day in 1949 by Governor-General C. Rajagopalachari. Built on the earlier British-era Territorial Army

History

LG Saxena launches AI system to detect brown bear intrusions, tackle human-wildlife conflict

EARTH NEWS SERVICE

LEH: Lieutenant Governor of Ladakh Vinai Kumar Saxena on Wednesday launched an AI-powered brown bear intrusion detection system developed to provide real-time alerts and strengthen protection of communities and wildlife in areas prone to human-bear conflict.

The technology was launched during the Wildlife Week Celebration 2026 in Leh in the presence of Chief Secretary, UT Ladakh, Ashish Kundra; Vice-Chancellor, University of Ladakh, Prof Saket Kushwaha; Chief Wildlife Warden Rajesh S (IFS) and senior officials of the UT Administration and Department of Forest, Ecology and Environment.

The system has been developed by the University of Ladakh, Kargil Campus, with technical and developmental assistance from iHUB DivyaSampark, IIT Roorkee, and the Technology Enabling Centre, University of Ladakh.

The Lieutenant Governor praised the University of Ladakh for advancing academic research towards developing technology tailored to the region's environmental and geographical challenges.

Designed for deployment in difficult mountainous terrain, the system uses edge computing and deep-learning algorithms to detect brown bears in real time. Intelligent computing devices installed directly at field locations continuously monitor sensitive areas, while integrated Pan-Tilt-Zoom (PTZ) cameras automatically track a bear's movement once detected. According to the information released, the system has reached Technology Readiness Level 6 (TRL 6) and has recorded detection accuracy of more than 85 per cent during night operations in field testing.

Once an intrusion is detected, the system automatically sends alerts and live visuals through communication platforms including WhatsApp and Telegram to local authorities and residents. The system is designed to facilitate faster response by providing real-time information on wildlife movement.

The technology has also been designed for locations without reliable electricity supply. Solar panel arrays with intelligent battery management systems provide power for field deployment in remote areas.

Two operational units have already been deployed in Drass and Shargole, identified as high-conflict zones. The units are currently monitoring brown bear movements and transmitting automated alerts when intrusions are detected.

The launch as reported in the regional press (The Earth News, 9 October 2026).

02 · CAPACITY BUILDING · INTELLECTUAL PROPERTY

TEC-UoL organises One-Day Programme on Intellectual Property Rights with CSIR-NCL experts

Conference Hall, Leh Campus • 18 November 2024

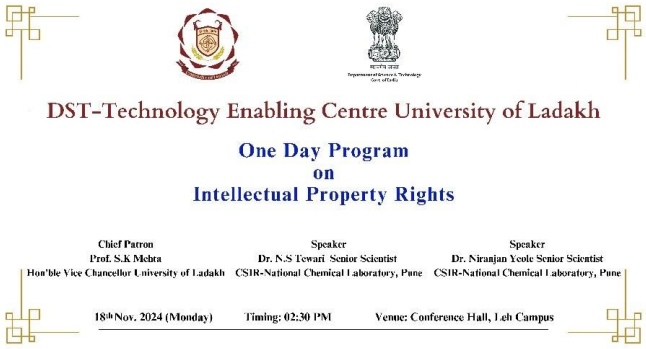
The DST-Technology Enabling Centre, University of Ladakh, organised a one-day programme on **Intellectual Property Rights (IPR)** on 18 November 2024 under the patronage of the then Hon'ble Vice-Chancellor, **Prof. S. K. Mehta**. The resource persons were **Dr. Nitin S. Tewari**, Senior Scientist, and **Dr. Niranjan Yeole**, Senior Scientist, Intellectual Property Group, both of the **CSIR-National Chemical Laboratory (NCL), Pune**.

Dr. Tewari covered the basics of patents, copyrights, Geographical Indication (GI) tags and trademarks, along with their filing procedures and the management of an IP portfolio, drawing on NCL's experience of championing technology innovation. The session explained the routes for national, regional and international protection, including the Patent Co-operation Treaty (PCT) and regional systems such as the African Regional Intellectual Property Organisation. Trademarks based on symbols, letters, colours, pictures, three-dimensional signs and holograms were discussed, as were national, regional and European community registration and trademark infringement.

Dr. Yeole then briefed participants on copyright: the rights it protects, types of rights, licensing and agreements, and the risks of infringement. The two experts concluded with a quiz that helped participants consolidate their understanding of patent filing procedures and of the legal aspects of copyrights and trademarks.

Faculty members, project staff and students from both the Kargil and Leh campuses took part. The programme laid the groundwork for TEC-UoL's own patent filings, two of which have since been made.

EVENT INFORMATION	
Date	18 November 2024 (Monday)
Time	2:30 PM to 4:00 PM
Venue	Conference Hall, Leh Campus, Taru-Thang, University of Ladakh, Leh – 194101 (with online participation)



Programme flyer for the One-Day Programme on IPR.



Participants from both campuses joined the session from the conference hall and online.

03 · TECHNOLOGY TRANSFER · AGRICULTURE & POST-HARVEST

GITAM TEC transfers Hybrid Solar Dryer technology to the University of Ladakh

DST-TEC event, University of Hyderabad • 10 January 2025

In an initiative aimed at empowering farmers and strengthening Ladakh's agricultural economy, the **GITAM Technology Enabling Centre (GTEC)**, GITAM University, Visakhapatnam, transferred its **"Hybrid Solar Dryer with Automatic Temperature Controller"** technology to TEC, University of Ladakh, on 10 January 2025, during a DST-TEC event at the University of Hyderabad. The technology was formally received by **Prof. S. K. Mehta**, then Vice-Chancellor of the University of Ladakh, from **Prof. Raja Phani Pappu**, Dean, GITAM School of Business and Coordinator, GTEC.

Speaking on the occasion, Prof. Mehta highlighted the potential of Ladakhi crops such as apricots — especially the renowned sweet **Halman** variety — and seabuckthorn berries, valued for their nutritional and medicinal properties. Inadequate drying and processing facilities mean that only a small share of the harvest is fully used, with **post-harvest losses of up to 30–40 per cent**. He said the hybrid dryer would enable efficient drying, reduce spoilage and help farmers use nearly their entire harvest.

Prof. Pappu observed that by minimising waste and producing high-quality dried products, Ladakhi farmers could significantly boost their incomes, since dried apricots and seabuckthorn are prized in health-conscious global markets. **Dr. Krishna Kanth Pulicherla**, Scientist-E, DST, credited the cross-talk series among TECs across India with helping TEC-UoL identify this solution to a challenge faced by the region's farmers.

The dryer was invented by **Dr. Karaka V.V.N.R. Chandra Mouli**, Manager, GTEC; **Dr. Ravi Kumar Gurazada**, former BARC scientist and GITAM Distinguished Professor; and **Mr. Sombhatt Shastri Ayyala**, COO, GTEC. The event was attended by **Dr. Sanjay Kumar**, Chief Scientist and Head, Metal Extraction & Recycling Division, and Professor,

AcSIR; the TEC-UoH team led by **Prof. S. Rajagopal**, Coordinator, and **Prof. G. S. Prasad**, former Coordinator; **Dr. Mehboob Ali** and **Dr. Mohd Rafee**, Co-Coordinators, TEC-UoL; and members of the GTEC team.

CURRENT STATUS

Following the Technology Transfer Agreement, TEC-UoL formed an expert committee to validate the dryer's suitability for Ladakh and optimise its drying parameters. GITAM has supplied the design for in-house construction at TEC-UoL. Once validated, the dryer is to be transferred to the Horticulture Department, supported by hands-on workshops for farmers, and proposed for inclusion in Ladakh's agricultural subsidy schemes.

EVENT INFORMATION	
Date	10 January 2025
Time	10:00 AM
Venue	DST-TEC event, University of Hyderabad



Exchange of the Technology Transfer Agreement between GTEC, GITAM and TEC-UoL.



Modular hybrid solar dryer units developed by GTEC, GITAM University.

04 · WORKSHOP · RENEWABLE ENERGY

Two-day Solar Rooftop cum Industry Connect Workshop with the Hydrocarbon Sector Skill Council

Hotel Grand Dragon, Leh • 27–28 January 2025

DST-TEC, University of Ladakh, in collaboration with the **Hydrocarbon Sector Skill Council (HSSC)**, organised a two-day workshop on **"Solar Rooftop cum Industry Connect"** to link budding local entrepreneurs and students with industry experts from reputed organisations, and to encourage the people of Ladakh to make greater use of solar energy.

The workshop was inaugurated by the Chief Guest, **Dr. Pawan Kotwal (IAS)**, Chief Secretary cum Advisor to the Hon'ble Lieutenant Governor, in the presence of **Prof. (Dr.) S. K. Mehta**, then Hon'ble Vice-Chancellor and Coordinator, TEC. The event was also graced by **Dr. Om Prakash Chaurasia**, Director, DIHAR Leh; **Shri S. K. Bose**, CEO, HSSC; and **Dr. Subhash Deshmukh**, Director, NCVET, MSDE, Government of India.

DAY 1

Welcoming the dignitaries, Prof. Mehta spoke on the scope of solar energy in Ladakh, government schemes and the entrepreneurship opportunities they open. Dr. Kotwal encouraged the people of Ladakh to install solar rooftops, pointing out that abundant year-round sunshine and open spaces make the region ideal for producing clean, renewable power.

Dr. Deshmukh spoke on the green-energy transition, the circular economy and ESG skills, presenting solutions such as floating solar, dual land use, bifacial panels, solar farms and e-waste recycling for solar applications. He described the transition as an opportunity to make energy cleaner, smarter and more equitable. Shri Bose highlighted the Skill India Mission and the benefits of the **PM Surya Ghar Muft Bijli Yojana**, along with entrepreneurship opportunities in solar energy and green hydrogen. **Shri B. N. Singh**, General Manager, WAAREE Energies, explained the basics of PV technology, the benefits of on-grid systems, the design of rooftop PV systems and the relevant IEC standards.

Participants also visited **NTPC's Green Hydrogen fuelling station** — the world's highest, at about 3,650 metres above sea level — to see solar-powered hydrogen generation and the hydrogen bus project.

DAY 2

The Guest of Honour, **Ms. Bhanu Prabha (IAS)**, Secretary, Higher Education, School Education and Skill Development, delivered the keynote on Ladakh's solar potential and urged the region's youth to build skills in identifying, assessing and diagnosing damage to solar panels. **Dr. Iftikar Ahmed**, Director, LAREDA, addressed the challenges of providing solar power to nomadic communities, including mobility and maintenance, called for portable solutions, and stressed that e-waste management be considered before solar components are adopted. **Shri Konchok Tharchin** of Demazong Enterprise shared his journey as a local entrepreneur, from identifying market needs to overcoming resource constraints.

Certificates were distributed to all participants, and the workshop concluded with a vote of thanks by **Dr. Mehboob Ali**, Co-Coordinator, TEC, who thanked the dignitaries, experts, faculty, organisers and participants.

EVENT INFORMATION	
Date	27–28 January 2025
Time	10:00 AM to 6:00 PM
Venue	Hotel Grand Dragon, Leh, Ladakh – 194101
Partner	Hydrocarbon Sector Skill Council (HSSC)



An address during the two-day workshop.



Dignitaries, experts and participants of the Solar Rooftop cum Industry Connect Workshop.

05 · OUTREACH · NATIONAL SCIENCE DAY

TEC showcases its work as Kargil Campus celebrates National Science Day 2025

Kargil Campus, Khumbathang • 28 February 2025

The University of Ladakh's Kargil Campus celebrated **National Science Day 2025** on 28 February, with the Hon'ble Vice-Chancellor, **Prof. (Dr.) Saket Kushwaha**, as Chief Guest. The day commemorates the discovery of the Raman Effect by **Sir C. V. Raman**, who received the Nobel Prize in Physics in 1930. Departments across the campus displayed their new technologies and research projects.

This year's theme, **"Empowering Indian Youth for Global Leadership in Science & Innovation for Viksit Bharat"**, encouraged young people to take the lead in science and contribute to a self-reliant India.

TEC used the platform to inform students and faculty about its services, including support for patent filing, mentorship, connections with industry experts, and technology commercialisation. Visiting the TEC stall, the Hon'ble Vice-Chancellor enquired about ongoing projects. The team briefed him on TEC's support for two major projects — the **Modern Root Cellar** at the Kargil Campus and the **Anti-Freezing Water Supply System** at the Leh Campus — and on technology transfers in progress, including the **Hybrid Solar Dryer** from GITAM TEC and the **Edible Food Coating** for apricots.

The Hon'ble Vice-Chancellor commended the TEC team for their work and advised students and faculty to make full use of TEC's resources for research and innovation.

EVENT INFORMATION	
Date	28 February 2025
Time	10:00 AM to 2:00 PM
Venue	Kargil Campus, Khumbathang, University of Ladakh, Kargil – 194103



The TEC stall at the National Science Day exhibition.



Celebrating National Science Day 2025 at the snow-covered Kargil Campus.

06 · EXPERT TALK · IPR & ENTREPRENEURSHIP

TEC-UoL Manager speaks on IPR at 5-Day IDE Bootcamp

Kargil Campus, Khumbathang · 15 May 2026

Mr. Shujaat Ali, Manager Technology, TEC-UoL, delivered an expert session on Intellectual Property Rights (IPR), commercialisation pipelines and startup funding stages on the final day of the **5-Day Innovation, Design and Entrepreneurship (IDE) Bootcamp** at the Kargil Campus, University of Ladakh.

The bootcamp, held from 11 to 15 May 2026 in collaboration with the **Ministry of Education**, the **All India Council for Technical Education (AICTE)** and the **Wadhwani Foundation**, aimed to cultivate an entrepreneurial spirit, nurture student-led innovation and foster startup development across the region.

His talk, **"Unlocking Innovation: Commercialisation, IP and Funding for Student Startups"**, served as a guide for turning raw ideas and research concepts into market-ready, protectable business assets. He stressed that universities are launchpads for tomorrow's companies, and set out the steps needed to take a prototype from the campus laboratory to the market while safeguarding its long-term value.

THE FOUR PILLARS OF IP

- **Patents:** protect new inventions, technical solutions and processes for up to 20 years.
- **Trademarks:** safeguard brand identity, logos, slogans and names for 10 years, renewable.
- **Copyrights:** protect creative expression, software code, media and user manuals.
- **Trade secrets:** secure proprietary formulas, internal algorithms and know-how indefinitely, without public disclosure.

He also highlighted the **Startup India advantage**: DPIIT-recognised startups receive an 80 per cent rebate on patent filing fees and free facilitation under the National IP Awareness Mission (NIPAM).

THE FUNDING LADDER

- **Stage 1 – Bootstrapping** (₹0–5 lakh): self-funding and personal networks.
- **Stage 2 – Government grants** (₹5–25 lakh): national schemes including BIRAC, DST and NIDHI-EIR.
- **Stage 3 – Incubators and university funds** (₹10–50 lakh): seed grants and workspace through Technology Business Incubators.
- **Stages 4 and 5 – Angel investors and venture capital** (₹25 lakh to ₹50 crore+): networks such as the Indian Angel Network, Sequoia Surge and Blume Ventures as startups scale.

GUIDANCE FOR STUDENT INNOVATORS

- **Observe and prototype:** address real regional challenges through lived experience and genuine problem-solving.
- **Protect early:** file provisional patents, register trademarks and sign NDAs before sharing ideas publicly.
- **Use institutional backbones:** draw on University Innovation Cells and Technology Enabling Centres to bridge laboratory research and industry.

EVENT INFORMATION	
Date	15 May 2026
Time	9:30 AM to 10:30 AM
Venue	Kargil Campus, Khumbathang, University of Ladakh, Kargil, Ladakh – 194103
Partners	Ministry of Education, AICTE and Wadhwani Foundation

07 · IN BRIEF

Recent initiatives at TEC-UoL

Highlights from May to November 2026

"Surbhi" enzyme feed supplement for Ladakh's livestock

22 October and 6 November 2026

TEC-UoL is facilitating "Surbhi", a DST-supported fibrolytic enzyme feed supplement developed by Dr. Sachin Mandavgane, VNIT Nagpur (TRL 8–9), which raises the dry-matter digestibility of dry roughage from about 35% to 65% at roughly ₹1 per animal per day. NDDB pilot trials on dairy cows at Stok and Choglamsar showed better digestion and more active animals within 20 days. On 6 November, the Animal and Sheep Husbandry Departments, UT Ladakh, and MAFSU met with TEC, and the Chief Animal Husbandry Officer consented to field trials on the Department's farms.

Mechanical seabuckthorn harvester with CSIR-CMERI

30 October 2026

On the advice of DST, TEC-UoL met CSIR-Central Mechanical Engineering Research Institute to explore developing a mechanical harvesting tool for seabuckthorn, whose harvesting losses in Ladakh are very high. CSIR-CMERI will prepare a pre-project report, and the two institutions will jointly seek funding, with TEC facilitating field trials, commercialisation and dissemination.

Institutional IPR policy with BITS Pilani

21 May 2026

TEC-UoL and BITS-TEC, BITS Pilani, are collaborating on an institutional IPR policy for the University, within a wider policy framework covering start-ups, entrepreneurship, consultancy and industry-sponsored research, aligned with the National Innovation and Startup Policy and attentive to Geographical Indications unique to Ladakh.

Wildlife technologies for the UT Wildlife Department

September 2026

Acting on problem statements referred by the Wildlife Warden, Leh, TEC-UoL has enabled an AI-based Off-Road Vehicle Detection System to protect marshland and breeding grounds (proposal submitted, DPR under way) and an AI-powered camera network for Black-necked Crane population estimation and nest protection (prototype in progress).

MILESTONES

22 Oct 2026	30 Oct 2026	6 Nov 2026	13 Nov 2026
Surbhi trial review with VNIT and NDDB	Harvester talks with CSIR-CMERI	Animal Husbandry Dept. agrees to trials	3rd PAG Meeting, then joint site visit

08 · TECHNOLOGY PIPELINE

Where every technology stands

Technology	Sector	Status
AI & IoT Bear Intrusion Detection System	Wildlife	Launched Oct 2026; TRL 6; 3 field sites; patent filed
Modern Root Cellar	Post-harvest	Completed; transferred to Horticulture Dept., Kargil (Jul 2025)
Hybrid Solar Dryer (GITAM TEC)	Post-harvest	Agreement signed; in-house construction and validation
Anti-Freezing Water Supply	Infrastructure	TRL 5/6; winter field-tested at Sakti and Leh
Edible Coating for Apricot	Post-harvest	Apricot trials with Chemistry Dept., UoL
De-icing for Black-Ice Roads	Infrastructure	Test site identified in Kargil; winter trials
Flash Flood Early Warning (ClimMaTech, IIT Mandi)	Disaster	Agreement signed; site assessment planned
Landslide Early Warning (Intiot, IIT Mandi)	Disaster	TRL 9; deployment under discussion with UT
Off-Road Vehicle Detection System	Wildlife	Proposal submitted; DPR under way
Black-necked Crane Camera Network	Wildlife	Prototype in progress
"Surbhi" Enzyme Feed Supplement (VNIT)	Livestock	TRL 8–9; field trials agreed with Animal Husbandry Dept.
Mechanical Sea-buckthorn Harvester (CSIR-CMERI)	Post-harvest	Collaboration initiated; pre-project report awaited

PATRON & GUIDANCE

Prof. (Dr.) Saket Kushwaha
Hon'ble Vice-Chancellor, University of Ladakh

Prof. K. Sankaran
Mentor, TEC-UoL

Dr. Mehboob Ali
Coordinator, TEC-UoL

HAVE A PROBLEM WORTH SOLVING?

DST Technology Enabling Centre, University of Ladakh

Kurbathang, Kargil, Ladakh – 194103
Melongthang, Leh, Ladakh (near FRL)

Tel: +91 94694 66640
Web: tecuol.in

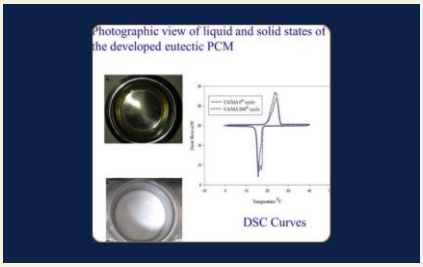
Bring your problem statement to TEC. We connect it with the right technology and the people who build it.

Unlocking Potential, Igniting Innovation

09 · LOOKING AHEAD

Technologies Identified for Development and Support, 2026–27

Patented technologies TEC-UoL has identified to adapt and support for Ladakh over the coming year.



1. Low-Temperature Phase Change Material

Patent No. 412428

Need: Rooms lose the warmth of heater and sun within minutes after dark.

Solution: A capric–myristic acid eutectic melting near 20.9°C, set in walls and floors to store heat and release it through the night; also for winter greenhouses.

To adapt: Encapsulation; sizing to a room's night-time heat loss.



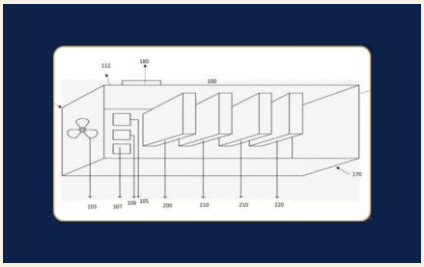
2. Machine-Vision Fruit Grading

Patent No. 518857

Need: Apple and apricot leave the orchard ungraded, lowering price and spoiling stores.

Solution: Automatic, non-destructive grading of internal and external fruit quality at intake.

To adapt: Train the model on apple, apricot and sea buckthorn.



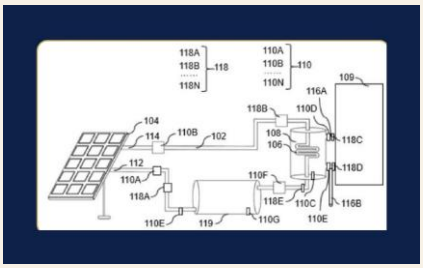
3. Solar Air-Pollutant Filter

Patent No. 557980

Need: Bukharis in sealed winter rooms cause smoke exposure and falling oxygen.

Solution: Portable solar-powered filter (pre-filter, HEPA, activated carbon) with sensing and display.

To adapt: Add oxygen and CO sensing with alerts; room-scale enclosure.



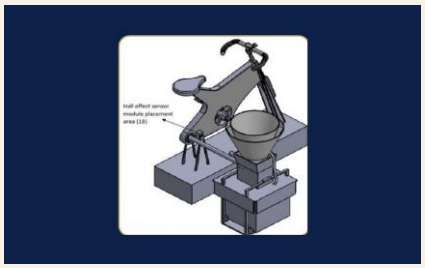
4. Solar PV-Heat Water Heating

Patent No. 586541

Need: Hot water for hostels and campuses relies on carried fuel or an uncertain grid.

Solution: Heats water with waste heat drawn from PV panels, cooling them and raising their output.

To adapt: Freeze protection: drain-back or glycol circuit, insulated runs, winter mode.



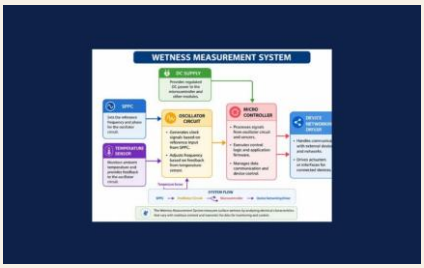
5. Pedal-Powered Organic Waste Shredder

Patent No. 388730

Need: Organic waste at kitchens, monasteries and tourist villages has no processing, often no power.

Solution: Bicycle-driven shredder feeding compost bins, with sensors and a participation app.

To adapt: An insulated or warmed digester stage for winter.



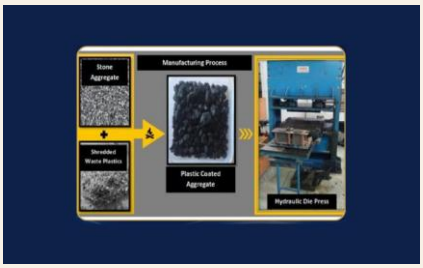
6. Surface Wetness Sensor for Black Ice

Patent No. 302230

Need: Black ice forms on winter roads with no warning to drivers.

Solution: Capacitive sensor measuring surface water to the millimetre over a wide temperature range; usable at Leh and Kargil airports.

To adapt: Add surface temperature and ice logic; road-hardened casing; driver alerts.



7. Plastic–Aggregate–Bitumen Roads

Patent No. 198254

Need: Freeze–thaw breaks roads while tourist plastic waste has no sink.

Solution: Plastic-coated aggregate for stronger, water-resistant pavement; proven on Indian roads.

To adapt: Trial sections over two winters; local mix design; collection with municipal committees.



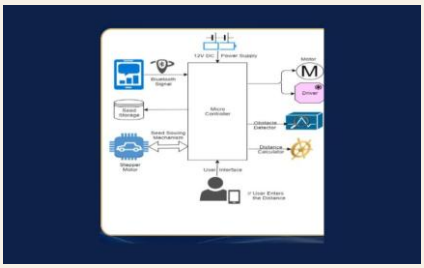
8. Water Recycling & Regeneration System

Patent No. 598370

Need: A cold desert of ~100 mm rainfall, with contaminated groundwater in Leh and Kargil towns.

Solution: Building-scale unit that filters drawn water and recycles used water back to service.

To adapt: Filters matched to assayed contaminants; drop the atmospheric-water stage; insulation and winter bypass.



9. Low-Cost Automated Seed Sower

Patent No. 567898

Need: A short sowing window, scarce labour and hand-sowing that wastes seed on small terraces.

Solution: App-controlled 12 V DC sower with even spacing and obstacle detection; runs from a solar-charged battery.

To adapt: Calibration for barley, wheat, peas and fodder; terrace chassis; cold-start battery.

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