

Regional Forum on Glacier Monitoring and the Cryosphere in Central Asia

Dushanbe, Republic of Tajikistan — 29 May 2025

Central Asia is a region where glaciers and the cryosphere play a crucial role in ensuring water resources, maintaining ecosystem balance, and regulating climate processes. However, rapid global climate changes are significantly impacting these fragile natural systems, creating new challenges for the management of water and natural resources.

The region encompasses some of the world's largest mountain systems—Tian Shan, Pamir, Hindukush, and Altay—home to numerous glaciers. These glaciers serve as the primary source for the major rivers of the region, including the Amu Darya, Syr Darya, Zarafshon, Yaksart, and others, thereby playing a key role in water supply, agriculture, and sustainable development in Central Asian countries.

The Regional Forum on Glaciers and the Cryosphere in Central Asia serves as a significant platform for bringing together leading scientists, experts, government representatives, and international organizations. The primary objective of the forum is to conduct a comprehensive analysis of glacier conditions, monitor changes in the cryosphere, and develop adaptation strategies in response to evolving climate conditions.

The forum facilitates the exchange of advanced knowledge, scientific research, and best practices in the conservation and sustainable use of natural resources. It also aims to strengthen intergovernmental cooperation in the sustainable management of glaciers and water resources.

Discussions, expert assessments, and recommendations formulated during the forum will enable Central Asian countries to develop comprehensive approaches and strategic solutions for effective cryosphere management. This, in turn, will ensure the long-term sustainability of ecosystems, water security, and economic development in the face of a changing climate.

Objective of the Forum	Key Tasks of the Forum
1.Raising awareness about the importance of glaciers and the cryosphere for Central Asia, as well as the potential consequences of their melting. 2.Discussing scientific research on the cryosphere, glacier changes, observations, and models that can aid in predicting future transformations. 3.Exchanging experiences between countries in the region and international experts on glacier monitoring, water resource conservation, and climate change adaptation. 4.Developing joint initiatives and strategies for glacier and cryosphere preservation, improving water resources management, and minimizing the impacts of global warming.	• Awareness raising about the challenges of glacier conservation, the threats they face, and the consequences of their melting for ecosystems and water resources in the region. • Scientific discussion on the current state of glaciers, the impact of climate change and human activities on their preservation. • Recommendations for policymakers for effective regional policies and measures for glacier protection. • Strengthening regional cooperation between governmental and private entities, scientific institutions, and international organizations in environmental protection and glacier conservation.





Executive Summary

The Regional Forum on Glacier and Cryosphere Monitoring in Central Asia was held on 29 May 2025 in Dushanbe, within the framework of the High-Level International Conference on Glacier Preservation. The Forum brought together over 150 representatives from Central Asian countries, international organizations, scientific institutions, and donor agencies.

Co-organized by the Agency for Hydrometeorology of Tajikistan, the GIZ “Green Central Asia II” program, and the Swiss Agency for Development and Cooperation (SDC), the Forum served as a high-level platform for regional dialogue and scientific exchange. The Forum culminated in a Draft Declaration and a series of concrete action points aimed at enhancing regional coordination, accelerating glacier monitoring, and promoting integrated approaches to climate resilience.

Key Messages and Priority Areas

1. Strengthening Cryosphere Monitoring and Modelling

Regional cooperation on glacier, snow cover, and permafrost monitoring was emphasized as essential. Participants called for the expansion of national observation networks, standardization of data, and the adoption of advanced technologies, such as satellite imagery, drones, and AI-based modelling systems.

2. Advancing Scientific Research and Collaboration

Joint field expeditions, transboundary research teams, and collaborative publications are seen as cornerstones for building a unified scientific understanding of cryosphere dynamics. Universities and academic networks were encouraged to foster long-term capacity-building and student engagement.

3. Strengthening Institutional Frameworks

Participants underlined the need for improved inter-ministerial coordination and the development of national strategies aligned with regional and global climate agendas. A proposal was advanced to create a regional coordination mechanism or secretariat for cryosphere governance.

4. Expanding Regional and International Partnerships

The Forum promoted engagement with global partners, including UNESCO, WMO, ICIMOD, UNDRR, GIZ, and SDC. Joint projects and inclusion in global climate initiatives were highlighted as means to mobilize resources and share best practices.

5. Investing in Infrastructure and Innovation

Modernizing monitoring infrastructure and investing in scientific laboratories were identified as priorities. Integration of artificial intelligence, big data, and machine learning can improve accuracy and policy responsiveness.

6. Promoting Education, Public Awareness, and Inclusion

Integrating cryosphere issues into school and university curricula, organizing public awareness campaigns, and ensuring gender equity in research were all emphasized. Youth and local communities must be empowered as key agents of change.

Forum Proceedings Overview

Opening Session

High-level speakers, including representatives from WMO, UNESCO, IOM, the German and Swiss governments, and Central Asian ministries, stressed the urgency of regional cooperation in response to accelerating glacier retreat. The cryosphere’s role in water security, biodiversity, and sustainable development was repeatedly highlighted.

Session 1: Regional Cryosphere Monitoring

Experts reviewed recent monitoring expeditions and highlighted new technologies, cross-country comparisons, and data-sharing opportunities. Discussion focused on glacier inventory mapping and the role of snowmelt in seasonal water supply.

Session 2: Climate Change Impacts

Panelists examined how climate variability is affecting glacier volume, permafrost stability, and water flows. Speakers called for data-driven adaptation strategies and regional alignment of climate policies.

Session 3: The Cryosphere as a Water Source

Up to 70–80% of summer river flows in the Amu Darya and Syr Darya basins originate from melting glaciers. The degradation of the cryosphere therefore directly threatens water and food security, energy supply, and livelihoods.

Session 4: Climate, Migration, and Resilience

The interconnectedness of climate change, migration, and community vulnerability was discussed. IOM shared findings on how climate-induced disasters trigger displacement and affect remittance flows. Despite challenges, growing scientific cooperation and youth participation signal promising trends.

Key Outcomes and Commitments

Proposal to Establish a Regional Glaciology Center in Dushanbe

The envisioned Center would coordinate research, facilitate data integration, and serve as a training hub for Central Asian experts.

Draft Declaration

Six shared priorities were agreed upon (as listed above), along with commitments to:

- Develop a unified glacier database
- Strengthen intergovernmental mechanisms
- Attract private sector investment in climate infrastructure
- Secure funding from international financial institutions

Launch of Joint Scientific and Educational Initiatives

New programs were proposed to support female scientists, youth researchers, and early-career experts in glaciology, hydrology, and climate studies.

Multi-Stakeholder Engagement

Civil society, academia, and indigenous communities were identified as vital partners. Education campaigns and school-based initiatives will support bottom-up climate action.



Conclusion

The 2025 Regional Forum marked a pivotal step toward enhancing Central Asia’s resilience to cryosphere degradation. With unified purpose and strong regional ownership, the Forum laid the groundwork for lasting scientific cooperation, institutional innovation, and climate security in the region.

As stated in the Forum’s closing remarks:

“Glacier preservation is no longer just a scientific concern — it is a matter of regional security, sustainability, and intergenerational equity.”

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