

9

SECTION

Water Education

9.1. Higher Education Institutions (HEIs) and Professional Development Centers

9.1.1. Kazakhstan

Kazakh National Agrarian Research University

The Kazakh National Agrarian Research University (KazNARU) was founded in 1929. The University includes in its structure (2023) the [Kazakh Research Institute of Agriculture and Plant](#), the [Water, Land and Forest Resources](#) and [Agrobiological](#) faculties, the [Center for Sustainable Agriculture \(CSA\)](#), the [International Institute for Green and Sustainable Development](#). KazNARU is a member of [UNAI](#)²⁴² since 2016. The [Green campus](#)²⁴³ program is under implementation. The [Dissertation Council](#) on 8D086 "Water resources and water use" functions at the University.

On the KazNARU policy and goals for the academic year 2022-2023, please, see <https://www.kaznaru.edu.kz/university/about>.

Major Events and Activities in 2023

Research. The following projects are under implementation: (1) "Selection of non-traditional crops for intensive use of irrigated land and creation of a green conveyor depending on bioclimatic potential of cultivation zones" (2021-2023); (2) "Development of a technology for the rehabilitation of anthropogenically degraded moving sands of desert pastures in the Southern Balkhash region" (2021-2023); (3) "Evaluating the effectiveness of various land cover/use systems to mitigate climate change by reducing greenhouse gas emissions and increasing albedo" (2021-2023); (4) "The effects of excessive water use and agricultural intensification on Aral Sea shrinkage: socioeconomic-environmental systems (SES) dynamics within the Syr Darya River Basin"²⁴⁴ (2021-2023, [PEER](#), USAID); agro-meteorological stations were installed in Zhanakorgan, Syrdarya and Karmakshy districts of the Kyzylorda region for long-term autonomous monitoring of weather parameters, as well as for having a comprehensive database on climate, river flow, agricultural land, and temporal land cover series along the Syrdarya River (July 10-15), a practical seminar on "Open Remote Sensing and Applications in Agriculture" was held (November 21-23); (5) "Interdependent dynamics of food, energy and water in Kazakhstan and Mongolia" (2020-2023)²⁴⁵.

Capacity building. On the basis of (1) the [Professional development office](#), the educational program "Water, land and forest resources" functions: "Integrated

water resources management, irrigation land reclamation and reliability of hydraulic structures in Kazakhstan", "Operation and repair of external networks and facilities of water supply and sanitation", "Formation and functioning of water management systems in river basins", "Water resources management, irrigation land reclamation and reliability of hydraulic structures in Kazakhstan"; (2) KazNARU the Kazakh-German Institute for the Protection of Ecosystems and Biodiversity (KaGEB) was established and the Memorandum of Cooperation was signed (April 19).

An agreement was reached for establishing a branch of TIIAME at KazNARU which will prepare bachelors and masters on "Water Resources and Water Use"; it is planned to open the "China-Kazakhstan Research Center on Water Sciences and Technologies", establish the "China-Kazakhstan Training Center for the Water Sector" (June 15) and the "Knowledge Hub" or a branch of the University in Taldykorgan, Zhetysay region (June 27).

The International Summer School was held in 2023 in 10 study fields, including "Problems of water resources assessment and management in Kazakhstan", "Innovative technologies and technical means in agriculture in the context of digitalization" (June 10-20, online).

Researchers from the University improved their skills through the training²⁴⁶ on "Introduction to Geospatial Technologies for Achieving Sustainable Development Goals (SDGs) – Enhancing Resilience" (July 23-28, Budapest).

Events. KazNARU hosted: (1) the international conference on the theme: "Biodiversity and ecosystem services as an integral component of sustainable development" (April 18); (2) 36th meeting of Balkhash-Alakol Basin Council (May 12); (3) roundtables "Kazakhstan's water resources: problems and ways of their solution", as a result of which a resolution was adopted on the current challenges in the water sector and ways to overcome them and a decision was made to establish a working group for identifying the systemic issues in the water sector and informing accordingly the higher-level authorities (June 26), and "Ways to improve the management system of water and energy resources of the Syr Darya River in present-day conditions" (September 12).

²⁴² United Nations "Academic Impact" program

²⁴³ a roadmap for KazNARU on contribution to the Sustainable Development Goals (SDGs), promotion of the ideas of green economy and the global climate action program

²⁴⁴ jointly with the University of Michigan and the University of South Dakota

²⁴⁵ jointly with the University of Michigan, the Humanities University of Mongolia and the Mongolian Academy of Sciences

²⁴⁶ in 2022, the leading German accreditation, certification and quality assurance institute ACQUIN in Bayreuth awarded the program a quality certificate

Cooperation. KazNARU signed (1) a memorandum of cooperation with the Xinjiang Institute of Ecology and Geography of the PRC (March 7); (2) an agreement on dual degree education with the American University of Emirates (November 15-17).

Achievements and awards. KazNARU entered the following rankings: 481st place in the “QS World University Rankings 2023”; 5th place in “QS Asia University Rankings 2023: Central Asia”; improved its results in the “QS World University Ranking by Subject 2023”, taking 301-350 positions; 5th place in “QS Sustainability Rankings 2024” among the higher education institutions of Kazakhstan.

For the results of the IQAA-Ranking of educational programs see <https://www.kaznaru.edu.kz/news/8608>.

KazNARU received the International Scopus Awards Kazakhstan 2023, and also “4 stars” in the QS Stars Rating System for its success in education.

Publications. Scientific journal “Research, results”, Almaty 2023, on <https://journal.kaznaru.edu.kz/index.php/research/issue/archive>.

Source: <https://www.kaznaru.edu.kz/>

German-Kazakh University

The German-Kazakh University (GKU) was founded in 1999 with the aim of training students in line with the German standards and is the only German university in Kazakhstan and Central Asia. The World Politics Faculty of the GKU has developed and carries out the master’s program “Integrated Water Resources Management”²⁴⁷; the Economics and Business Faculty holds the “Strategic Management of Renewable Energy and Energy Efficiency”²⁴⁸ Program. The Center for Natural Resources and Sustainability (CRS) was established on the base of the GKU and received the status of the UNESCO Chair for Water Resources Management in Central Asia. The Central Asian Journal of Water Resources/CAJWR²⁴⁹ and the “Central Asian Journal of Sustainability and Climate Research”/CAJSCR have been published by GKU.

Since 2022 the Kazakhstan Climate Accelerator²⁵⁰ is implemented in partnership with EIT Climate-KIC.

Major Events and Activities in 2023

Research. The following projects are under implementation by CRS: (1) “Climate Change and Resilience in Central Asia” (UNDP) aimed to create and operationalize the regional knowledge sharing practices through a series of regular thematic webinars on

the risks of instability caused by climate change. The CRS conducted the online regular technical webinar series: 1st – on the assessment of national and regional platforms for the exchange of information and knowledge on climate risks and resilience in Kyrgyzstan, Tajikistan and Uzbekistan (July 18); 2nd – on “Emergencies related to climate change in Central Asia” (August 15); and, 3rd – on “Water resources. Review of scientific achievements and knowledge platforms in Central Asia” (December 21); (2) “Development of the Almaty City Green Space Management Plan and the Almaty Agglomeration Regional Green Corridor Action Plan” (WB, August 1, 2022-September 30, 2023), the aim of which is to contribute to the achievement by Kazakhstan of the global objectives on carbon sequestration and forest landscape enhancement and in the development of two products; (3) “Strengthening Higher Education in the Water Sector for Climate Resilience and Security in Central Asia (HWCA) Erasmus+” (European Education and Culture Executive Agency (EACEA), May 2023-April 2026), the aim of which is to support the relevance, quality and modernization of MA/MSc curricula on water governance and water diplomacy offered by universities of Central Asian countries; (4) “Green Education and Science for Central Asia in frame of “Green Central Asia” – Regional Initiative on climate and security in Central Asia and Afghanistan” (German Foreign Ministry, April 2020-March 2024); (5) “Empowering Central Asian women in the energy sector” (OSCE, 2021-2024); (6) “Involvement of youth in solving environmental problems in Almaty” (“Eurasia” Foundation, February 22, 2022-February 23, 2023) and others.



The following projects were completed: (1) “Ecothon” aimed at supporting development of ecological and social entrepreneurial skills among students; (2) “International School of Green Business “Eco-Talk””, the aim of which is to provide opportunities for young people in Central Asia to translate their eco-business ideas into sustainable business projects with an emphasis on the priorities of water, renewable energy and circular economy.

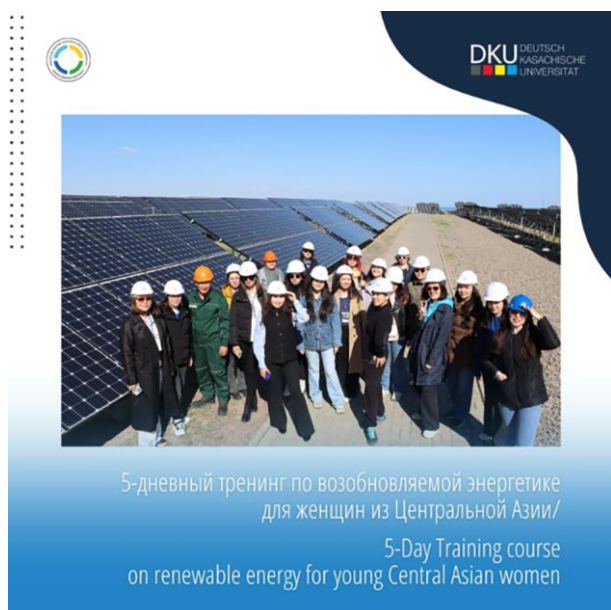
²⁴⁷ in 2022, the leading German accreditation, certification and quality assurance institute ACQUIN in Bayreuth awarded the program a quality certificate

²⁴⁸ in 2023, the programme was granted International Programme Accreditation by the ACQUIN Institute for Accreditation, Certification and Quality Assurance for a period of 6 years until 30 September 2029

²⁴⁹ indexed in DOAJ, EBSCO, IndexCopernicus, Russian Science Citation Index, Cite Factor and Google Scholar and included in the list of recommended publications by the Ministry of Education and Science of RK (Order No.623 dated 29.07.2021)

²⁵⁰ a mentorship program for young Central Asia entrepreneurs willing to grow their eco-friendly start-ups into scalable sustainable businesses

Capacity building. (1) Trainings for government officials on the topic: "NEXUS assessment: water-energy-food-ecosystem interlinkages" (February 8-9, Ashgabat), course: "Clean Energy Transition"²⁵¹ (February 27-March 3), for Central Asian women on renewable energy sources²⁵² (April 17-21); (2) 2023 Student Olympiad "Sustainable Development Goals in Central Asia", as part of which the tests were organized in such fields as "Integrated Water and Land Resource Management", "Climate Change and Clean Energy" (March 27); (3) Summer School on the Aral Sea (August 21-31).



CRS jointly with the partners developed the following online courses: "Networking on Water and Climate Data in Central Asia" (NWCD_CA); "Clean Energy Transition Course"; "Kazakhstan Climate Accelerator"; "Weather and Climate Services for the Energy Sector of Central Asia: training course for practitioners"; "Training for Government Officials from Central Asia on promoting the Water-Energy-Food-Ecosystem Nexus assessment".

Events. The following events were held: (1) the international seminar "Decarbonization in Kazakhstan and energy cooperation in Central Asia" (February 16); (2) the online international conference 2022-2023 "The Silk Road of Knowledge: science meets green policy" with 6 thematic sessions organized, in particular on the topic "Innovations in adaptation and mitigation methods of climate change in the water sector of Central Asia" (February 22-24); (3) XV international student conference "Modern Global Trends: Challenges and Risks for Central Asia" with 6 sessions, in particular on the topic "Energy Systems and Renewable Energy Technologies" (April 7); (4) the roundtable "Energy Saving and Energy Efficiency

Improvement – the Most Important Directions of Modernization and Innovative Development of the Economy" (May 5).

Cooperation. GKU in collaboration with the Caspian State University of Technologies and Engineering named after Sh. Yessenov established the German-Kazakh Institute of Sustainable Engineering Sciences in Aktau (June 21). In 2023, the Institute launched, among others, an educational program "Energy and Environmental Engineering" aimed at training in production of green hydrogen in Mangystau.

The following documents were signed: (1) a framework agreement between the German-Kazakh University and D. Serikbayev East Kazakhstan Technical University on cooperation in establishing the Kazakh-German Institute of Science and Technology in Ust-Kamenogorsk; (2) a consortium agreement between the German-Kazakh University, Technical University of Berlin, Darmstadt Technical University, Hamburg University of Applied Sciences (HAW Hamburg), and Yessenov University.

Publications. For CAJWR publications, please, visit <https://water-ca.org/issues>; for CAJSCR publications, see <https://cajscr.com/>; and, for CRS publications, see <https://ks.dku.kz/ru/>.

Collections of articles and selected publications are available on <https://dku.kz/ru/content/view/?slug=nauchnyye-publikatsii-dku&tab=2>.

The "Belt and Road" Initiative – The Great Silk Road of Modernity. Proceedings of scientific conferences (Almaty, May 12, 2023; ICBC "Korgos", August 29, 2023). Almaty: Research Institute of International and Regional Cooperation of the Kazakh-German University (RIIRC of the DKU), 2023. 240 pages, on <https://disk.yandex.ru/d/RzU6VfJr7TDFg>.

Source: <https://dku.kz/>, www.crs.dku.kz/ru/

Nazarbayev University

Nazarbayev University (NU) was established in 2010. The university is comprised of 7 schools, including the Graduate School of Public Policy (GSP) and the School of Mining and Geosciences (SMG). The long-term mission of the NU is to create a wide range of engineering and applied science programs in land, water, energy and ecology.

NU has been implementing a "Green Campus" initiative aimed at promoting an environmental sustainability in the campus, including the efficient use of resources and reduction of negative environmental impact, and the Sustainability Living Lab Program, which supports the sustainable development research and innovation projects of the university community and actively contributes to the development

²⁵¹ with the support of the U.S. Mission in Kazakhstan within the framework of the project "Clean Energy Transition course" implemented by DKU and CRS

²⁵² as part of the project "Empowering Central Asian women in the energy sector"

of SDSN Kazakhstan²⁵³ through the integration of research and educational resources into the network.

In 2023, 1,450 graduates received their diplomas from the NU; a new campus was opened in Almaty (June 5).

Major Events and Activities in 2023

Research. The NU Office of Sustainable Development in cooperation with the “National Conservation Initiative” Corporate Fund and with the support of Chevron company continues implementing the Sustainability Living Lab Program (SLL)²⁵⁴ to support students’ green research and innovation projects in water conservation, energy, etc. The NU hosted the conference of the SLL program, where the program participants demonstrated their “green projects” for energy efficiency, plastic recycling, greening the campus, searching for alternative energy sources, introducing green standards, etc. (March 28-29).



March 28-29, the conference of the SLL program

Capacity building. The following events were organized: (1) a panel discussion on the topic “Development of green entrepreneurship. Which startups will be in demand in the near future?” (August 9); (2) a webinar “Assessing Economic and Social Effects of Climate Change and Energy Transition in Central Asia” (August 29); (3) a training course “Numerical Groundwater Modelling using the INOWAS Platform” (October 24).

Events. NU hosted: (1) the 1st SDSN Kazakhstan conference on SDGs in Central Asia, comprising 6 panel sessions. The conference session themes were designed to align with the 3 research priority areas of SDSN Kazakhstan: Land, Water and Communities (SDG 1, 2, 6, 11, 14, 15); Energy and Climate (SDG 7, 13); Education and Partnerships (SDG 4, 10, 17) (May 30); (2) the First Kazakh-French²⁵⁵ Decarbonization Day²⁵⁶, aimed to explore cooperation opportunities between companies in the realm of low-carbon

solutions (June 7); (3) the youth conference dedicated to the problems of climate change, with the participation of rural teachers and school students (July 10-13); (4) the Local Youth Conference on Climate Change in Kazakhstan/LCOY Kazakhstan 2023, within which the following events were organized: panel discussions on various topics, including “Climate Change in Kazakhstan”, “Assessing the Impact of Climate Change on the Water Sector”, “Local Solutions for Climate Change Adaptation”, and “The Importance and Future Prospects of Mass Adoption and Utilization of Green and Sustainable Energy in Kazakhstan”; an exhibition of green projects initiated by students, an art exhibition, and the “Climate Fresco” game, designed to enhance participants’ knowledge on climate change and its consequences. Based on the conference results, the joint statement was prepared by Kazakhstan’s youth, and then presented at the COP 28 (September 28).



May 30, the 1st SDSN Kazakhstan conference on SDGs in CA

Achievements and awards. NU enters the top 30% of international research universities in the Times Higher Education (THE) World University Rankings 2024.

Source: <https://nu.edu.kz/ru/>

Non-profit joint-stock company “Al-Farabi Kazakh National University”

The non-profit joint-stock company “Al-Farabi Kazakh National University” (Al-Farabi KazNU) is the leading multidisciplinary research²⁵⁷ institution of higher education in the country. The multilevel system of education includes higher basic education, master’s and doctoral studies program. University branches have been opened in Bishkek and Istanbul. The University has 17 faculties, the Institute for Advanced Studies and Additional Education. The Earth Remote Sensing Center was opened at Al-Farabi KazNU in association with the Academy of Sciences of China. Al-Farabi KazNU continues to lead the Global Hub of the United Nations “Academic Impact” Program (UNAI) for Sustainable Development.

²⁵³ <https://www.sdsn.kz.nu.edu.kz/>

²⁵⁴ launched at NU in 2019 and currently implemented at 10 universities in Kazakhstan

²⁵⁵ both nations have set ambitious targets of achieving carbon neutrality by 2050 and 2060, respectively

²⁵⁶ organized by the France-Kazakhstan Chamber of Commerce in collaboration with JSC “NC “KAZAKH INVEST”

²⁵⁷ Decree of the Government of the Republic of Kazakhstan No.516 of 25.07. 2022

Training in water is offered by the Faculty of Geography and Environmental Sciences²⁵⁸, Meteorology and Hydrology Department. The UNESCO Chair in Sustainable Development functions at the faculty.

Major Events and Activities in 2023

Research. In 2023, University scientists were implementing 354 research projects. The projects on water, agriculture, environmental protection and sustainable development included: (1) AP09058406 "Modeling of flood, breakthrough waves and mud-stone impurities during normal and emergency dam breaks in a complex system of rivers and canals"; (2) AP09260687 "Technology for the extraction and disposal of toxic compounds of industrial wastewater"; (3) BR18574227 "Scientific and applied justification for managing the NAS²⁵⁹ to prevent desertification processes in the southern regions of Kazakhstan, to ensure the sustainable development of rural areas"; (4) BR18574168 "The role of Kazakhstan in deepening the regional integration of CA countries and its sustainable development goals in the context of modern global trends" (0123PK01034); (5) IRN AP14869740 "Biotesting of water and bottom sediments of the Ile River and the Kapshagay reservoir, forecasting the environmental risk for the biodiversity of the studied ecosystems"; (6) AP14871838 "Study of the wave climate of the water bodies of Kazakhstan using the satellite altimetry data"; (7) IRN AP14872548 "Modern ecological law and order: Kazakhstan case study"; (8) AP14870596 "Problems of legal regulation of rational use and protection of pasture ecosystems"; (9) AP19680487 "Monitoring and management of pasture lands of the Moyinkum sandy massif under the climate change using the remote sensing data"; (10) BR21882122 "Sustainable development of natural-industrial and socio-economic systems of the West Kazakhstan region in the context of green growth: a comprehensive analysis, concept, forecast estimates and scenarios", linked to the SDGs and aimed at solving strategically important tasks related to sustainable ecological, social and economic development of the territory. The results of the first year of implementation were presented at the working meeting (December 5); (11) AP09058590 "Monitoring of land degradation and desertification processes in Talas district of Zhambyl region using GIS and remote sensing data for sustainable land use"²⁶⁰: a scientific seminar was held on the topic "Desertification processes in the context of climate change" (October 24); (12) BR18574227 "Scientific and applied justification for managing the NAS²⁶¹ to prevent desertification processes in the southern regions of Kazakhstan, to ensure sustainable development of rural areas": field work was undertaken to study the state of agricultural land and pastures (June 22-July 24 and August 6-15, Zhambyl, Turkestan, Almaty, Zhetysu and Kyzylorda regions); (13) AP14871372 "Geospatial

approach to assessing the risks of climate disasters (drought and erosion) and their impact on agriculture in the Western region of Kazakhstan": field studies were conducted for the physical and geographical description of the research area, soil pits with sampling, etc. (August 16-31, Aktobe, West Kazakhstan, Atyrau and Mangystau regions).

As part of a startup project aimed at maximizing energy generation and accelerating national and global transition to clean and green energy, the University students have developed the software called VOLT for tracking solar energy.

Capacity building. The Faculty of Geography and Environmental Management together with the Faculty of International Relations have developed a new educational program "7M05220 – Water Diplomacy".

KazNU organized: (1) the international webinar "Strengthening the universities' role in the implementation of SDGs" (February 3); (2) the roundtable "Green Economy: Challenges and Prospects" (April 1); (3) XV Republican Student Thematic Olympiad in the discipline "6B05202-Ecology" (April 20-21); (4) II advanced training course "Environmental journalism in the context of the Sustainable Development Goals" (June 7-9).

Representatives of the University took part in the following events: (1) roundtable "Transboundary Environmental Problems between the Central Asian States" (March 23, PRC); (2) XV Republican Subject Olympiad on "Life Safety", where the University team took the 1st place (April 18-22, Toraihyrov University, Pavlodar); (3) training of trainers on the "Rational use of water resources"²⁶² (September 20-22), etc.

Events. The Al-Farabi KazNU hosted: (1) international conferences "Ecological Genetics and Public Health: Achievements and Prospects" (January 19), "A new way of decarbonization of the economy (KZGT-2023)", within the framework of which 7 sessions were organized, in particular on the topic "Environmental Sustainability, Social Economy" (November 8-9), and "GIS Day Kazakhstan" (November 18); (2) the roundtable "SDG 6. Environmental regulation and control in the field of water supply and sanitation" (March 21); (3) the international scientific and practical conference "Geographical foundations of sustainable development" (November 23, Almaty).

The University representatives took part in: (1) the international scientific and practical conference "Mudflow security – 50 years of Kazselezaschita activity: status and prospects" (April 22-24, Almaty); (2) the international forum on sustainable environmental development in the economic belt of the Silk

²⁵⁸ the faculty celebrated its 75th anniversary in 2023

²⁵⁹ natural and agricultural systems

²⁶⁰ on the way to SDG 15 "Conservation of terrestrial ecosystems"

²⁶¹ natural and agricultural systems

²⁶² organized by the USAID Regional Water and Environment Project



Road (September 17-19, Urumqi, China); (3) the international symposium "Science for Sustainable Development: Challenges for Central Asia" (November 3-5, Tashkent); (4) the 13th UNESCO Youth Forum (November 14-15, Paris).

Achievements and awards. The Al-Farabi KazNU is the leader of national ratings, both institutional and educational program ratings. The university's entry into the world rankings of QS WUR and THE WUR contributed to its dynamic promotion at the international level. For more details, refer to https://farabi.university/university/rating?&active_tab_order=undefined.

The senior lecturer of the Department of Meteorology and Hydrology Zhanabaeva Zhanara Anuarbekkyz was awarded the "Eren enbegi ushin" medal. Lecturers of the "UNESCO Chair for Sustainable Development" T.L. Tazhibayeva, G.M. Minzhanova and G.B. Tanabekova became winners of the prestigious International Pedagogical Competition "Pedagogical vocation".

Publications. The Al Farabi Kazakh National University publishes 24 scientific journals, including 6 international scientific journals in English, 17 series of KazNU bulletins and the Journal of Open Systems Evolution Problem. The following publications were prepared and issued: textbooks "Biorisk management in life sciences", "Geographic information systems in Hydrology", "The concept of climate policy in the context of Sustainable Development Goals", "UNESCO Chair for Sustainable Development" released 4 bulletins, <https://www.kaznu.kz/ru/22319/page/>, <https://pps.kaznu.kz/en/Main/ChairPublications/131/0/>.

Source: <https://www.kaznu.kz/ru/>, <https://farabi.university/>, <https://www.kaznu.kz/ru/26424/page/>

Taraz Regional University named after M.Kh. Dulati

The Taraz Regional University named after M.Kh. Dulati (M.Kh.Dulati TarRU)²⁶³ was established by the Resolution of the Kazakh President No.752 dated October 11, 2019 and on the basis of the Order of the Ministry of Finance of the Republic of Kazakhstan No.346 dated June 3, 2020. The University has, in its composition, 1 college, an institute, 6 faculties and 47 departments, academic library, 2 museums, 2 research institutes, 10 research centers, educational-research and production center "Phytochemistry", Research engineering laboratory "Nanoengineering research methods named after A.S. Akhmetov" and a specialized hydrologic and technical safety (HTS) laboratory.

The workforce capacity is 2,190 people, including 910 persons of teaching staff. The number of students is 13,651, including 470 graduate students and 34 postgraduate students. The educational activity is performed under 182 educational programs, including 103 bachelor's, 69 master's and 10 doctoral programs.

Water education is offered at the Institute of Water Management and Environmental Engineering²⁶⁴.

The University was assigned to be a **basic organization** of higher and (or) postgraduate education for water professions (Order of the Minister of Science and Higher Education of the Republic of Kazakhstan No.64 dated September 22, 2022 as amended on May 16, 2023). A memorandum on the establishment of a Consortium, which comprises 13 organizations of the country, was concluded by the universities and research organizations in 2023 with the purpose of further training of personnel and research activities for the water sector of Kazakhstan.

Major Events and Activities in 2023

Research. The University is underway of successful implementation of the Erasmus+ international educational project "Human capacity development for the water sector of Central Asia to strengthen resilience to climate change and support sustainable development, peace and security"/HWCA (2023-2025).

Capacity building. The teaching staff (1) built capacity at: the training of trainers on the "Rational use of water resources" (September 20-22, Almaty); the training on water diplomacy and international water law (November 20-24, Almaty); advanced training course "Municipal wastewater sludge management" (March 1-3, online); training workshop covering such topics as the operational hydrometry for water management systems, water accounting, operation of collector-drainage network and vertical

²⁶³ Zhambul Hydromelioration and Construction Institute celebrated its 60th anniversary in 2022

²⁶⁴ The Institute of Water Management and Environmental Engineering was established as a result of merging the Institute of Water Management, Ecology and the Faculty of Oil and Gas Engineering and Mechanics since the 2021-2022 academic year

Training workshop, March 13-17



drainage wells (March 13-17); (2) conducted career guidance events for secondary school students (April 19, Sarysu district; April 20-21, Karatau; May 3-4, Jualy, Talas, Zhambul districts); (3) organized a roundtable "Young professionals in the water sector" (March 15, Taraz).

Events. The teaching staff of the Institute of Water Management and Environmental Engineering took part in 22 conferences conducted both at the international and Republican levels.

Cooperation. The University developed and implemented the 2022-2024 Roadmap for preparation of highly-skilled water professionals.

A memorandum of cooperation was signed between the Dulati TarRU and "TIAME" NRU. The Agreement on the first-stage training of bachelors in the format "2+2" (4 years of study) and of masters – "1+1" (2 years of study) and the Agreement on organization of educational process as part of the joint educational two-diploma program are implemented.

Leading water researchers were invited to the University to enhance academic mobility: Nobel Laureate Rae Kwon Chung, advisor on climate change to the UN Secretary-General, South Korea; Professor Ng Cheng Ye, Petronas University of Technology, Malaysia; Professor Daniel Snow, University of Nebraska, USA.

Achievements and awards. Dulati TarRU entered the global rating "QS World University Rankings" and took the 1200-1401st place in this rating; entered the QS Asia University Rankings 2024 taking 601-650 positions; took the 30th place in the QS Asia University Rankings 2024: Central Asia; was included in the general rating "Times Higher Education World University Rankings 2024" with the status "reporter"; ranked the 8th among 95 higher educational institutions of Kazakhstan and was placed in A+ category in the international rating of the European Scientific-Industrial Chamber ARES-

2020, improving its **result** by 25 positions over the past five years. This rating assessed the quality of education, research activities and demand for graduates by employers.

Publications. The teaching staff of the Institute of Water Management and Environmental Engineering issued 5 monographs, 2 manuals, 3 textbooks, 8 teaching aids; published 7 articles in journals with the high impact-factor in Scopus, 15 articles in journals recommended by the Committee for Control in the Sphere of Education and Science at the [Ministry of Science and Higher Education](#); got 14 patents and provisional patents for inventions and models.

Source: M.Kh.Dulati TarRU, <https://dulaty.kz/ru/>

South Kazakhstan State University named after M. Auezov

The South Kazakhstan State University named after M. Auezov ([M. Auezov SKSU](#)) is a state multidisciplinary higher education institution, which celebrated its 80th anniversary in 2023. The SKSU named after M. Auezov was awarded the status of a research university by the Decree of the Government of Kazakhstan. The University is comprised of 9 faculties, the Distance Learning Institute, five higher schools and a college.

The [Department of Water Resources, Land Use and Agricultural Engineering](#) of the Faculty of Agriculture teaches specialists in such disciplines as "Water resources and water use" and "Water supply, sewage and water protection". The agrochemical laboratory of the TOO "Republican Soil Center" has been [opened](#).

The "[New Climate Economy Center named after Rae Kwon Chung](#)"²⁶⁵ functions at the University as well. It focuses on the implementation of a new model of economic development based on the principles of sustainable growth, green technologies and climate change mitigation.

For the University's 2021-2025 Strategic Development Plan, see <https://auezov.edu.kz/media/attachments/2023/05/23/strategic-development-plan-2021-202523.05.2023.pdf>.

Research activities. The following projects were implemented in the course of the year: (1) "Study of water and soil quality within settlements in the suburbs of Shymkent"; (2) "Development and adoption of groundwater treatment technology and provision of drinking water to the population and animals" in line with the sanitary-epidemiological standards; (3) "Development of effective technologies for the sound use of degraded rural pastures in the desert zone of Turkistan region"; (4) "Environmental monitoring of groundwater sources in the south of Kazakhstan and recommendations for the optimal water treatment technology".

Capacity building events. (1) 2023 International Summer School "Smart and innovative agriculture –

²⁶⁵ professor Rae Kwon Chung – Nobel Prize laureate, Advisor to the UN Secretary General on Climate Change

effective technologies and practices" (June 12-23, online); (2) an open regional debate tournament AGRO CUP V "Green Country – the Future of a New Country" (November 25); (3) a training seminar for deans, heads of departments and structural divisions on the topic "Implementation of the Sustainable Development Goals in Kazakhstan: challenges and opportunities" (December 20).



Events. (1) the 27th scientific and practical conference for students and young scientists on the "Current challenges in the development of the agro-industrial complex: past, present, future", which included presentations on the discipline "Water Resources, Land Use and Agricultural Engineering" as well (December 5-6); (2) the International Scientific and Practical Conference "Innovative development of the agro-industrial complex: experience, problems and solutions" (December 22).

Representatives of the University took part in: (1) the seminar "Improving water security and water resources management in Central Asia: focus on Kazakhstan (Syr Darya River basin, south of Kazakhstan)" (July 31); (2) the international scientific and practical conferences "Environmental improvement through afforestation and agricultural development

9.1.2. Kyrgyz Republic

American University of Central Asia

The American University of Central Asia (AUCA) founded in 1993 is the first university in Central Asia to offer US accredited degrees in liberal arts programs through a partnership with the Bard College in the US. Its curriculum includes 15 undergraduate degree programs, in particular "Environmental Sustainability and Climate Science", and 10 graduate degree programs. The "New Generation Academy" at the American University of Central Asia offers a one-year

challenges" (August 4, Turkistan) and "Scientific and practical foundations for the effective use of innovative resource-saving technologies in agriculture" held at the Andizhan Institute of Agriculture and Agro-technologies (October 27-28).

Achievements and awards. Based on the results of international rankings, the M. Auezov SKSU (1) took the 253rd place among 1183 universities of the world and the 2nd place among 18 higher education intuitions of Kazakhstan in the UI GreenMetric World University Rankings; (2) entered the 981-1000 position among 1403 universities of the world in the QS Sustainability 2024 of the Quacquarelli Symonds (QS) company. In Kazakhstan, the University is on the 4th place among 12 higher education intuitions. In the Asia regional ranking, the University took the 293rd place among 487 higher education intuitions of the region.



Source: <http://www.sdo.ukgu.kz/?q=r>

Publications. Scholars of the Department of Water Resources, Land Use and Agricultural Engineering issued a textbook "Water supply and sanitation system".

Source: <https://green.auezov.edu.kz/ru/component/sppagebuilder/?view=page&id=443>, <https://auezov.edu.kz/kaz/>, <http://www.sdo.ukgu.kz/?q=r>

intensive preparatory program. AUCA also includes the Technical School of Innovation, which offers six disciplines, in particular "Ecology and Energy Efficiency", the Tian-Shan Policy Center (TSPC) and the Center for Environment and Development (CED).

Major Events and Activities in 2023

Research. The University is implementing the following projects: (1) "Promoting Energy and Resource Efficiency in the Tourism Industry of Kyrgyzstan"²⁶⁶, within

²⁶⁶ implemented by the AUCA with the financial support from the European Union's SWITCH-Asia programme and in consortium with partner organizations: UNISON Group (Kyrgyzstan), Technopolis Group (Belgium), Collaborating Centre on Sustainable Consumption and Production – CSCP (Germany)

which, in partnership with the "IDEA Central Asia" youth organization, the extensive Ecology 3.0 ecological campaign, Ecological Hackathon (December 4-7, Bishkek) was held; (2) OSUN's GeoHub project in partnership with the Central European University and Bard College²⁶⁷. The summer school "Geospatial Technologies for Building Resilience" (July 24-28, Hungary, Budapest) and GIS lectures (June 7) were offered; (3) CEPF²⁶⁸ on the sustainable rangeland management in Chychkan and Suusamy, as part of which an environmental camp for students "Sustainable Natural Resource Management and GIS in Chychkan" (June 25-29, Chychkan gorge, Kyrgyzstan) and a meeting with school students (September, Zhany-Zhol village, Jalal-Abad region) were organized.



Events. The AUCA organized a series of events: (1) lecture on Earth observation data and geospatial technologies for Global Agendas monitoring (February 28) and Sustainability Week (March 27-31); (2) workshops "Sustainable environment" (March) and "Integrated Water Resources Management for Building Resilience to Climate Change and Environmental Protection"²⁶⁹ (September 22-23); (3) research conference "Prospects and opportunities for achieving carbon neutrality in the Kyrgyz Republic until 2050" (October 20); (4) EcoMovieDay (November 4); (5) environmental conference EcoTEDx-3 (November 11).

AUCA in collaboration with partners hosted a Climate Week (September 16-23), "Green Month", including the art object opening (October 6), a tree planting event at Elm Grove and others.

Achievements. AUCA secured the 1st position among Kyrgyz universities in the prestigious QS World University Rankings Asia 2024. Additionally, it placed within the Top-10 universities in Central Asia.

AUCA successfully completed its second voluntary environmental certification with the Waste Manage-

ment Network in the Kyrgyz Republic (WasteNet.kg), demonstrating its ongoing commitment to eco-friendly practices and compliance with eco-labelling standards.

Source: AUCA

Kyrgyz-Russian Slavic University named after B.N. Yeltsin

The Kyrgyz-Russian Slavic University named after B.N. Yeltsin (B.N. Yeltsin KRSU) was established in 1993. Education in the University is offered in 24 disciplines. KRSU has the Dissertation Councils of the Higher Attestation Commission of KR, postgraduate program (on disciplines 05.23.07 "Hydraulic engineering construction" and 25.00.30 "Meteorology, climatology and agrometeorology"), doctoral school (05.23.07 "Hydraulic engineering construction"), and the Inter-branch Scientific-Research Center for High-Altitude Dam Monitoring. The Center, among others, studies the effects of earthquakes and microseisms on hydraulic structures and makes forecasts of their state in order to prevent failures. Water education is offered at the Architecture, Design and Construction Faculty (ADCF) and at the Faculty of Science and Technology.

Major Events and Activities in 2023

Events. KRSU held: (1) Green Economy Week, including the international scientific and practical forum "Green Economy and Sustainable Development" (February 14-17) and the winter school "Green Economy and key directions of development in Kyrgyzstan" (February 16-18); (2) roundtable "Green Economy of the EAEU: Challenges and Prospects" jointly with the Russian Council for International Affairs (Bishkek, October 25).

The ADCF organized a NEXUS game "Agreement on water resources management" (October) and a seminar devoted to the World Science Day. The latter served to discuss how to promote energy efficiency and energy saving in construction (November 10).

Publications. KRSU published 12 issues of the "KRSU Newsletter". Faculty members from the Department of Water Resources and Engineering disciplines have made contributions to the range of fields: (1) Frolova G.P., Ershova N.V., Strizhantseva O.M. "Classification of rivers on the northern slope of the Kyrgyz range by the features of their hydrological regime"/Collection "Improving the system of forecast, reduction and mitigation of damage caused by hazards". Bishkek, KRSU, 2023, pp.38-42; (2) Yakovleva N.V. "Methodical instructions for practical work in the discipline "Water chemistry and microbiology" for the area "Environmental engineering and water use". Bishkek: KRSU, 2023. 20 p.; (3) Training modules: No.1 "Basic

²⁶⁷ Open Society University Network (OSUN) is a global network of educational institutions that integrates learning and the advancement of knowledge across geographic and demographic boundaries

²⁶⁸ CEPF is the Critical Ecosystem Partnership Fund

²⁶⁹ jointly with the USAID Regional Water and Environment Project

concepts of integrated water resources management and economic instruments"; No.2 "Water market features and regulation of water services"; No.3 "Water Demand Management and Water Services"; No.4 "Strategic and medium-term planning in the water sector: challenges, methods and instruments", Bishkek-Moscow-Paris-Luxemburg, 2023.

Source: <https://www.krsu.edu.kg/>

Kyrgyz National Agrarian University named after K.I. Skryabin

The Kyrgyz National Agrarian University named after K.I. Skryabin (K.I. Skryabin KNAU) was established on January 30, 1933. The University consists of 6 faculties, including the Hydromelioration, Ecology and Land Management Faculty (HELMF) which trains: (1) bachelors on "Land reclamation, recultivation and protection", "Engineering systems of agricultural water supply, irrigation and drainage", "Hydraulic engineering construction", "Land management and cadastre", "Geodesy and remote sensing", "Ecology and nature management"; (2) master's students on "Hydraulic engineering construction", "Land management and cadastre", "Environmental management and water use", "Geodesy and remote sensing", and "Ecology and nature management".

Major Activities and Events in 2023

Research. KRSU's faculty has been actively involved in several projects: (1) "Development of higher education content aimed to support industries for sustainable production of qualitative agri-food in Uzbekistan and Kyrgyzstan" (AgroDev) and "Human capacity development for the water sector of Central Asia to strengthen resilience to climate change and support sustainable development, peace and

security" (HWCA). KRSU's contributions to these projects were highlighted at the October 20 meeting in Bishkek; (2) "Sustainable regional management and value creation to conserve endemic apple varieties in Kazakhstan and Kyrgyzstan "ALMA"²⁷⁰. This project culminated in the opening of the "Kyrgyz-German Institute for the Protection of Ecosystems and Biodiversity in the Kyrgyz Republic" in April 20, 2023; (3) "On promotion of organic farming and human resource development to study soil and crop analysis technologies at KNAU" funded by the JICA. A greenhouse was opened to facilitate practical training and research (May 18).

Capacity building. Visiting professors from the Hugo Kołłątaj University of Agriculture in Kraków, Poland, conducted guest lectures and master classes²⁷¹ (May 2-4). Faculty, master's students, and undergraduate students participated in the online webinar "QS Sustainability Ranking: Find out more" (November 28) and the workshop on "Modern Agricultural Development in SCO Countries" (December 6).

Students had the opportunity to gain practical experience through an internship under the Logo.ev program in Germany (April 28-October 27) and by attending the Summer University at Ural Federal University in Ekaterinburg, Russia (July 10-24).

Events. K.I. Skryabin KNAU hosted several significant events: (1) Republican Student Scientific and Practical Conference "Innovative development of modern science: status of challenges" (April 4); (2) Environmental Marathon "Ecology begins with me" organized by the Ecology Club of the University (April 5-May 25); (3) Exhibition of Research and Experimental Developments and Achievements devoted to the Science Day (November 9).

The faculty, master's students and undergraduate students actively participated in several events in Bishkek: (1) Conference "The role of youth in the development of agribusiness: motivation, support, initiatives" (October 22); (2) Exhibition of scientific achievements of higher education institutions in Kyrgyzstan at the Kyrgyz National University named after J.Balasagyn (November 10); (2) MAKE-A-THON "Smart Technologies in Agriculture"²⁷² at the Kyrgyz State Technical University named after I.Razzakov (December 5-8).

Cooperation. K.I. Skryabin KNAU signed a bilateral agreement with the rectors of Peoples' Friendship University of Russia (PFUR) and Kalmyk State University named after B.B.Gorodovikov (October 13, Osh).

Publications. KNAU published 4 issues of its "KNAU Newsletter".

Source: <https://knau.kg/>



²⁷⁰ jointly with the NETSCI GmbH with the financial support from the German Federal Environmental Fund (DBU)

²⁷¹ as part of the project "Development of higher education content to support industries for sustainable production of qualitative agri-food in Uzbekistan and Kyrgyzstan" (AgroDev) funded by the Erasmus+ 619039-EPP-1-2020-1-LV-EPPKA2-CBHE-JP

²⁷² initiators: Seoul International Friendship Organization (SIFO), Kyrgyz State Technical University (KSTU), FabLab Bishkek and Korea International Cooperation Agency (KOICA)

9.1.3. Tajikistan

Tajik Agrarian University named after Shirinsho Shotemur

The Tajik Agrarian University named after Shirinsho Shotemur (Sh. Shotemur TAU) was established in 1931. The University has 9 faculties, including the Hydro-melioration Faculty, which offers the following disciplines: "Irrigation and water management", "Hydraulic engineering", "Rational use and protection of water resources", "Land reclamation and water management".

Major Events and Activities in 2023

Research activities carried out under the University's research plan for 2021-2025 include 15 mandatory topics. These topics include: "Impact of climate change on the botanical composition of native grasses while improving the state of transitional (seasonal) pastures of Tajikistan" (2021-2025) RKD No.01011TD075; "Monitoring and prospects of land use in the Republic of Tajikistan" (2022-2026) No.0122TJ1316; "Development of effective use of land and water resources of the Upper Zeravshan for the expansion of agricultural production and food self-sufficiency" (2022-2026) No.0122TJ1318.

Events. Sh. Shotemur TAU hosted several important events: (1) Scientific-Practical Conferences "Urgent issues of using green energy and energy-saving machines in agricultural mechanization in Tajikistan" (November 4), "Current issues of sustainable land management and use in Tajikistan" (November 20) and "Agrarian economy in the context of globalization and integration" (December 16); (2) Round Table on green energy (November 21).

The managerial and teaching staff participated in the Regional Scientific-Practical Seminar "Sowing techniques using laser equipment for cultivating

cereal crops on waterlogged lands" (Hissar, Tajikistan, November 17) and COP28 (Dubai, UAE, November 30-December 10).

Cooperation. Sh. Shotemur TAU signed a cooperation agreement with the Penza State Agrarian University of the Russian Federation²⁷³ (March 2).

The University opened: the Career Development Center, the **education and production greenhouse** built by the TIKA²⁷⁴, and, the first greenhouse of Korean-style Smart Farm²⁷⁵ for training in smart-farming.



Publications. In 2023, the University published 4 issues of its *Kishovarz* journal.

Source: <http://www.tajagroun.tj/>,
https://www.instagram.com/_tau_official_/,
www.facebook.com/groups/683492831824366/

Tajik Technical University named after Acad. M. Osimi

The Tajik Technical University named after Academician M. Osimi (TTU) was founded in 1956. The University has 7 faculties, including **Power Engineering Faculty** and **Construction and Architecture Faculty**. The latter includes the "Hydraulic structures and water resources protection" Department, which offers training in the following disciplines: (1) "Construction and operation of HPPs" and "Rational use and protection of water resources" (bachelor's degree); (2) "Construction and operation of HPPs" (master's degree, correspondence and second higher education).



²⁷³ in the course of the 9th conference on interregional cooperation between Russia and Tajikistan

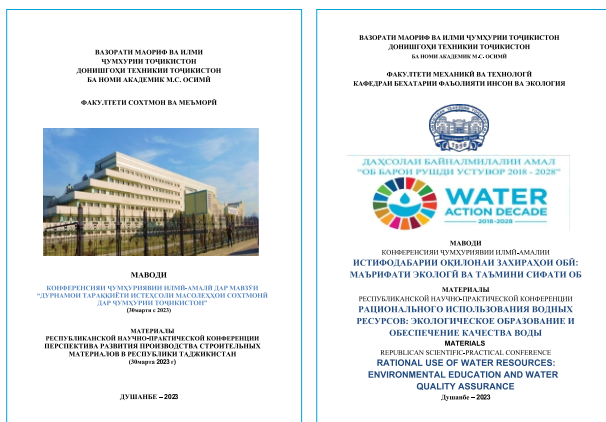
²⁷⁴ with the support of the Turkish government

²⁷⁵ with the support of the South Korea government and such companies as Shinhan A-tech, Hyundai Nongong Metal, IlSen Highpoly

TTU is a member of the SCO University; Technical Universities Association for CIS; Technical Universities Association for CA, Urals and Siberia; Association of Engineering Universities of Islamic States.

Major Events and Activities in 2023

Events. The University hosted: (1) republican scientific-practical conferences "Prospects of development of building material production in the Republic of Tajikistan" (March 30), "[Reasonable use of water resources: environmental awareness and water quality](#)" (May 20) and "Heat-power engineering and thermo-physical properties of substances" (December); (2) international scientific-practical conference "Energy: status and prospects for development" (December 20).



The teaching staff, postgraduates and students participated in the 29th international scientific and technical conference "Radio Electronics, Electrical Engineering and Power Engineering" (March 16-18, Moscow, RF), workshop "Strengthening the role of women and youth in water management in the Kafarnigan River Basin" and in the environmental campaign (February 27, Sughd Province).

Cooperation. Within the framework of the Tajik-Chinese forum on engineering education held in the Center named after Lu Ban²⁷⁶, an educational agreement on certain disciplines for bachelor's and master's degree "Engineering Geodesy and Heat Supply" was signed between the TTU, the Tianjin Urban Construction Management Vocational and Techni-

cal University and the Tianjin University of Urban Planning (December 13).

For advanced training and retraining and also for the on-the-job internship of students, the TTU signed cooperation agreements with the "Varzob" power plants of "Barki Tojik" OJSC (October 30) and "Roghun HPP" JSC (September), in line with which branches of University's departments have been opened at these agencies.



Publications. In 2023, TTU published 4 issues of its academic journal "Polytechnic newsletter series: Intelligence, Innovation, Investment" and 4 issues of "Polytechnic newsletter series: Engineering Studies". For the article of masters of the "Electrical Power Plants" department, Power Engineering Faculty in the Scopus (Q3) review journal "International Journal of Electrical and Computer Engineering (IJECE)" (Indonesia), please, visit https://ijece.iaescore.com/index.php/IJECE/article/view/33578?fbclid=IwAR3482YjSZHNwxXo8fmn0U4p0Qv07m_ospLFakWMegVxM3fF87VWgLCkuc

Achievements and awards. The Assistant Professor of the Department of Electrical Power Engineering, Power Engineering Faculty was awarded a second degree diploma and a breastplate at the international competition among CIS' scientific and educational institutions – "The Best Young Scientist-2023".

Source: <https://web.ttu.tj/ru>, www.facebook.com/ttu.m.s.osimi

9.1.4. Turkmenistan

Turkmen Agricultural University named after S.A. Niyazov

The Turkmen Agricultural University named after S.A. Niyazov (S.A. Niyazov TAU) was founded in 1930.

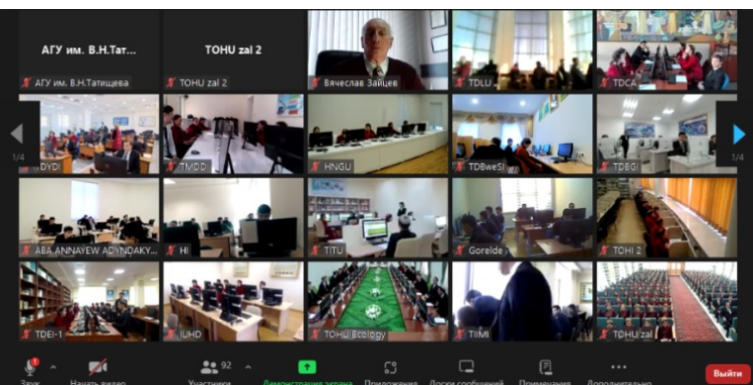
The University consists of 8 faculties, including the [Hydromelioration Faculty](#), which offers training in such disciplines as "Hydromelioration" and "Land construction and cadastre". The bachelor's degree program in the discipline "Information Security Management in Agriculture" was opened in 2023.

²⁷⁶ Tajik-Chinese workshop named after Lu Ban was opened at the Faculty of Civil Engineering and Architecture

Major Events and Activities in 2023

Capacity building. TAU organized weekly scientific and practical workshops covering a wide range of topics, including drip irrigation (May 13; September 16), development of agroecology and agroforestry in Turkmenistan and in the world (October 14). TAU held: (1) international competition of scientific projects "The role of youth in achieving the sustainable development goals" among students of higher education institutions in Turkmenistan and abroad (May-June); (2) exhibition and competition of scientific works and projects "Scientific Youth - the Future of the Country" (November 11); (3) 2nd open international Internet Ecology Olympiad among students (December 5).

TAU in collaboration with the Federal State Educational Institution of Higher Education of the Russian Federation "V.N.Tatishchev Astrakhan State University" (FSBEI HE "V.N.Tatishchev ASU") conducted an online course on the topic "Ways to use effectively the capabilities of geoinformation systems in agriculture".



Source: <https://www.ablaikhan.kz/>

Events. The teaching staff and students took part in: (1) the forum of the University Alliance of the Silk Road entitled "Development and innovations in higher education in the age of new technological reforms" (Xi'an, PRC, October 7-9); (2) the international exhibition and scientific conference "Health care, education and sports during the revival of the new era of a powerful state" (Ashgabat, October 10-12); (3) the international scientific-practical conference on "Advancing Sustainable Future" (ICASF 2023) (Dubai, UAE, December 5-6); (4) the international scientific-practical conference and multidisciplinary exhibition for summing up the results of the outgoing year "Happy Youth with Arkadag Serdar" (Ashgabat, December 27).

Cooperation. As part of bilateral meetings, scientific and education issues of cooperation were discussed

with: (1) the representatives of "Ion Ionescu de la Brad" University of Social Sciences in Iasi, Romania (November); (2) the delegation of the Federal State Educational Institution of Higher Education of the Russian Federation "Moscow State University of Geodesy and Cartography" (December 25).

Memos and agreements were signed with: (1) the Gorgan University of Agricultural Sciences and Natural Resources (IRI) (Teheran, IRI, May 30); and, (2) FSBEI HE V.N.Tatishchev Astrakhan State University (Ashgabat, October 13).



Source: <https://tohu.edu.tm/?/HABARLAR/&page=habar&habar=690>

Achievements and awards. TAU took the 456th place with 6545 points in the UI GreenMetric World University Ranking²⁷⁷, and the 2nd place among the universities of Turkmenistan.

The teaching staff and students became winners of the Youth Award of Turkmenistan in 2023; students were awarded about 20 medals and more than 70 diplomas at international Olympiads and academic competitions, teachers became winners in the annual competition of scientific works held on the occasion of Science Day²⁷⁸.

Source: S.A. Niyazov TAU

Turkmen Agricultural Institute

The Turkmen Agricultural Institute (TAI) was established in 2010 at the Ministry of Agriculture and Environmental Protection of Turkmenistan²⁷⁹. The Institute offers training at the Hydromelioration and Agricultural Mechanization Faculty in such disciplines as "Operation of hydro-reclamation systems", "Hydromelioration" and, since 2022, "Hydraulic facilities". TAI

²⁷⁷ UI GreenMetric World University Ranking is a ranking on green campus and environmental sustainability initiated by the University of Indonesia in 2010. It determines the rankings by universities' environmental commitments and initiatives. The universities are ranked in 6 criteria (university infrastructure/SI; Energy Efficiency and Climate Change/EC; university-generated waste disposal/W/S; transportation policy reducing emissions of carbon dioxide and harmful particles/TR; environmental education in university programs/ED; water/WR) and 39 indicators

²⁷⁸ organized jointly by the Academy of Sciences of Turkmenistan and the Central Council of Youth Organization named after Magtymguly

²⁷⁹ the Ministry of Agriculture of Turkmenistan was established on the basis of the Ministry of Agriculture and Environmental Protection by the Decree of the President of Turkmenistan No.240 dated 14.07.2023

includes the Training and Production Facility and the Research and Production Center (RPC). The UNESCO Club “Environmental Protection – an important concept of sustainable development” was opened at the institute in 2023 (March 11).

Major Events and Activities in 2023

Capacity building. Training workshops were held: (1) on the topic “Adaptation to climate change in urban and agricultural water supply”²⁸⁰ (on the base of the Institute in Dashoguz city, November 13-15); (2) on the use of digital technologies in agriculture (December); (3) in such areas as “GIS and its capabilities”, “Innovative technologies in agriculture”, “Digital economy”, “Digital technologies in agricultural mechanization”, “Innovative technologies in veterinary medicine” for personnel from the Dashoguz velayat hakimlik (municipal administration), production associations “Dashoguzgallaonumleri” and “Dashoguzsuvkhodzhalik”, Dashoguz land-building research field stations and others (November).

The following competitions were also held: the hackathon “AgriHack” between the students of higher educational institutions of Turkmenistan (September 30); the Environmental Brain Ring among the youth²⁸¹, organized jointly by the UNDP in Turkmenistan and the USAID Youth Development Activity (YDA) (December 2).

The teaching staff took part in the NEXUS interactive game²⁸² (February), professional development courses organized by the Magtymguly Turkmen State University (February).

9.1.5. Uzbekistan

National Research University “Tashkent Institute of Irrigation and Agricultural Mechanization Engineers” (NRU “TIAME”)

NRU “TIAME” is the first and single national research university in Uzbekistan; it has a long history as a leading educational institution that offers research, higher education and expert consultations on water and environment.

NRU “TIAME” consists of: a parent university with 7 faculties, Research institute of fundamental and applied sciences, Bukhara Institute of Natural Resources Management, Karshi Institute of Irrigation and Agrotechnology, Educational and Scientific Center in Tashkent region, UNESCO Chair on Water Diplo-

Events. TAI held the following: (1) the scientific-practical conference “Sustainable Development Goals and the prevention of global drought through the use of scientific-proven natural substances to improve the saline landscapes for agricultural production” (June 17); (2) the conference devoted to the International Youth Forum on Climate Change LCOV-2023 (October).

The teaching staff took part in the international conference “Central Asia: towards a sustainable future through a strong regional institution” dedicated to the 30th anniversary of the IFAS (Dushanbe, June 5-7).

Achievements and awards. The teachers and students from the TAI took part in the competition of scientific works held on the occasion of Science Day and took top places (Ashgabat, June 12).

In 2023, declared the year of the happy youth with Arkadag Serdar, students of the Institute won: (1) 12 awards, namely 1 silver medal, 1 bronze medal, 3 awards of the I degree, 6 awards of the II degree and one award of the III degree in international Olympiads and competitions; (2) 30 awards, including 9 diplomas of the I degree, 11 diplomas of the II degree and 10 diplomas of the III degree in national Olympiads.

TAI took (1) the 1058th place with 3080 points in the UI GreenMetric World University Ranking; (2) the 1001st position in the Times Higher Education²⁸³ (THE).

Source: TAI

macy, Water Resources Management and Environmental Protection (established in 2018), which serves as a platform for multidisciplinary education and research. The University offers about 40 curricula for bachelor’s degree, 36 – for master’s degree and 21 – for doctoral.

Major Events and Activities in 2023

Research efforts were carried out under 5 fundamental and 11 applied projects (for an amount of 6.4 billion soums), economic contracts concluded with 58 organizations (over 1.6 billion soums) and 9 international research grants (over \$500 thousand).

The following results were achieved: (1) Optimized cotton irrigation technology: Through the application

²⁸⁰ within UNDP projects “Developing the National Adaptation Planning Process in Turkmenistan” and “Conservation and Sustainable Management of Land Resources and High Nature Value Ecosystems in the Aral Sea Basin for Multiple Benefits” (GCF, GEF)

²⁸¹ the competition was held within the framework of the project “Conservation and Sustainable Management of Land Resources and High Nature Value Ecosystems in the Aral Sea Basin for Multiple Benefits”, implemented by UNDP and the Ministry of Environmental Protection of Turkmenistan

²⁸² held as part of the USAID Regional Water and Vulnerable Environment Activity in collaboration with the EU “Central Asia Nexus Dialogue project: Fostering Water, Energy and Food Security Nexus and Multi-Sector Investment (phase II)”

²⁸³ the ranking, which assesses the universities for their contributions to the SDGs by comparing them in four areas: research, governance, outreach activities and teaching

of the FAO CROPWAT model, irrigation water use was reduced by 17% in the Kashkadarya River basin, resulting in a 31% increase in cotton yield; (2) Intelligent sensor technology: Developed theoretical foundations for intelligent sensors to enhance the energy efficiency of pump units; Smart crop cultivation system: Created an automated system for efficient resource management, conserving energy, water, and fertilizers while preserving ecosystems; Two-phase flow modeling: Established a closed equation system to describe the complex dynamics of two-phase flow (gas and liquid) relevant to agricultural processes; (3) Meteorological parameter analysis: Refined methods for analyzing meteorological parameters, considering the influence of micro- and macro-topographic features on atmospheric stability. Computational algorithms were developed to assess stability within the atmospheric surface layer; (4) Embankment dam hydraulics: Investigated the hydraulic behavior of embankment dams, developing mathematical models to account for factors such as structural weight, filtration, moisture distribution, and dynamic stress; (5) Precision agriculture mapping: Produced high-precision digital illustrating groundwater levels and salinity, and soil salinity distribution in the Boyovut district; (6) Water intake optimization: Assessed the impact of turbid sediments on hydraulic elements and channel siltation during water intake from reservoirs, providing guidelines for optimized water extraction; (7) Innovative cultivation tool: Designed a universal cultivator that enables efficient inter-row cultivation based on water-saving principles and precise row formation.

Capacity building. The University, in collaboration with international partners, has implemented 12 specialized curricula. University departments have integrated practical learning into their programs, with students spending one day per week at organizations within the Ministry of Water Management, Ministry of Energy, Cadastral Agency, and "Uzbekhydroenergo."

University students and researchers have showcased over 20 innovative projects at events such as INNOWEEK 2023, covering areas like scientific research, commercialization, youth initiatives, and creative education (Tashkent, October 16-20).

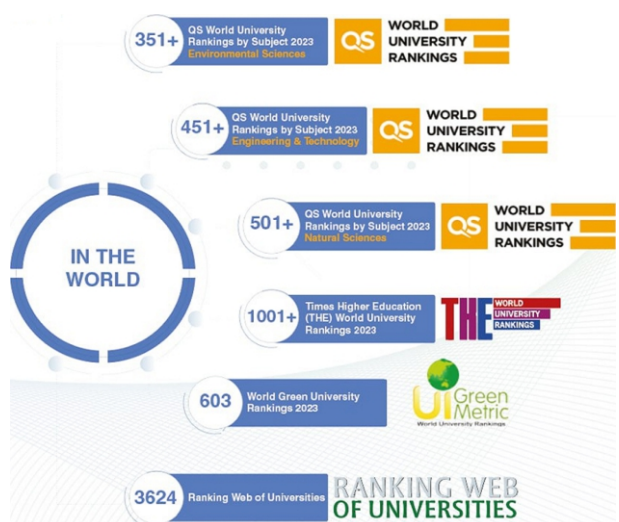
The Information-Resource Center houses a digital library equipped with RFID technology for efficient material tracking. All educational and scientific literature is cataloged within the IRBIS64+ program. Additionally, a partnership with Felder KG has led to the establishment of an Innovative Training Center for Woodworking.

40 dissertations were successfully defended for the degrees of Doctor of Science (DSC) and Doctor of Philosophy (PhD). The national stage of the regional student Olympiad "Sustainable Development Goals"

was hosted, with participation from Central Asian countries. The University held: (1) 2nd International Summer School "Assessing the sustainability of water-energy-food-ecosystem nexus for irrigated agriculture: interdisciplinary approaches for Central Asia"²⁸⁴ (August 21-25); (2) workshops "Educational course on water-saving irrigation technology in agriculture" (September 7-14), "Groundwater level response to climate change and human activities: A Case Study in the Amu Darya Delta"²⁸⁵ (September 25), "Climate protection: international energy transition, energy security and decarbonisation policy"²⁸⁶ (September 26), and "Decision-making support to improve water security under climate change in Central Asia"²⁸⁷ (October 20).

Events. NRU TIAME hosted 13 international scientific-practical conferences and symposiums at the level and one republican conference, including: "Construction Mechanics, Hydraulics and Water Resources Engineering (CONMECHYDRO-2023)" (April 26-28); "Agricultural Engineering and Green Infrastructure Solutions (AEGIS-2023)" (March 28-30); "Current problems of agriculture and water supply" (May 12-13); "Problems related to water resources and agriculture management under climate change in Central Asia" (May 18-20); "Priorities of land resources management in Uzbekistan: challenges and solutions" (May 25); "Engineering for Environmental Technologies and Sustainable Development" (October 14); "Construction Mechanics, Hydraulics and Water Resources Engineering (CONMECHYDRO 2023)" (December 21-22); "Water, Energy and Food Security in the Context of Global Climate Change and Water Scarcity" (December 22).

Achievements and awards. NRU TIAME, for the first time among the universities of Uzbekistan, entered



Source: <https://tiame.uz/ru/>

²⁸⁴ in cooperation with IWMI and a number of German institutions

²⁸⁵ in cooperation with scientists from the Xinjiang Institute of Ecology and Geography (XIEG) of the Chinese Academy of Sciences

²⁸⁶ in collaboration with the German Embassy

²⁸⁷ in collaboration with partners from Germany and CA countries within the framework of the international platform "Tashkent Water Security Lectures"

the Top-500 world universities by Subject 2023 in three disciplines: (1) Engineering and Technology – ranked 451-500 with a score of 60.9 points; (2) Natural Sciences – ranked 501-520 with a score of 58.0 points; (3) Environmental Science – ranked 351-400 with a score of 66.2 points.

NRU TIAME has achieved significant global recognition: (1) QS Stars Rating: the university earned a 4-star rating with a score of 689 out of 1000; (2) QS World University Rankings: Asia 2024: ranked 249th in the Asia-Pacific region with a score of 88 points; (3) QS World University Rankings: Asia 2024: ranked 9th among Central Asian universities and 1st among Uzbek universities.

Publications. NRU TIAME publishes several scientific journals in Uzbek, Russian, and English, including "Irrigation and Land Reclamation", "Sustainable Agriculture", "Fundamental and Applied Research", and "Ecosystems and Biomass". The university has also published 53 manuals, 105 textbooks, and 80 monographs, and obtained 16 patents and 80 certificates. NRU TIAME researchers published 939 articles in journals indexed by the international databases QS (Q1, Q2, Q3, Q4) and Web of Science. These publications have garnered over 16,200 citations, representing 20% of all citations for Uzbek publications.

Source: NRU TIAME, <https://tiame.uz/>

National University of Uzbekistan named after Mirzo Ulugbek

The National University of Uzbekistan named after Mirzo Ulugbek (M. Ulugbek NUUZ) was established on May 12, 1918. The University has in its structure 16 faculties, including [Geography and Natural Resources](#), [Ecology](#), [Geology and Geoinformation System](#), [Hydrometeorology](#)²⁸⁸.

Major Events and Activities in 2023

Research activities. As part of the Uzbek-Indian cooperation, the following projects were completed: (1) "Evaluation of effect of dams and climate change on water scarcity and drought in arid and semi-arid river basins of India and Uzbekistan" (2021-2023), following the results of which the annual and seasonal variability of the Chirchik River runoff was assessed; the meteorological and hydrological drought indices (SPI, SSI, Run theory) and correlations²⁸⁹ between them were determined; a memorandum of understanding was signed between the M. Ulugbek NUUZ and [Maharaja Sayajirao University of Baroda](#) (December 22, Baroda, India) and joint workshops were held on the effective water use and management in Uzbekistan

and India in the context of climate change (December 1 and 19); (2) "Studying the dynamics of glacier degradation in the mountain ranges of Uzbekistan based on remote sensing" (2021-2023). The project assessed the long-term changes in areal and linear characteristics of glaciers, in meteorological parameters of high-mountain zone and in glacial runoff and mass balance in Uzbekistan.

A number of projects are ongoing, including: (1) "Development of a system of monitoring over changes in the glacier mass balance and building scenarios of glacier future in the face of global climate change"; (2) "Integrated use of ground-based observations and solar radiation data from geostationary weather satellites for the sustainable development of agriculture, water and energy"; (3) "Climate change, renewable energy and public health in Uzbekistan"²⁹⁰. The University hosted a training workshop, while the faculty participated in a scientific workshop at the Potsdam Institute for Climate Impact Research/PIK (November 15-16).

The University's faculty and students participated in the international project "Anchor Schools for the Development of Entrepreneurship Skills Related to Natural Resources and Climate" (WB). As part of this project, a workshop²⁹¹ on climate change and environmental awareness, education, and entrepreneurship was held (December 5).

Capacity building. Since the 2022-2023 academic year, NUUZ, in collaboration with the [Russian State Hydrometeorological University](#), has organized an online course in "Meteorology and Climatology" under the 3+2 program.

Specialists from renowned foreign universities and research institutes have delivered lectures, practical classes, and training workshops for NUUZ's students. Notably, Dr. Iulii Didovets and Bijan Fallah from the Potsdam Institute for Climate Impact Research (PIK) conducted training sessions on "Mathematical Modeling of Hydrometeorological Processes" and "Climate Monitoring and Climate Models." Additionally, experts from the [Leibniz Institute for Tropospheric Research](#) (Germany) provided insightful lectures on "Dust Research and Dust Processes in Central Asia."

The University's faculty participated in a training seminar on "SPACECOM: New Curriculum in the Area of Space Systems and Communication Engineering" at the [Technical University of Berlin](#) (August 21-25). Additionally, G.U. Umirzakov, Associate Professor at the Department of Hydrometeorology and Environmental Monitoring, Faculty of Hydrometeorology,

²⁸⁸ Faculty of Hydrometeorology was formed in the 2021/2022 academic year in accordance with the Decree of the President of Uzbekistan No. PP-4896 dated November 17, 2020 "On measures to further improve the Hydrometeorological Service of the Republic of Uzbekistan. The Faculty has 3 departments: "Land hydrology", "Hydrometeorology and Environmental Monitoring", "Meteorology and climatology". "Land hydrology" Department offers PhD and DSc programs in the disciplines "Land Hydrology", "Water Resources", and "Hydrochemistry"

²⁸⁹ "Hit-score" indices were determined through different meteorological and hydrological drought indices

²⁹⁰ as part of the research cooperation program "Uzbekistan-Germany"

²⁹¹ Jointly with the Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan, M. Ulugbek NUUZ, Central Asian University of Environmental and Climate Change Studies ([Green University](#)), and the WB

completed a scientific internship at the [University of Fribourg](#). The internship focused on studying geodetic and modeling methods for determining glacier mass balance and conducting research on the Barkrak Glacier in the Pskem River basin (Fribourg, Switzerland, April 1-30).

Students from the Department of Land Hydrology, Faculty of Geography at Lomonosov Moscow State University, completed a field academic internship on the Ugam River near the Charvak Reservoir (July 15-30) at the NUUZ Camp in Uzbekistan.

In 2023, Z.F. Khakimova, a faculty member of the Faculty of Hydrometeorology, successfully defended her dissertation in the field of Land Hydrology, Water Resources, and Hydrochemistry (11.00.03).

Events. M. Ulugbek NUUZ hosted two international scientific-practical conferences: "Integrated management and reclamation of degraded soils for food security: new approaches and innovative solutions" (April 19-21) and "Water resources of arid regions under climate change conditions: problems and solutions" (October 20).

Students from the Faculty of Hydrometeorology participated in events commemorating International Water Day (March 11) at NRU "TIIAME" and won prizes in the international subject student Olympiad on "Land Hydrology" (April 26-27).

Achievements and awards. M. Ulugbek NUUZ was ranked as a 5-star university in 4 categories (education, employment, opportunities for students, and inclusive education) based on the performance analysis results at the "QS Higher Education Summit Asia Pacific 2023".

Publications. Since 1997, NUUZ has been publishing the "NUUZ Newsletter" to showcase the results of research activities and articles by faculty and students.

In the current academic year, the University published 1 manual and 2 textbooks. Faculty and students from the Department of Hydrometeorology and Environmental Monitoring contributed significantly, authoring 4 monographs, over 70 scientific articles, including 8 in international journals and 20 in national journals.

Source: M. Ulugbek NUUZ, <https://nuu.uz/en/university/>

Samarkand State University named after Sharaf Rashidov

The Samarkand State University named after Sharaf Rashidov²⁹² (SamSU) was founded in 1927. The University has 14 faculties. The [Faculty of Geography and Ecology](#) offers training in such disciplines as "Ecology and environmental protection", "Hydrometeorology" (Bachelor's degree) and "Ecology", "Hydrology" (Master's degree).

Major Events and Activities in 2023

Capacity building. A group of students and researchers from the Institute of Agrobiotechnology and Food Safety at the SamSU visited the international [Arid Land Research Center](#) of the [Tottori University](#) (Japan) as part of the "Sakura science exchange program"²⁹³, where they got a chance to become familiarized with the specifics of salt tolerance of agricultural crops and technologies for growing fruit trees on sandy soils (December, Tottori, Japan).

SamSU has organized several international collaborations: (1) professors from the [University of Bologna](#) (Italy) delivered [lectures](#) on establishing and maintaining intensive orchards in arid regions, particularly focusing on resource-efficient and innovative methods for grape cultivation in drought conditions; (2) faculty from the University of California (USA) conducted a workshop on "Analysis of Water Quality Data Based on QGIS and Remote Sensing Methods"; (3) a professor from the [University of Debrecen](#) (Hungary) presented [lectures](#) on modern agricultural technologies, followed by practical sessions on geoinformatics systems, 3D modeling, and satellite remote sensing.

Events. SamSU hosted: (1) international scientific-practical conferences "Geographical problems of countries and regions: fundamental and practical aspects"¹²⁹⁴ (April, online) and "Modern geographical research: theory, practice, innovations" (May 12-13);

M. Ulugbek NUUZ in the international rankings:



Source: <https://www.instagram.com/p/CyIFD5JNVcP/>

²⁹² by the Decree of the President of Uzbekistan No.PP-82 dated January 13, 2022 "On measures to further improve the activities of the Samarkand State University"

²⁹³ in 2014, the Japan Science and Technology Agency (JST) started the "Sakura Science Program", the purposes of which are to support the development of talented human resources from overseas who have the potential to contribute to innovation in science and technology, to promote continuous collaboration, cooperation and interaction between Japanese educational and research institutes and those overseas

²⁹⁴ jointly with the North Caucasus Federal

(2) conference "Geographical basis for the sustainable development of mountain and lowland landscapes" dedicated to the 85th anniversary of Lapas Alibekov (September); (3) V international conference "Food Security: Global and National Problems" (October 13-14); (4) international conference "Opportunities for increasing stability under conditions of transboundary water scarcity: Central Asia case study"²⁹⁵ (November 1-3); (5) international workshop "Development of a Central Asian model of climate change" (November 27-29).

Cooperation. SamSU had meetings with the delegations of: (1) the University of Malaysia Terengganu

(UMT) and signed a memorandum of cooperation (December); (2) the Xi'an Jiaotong University (XJU) led by Deputy Minister of Education of the PRC and Vice President of the XJU and signed a Memorandum of Cooperation to establish a "Chinese Research Center"²⁹⁶ (December).

Publications. SamSU published 6 issues of the "Scientific Newsletter of the Samarkand State University" and 3 issues of the "Food Security: National and Global Challenges" journal in 2023. These publications featured articles by the Institute's staff members.

Source: <https://www.samdu.uz/ru>

9.2. Regional Higher Education Institutions and Professional Development Centers

9.2.1. Regional Training Center at SIC ICWC

Water sector professional development courses in Central Asia were established at SIC by the ICWC decision (ICWC Protocol No.24 of 23.10.1999). The courses were founded by the ministries of agriculture and water resources of five CA states, SIC ICWC, BWO Amu Darya and BWO Syr Darya. Later, these vocational training courses were transformed into the Regional Training Center (RTC) at SIC ICWC.

Major Events and Activities in 2023

SIC ICWC organized: (1) jointly with the IWMI, training workshops as part of events dedicated to the 30th anniversary of IFAS: "Efficient Allocation of Water Resources in the Syr Darya River Basin in the context of Climate Change" for experts from the BWO Syr Darya and water management organizations in the Fergana Valley (Tashkent, February 23-24) and "Efficient Allocation of Water Resources in the Amu Darya river basin in the context of climate change" for experts from the BWO "Amu Darya" (Urgench, September 28); (2) a roundtable in memory of Prof. V.A. Dukhovniy "Improvement of regional water and energy cooperation in Central Asia" (August 16, online); (3) in colla-

laboration with the Potsdam Institute for Climate Impact Research (PIK), training workshop "From Climate Modelling to River Flow: High-resolution scenarios and hydrology in Central Asia's climate change context" for climate change experts from the CA countries (Tashkent, October 24-26).

As part of collaboration with NRU "TIAME": (1) SIC ICWC held an introductory meeting with TIAME to present information about the ICWC and SIC ICWC (June 26); (2) Deputy Director Sh. Muminov participated in the 6th series of lectures on water security in Tashkent, delivering a presentation on "Water Security Outlook in Khorezm, Navoi, and Samarkand Provinces of Uzbekistan" (Tashkent, October 20).

Director D.R. Ziganshina delivered a lecture on "Specifics of Transboundary Water Allocation in Central Asia" for IWRM Master's students of DKU (February 21, online) and participated in the Peer-to-Peer workshop: how to use the two global Water Conventions to promote cooperation on the ground" organized by the Secretariat of the Water Convention (Geneva, July 3-4).

9.2.2. University of Central Asia (Kazakhstan, Kyrgyzstan and Tajikistan)

The University of Central Asia was founded in 2000 to promote socio-economic development in Central Asia, particularly in its mountain communities, by offering an internationally recognized standard of higher education. UCA is comprised of the: (1) School of Arts and Sciences (SAS), offering a five-year undergraduate program in six majors, including "Earth and Environmental Sciences"; (2) Graduate School of Development (GSD), which includes the Mountain Societies

Research Institute (MSRI); (3) School of Professional and Continuing Education (SPCE).

Major Activities in 2023

Research activities. UCA experts conducted research: (1) on climate impact on economy and local communities in the Isfara river catchment. The findings of this research were presented at the National Forum on

²⁹⁵ in collaboration with the US Academies of Sciences, Engineering and Medicine, and the Universities of California and Oklahoma

²⁹⁶ this center aims to address critical issues such as water and land resource management, dust storm mitigation, environmental pollution, agricultural productivity, and biodiversity conservation

Climate Change in Bishkek, Kyrgyzstan, held in conjunction with the 28th Conference of the Parties of the UN Framework Convention on Climate Change (November 10); (2) on food security in the high mountain regions of Central Asia. The results of this research were published in the prestigious BioScience journal in an article titled "Food Security in High Mountains of Central Asia: A Broader Perspective."

Capacity building. UCA organized: (1) a workshop in Naryn, Kyrgyzstan, to discuss the impacts of climate change on water resources (April); (2) the EcoKyzdar Hackathon on "Climate Change and Environmental Sustainability" in Naryn (April 15-16); (3) a training course in Tajikistan to equip key stakeholders with the skills to map snow avalanches (June).

UCA GSD and the University of Oxford jointly organized and held a Social Science Research Summer School (August).

Events. UCA held: (1) a side event²⁹⁷ "Adopting the Water-Energy-Food-Environment Nexus for a water-wise energy transition" (New-York, USA, March); (2) the youth forum addressing the Sustainable Development Goals (Naryn, May); (3) the expert workshop on developing the agricultural value chains in Central Asia (October); (4) the Youth Climate Action Conference²⁹⁸ (Naryn, Kyrgyzstan, November).

Collaboration. As part of its Mountain Universities Partnership (MUP), UCA has established state-of-the-art facilities at Khorog State University (KSU), including geology laboratories, a digital library, a tourism center, and an IT hub.

UCA signed a Memorandum of Understanding with Ala-Too International University in March. UCA also signed a Memorandum of Understanding with Naryn State University to strengthen collaboration in various areas, particularly focused on improving the quality of life in Naryn and its surrounding regions (December).

UCA's post-doctoral fellows from the Institute of Public Policy and Administration visited Oxford University's School of Geography and Environment and Cambridge University to discuss potential research collaborations.

Publications. UCA published: (1) an article "Food security in high mountains of Central Asia: A broader perspective"/Roy C Sidle, Aziz Ali Khan, Arnaud Caizerman, Aslam Qadamov, Zulfiqor Khojazoda//BioScience, Volume 73, Issue 5, May 2023, pages 347-363, <https://doi.org/10.1093/biosci/biad025>, noted as the "Editor's choice"; (2) a policy brief by Asel Murzakulova "Climate Change Concerns in Central Asia Public Discourse", <https://ucentralasia.org/media/licf2k1h/uca-policy-briefclimate-change-concerns-in-central-asia-public-discourse.pdf>; (3) a book by Yuri Badenkov "Life in the Mountains: Environmental and Cultural Diversity – Diversity of Development Models", ucentralasia.org/publications/2023/April/chhubook.

UCA produced a documentary film "Cold Wind Valley"²⁹⁹ addressing the impact of climate change on the Khan Tengiri Nature Park, www.youtube.com/watch?v=NQfBdL0CA5c.

Source: <https://ucentralasia.org/ru>

9.3. Professional Development Courses and Trainings

9.3.1. Professional Development Courses and Trainings in 2023

February 3, March 3, April 7, November 3, December 1 – GOFC-GOLD CARIN (Central Asia Regional Information Network) Webinar Series/CARIN (№№ 9-13)

March 9-13 – workshop on the RDS process for a group of national experts from Central Asian countries within the framework of the USAID Regional Water and Vulnerable Environment Activity in Central Asia

March 27-28 – workshop on "Learn to use Earth-observation and remote sensing facilities/GIS to improve the water resources management on the transboundary river Qaratogh"

April 18-19 – workshop on climate risks in Central Asia

April 19, July 13; July 27; September 17 – WEFE Nexus lecture series within the framework of the USAID Regional Water and Vulnerable Environment Activity in Central Asia

April 27-28 – CAWAMNET regional seminar within the framework of the IAMO project "Central Asian Water Conflict and Migration Network"

June 12-23 – online International Summer School-2023 "Smart and innovative agriculture – effective technologies and practices"

June 13-14; July 11-12; September 12-14; September 20; November 13-15; November 16-17 – workshop series within the framework of the project "Developing a National Adaptation Planning Process in Turkmenistan" (UNDP/GCF) on such topics as: "Climate and water resources", "International cooperation on climate change and water", "Implementation of IWRM as an adaptation tool to climate change", "National legislation, policies and institutions on water and adaptation to climate change" and "Impact of climate change on the water and agriculture sectors and adaptation efforts"

²⁹⁷ this event was organized by the UCA and Aga Khan Development Network agencies along with Tajikistan Ministry of Energy and Water Resources, International Hydropower Association, "ITAIPU Binacional" company, Executive Committee of IFAS, USAID, and GIZ

²⁹⁸ the event was a collaborative effort by the UCA, the World Bank, Resiland CA+ project, Anchor Schools (an education and community development advisory firm based in Philadelphia, USA)

²⁹⁹ this film was directed by A. Baiymbetov and produced as part of the "Voices from the Roof of the World" project, a joint initiative of Aga Khan University, Aga Khan Agency for Habitat, Aga Khan Foundation, and the University of Central Asia

June 20 – workshop “Climate Finance Tracking: Reporting, Methodologies and Best Practices”

July 24-28 – summer school “Geospatial Technologies for Building Resilience”, Budapest, Hungary

August 17-18 – workshop “Operational monitoring and forecast of seasonal water availability in Central Asia using the MODSNOW tool”

August 21-31 – summer school on the Aral Sea organized by DKU

September 11, 13, 15, 19, 22 – IWMI regional workshops in Central Asia, in collaboration with partners, within the framework of the US Forest Service project “Improving and strengthening water security and watershed management in Central Asia”

October 9-12 – regional workshop on climate action transparency

November 21-23 – training for trainers (lecturers) on water diplomacy and international water law

NASA Applied Remote Sensing Program Trainings/ARSET: **July 18-25** – “Monitoring Water Quality of Inland Lakes using Remote Sensing”; **September 19-21** – “Building Climate Risk Assessments from Local Vulnerability and Exposure”; **October 26-November 9** – “Spectral Indices for Land and Aquatic Applications”

Series of webinars held by the **International Water Training Institute**, <https://hydroschool.org/webinars/>

9.3.2. Professional Development Courses and Trainings in 2024

CAREC training workshops:

February 13 – webinar “Energy Sector and Climate Risks”

March 11-15 – workshop on climate finance issues

March 12-15 – workshop on transboundary cooperation in Central Asia

April 25 – webinar “Green jobs and skills assessment”

June 26-28 – webinars and workshop on reporting in adaptation (GIZ methodology, best practices, ICAT tool)

July 3-5 – practical training on LEAP³⁰⁰ and GACMO³⁰¹ models

July 22-August 2 – summer academy covering a wide range of topics in climate action and reporting³⁰²

September – Annual Central Asian Leadership Programme on Environment for Sustainable Development/CALP

Online education on environmental protection and sustainable development/free online courses, see <http://elearning.carececo.org/>.

The **International Water Training Institute/Hydroschool** provides training on the following disciplines: “Surface Water Hydrology”, “Surface Water Hydraulics”, “Water quality”, “Groundwater”. In addition, the institute offers a series of webinars in 2024

The **International Water Association/IWA** offers short-term courses (refer to <https://iwa-network.org/iwa-learn-short-term-courses/>), self-paced courses (refer to <https://iwa-network.org/iwa-learn-self-paced-courses/>), webinars (refer to <https://iwa-network.org/iwa-learn-webinars/>).

The **University of Geneva/EUG** conducts a short-term course “International Water Law and the Law of Trans-

boundary Aquifers” (see <https://www.unige.ch/formcont/en/courses/water-law#t1>).

The **UCAS China-Danish College** will organize the International Summer School “Global Change and Environmental Health” on July 18-27 in Beijing (refer to <https://ekois.net/mezhdunarodnaya-letnyaya-shkola-globalnye-izmeneniya-i-ekologicheskoe-zdorove/#more-44396>).

The **Leibniz Institute** for Agricultural Engineering and Bioeconomy, the **Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)**, the Research Institute for Sustainability – **Helmholtz Centre Potsdam (RIFS)** and the **University of Potsdam** will conduct the Potsdam Summer School entitled “Ecosystems Change & Resilience in the Anthropocene” on September 16-20 (refer to <https://potsdam-summer-school.org/>).

NASA Applied Remote Sensing Program Trainings/ARSET, for more details refer to https://appliedsciences.nasa.gov/get-involved/training?program_area=All&languages=All&source=All&page=0

Geneva water hub offers a diverse range of classes and teaching modalities, including an annual summer school, distance-learning courses, free Massive Open Online Courses and others. For more details, refer to <https://www.genevawaterhub.org/what-we-do/education-and-training>

UNESCO-IHE Online Courses on <https://www.un-ihe.org/courses/online>

DKU Online Courses on sustainable development, <https://edu.dku.kz/>

GOF-C-GOLD CARIN (Central Asia Regional Information Network) Webinar Series, on <https://icluc.umd.edu/content/gofc-gold-carin-webinar-series-2023>

³⁰⁰ Long-range Energy Alternatives Planning System

³⁰¹ Greenhouse Gas Abatement Cost Model

³⁰² as part of the ReCATH project