



14TH CENTRAL ASIAN LEADERSHIP PROGRAMME ON ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT (CALP)

REPORT

« Glacial Horizons and Climate Sensitive mountains disaster risk management in Central Asia »

Almaty, Kazakhstan

September 09-13, 2024





GRATITUDE TO PARTNERS

In 2024 the Regional Environmental Centre for Central Asia (CAREC) in cooperation with partners conducted the 14th Central Asian Leadership Programme on Environment for Sustainable Development (14th CALP) «Glacial Horizons and Climate Sensitive mountains disaster risk management in Central Asia» for environmental young leaders of Central Asia.

CAREC is grateful to all partners and donors for the support, commitment and contribution in organizing of the 14th CALP in 2024, namely: OSCE Programme Office in Astana, OSCE Programme Office in Dushanbe, OSCE Programme Office in Bishkek, the Secretariat of the High-Level Dialogue Platform of the Swiss Blue Peace Central Asia Initiative and German Society for International Cooperation (GIZ). Our partners provided a great support to the enhancement of youth programs and networks, capacity building of the young leaders from Central Asia by promoting the values of regional cooperation, leadership, sustainable production and consumption, green economy and circular economy.

CAREC is grateful to the CALP facilitator, moderators and speakers, representatives of state bodies of the Central Asian countries, international, regional and non-governmental organizations, programs and projects for the participation and contribution to the success of the 14th CALP.

CAREC is also grateful to all the staff members, consultants and experts of CAREC, who shared their invaluable experience with the participants of the 14th Leadership Programme on priority environmental, leadership, sustainable production and consumption, green economy and circular economy issues of the Central Asian region.



The 14TH CALP:

Goals and objectives

The overarching goal of the 14th CALP was to empower and inspire young professionals from Central Asia to become influential leaders in the field of environmental change. By providing them with the necessary knowledge, skills, and networks, CALP aims to cultivate a new generation of change-makers to address climate change challenges, disaster risk management, and foster regional collaboration for a resilient and environmentally conscious future in Central Asia.

Thematic Directions:

The 14th CALP focused on key thematic areas such as mountain disaster risk management, glaciers, water diplomacy, transboundary water cooperation, and sustainable water resources management. These sessions also explored high-altitude lakes and their role in climate-sensitive ecosystems.

Participants of the 14th CALP engaged in a comprehensive exploration of regional water cooperation in Central Asia. They gained theoretical insights into the effects of climate change on regional water systems and ecosystems, with a specific focus on sustainable water management practices. Subsequently, participants delved into the current state of regional and transboundary cooperation, along with various aspects of sustainable water management influencing inter-state water relations, including gender and inclusive decision-making. The program equipped participants with tools and approaches for making integrated decisions (WEFE Nexus, IWRM) that considered the needs of different sectors and levels, including the complex ecological systems of the region.

Topic of the day: Opening of the 14th CALP, greetings from international partners, introduction to the CALP agenda and thematic areas.



The 14th CALP officially began with opening remarks from Mr. Zafar Makhmudov, Executive Director of CAREC, and Ms. Zulfia Suleimenova, Advisor to the President of the Republic of Kazakhstan. Ms. Suleimenova's speech was particularly inspiring, as it highlighted her journey from a graduate of the 1st CALP to her current role as the President's Special Representative for International Environmental Cooperation.

The opening speeches were continued by two representatives of international partners, who helped to organize the programme this year: Dr. Volker Frobarth, Head of the OSCE Program Office in Astana, and Ms. Ashanti Bleich, Regional Program Officer on Water infrastructure and Climate Change for Central Asia, Federal Department of Foreign Affairs (FDFA), Swiss Development Cooperation (SDC)

The opening speeches emphasized the essential role of youth in addressing climate change challenges and fostering sustainable development. Speakers underscored the importance of regional cooperation, good neighborly relations, and the active involvement of women and youth in decision-making processes.

The opening session continued with a keynote presentation by Ms. Tatyana Shakirova, a CAREC expert, who provided an overview of CALP as a flagship program. She noted that the program, which has been implemented for 14 years, promotes regional cooperation and facilitates the development of leadership skills among participants. Over this period, the CALP alumni network has grown to include more than 400 representatives from five Central Asian countries, spanning various sectors such as water management, energy, and environmental governance.



Following the presentations, Ms. Evgeniya Postnova, a program facilitator, introduced the agenda and conducted an icebreaker activity titled "Caravan of Wonders." The activity enabled participants to become acquainted with one another and set the stage for a collaborative learning environment.

The second session began with a presentation moderated by Valeriya Orlova, Program Manager for Education for Sustainable Development (ESD). Ms. Orlova provided an overview of CAREC's ongoing projects, including the REAP Project, which aims to promote resource efficiency in the agri-food sector (<https://reap-centralasia.org/>), LESLIE project (<https://leslieproject-eu.com/>) and other projects that are currently being implemented.

Following Ms. Orlova, Ms. Tais Reznikova, Manager of the Water Initiatives Support Program,

elaborated on CAREC's water-focused projects, such as:

Blue Peace Central Asia: A platform fostering dialogue and collaboration on transboundary water issues (<https://bluepeace-centralasia.ch/ru/>). The expert focused on such key concepts as Integrated Water Resources Management, Dublin Principles, basin management, basin governance, etc.

Ms. Reznikova emphasized the importance of integrated water resource management, basin-based governance, and the Dublin Principles. She highlighted CAREC's pioneering work in drafting the first management plan for the Ili-Balkhash Basin and the potential of artificial intelligence in water resource management.

Ms. Reznikova underlined that the initiatives on Water Diplomacy and Support to the Regional Working Group on Water Quality in Transboundary Basins of Central Asia also play a crucial role. In response to the participants' questions, the expert explained how exactly periodic meetings of delegates from different countries help to develop dialog and solve transboundary problems. In the afternoon, Session opened with a presentation by Dr. Volker Frohbart, Head of the OSCE Programme Office in Astana, on "Challenges in Glacier-Melting Planning and Disaster Risk Management in Mountainous Areas". In a vivid presentation with many examples, Mr. Frohbart showed the trend of increasing disaster risks in the mountainous regions of Central Asia due to multiple causes, including climate change. He also described OSCE projects aimed at improving governance and reducing disaster risks. The report was followed by a lively discussion during which participants from Turkmenistan, Kazakhstan and other countries shared their views on the situation with climate and water risks in Central Asia.

Projects and activities of CAREC projects and events were also presented by Ms. Botagoz Smagulova, PR-specialist of the Environmental Management programme (EMP). The expert noted that the goal of the program is to promote and demonstrate the best approaches of sustainable management of natural resources, to support national strategies and regional initiatives, to support dialogue between government agencies and NGOs on environmental management, as well as to support countries in fulfilling their obligations under multilateral environmental agreements. Ms. Smagulova also spoke about opportunities to join the community of practice e (https://www.riverbp.net/community_of_practice/)

The expert also spoke about the Ramsar Regional Initiative network (<https://carececo.org/main/activity/projects/ramsarskaya-regionalnaya-initsiativa-tsentrlnoy-azii-rri-tsa/>)

At the end of the presentation, various handouts were distributed to the participants.

After a short break, the work was continued by Mr. Azamat Kauzov, CACIP Coordinator¹, who spoke about such projects of the CAREC Climate Change and Sustainable Energy Program, as:

- CAMP4ASB - Climate Adaptation and Mitigation Program for the Aral Sea Basin. The project aims to address common problems and challenges related to the impacts of climate change in Central Asian countries through increasing access to improved knowledge and data on climate change for key stakeholders (decision makers, expert communities, etc.); as well as through increasing investment and building technical capacity.
- CACIP - Information portal on climate change in Central Asia (Information portal on climate adaptation and mitigation in Central Asia) is a Central Asian climate information platform that aims to help stakeholders access, analyze and visualize publicly available data (e.g. mapping tools for data layers and mapping of hotspots and risk zones, etc.) to support awareness raising, assessment and decision support. The resource link is - <https://centralasiacimateportal.org/ru/>
- COP28 - CAREC, with the support of the GIZ, held a meeting of country representatives on 24 July 2023 to prepare a regional statement on behalf of the governments of Central Asian countries at the 28th Conference of the Parties to the UN Framework Convention on Climate Change (COP-

¹ Central Asian Climate Information Platform

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The expert also spoke about the support provided by CAREC to Central Asian countries during their participation in COP 26, COP 27 and COP 28. Mr. Kauzov also emphasized the need to master artificial intelligence in the environmental sphere, noting the growing role of knowledge engineering².

Next, Ms. Oksana Kravtsova, specialist of the RECATH project (Regional Climate Action Transparency Hub for Central Asia) – spoke about the thematic area of the hub(transparency of climate action, measurement, reporting and verification (MRV) systems, UN FCCC reporting, greenhouse gas emissions calculation, etc. <https://carececo.org/en/main/activity/projects/recath/>)



The presentation continued with expert Bulat Yessekin, who explained that, since Central Asia is one of the most vulnerable regions to climate change, in addition to government plans and programs, a network of public organizations and experts in Central Asia initiated the collection and dissemination of information on climate-resilient technologies in the region among the general public. As part of the implementation of the "Program on Adaptation and Mitigation of Climate Change in the Aral Sea Basin (CAMP4ASB)" with financial support from the World Bank, a handbook on available climate-resilient technologies and practices has been developed.

The first day of work was concluded by a report by Ms. Ashanti Bleich (Swiss Agency for Development and Cooperation), who spoke about the Blue Peace initiative, as well as the Nexus approach - the concept of interdependence between water, energy and food resources.

² Knowledge engineering is part of the field of artificial intelligence sciences and is associated with the development of expert systems and knowledge bases

Topic of the day: Water Day

The morning of the second day of CALP was opened by the warm-up session “Kazakhstani Rain” and the team-building exercise “As our name will resonate...” conducted by facilitator Ms. Evgeniya Postnova.

Session 3 “Water Resources Management: Concepts, Approaches and Frameworks” was organized by the moderator Ms. Tais Reznikova, head of WIS Programme.

The conceptual framework of the session was set by the report "Water Resources Management in Central Asia: Following a Sustainable Path" by Mr. Bulat Yessekin, water expert. He demonstrated to the participants the threats of decreasing water availability at the global level (concept of planetary boundaries) as well as at the scale of the Central Asian region. The report also showed the benefits of transition to ecosystem-based water resources management and encouraged young leaders to further study the principle of the basin approach and strive for the establishment of basin social corporations, which allow the population of a locality to overcome alienation when dealing with water resources on which they depend.



Further within the framework of the session, a presentation "Climate-resilient Water Management in Central Asia" was organized by Mr. Oytur Anarbekov, who is a representative of the country consortium and a senior technical adviser to Caritas. The presentation showed numerous challenges related to shared use of water sources in the region, examples of Nexus approach in water resources management.

Next Ms. Tais Reznikova presented the report "Water Footprint concept and application in Central Asian countries", the expert revealed the essence of such concepts as "Green water footprint (rainwater)", "Blue water footprint (surface and groundwater)", "virtual water" and others. She also gave examples of actions that allow reducing the water footprint in order to obtain more crops and increase the economic value of the water consumed.

The presentation showed interesting diagrams of the water footprint of Central Asia, for example, the fact that approximately 80 % of water stays in the region and about 20 % is exported. The water footprint is different for different CA countries.

The expert explained that the water footprint can be estimated from the reports of the Ministries of Agriculture (yield statistics), i.e. it is possible to calculate how much water was used, but there is a problem with the reliability of the data.

At the end of the presentation, a general discussion was held, during which the concept of water consumption limits was discussed, as well as forecasts for water withdrawal from the Amu Darya, and the application of "public-private partnership".

After the break, the group began work in Session 4: Water Diplomacy. The moderator of the session Ms. Tais Reznikova presented the report "Water Diplomacy: Theory and Practice", During the report, the expert defined water diplomacy as well as methodological bases of its construction. Among the main sources of information, publications of the Stockholm International Water Institute were presented to the participants. The organization is known for holding the International Water Week in Stockholm and working on how to solve water problems on a global level.

As an interactive component of the session in order to consolidate the acquired knowledge, a “Water Quiz” was organized for CALP participants which was conducted by Mr. Farhat Dusekenov, WIS

Program Assistant. The quiz was organized in the format of "Jeopardy" show, where questions were built on facts about water governance and diplomacy on a global scale. Participants were divided into 2 groups "H2O" and "Climate nomads" The quiz was held in a cheerful relaxed atmosphere and was very much enjoyed by the participants.

The session continued with an online presentation by Mr. Matus Samel «How to access cross-border cooperation: the Blue Peace Index and other tools". In addition to a detailed description of opportunities to participate in research and initiatives related to water monitoring, participants were drawn to such a source of information as Blue Peace Central Asia (<https://bluepeace-centralasia.ch/ru/>).

During the afternoon sessions, a team-building exercise 'Brownian motion' was conducted and the facilitator announced the beginning of Session 5: Water and Gender, introducing its moderator Ms. Irina Yugai, WIS Programme Specialist.

A unique presentation format (in the form of online interviews) was given by Mr Tim Kraenzlein and Ms Letizia Zuliani from the OSCE's Environmental Co-operation Division. They spoke about the experience of gender mainstreaming in water resources management in Central Asia", the benefits of women's participation in natural resources management.

The online presentation of the experts was complemented by one of the CALP participants, Ms. Aigerim Karibay, who spoke about her experience of being a member of the network "Women in Water Management. She showed several ways how women can be involved in decision-making process at different levels.



At the end of the thematic block, Ms. Irina Yugai presented the report "Women's Involvement in Basin Water Resources Management: Central Asian Experience". After a brief introduction on what gender equality is, the expert showed a range of benefits associated with women's participation in water resources management at the level of basin councils. The presentation also showed a diagram of the "Global gender gap", which is periodically assessed in the Central Asian region.

The session concluded with a general discussion on the topic "Why is inclusive water management more effective and sustainable?"

After a short warm-up and a "Pairs and Threes" exercise on getting to know each other and team-building organized by the facilitator, the group started working on the Introduction to Glaciers of Central Asia Session.

Moderator Ms. Irina Yugai organized two consecutive online presentations:

1. Report "Glacier Dynamics in Central Asia: Current Status and Predictions" presented by expert Martina Barandun from the University of Fribourg.
2. Report "Unveiling the Future Water Pulse of Central Asia: A Comprehensive 21st Century Hydrological Forecast from Stochastic Water Balance Modeling" presented by Dr. Tobias Siegfried, Hydrosolutions Ltd.

Both reports were very informative and contained the most relevant data on the cryosphere in the Central Asian region. Most of the questions of the participants were related to the sphere of forecasts, e.g. "Is it possible to influence the factors that can reduce the rate of glacier melting and mitigate the consequences of their disappearance for the population of the region?"

To conclude Session 6, Dr. Larisa Kogutenko from the UNESCO Almaty Regional Office spoke about reducing the vulnerability of communities to cryosphere-related disaster risk in high mountain Asia in

a changing climate. Together with the participants, the expert considered different future scenarios related to the shrinking and total disappearance of glaciers. Also, together with the participants various risks of natural disasters were considered and statistics on the countries of the region were given. Ms. Kogutenko also spoke about projects to install early warning systems for the population in the most vulnerable mountainous areas.

To summarize the results of the day facilitator Evgenia Postnova suggested the game "Apple Jam", during which participants shared their impressions of the first two days of work, noted the most favorite sessions (many noted Session 3 and the quality of information materials) and exercises (e.g., the Water Quiz), as well as expressed their opinion on what could be changed (several people noted the need for group work and more interactive exercises).

DAY 3 – September 11, 2024

Topic of the day: Water Security and Innovations

At the beginning of the third day, facilitator Evgenia Postnova organized the exercise "Rainbow", which allowed participants to adjust to the working mode.

Then the floor was passed to Ms. Nigmyat Nurtaza, Programme Assistant, OSCE Programme Office in Astana, and the group moved on to Session 7 "Water Resources Management Technology".

Within the framework of the report "Machine Learning and GIS for Climate Resilience and Sustainable Decision Making", Ms. Nigmyat Nurtaza revealed the essence of such concepts as "machine learning", "supervised learning", etc. Further, examples of application of machine learning for climate resilience analysis were shown. The ethics of artificial intelligence and responsible use of this tool were also discussed. Using the example of biodiversity analysis, the expert offered the group a practical coding exercise - training a machine to recognize animal species from photographs.



In preparation for the simulation exercise in session 8, Ms. Nigmyat Nurtaza divided the participants into 5 groups, introduced the participants to the topic and discussed the rules of the game with the group.

Each team was presented with one of the real-world scenarios related to climate change and environmental issues. These scenarios required the application of AI and policy development to create a viable solution.

Each team was assigned one of 5 problems under three environmental scenarios (air pollution, renewable energy sources and natural disasters). Each team also selected a leader, analysts, an ethics advisor and a sustainability strategist.

The objectives of the game included the following:

- To try to solve the proposed environmental problems using artificial intelligence tools.
- Developed a comprehensive response strategy or project proposal.
- Balance environmental, social and political factors.
- Find the best, most innovative and sustainable solution.



Team 1: Problem with missing data from air quality sensors.

Participants worked on an air quality monitoring project in a large city. Sensors record pollutants, but 10-20% of the data is missing due to malfunctions.

Team 2: Problem with insufficient coverage of air quality sensors.

The participants worked on the problem of a lack of sensors—they are placed too far apart, leaving gaps in air pollution data.

Team 3: Forecasting wind power generation

Participants worked on the problem that forecasting wind farm power generation depends on the unpredictability of wind, and quality forecasting is essential.

Team 4: Disaster Damage Assessment

The project being developed by the group aimed to assess damage and prioritize aid in the aftermath of natural disasters

Team 5: Analyzing text queries after a disaster

The group's task was to create a mechanism to analyze text messages (with residents requesting help after the storm) and model where and how much help should be sent.



At the end of the team activities, presentations were held, during which other groups had the opportunity to ask questions after each presentation. Following the presentations, a participant vote took place, and Group 5 was chosen as the winner of the exercise. They received small commemorative prizes from the OSCE.

After the lunch break, the facilitator announced the start of Session 10, "Climate Sensitive mountains disaster risk management", and invited the session moderator, Mr. Roman Karazhanov, a monitoring and evaluation specialist from the GIZ, to deliver his presentation. Mr. Karazhanov highlighted key milestones in the collaboration between

Germany and Central Asian countries and provided an overview of the "Green Central Asia" initiative.

In the subsequent presentation, Ms. Aigerim Bolatova, a water resources advisor at GIZ, gave participants of the CALP an overview of the "Green Central Asia" program and the project on climate risk management in Central Asia.

Additionally, one of the CALP participants, Mr. Bekzat Anarbekov, was invited to present. He shared insights into the methodology for assessing climate risks in the Central Asian region.



The work continued with Session 11, featuring a presentation titled "Activities of the Central Asian Regional Glaciological Center in Studying Cryosphere Components in Kazakhstan and Central Asia", delivered by Mr. Vasily Kapitsa, head of Laboratory of High-Mountain Geocryology. The specialist provided a detailed description of the data collection process on the Tuyuk-Su reference glacier, from equipment installation to data processing and forecasting.

Session 12 included a report titled "Research of the Institute of geography and water security on mudflows, avalanches and landslides in the mountainous regions of Ile Alatau ", presented by Ms. Sandugash Ranova, head of the Natural Hazards Laboratory. The expert showcased maps of mudflow and landslide hazards, as well as results from mapping other climate-related emergencies. These data, as emphasized by Ms. Ranova, form the foundation for 3D modeling, decision-making, and action planning.

The day concluded with a summary exercise called "Breaking News", facilitated by Ms. Evgeniya Postnova.

The day began with participants being transported to the "Center for Emergency Situations and Disaster Risk Reduction," where Session 13, "Disaster Risk Management in Central Asia," was held.



Deputy Director of the Center, Mr. Meimanbek Chekirbayev, conducted a guided tour of the Center and delivered a thematic lecture titled "Emergency Situations in Central Asia." He explained that the Center is accredited by the Ministries of Foreign Affairs of the Kyrgyz Republic and the Republic of Kazakhstan and holds the status of an interstate body—an international organization. The speaker emphasized that the Center's mission includes: providing effective mechanisms for disaster risk reduction, mitigating the impacts of disasters,

Coordinating joint responses through agreed-upon activities, Promoting regional and international cooperation. Mr. Chekirbayev also introduced the Center's online resources, including publications and e-learning courses available on its website (<https://cesdr.org/>)

After the lecture, participants were transferred to the "Kazselezashchita" (Kazakh Mudflow Protection) unit of the Ministry for Emergency Situations of the Republic of Kazakhstan. There, they attended a guided tour and a lecture titled "Kazselezashchita and Its Activities," which featured a 3D map of the surroundings of Almaty.

The expert explained the concept of "moraine lakes," the risks of high-altitude lake outbursts, and the measures taken by "Kazselezashchita" to prevent natural disasters. These include monitoring water levels and other parameters via dispatch centers, maintaining dams, and siphoning excess water.

To observe practical disaster risk prevention measures, CALP participants visited the Ayusai mudflow dam, Big Almaty Lake, and other related sites.



Topic of the day: «NEXUS» Game and the closing ceremony

The morning session, Session 14, "The NEXUS Game," began with an introduction and the first round, facilitated by Ms. Zamira Zholdasqyzy, Community of Practice and Academic Network Development Coordinator.

Under the guidance of Ms. Zholdasqyzy and Ms. Botagoz Smagulova, participants were divided into two parallel groups. Teams were assigned roles, and the rules of the game were explained.



At the end of the first round, the first group was unable to achieve sustainable decision-making, which led to a crisis in the downstream ecosystem. In contrast, the second group focused on investments in green technologies and the preservation of ecosystems. As a result, both upstream and downstream countries avoided major economic losses and managed to maintain environmental health.

After lunch, the second round of the NEXUS Game was conducted. During this stage, the first group successfully reached

a consensus as the countries agreed on the joint and mutually beneficial use of the river ecosystem's natural resources. This resulted in a reduction of downstream pollution and the beginning of ecosystem recovery. The second group further built upon their achievements, with both countries benefiting from the sustainable use of resources while maintaining a healthy ecosystem.

The final round of the game involved intergroup negotiations, where the "governments" of the countries discussed pathways for mutually beneficial cooperation and explored solutions for building a sustainable future. However, the groups were unable to agree on the transfer of green technologies, which prevented their cooperation from reaching a higher level.

The discussion allowed participants to compare the game experience with real-world situations in Central Asia, analyze the root causes of systemic crises, and explore strategies for overcoming them. The game received overwhelmingly positive feedback, with many participants describing it as one of the most valuable sessions of the program.



To conclude the thematic part of the 14th CALP, participants were asked to complete evaluation surveys.

The closing ceremony included remarks from Mr. Zafar Makhmudov, Executive Director of CAREC; Ms. Ashanti Bleich, Regional Specialist for Water Infrastructure and Climate Change at SDC; and Mr. Nuraddin Murshudlu, Senior Economic and Environmental Officer at the OSCE Program Office in Astana.



The speakers highlighted the importance of regional cooperation, sustainable resource management, and the impact of CALP in fostering collaboration and capacity-building among professionals in Central Asia. Their messages underscored the value of innovative solutions to address environmental challenges while strengthening partnerships across the region

After the speeches, certificates of participation in the 14th CALP were awarded. The ceremony ended with a group photo session, celebrating the

conclusion of a successful and meaningful program.

Conclusions:

The overall program evaluation, based on the final survey, corresponds to the "excellent" rating. Many participants highly appreciated the presentations by Mr. B. Yesekin on eco-technologies and Ms. Nigmiyat Nurtaza on AI applications in environmental management. This positive experience should be incorporated into future programs. Sessions on sustainable water management, particularly those delivered by Ms. Tais Reznikova, were widely recognized as highly valuable. The field visit on disaster risk management was highlighted as a particularly positive and insightful experience. The NEXUS Game received unanimous praise and was acknowledged as an excellent tool for demonstrating the principles of regional cooperation in natural resource management.

Recommendations:

1. Future CALP programs should incorporate opportunities for country delegations to present their current projects and initiatives. This would foster regional knowledge exchange and encourage collaborative problem-solving.
2. In the framework of the following CALP, along with themes devoted to glaciers and water resources management, greater attention should be paid to the conservation of ecosystems, which are natural regulators of the planet's climate (see UN Decade on Ecosystem Restoration). Equally important is the coverage of topics related to the Green Economy;
3. If possible, save a day dedicated to the NEXUS game in the next CALP programs.
4. If possible, include a field trip in the programs of the following CALPs.
5. Provide more time within the program to familiarize participants with environmental issues in each country in the region.