# Workshop "Cryosphere and Economy: Water Resources, Agriculture, and Emergencies" at the Regional Ecological Summit (RES)

**Date:** 24 April 2026, 14:00 - 17:00
**Venue:** Congress Center, Burabay (2nd floor)
**Location:** Astana, Kazakhstan

## Background

The 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” brings together five Central Asian (CA) countries - Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan - to jointly develop harmonized approaches to monitoring and researching the cryosphere, including glaciers, snow cover and permafrost.

The key objective of the project is to facilitate collaboration among CA countries in creating a technical analytical basis that clearly establishes the causal chain behind major cryospheric challenges. This process led to the development of a Joint Sub-Regional Action Programme (JSAP) and National Action Plans (NAPs) for the cryosphere in each participating country, applying the GEF International Waters methodology.[1]

During the collaborative work carried out in 2024–2025, stakeholders represented by nominated experts from relevant government authorities of CA countries in the fields of environmental protection, science, education and innovation, water resource management and emergency situations, agriculture, hydrometeorological services, research institutions, academic institutes, universities, civil society organizations, and the private sector, with the support of UNESCO and participation of the University of Fribourg (Switzerland) and international consultants, developed a **Transboundary Diagnostic Analysis (TDA) of key challenges in the monitoring, observation, and research of the cryosphere in CA**[1]**,** on the basis of which the **JSAP and NAPs on the cryosphere were developed.**

Moreover, experts from the University of Fribourg, with the involvement of specialists from CA countries, developed a number of thematic reports for the TDA, including: - “Current State of the Cryosphere and Its Impact on Water Availability in Central Asia”;[2] “Climate Change Scenarios for Glaciers and the Contribution of Meltwater to Water Availability in Central Asia”;[3]

[1] https://backend.cryosphereca.org/storage/database-files/1767181530_%D0%94%D0%B8%D0%B0%D0%B3%D0%BD%D0%BE%D1%81%D1%82%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%B8%D0%B9__%D0%B0%D0%BD%D0%B0%D0%BB%D0%B8%D0%B7.pdf
[2] https://backend.cryosphereca.org/storage/database-files/1767181725_%D0%9F%D1%80%D0%B8%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5_1_Diagnostic-Analysis_the-State-of-Cryosphre-of-Central-Asia.pdf
[3] https://backend.cryosphereca.org/storage/database-files/1767181856_2_Climate_Change_Scenarios-_Glaciers[Rus].pdf

"Development of High-Resolution Climate Change Scenarios for Snow Cover in Central Asia";[4] "Assessment of Needs and Gaps in Higher Education Programmes on the Cryosphere in Central Asia".[5]

The above-mentioned thematic reports enhance understanding of the importance of the cryosphere in the formation of water resources, the functioning of ecosystems, and the socio-economic development of CA countries, as well as provide a comprehensive understanding of the climate change impact on the cryosphere for timely mitigation actions, and highlight the need to address challenges identified through the joint analysis of their causal chain, which limit the ability of CA countries to fully understand the depth of ongoing processes and to make informed decisions on adapting various sectors to the climate change impact on the cryosphere.

**Objective**

Based on the above-mentioned thematic reports and the TDA, to use key indicators of climate models for cryosphere components over the next 25–50 years, as well as economic development trends of CA countries over the same period, to develop scenarios of the most likely and recommended development across the interlinkages: **cryosphere – water resources; cryosphere – ecosystems; cryosphere and disaster risks,** with the development of recommendations (minimum 2–3) for actions over the next 10–20 years.

**Expected result**

The exercise will contribute to achieving the objectives of RES-2026, initiated by the Republic of Kazakhstan, and will justify specific initiatives of joint research aimed at launching environmental research to serve the basis for enhancing subregional cooperation and harmonizing a common approach to implementing environmental solutions at the regional level, while also proposing specific tools for assessing the impact of climate change on the cryosphere and water resources in CA.

The exercise will serve as a basis for developing a Vision for joint and national measures to enhance the economic resilience to the climate change impact on cryosphere components.

**Participants**

Relevant environmental authorities of CA countries, higher education and science, water resources, emergency situations, hydrometeorological services, academic and research institutions, universities, and regional organizations.

[4] https://backend.cryosphereca.org/storage/database-files/1767182057_%D0%9F%D1%80%D0%B8%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5_3_High-Resolution_Climate_Change_-_Snow.pdf

[5] https://backend.cryosphereca.org/storage/database-files/1767182196_%D0%9F%D1%80%D0%B8%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5_4_Higher_Education.pdf

CRYOSPHERE PROJECT | in Central Asia

**Agenda**

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| Time | Agenda Items and Speakers |
|---|---|
| 10 min | **Presentation of the exercise methodology** – Talaibek Makeev |
| 20 min | **Presentation of climate change models for snow cover and glaciers in Central Asia up to 2050-2075-2100** – Tomas Saks (University of Fribourg) |
| 30 min | **Presentation of economic development trends in Central Asian countries up to 2075**<br><br>(GDP, population growth, water abstraction per capita, water abstraction per unit of GDP, share of agriculture in GDP, share of irrigated agriculture, cryosphere-related emergency events using Kyrgyzstan as an example) – Serikzhan Atanov, Larissa Kogutenko, Talaibek Makeev |
| 55 min | **Division of participants into three groups** – Larissa Kogutenko – 5 min<br>• Cryosphere and water resources<br>• Cryosphere and disaster risks<br>• Cryosphere and ecosystems<br><br>**Group Exercises**<br>• Baseline and trend analysis – 15 min<br>• Scenario development by sector – 25 min<br>• Formulation of recommendations – 10 min<br><br>**Group moderators** – Serikzhan Atanov, Diana Aripkhanova, Diana Charyyeva, Larissa Kogutenko, Talaibek Makeev, Elena Osipova |
| 15 min | **Presentation of group work results** – 15 min |

*Note: The number of participants matters. If each group has at least 6–8 participants, two subgroups will be formed to develop business as usual and recommended scenarios. If a group has no more than 5–7 participants, only the recommended scenario will be developed. The development of action-oriented recommendations will be formulated out by the group as a whole.*