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SUPARCO4CLIMATE

Volume 01

NEWSLETTER

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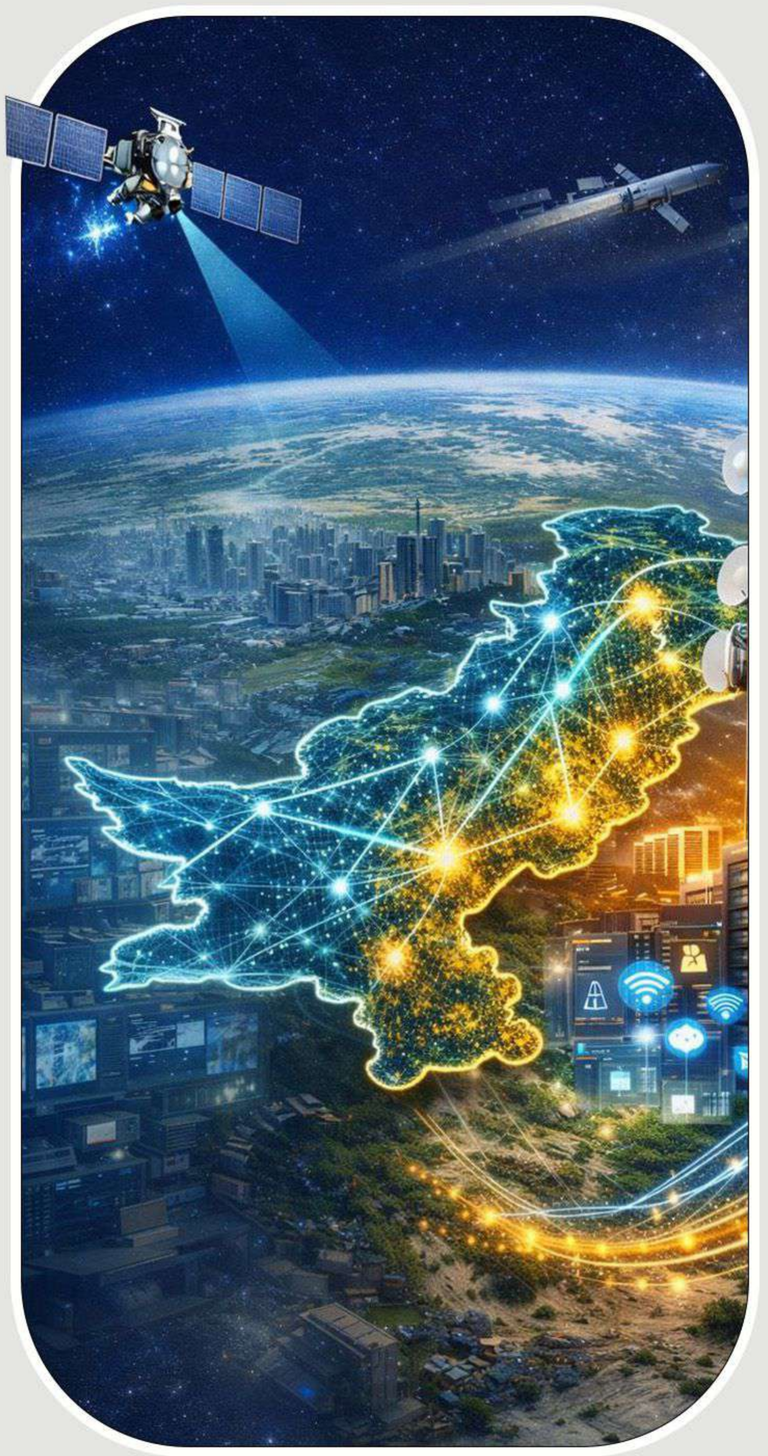
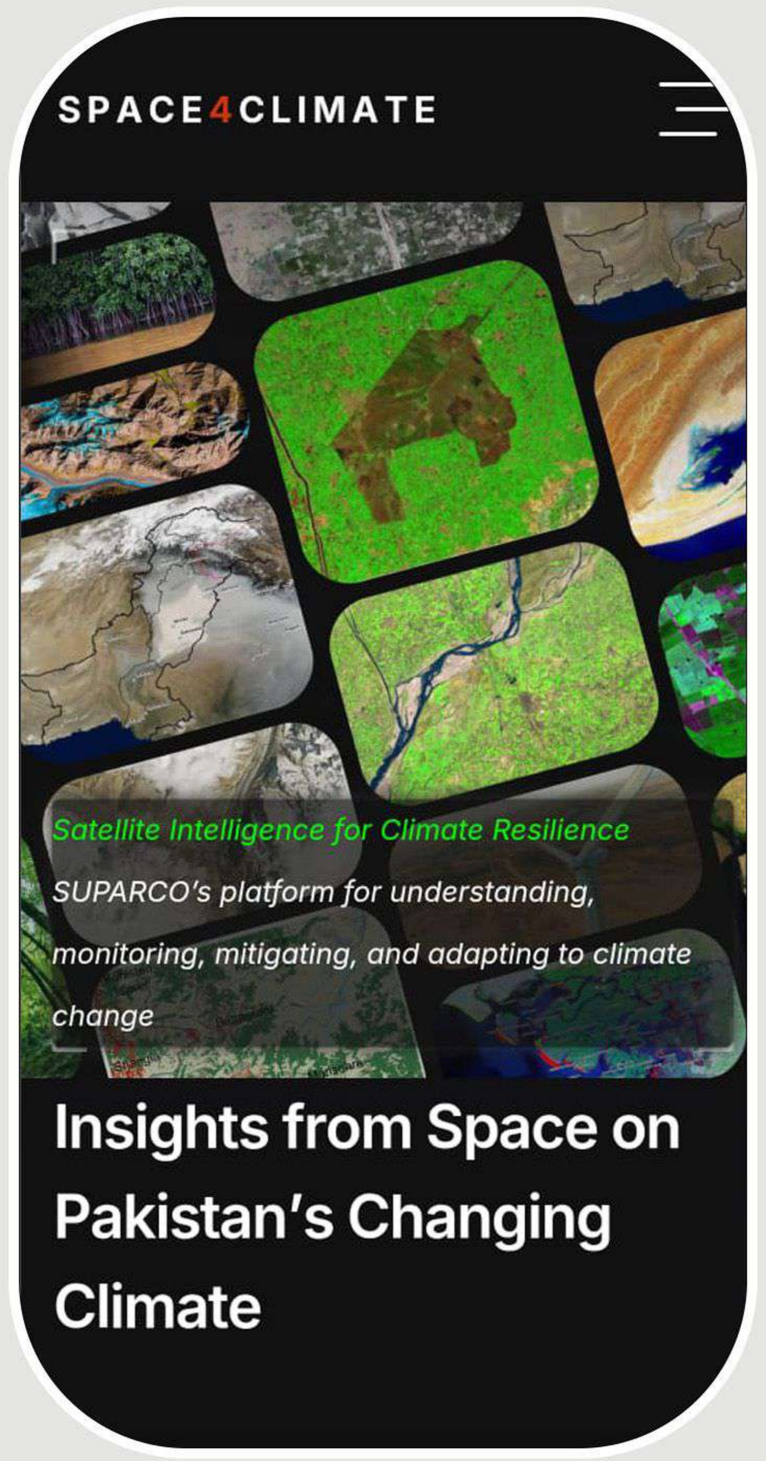
01 Establishment of the Space Application Centre for Climate Sciences

SUPARCO has established a dedicated Center named as The Space Applications Center for Climate Sciences (SACCS), in October 2025, that will serve as a dedicated national hub for climate science and applications. Leveraging indigenous satellite assets and international data partnerships, SACCS delivers systematic monitoring and analysis of critical environmental indicators. Under its immediate action plan, the Center focuses on six Essential Climate Variables—Snow and Glaciers, Forest and Above-Ground Biomass, Land Cover, Atmospheric Aerosols and Air Quality, Greenhouse Gas Emissions (CO_2 and CH_4), and Mangrove Ecosystems—establishing a robust scientific baseline to support national climate reporting and evidence-based policy. This foundation will expand in the medium term to include additional climate variables such as Stratospheric Ozone, Lake Water Quality, Leaf Area Index, Land Surface Temperature, and Sea Surface Temperature, strengthening Pakistan's climate intelligence and long-term environmental assessments.
SACCS operates through integrated facilities that translate satellite data into actionable insights for climate resilience and sustainable development. Its disaster response arm, SACRED, provides rapid satellite-based situational awareness during emergencies and serves as Pakistan's focal point for key international disaster-response mechanisms, including UN-SPIDER, Sentinel Asia, and the International Charter on Space and Major Disasters. Complementing this operational role, SACCS advances scientific analysis through specialized Earth Sciences, Atmospheric Research, and Geoforestry teams, delivering critical intelligence on glaciers, water resources, air quality, forests, mangroves, and carbon stocks. The International Scientific Research Exchange department of the Center further strengthens these efforts by fostering global collaboration, data sharing, and capacity building, positioning Pakistan as an active contributor to the international climate science community.



02 Launch of Space4Climate Website and Climatic Portals

SUPARCO has initiated the development of a dedicated national platform, Space4Climate (www.space4climate.gov.pk), to consolidate and disseminate satellite-driven climate intelligence for Pakistan. Rooted in more than five decades of leadership in space science and technology, this initiative channels SUPARCO's sovereign Earth-observation capabilities, supported by missions such as PRSS-1, PakTES-1A, EO-1, and the Hyperspectral Satellite (HS-1), toward addressing the growing challenges of climate change. The Space4Climate website serves as an integrated digital gateway, translating advanced satellite remote sensing, geospatial analytics, and atmospheric modelling into accessible, policy-relevant information for government agencies, researchers, and the public.Space4Climate features six thematic climate portals covering Environment, Forestry, Glaciers, Coastal Dynamics, Waterways, and Land Cover & Agriculture. The Environment portal delivers satellite-based monitoring of greenhouse gases, gaseous pollutants, aerosols, and meteorological parameters, supported by ground-based validation and atmospheric modelling for forecasting and transboundary analysis. The Forestry portal provides national-to-district scale forest cover estimation, deforestation and afforestation monitoring, biomass and carbon stock assessments, and biodiversity mapping. Complementing this, dedicated portals for Glaciers, Coastal Dynamics, and Waterways track glacier mass balance, snow melt, glacial lake outburst flood risks, shoreline change, sea-level rise, mangrove health, river dynamics, encroachment, and flood hazards. The Land Cover and Agriculture portal supports national land-use mapping, crop classification, yield forecasting, land degradation assessment, and post-flood agricultural damage analysis. Together, these portals position Space4Climate as a cornerstone of Pakistan's climate information ecosystem, bridging space technology with actionable science to strengthen national resilience and sustainable development.



03 Launch of Pakistan's First Hyperspectral Satellite (HS-1)

In a landmark achievement that marks a new era in Pakistan's space exploration journey, SUPARCO has successfully launched the country's first-ever Hyperspectral Satellite (HS-1) from China on October 19, 2025.

The breakthrough not only represents a major technological leap for Pakistan but also demonstrates its growing capabilities in harnessing advanced space science for national development, sustainability, and disaster resilience. The HS-1 satellite is engineered to capture ultra-precise hyperspectral imagery across hundreds of narrow spectral bands, offering unprecedented resolution for the analysis of land, vegetation, water, and urban features. This cutting-edge technology will fundamentally transform Pakistan's capacity in precision agriculture, rigorous environmental monitoring, urban planning, and proactive disaster management.

04 Capacity Building - International Training Course on Programming for Web GIS Development using Open-Source Technologies, 22-26 Sep 2025, Lahore

Space Research and Development Centre (SRDC), SUPARCO hosted the five-day international training on "Programming for Web GIS Development using Open-Source Technologies", form 22-26 Sep 2025, in Lahore. The training was jointly organized by the SUPARCO and co-sponsored by the Inter-Islamic Network on Space Sciences and Technology (ISNET). Delegates from Iraq, Senegal, Libya, Türkiye, and Tunisia participated in training which aimed to strengthen technical expertise in applying space science and technology for sustainable development among member states of the Organization of Islamic Cooperation (OIC).

The event stands as yet another milestone in SUPARCO and ISNET's ongoing journey of strengthening collaboration, advancing technical expertise, and promoting the use of space science and technology for socio-economic development across the Islamic world.

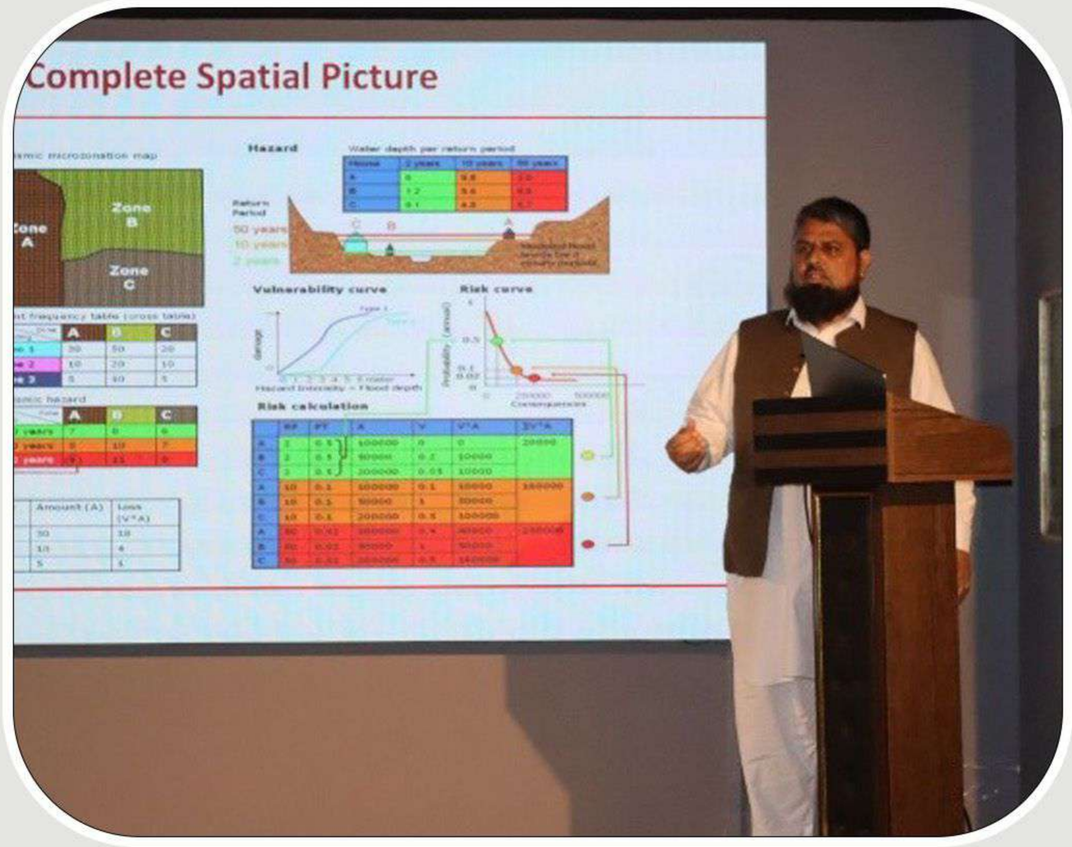
Capacity Building - International Training Course on Space-Based Disaster Management – Shifting Focus from Reactive to Proactive Approaches, 29 Sep-03 Oct 2025, Islamabad

SUPARCO, in collaboration with the Inter-Islamic Network on Space Science and Technology, organized a five-day training course titled "Space-Based Disaster Management – Shifting Focus from Reactive to Proactive Approaches" from 29 Seo-03 Oct 2025, in Islamabad. The course aimed at using space science to tackle natural disasters. Training was attended by participants and experts from OIC member states including Tunisia, Libya, Senegal, and Iraq.

The training consisted of lectures, interactive session, and hands-on exercises where experts and participants exchanged views on national experiences, challenges, and opportunities in applying space-based solutions for disaster management. The participants also had collaborative discussions aimed at equipping participants with practical skills and knowledge that can be applied in their home institutions to strengthen national and regional disaster resilience. SUPARCO's capabilities experience in predicting earthquakes, floods, cyclones, droughts, and glacier melting provided learning opportunities and case studies for participants that will help in providing timely information on disasters.

Capacity Building - NatCat
Capacity Building Session – Islamabad

Pakistan Meteorological Department (PMD) in collaboration with the National Disaster Risk Management Fund (NDRMF) and SUPARCO, organized a capacity building session on Institutionalizing Risk Knowledge: A NatCat Capacity Building on 16 October 2025 in Islamabad. The session aimed to strengthen Pakistan's resilience to natural disasters by promoting a data-informed and risk-aware approach to disaster preparedness and mitigation. Participating organizations reaffirmed their commitment to continued collaboration in fostering a locally grounded, nationally coherent, and globally aligned disaster risk reduction strategy.



Capacity Building - International Training Course on Geo-AI for Forest Information: Advanced Remote Sensing and GIS Applications in Forestry, 27-31 October 2025, Karachi

SUPARCO conducted an International Training Course on “Geo-AI for Forest Information: Advanced Remote Sensing and GIS Applications in Forestry” from 27 to 31 October 2025 in Karachi. The course was designed as an advanced capacity-building programme for professionals engaged in forest monitoring, natural resource management, and climate analytics, with a strong focus on integrating artificial intelligence and next-generation geospatial technologies to enhance forest information systems.

The training covered AI-driven image interpretation, machine-learning-based forest type and density classification, biomass and carbon stock modelling, hyperspectral and SAR data fusion for forest structure analysis, and automated species discrimination using deep learning. Delivered through expert-led sessions, demonstrations, and hands-on analytical exercises, the programme enhanced participants’ proficiency in developing end-to-end Geo-AI workflows for climate-smart forestry, biodiversity conservation, and sustainable land management

Capacity Building - SUPARCO in collaboration with NDRMF Conducted Capacity-Building Workshop on NatCat Model in Gilgit-Baltistan

The National Disaster Risk Management Fund (NDRMF), in collaboration with the SUPARCO, organized a one-day capacity-building workshop in Gilgit-Baltistan on 1 December 2025. The workshop focused on providing hands-ion training on the effective use of the advanced NatCat model for natural disaster risk assessment and response.

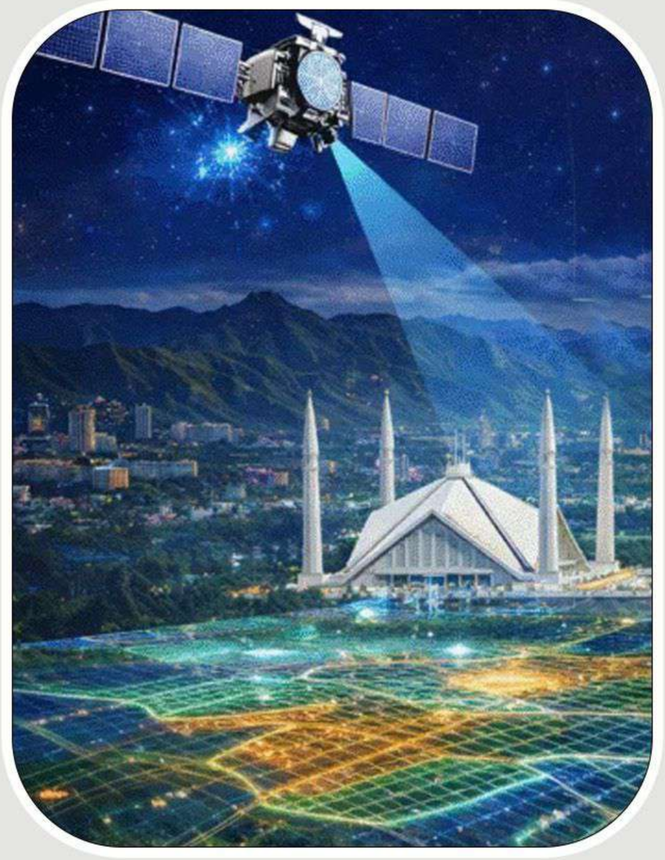
The workshop, held at the SUPARCO Regional Office Gilgit, was attended by senior officials, section chiefs, and GIS/IT specialists from various government departments. The training aimed to strengthen scientific modeling, data integration, advanced technologies, and decision-support systems to enhance provincial planning, response mechanisms, and public awareness efforts related to natural hazards. Experts from NDRMF and SUPARCO briefed participants on the functions and institutional applications of the NatCat model, followed by hands-on technical sessions involving scenario simulations, GIS integration, and operational training.

05 Collaborations & Partnerships - SUPARCO and CDA Join Hands for Urban Planning and Encroachment Monitoring in Islamabad

SUPARCO has entered into a strategic collaboration with the Capital Development Authority (CDA) to support effective urban planning and monitoring of encroachments in Islamabad through advanced space-based technologies. The decision was taken during a meeting on 26 November 2025, between Chairman CDA, Mr. Mohammad Ali Randhawa, and Chairman SUPARCO, Mr. Muhammad Yousaf Khan, along with senior officials from both organizations.

Under this collaboration, CDA, with SUPARCO's technical support, will establish a modern geospatial laboratory at the CDA Headquarters, equipped with advanced satellite imagery and analytical technologies. Chairman CDA stated that SUPARCO's high-resolution satellite data will assist in resolving land-related issues across various sectors and ensure the swift identification and elimination of illegal constructions and encroachments, thereby strengthening data-driven urban planning in both sectoral and non-sectoral areas of the capital.

During the meeting, key areas of mutual cooperation were discussed, including the use of satellite imagery, drone-based monitoring, and educational collaboration. SUPARCO reaffirmed its commitment to provide full technical support for the establishment of the laboratory and to align Islamabad's development activities with modern geospatial technologies. The collaboration also builds upon SUPARCO's recent support to CDA in identifying pre-existing built-up properties during land award processes, reinforcing institutional coordination for resolving land disputes, advancing stalled sector development, and promoting sustainable urban growth in the federal capital.



Collaborations & Partnerships - SUPARCO and NTC Partner to Enhance Satellite-Backed Digital Connectivity Across Pakistan

On 25 November 2025, SUPARCO and the National Telecommunication Corporation (NTC) have formalized a strategic partnership to strengthen Pakistan's satellite-based communication and information technology infrastructure through the signing of a Memorandum of Understanding. The agreement was concluded at NTC Headquarters in Islamabad in the presence of Chairman SUPARCO, Mr. Mohammad Yousuf Khan, and Managing Director NTC, Major General Ali Farhan, along with senior officials and technical teams from both organizations.

Under the MoU, NTC will gain access to geo-communication satellites to enhance its nationwide connectivity network, while SUPARCO will leverage NTC's terrestrial infrastructure to deliver satellite-enabled services more efficiently. The collaboration covers satellite communications, satellite imagery, geospatial solutions, cloud services, and secure digital platforms. This partnership supports Pakistan's national vision of a "Satellite-Powered Digital Pakistan" by integrating space and telecommunication capabilities to expand secure, reliable, and high-quality digital services, particularly in remote and underserved regions. The initiative marks a significant step toward strengthening mission-critical communications, improving digital security, and building indigenous capacity in space and telecommunication technologies across the country.

Collaborations & Partnerships - CDA Collaborates with SUPARCO for Smart Urban Planning and Accelerated Sector Development in Islamabad

A meeting on sectoral and urban development was held at the Capital Development Authority (CDA) Headquarters on 01 November 2025 under the chairmanship of Chairman CDA and Chief Commissioner Islamabad, with participation from senior CDA officials and a technical team from SUPARCO. The meeting reviewed the provision of high-resolution satellite imagery by SUPARCO to support enhanced urban planning, monitoring of development activities, and identification of land-related issues under the existing MoU. Chairman CDA emphasized that SUPARCO's advanced satellite technology would significantly improve land monitoring accuracy, enable efficient detection of encroachments, and ensure greater transparency and efficiency across sectoral and non-sectoral planning, terming the collaboration a key milestone toward smart urban management in Islamabad.

Collaborations & Partnerships - SUPARCO and e-Agri Sign MoU to Advance Space-Enabled Agriculture in Pakistan

The Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) and e-Agri signed a Memorandum of Understanding on 19 December 2025 to integrate space-based intelligence with digital agricultural platforms, marking a significant step toward modernizing Pakistan's agriculture sector. The agreement was signed at SUPARCO Headquarters, Islamabad, by Mr. Zafar Iqbal, Member (Space Applications & Research), and Mr. Adnan A. Syed, Chief Executive Officer of e-Agri, establishing a strategic partnership to support climate-smart, data-driven agricultural decision-making.

Under the collaboration, SUPARCO will provide satellite-based geospatial services and AI-driven analytics integrated with e-Agri's digital ecosystem to generate actionable agricultural insights. The initiative aims to improve farm productivity, enhance climate and financial risk management, and strengthen access to agricultural finance, supporting farmers, agribusinesses, and financial institutions. The partnership reflects SUPARCO's commitment to leveraging space technology for socio-economic development and advancing sustainable, competitive agriculture in Pakistan.

SUPARCO

e-Agri

Collaborations & Partnerships - SUPARCO and HBL Microfinance Bank Launch Pakistan's First Climate-Smart Agri-Finance Using Satellite Intelligence

On 17 November 2025, HBL Microfinance Bank (HBL MfB), in partnership with the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), commenced disbursements under Pakistan's first climate-smart agricultural finance initiative powered by satellite data intelligence. This marks a significant milestone in advancing sustainable, technology-driven agriculture by integrating satellite-based crop monitoring and remote-sensing analytics into agri-credit decision-making.

Through SUPARCO's geospatial and remote-sensing capabilities and HBL MfB's on-ground outreach, the initiative enables accurate assessment of land use, crop health, and vegetation stress, strengthening risk management and improving the timeliness of agricultural financing. The collaboration supports climate resilience, enhances farmer productivity, and establishes a scalable model for satellite-enabled agricultural credit, contributing to national food security and inclusive economic growth.

HBL

06

Interaction & Dialogues - SUPARCO Participated in the 23rd International Training Course on the Application of Meteorological Satellite Products,15th Asia-Oceania Meteorological Satellite Users' Conference (AOMSUC-15) and FengYun Satellite User Conference 2025 to Strengthen Meteorological Satellite Applications

SUPARCO officials participated in the 23rd International Training Course on the Application of Meteorological Satellite Products, the 15th Asia-Oceania Meteorological Satellite Users' Conference (AOMSUC-15), and the 2025 FengYun Satellite User Conference (FYSUC-2025), held from 22 to 30 October 2025 in Beijing and Qingdao, China. The events were organized by the China Meteorological Administration (CMA) in collaboration with the World Meteorological Organization (WMO) and brought together experts from over 50 countries to advance the application of meteorological satellite data for forecasting, climate monitoring, and early warning systems.

SUPARCO representatives actively engaged in training sessions and plenary discussions focused on FengYun satellite capabilities, AI-based weather forecasting, data fusion, and regional data sharing. During the conference, SUPARCO's Ms. Hadiqa Khan delivered a presentation titled "Modeling Near-Surface Air Temperature Using FengYun-LST: A Regression-Based Approach for Climate Monitoring," which received a Best Presentation Award. The participation provided valuable insights into current and upcoming FengYun satellite missions, strengthened engagement with international satellite operators, and reinforced SUPARCO's commitment to leveraging space-based meteorological data for climate resilience and early warning applications in Pakistan.

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