CRYOSPHERE PROJECT in Central Asia

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POLICY BRIEF

CENTRAL ASIAN CRYOSPHERE KNOWLEDGE MANAGEMENT PLATFORM

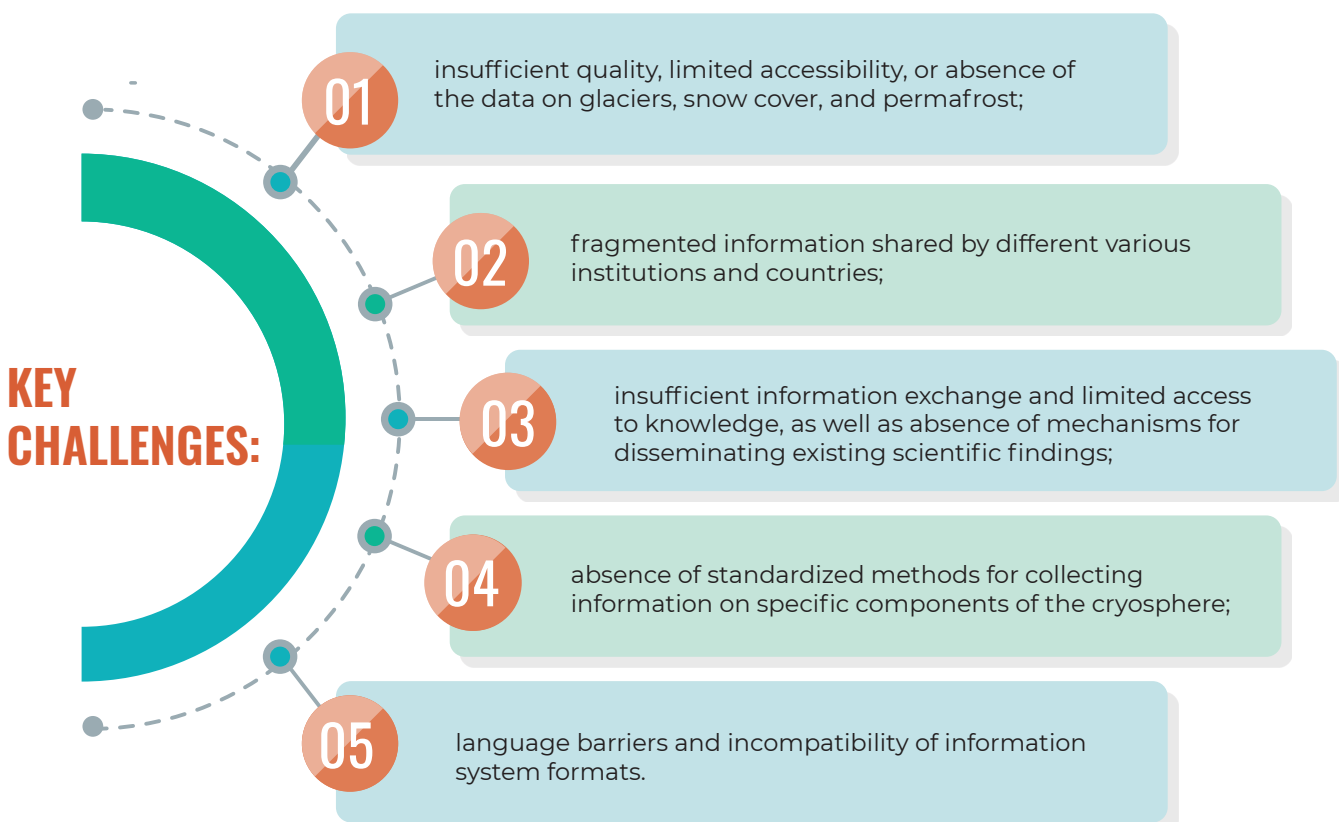
CLIMATE CHANGE DECISION-SUPPORT AND ADAPTATION TOOL

The cryosphere of Central Asia, comprising glaciers, snow cover, and permafrost areas, is undergoing significant impacts from climate change. These processes directly affect water resources, agriculture, and the energy sector, as well as pose a threat to the safety of mountain communities in the region.

Despite differences in national contexts, water resources issues in the region are transboundary in nature and require coordinated action and aligning at the regional level. At this, effective management of water resources and ecosystems directly depends on the availability and quality of scientific information.

CURRENT CHALLENGES IN CRYOSPHERE DATA MANAGEMENT

The 2024 diagnostic analysis conducted under the GEF-UNDP-UNESCO project "Strengthening the Resilience of Central Asian Countries through Enhanced Regional Cooperation in the Assessment of Glacio-nival Systems to Develop Comprehensive Approaches to Sustainable Development and Climate Change Adaptation" (Cryosphere Project), identified a number of systemic challenges that limit countries' ability to make informed decisions on climate change adaptation.



As a result, the available data is not being fully utilized, which, in turn, makes it difficult to assess regional climate risks and implement adaptation measures.

In response to these challenges, the **Central Asian Cryosphere Knowledge Management Platform** (www.cryosphereca.org) was established within the framework of the GEF-UNDP-UNESCO Cryosphere project.

The platform brings together data, scientific knowledge, and practical solutions in a common digital space, improving data comparability in the region and ensuring access for stakeholders. It aims to fill critical knowledge gaps in cryosphere monitoring and management in the five Central Asian countries.

The platform also promotes the development of specialists' capacity by providing methodological materials, analytical tools, training courses, and monitoring guides, thereby supporting the development of unified professional approaches in the region.

KEY FEATURES OF THE PLATFORM

The platform integrates several key features designed to support cryosphere monitoring and making informed decisions.

DATA INTEGRATION

The platform integrates monitoring data on glaciers, snow cover, and permafrost, as well as meteorological, hydrological, and satellite observations obtained from both national and international sources.

INFORMATION ANALYSIS AND VISUALIZATION

The platform provides tools for data analysis and visualization, including interactive maps, time series, and forecast models, enabling more accurate assessment of climate impacts and developing adaptation strategies at the national and regional levels.

WWW.CRYOSPHERECA.ORG

KNOWLEDGE SHARING AND SCIENTIFIC CAPACITY BUILDING

The platform serves as a hub for the dissemination of scientific and practical knowledge, providing access to publications, methodological materials, political and analytical documents, and educational resources for specialists and researchers.

REGIONAL COOPERATION

The platform facilitates interaction between research organizations, government agencies, civil society organizations, and private sector enterprises, facilitating accelerated information exchange and the development of joint research in the region.

THE PLATFORM'S CONTRIBUTION TO THE JOINT SUBREGIONAL ACTION PROGRAMME (JSAP) ON THE CRYOSPHERE

The Central Asian countries have developed the Joint Subregional Action Programme (JSAP) on the Cryosphere, supported by the GEF-UNDP-UNESCO project, aimed at strengthening regional cooperation in the field of monitoring and adaptation to climate change. The JSAP is based on the Strategic Vision 2050: developed cryosphere monitoring with sustainable funding, qualified personnel, accessible data, and informed population to adapt economic sectors.

THE PLATFORM PLAYS AN IMPORTANT ROLE IN ACHIEVING THE JSAP'S KEY OBJECTIVES

OBJECTIVE 1	OBJECTIVE 2	OBJECTIVE 3	OBJECTIVE 4	OBJECTIVE 5
Adapt and use unified systems of methods for monitoring and studying the cryosphere	Expand, restore and improve the cryosphere monitoring network	Develop collaborative / partnership research	Ensure that the public, professionals and decision makers in their industries are informed about the impact of the cryosphere on their industries	Improve training programs for specialists

THE PLATFORM'S ROLE

The platform serves as a tool that integrates fragmented sources of information into a unified regional educational space by overcoming technical and language barriers.	*The digital platform serves as an information center for hosting remote sensing data with ground observations.*	*The platform creates opportunities for cross-border scientific collaboration through shared repositories of information and open-access publications, modeling and forecasting tools for regional assessments, and knowledge-sharing mechanisms.*	*The platform transforms complex scientific data into accessible information through:* • *interactive visualizations and infographics;* • *educational modules and online courses;* • *multimedia content created in the official languages;* • *virtual reality tools for immersive learning.*	*The platform is designed to fill the acute shortage of qualified personnel in the industry through:* • *structured programs for different levels of study;* • *webinars and virtual trainings with the participation of international experts;* • *a library of educational materials and teaching aids.*

The platform promotes stronger scientific and political collaboration, improved decision-making, and sustainability of the region's socioeconomic development. In the long term, it will become a key tool for supporting regional cooperation and implementing joint actions by the Central Asian countries in response to accelerating changes in the cryosphere.

THE UPCOMING PATH

The platform's development is being carried out in stages: from the creation of a technical foundation to the establishment of a sustainable regional knowledge management system and long-term cooperation. This approach ensures gradual implementation, the involvement of national institutions, and the institutional sustainability of the platform.

1 STAGE

INFRASTRUCTURE DEVELOPMENT AND INSTITUTIONALIZATION OF THE PLATFORM

The first stage established the technical and organizational framework of the platform, including development of a digital architecture, testing of key functions and initial integration of cryosphere data available at national, regional and global levels.

The final stage of this phase is the transfer of the platform to a regional partner—the Central Asian Regional Glaciological Centre under the auspices of UNESCO (category 2), which ensures the regional institutional framework, long-term management, and sustainability. User training and pilot testing are also underway in collaboration with scientific and government institutions in the region.

2 STAGE

SCALING FUNCTIONALITY AND REGIONAL PARTICIPATION

The second stage is focused on developing the platform as a fully functional regional tool for joint analysis and knowledge sharing.

The Central Asian countries will gain access to the platform's full functionality and begin systematically uploading country-specific data. A key focus will be expanding analytical capabilities through the development of a system of cryosphere indicators that reflect the priorities of countries in the region. These indicators will enable a comparable assessment of cryosphere changes, support regional monitoring of climate risks, and enhance the applicability of scientific data for policy development and adaptation planning. Additionally, the platform will be integrated with national monitoring systems, and the users' community will be strengthened through regular joint events and the exchange of expertise.

3 STAGE

ENSURING LONG-TERM OPERATION

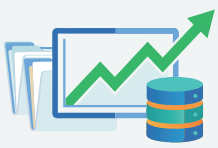
The final stage aims to entrench the platform as a sustainable regional cooperation mechanism. The main focus will be on establishing long-term financing and management mechanisms, continuously updating technological solutions, and expanding international scientific and institutional partnerships. The outcome will be a sustainable regional cryosphere knowledge management system, designed to function in the future as a long-term mechanism for supporting political decisions and scientific cooperation.

CONCLUSION AND RECOMMENDATIONS

The Central Asia Cryosphere Knowledge Management Platform is the strategically important regional tool aimed at strengthening cooperation among countries in the region in response to accelerating changes in the cryosphere and associated climate risks.

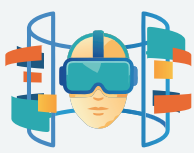
Further development of the platform requires coordinated action by the Central Asian countries, international organizations and development partners.

In order for the platform to become a key regional infrastructure for managing knowledge about the cryosphere, the following measures should be consistently implemented:



supporting the long-term functional development of the Knowledge Platform by expanding its analytical capabilities and strengthening existing knowledge-sharing mechanisms;

ensuring sustainable funding and raising investments for the platform's further development;



supporting the continued development of innovative platform's tools, including virtual reality technologies and the implementation of artificial intelligence;

developing training programs for relevant communities or implementing knowledge-sharing initiatives.

EACH CONTRIBUTION PROMOTES THE SHARED VISION OF CLIMATE-RESILIENT CENTRAL ASIA

ABOUT THE POLICY BRIEF

This policy brief was prepared within the framework of the GEF-UNDP-UNESCO Cryosphere Project "Strengthening the Resilience of Central Asian Countries through Enhanced Regional Cooperation in the Assessment of Glacio-nival Systems to Develop Comprehensive Approaches to Sustainable Development and Climate Change Adaptation" (Cryosphere Project).

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The project is being implemented by the UNESCO Regional Office in Almaty.

The platform is available at: www.cryosphereca.org

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GEF-UNDP-UNESCO project “Strengthening the Resilience of Central Asian Countries by Enabling Regional Cooperation to Assess Glacio-nival Systems to Develop Integrated Methods for Sustainable Development and Adaptation to Climate Change”

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