



Section 9

Water Education

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

9.1.1. Kazakhstan

Al-Farabi Kazakh National University

In 2019, the Al-Farabi Kazakh National University (Al-Farabi KazNU) celebrated its 85th anniversary. Al-Farabi KazNU is the only University in Central Asia to be listed in the top 210 among the world best HEIs by the international QS World University Rankings, the leader among the universities of Kazakhstan in the prestigious European rating “Academic Ranking of World Universities-European Standard”, and in the top 200 most environmentally friendly Universities in the world. In 2019, the World Congress of Turkic Peoples awarded Al-Farabi KazNU the title of the “Best University of the Turkic World” and honored Rector, Academician Galym Mutanov with a Gold Medal of this International Organization. The Rector was also elected the President of the International Association of Universities “Universities Open Network”, and the University teachers are the leaders of the National Rating of Demand for Universities of the Republic of Kazakhstan.

KazNU as a Global Hub of the UN “Academic Impact” program on Sustainable Development is [actively involved](#) in protecting ecology and environment, and it is working to promote ideas for sustainable development, research and development of alternative and renewable energy sources.

Experts for water sector are trained at the [Meteorology and Hydrology Department](#) and [UNESCO Chair in Sustainable Development](#) at the [Geography and Environmental Sciences Department](#).

Major Events and Activities in 2019

Al-Farabi KazNU organized:

- a [round table](#) “Climate Change in Kazakhstan: Vulnerability and Resilience”, which discussed current trends in climate change in Kazakhstan, risk factors and measures to increase resistance to them (January 24);
- in the framework of the VI International Forum “[Farabi Readings](#)”, lectures by professors from the University of Lorraine (France) and Karadeniz Technical University Trabson (Turkey) on soil and environment preservation (April 9);
- a [seminar-lecture](#) on environmental safety (September 10);
- in the framework of the Global Summit, a [Panel Session](#) dedicated to sustainable development, climate change management and best practices in this area (September 20) and the [first Plenary Session](#) “Youth’s Contribution to SDGs” (September 21);
- a [meeting](#) with the representatives of the Academy of Management of Hansu (PRC); the participants discussed prospects of cooperation in alternative energy sources, transboundary water sharing and green economy studies (November 11);
- International [Scientific-Practical Conference](#) “The Role of the President of Tajikistan in Solving Global Problems: Water is the Source of Life”, where the topical matters of water security were discussed (December 13).

Capacity building. In the current academic year, more than 1,000 undergraduates and doctoral students of KazNU were trained at leading foreign Universities, including the [School of Geography and the Environment](#) of the Oxford University.

The representatives of Al-Farabi KazNU presented reports on traditional and modern water management systems at the [1st Aquatic Culture Forum](#) (December 6, Lima, Peru).

Source: www.kaznu.kz/en

Kazakh National Agrarian University

The Kazakh National Agrarian University (KazNAU) was founded in 1929. The University consists of six faculties, seven research institutes, including the [Research Institute of Water Problems and Land Reclamation](#), five innovation centers, Institute of Postgraduate Education, [Institute of Professional Development](#), Distance Learning Center, Farmers’ High School, [Agro-technology Hub](#) (AgriTech Hub), innovative greenhouse, “Agro-university” industrial training facility. In addition, the University publishes the “Agrarian University” newspaper (since 15 Oc-

tober 1957) and scientific journal “Research and Findings” (since 1999).

The University prepares specialists for the water sector at the [Hydraulic Engineering, Land Reclamation and Business Faculty](#). In 2019, 159 bachelors and 42 masters graduated from the Faculty. The Faculty is comprised of four departments, including the [Water Resources and Land Reclamation Department](#), which offers specializations on water resources and water use; land reclamation, rehabilitation and protection (bachelor's degree – 342, master's degree – 60, PhD students – 16).

On water resources and water use, educational programs are offered for the (1) bachelor's degree in integrated water resources use, rural water supply and pasture flooding; (2) master's degree in integrated water resources use and protection, water management (TEMPUS); (3) doctoral degree in integrated water resources management, rural water supply and pasture flooding, hydrotechnical constructions for sectoral and complex purposes.

On land reclamation, rehabilitation and protection, educational programs are offered for the (1) bachelor's degree and (2) master's degree in land reclamation, rehabilitation and protection and in design of structures and hydromelioration systems.

A Water Hub was established at AgroHub with the support of ADB (2017); the tasks of the former include developing a single water database in Kazakhstan, introducing advanced technologies in the use of land and water resources, working with various institutions (franchises, trusts, etc.), monitoring and evaluating projects, etc. The Water Hub has the Water Resource and Land Reclamation Department and the Research Institute for Water Problems and Land Reclamation. The Hub includes 9 innovative educational and research laboratories.

With the Agricultural Research Service of the Ministry of Agriculture of the Republic of Kazakhstan and the University of Michigan, work is underway to launch Land and Climate Hubs with the purpose of addressing the issues of effective land and water management in Kazakhstan and other CA countries.

Major Events and Activities in 2019

KazNAU hosted:

- [International Winter School-2019](#) in 12 areas, including Water Resources Manage-

ment, Green Economy, Natural Resources Management, Innovative Technologies and Technical Facilities in Agriculture, etc. (February 11-23);

- [XI Republican Subject Olympiad](#) on 16 topics, with 244 students from 19 Kazakh HEIs. Students of KazNAU showed the best results (April 11-12);
- [XXIII International Scientific and Practical Conference](#) of Young Scientists and Students “The Youth of Agrarian Science: Achievements and Prospects” (April 26-27);
- International Symposium “Modern Research and Assessment Methods for Environmental Monitoring and Land and Water Management in Agricultural Landscapes of Central Asia” (July 2-3);
- a [seminar](#) on “The Use of Surface Water and Groundwater for Irrigation of the South Kazakhstan: Quantity and Quality” with the participation of scientists from the University of Nebraska-Lincoln, USA (August 22);
- [International Workshop](#) “Restoration and Sustainable Management of Dryland Forests in Central and Northeast Asia” (August 26-30).

International cooperation. Meetings were held with the delegations of (1) China, where the issues of innovative development in the water sector were discussed, and a Memorandum of Understanding was signed (September); (2) ADB, which addressed the development of bilateral cooperation, agriculture and water resources management in the country (May) and support to KazNAU projects on agricultural development (June). Delegations got acquainted with the work of the Water Hub.

A Memorandum of Understanding and Cooperation was signed between KazNAU and the Korean company “Vitrosys Inc”, which deals with high technologies of growing crops (June).

Awards. Candidate of agricultural sciences, professor of the Water Resources and Land Reclamation Department E.D. Zhaparkulova was one of the winners of the Republican competition “[The Best Teacher of Higher Education Institution 2018](#)”. A. Ydyrys, a fourth year student of the Hydraulic Engineering, Land Reclamation and Business Faculty, was awarded the medal “Best student of CIS 2019” and a special diploma.

Source: Water Resources and Land Reclamation Department, www.kaznau.kz/

Taraz State University named after M.Kh. Dulati

The Taraz State University named after M.Kh. Dulati ([TarSU](#)) was founded on 24 March 1998. According to the ARES-2018 rating (Academic Ranking of World Universities – European Standards), the University takes the 9th position among 96 HEIs of Kazakhstan and 5th place in the University Ranking by the Kazakhstan Association for Engineering Education (KazSee).

Specialists for the water sector are prepared at the Water Management, Environment and Construction Faculty established in 1962. The Faculty has 15 doctors of sciences, professors, more than 40 candidates of sciences, associate professors, 11 doctors and 27 masters.

There are 8 Departments at the Faculty, including for Land Reclamation and Agronomy; Water Resource; Ecology; and Life Safety. The Faculty prepares (1) bachelors in hydraulic construction and structures; land reclamation and irrigated agriculture; water supply and sewage in settlements; water resource management; engineering reclamation; (2) masters in water resource management; water supply and sewage in settlements; land reclamation and irrigated agriculture; hydraulic construction and structures; (3) doctors in land reclamation and irrigated agriculture; hydraulic construction and structures. For many years, the Dissertation Council for the awarding PhD degree in hydraulic construction and structures and land reclamation, rehabilitation, and protection has been functioning at TarSU.

TarSU implements a number of joint scientific projects together with KazNIIVKh.

Major Events and Activities in 2019

TarSU held:

- XXI Student Scientific and Practical Conference “Modern Youth – a Generation of Great Opportunities”, where topical issues, including water management and ecology were addressed (March 5-13);
- “Environmental Descent” on the territory of “Aulie Bastau” settlement (April 16);
- a [seminar](#) on “The Use of Surface Water and Groundwater for Irrigation of the South Kazakhstan: Quantity and Quality” (August 20);
- XIII International Scientific Conference “Innovative Development and Demand for Science in Modern Kazakhstan”, where the reports on “Natural Resources Research for Sustainable Environmental Protection with Economic Benefits”, “Prospects of Remote Sensing Methods Application for Ravine Erosion” were presented among others (November 7);
- International Scientific and Practical Conference “V Urkumbayev’s Readings” dedicated to the 80th anniversary of academician M.F. Urkumbayev. For the second section “Hydraulic Engineering, Reclamation and Environmental Protection”, 36 reports were presented. Those addressed reclamation, ecology, monitoring of debris flow formation, rational system of animal management on pastures, and the status of hydraulic structures (November 22-23);
- IX International Ecological Olympiad of Universities of the CIS states, where TarSU took the 1st place (November 29);
- opening of the lecture hall 6.2.406 “Bioresources of Kazakhstan” in honor of Prof. A.E. Danebekov, Candidate of Biological Sciences (December 12).

Participation in events. The TarSU student S. Majitova took the 2nd place at the XI Republican Subject Olympiad on Water Resources and Water Use (April 18-19, KazNAU); TarSU also took the 2nd place at the First International Olympiad on Hydrology (April 22-23, L.N. Gumilyov Eurasian National University, Nur-Sultan).

International cooperation. Prof. V.Ya. Katz from the [Ariel University](#) (Israel) held seminars (November 15, 28) and delivered a lecture “Hydraulic Shock. Hydraulic Resistance and Pressure Losses” (November 18) at the Water Resources, Environment and Construction Faculty.

Capacity building. Lecturer of the Water Resources Department Zh.I. Minarbekov has got a practical training at TIAME and delivered lectures on water management and land reclamation. Students and masters of the water resources and water use specialization took part in an educational trip on RES – Renewable Energy to study best practices of RES use in three countries of Central Asia (June 18-26, organized by GKU).

Source: Science and Commercialization of Technologies Department, TarSU, <http://www.tarsu.kz/index.php/ru/>

South Kazakhstan State University named after M. Auezov

The South Kazakhstan State University named after M. Auezov ([SKSU](#)) is a state multidisciplinary higher education institution. The University is comprised of six faculties, research institutes, SKSU LLP, SKSU College, Pre-University Training Center, Distance Learning Institute, Institute of Postgraduate Studies, and six higher schools, including the Higher School of Agricultural Sciences.

The Ministry of Education and Science of the Republic of Kazakhstan launched the Dissertation Council on PhD degree program on “Life safety and environmental protection” at SKSU.

According to the results of the national rating of the educational programs for the academic year 2018-2019, 84 specialization fields of SKSU entered the top three in the country by the Independent Kazakh Agency for Quality Assurance in Education, including life safety and environmental protection, water resources and water use, and ecology. In the QS World University Rankings 2020, SKSU retained its positions in the TOP 500 best universities of the world and moved from the 5th to the 3rd place among the universities of Kazakhstan.

The [Higher School of Agricultural Studies](#) prepares specialists in 9 fields, including water resources and water use, water supply, sewage and water protection. The School includes the [Water Resources, Land Use and Agrotechnology Department](#). In the academic year 2019-2020, 307 students studied at the department in 4 areas: water resources and water use; agricultural machinery and technology; land management; and cadastre. The department maintains close ties with counterpart departments of the Moscow University of Environmental Engineering, Kyrgyz Agrarian Academy and TIAME.

Source: <http://ukgu.kz/en>, <http://ap.ukgu.kz/en>

German-Kazakh University

The German-Kazakh University ([GKU](#)) was founded in 1999 with the aim of training students in line with the German standards. GKU has been the only German university in Kazakhstan and Central Asia up to present time. In 2019, GKU celebrated its 20th Anniversary (September 20).

The World Politics Faculty of GKU developed jointly with the [Free University of Berlin](#) (Freie Universität Berlin) and with the financial support of

the German Federal Foreign Office and DAAD and carries out the training program “[Integrated Water Resources Management](#)” as part of the Master's Degree in Management. The goal of the program is to train future leaders as experts in IWRM for solution of water problems in Central Asia at national and regional levels.

Within GKU, the [Natural Resource Institute](#) was established for building the applied science capacity in order to address the natural resource management issues in the countries of the region, as well as strengthening cooperation with international, regional and Kazakh scientific organizations.

GKU offers:

- [Central Asia Youth for Water Network \(CAY4W\)](#) – a regional network to share experience and knowledge and empower a new generation of water leaders in Central Asia;
- [Central Asian Journal of Water Research \(CAJWR\)](#) – an open access online journal dedicated to all aspects of water management in the region of Central Asia. It is available in English and Russian (<https://www.water-ca.org/>).

Major Events and Activities in 2019

GKU hosted:

- a series of [Water Days](#), which brought together students from many universities in Almaty, allowed them to share their research and visit lectures of leading experts from Europe and Kazakhstan;
- a [roundtable-conference](#) “Evaluation of the Integrated Water Resources Management Master's Program” to study state-of-affairs in water training courses in Central Asia and assess prospects of further development of the IWRM master's program (May 17-18);
- a lecture on “Water Quality Management: EU Experience” with speakers from Latvia (May 23-24);
- jointly with the YouTube channel “Land and Water CA” and with the support of DAAD in Kazakhstan, the [first online distance scientific conference](#) of the young researchers and students – “Sustainable Development in Central Asia”, where a number of reports were presented, including on agriculture

and ecology, assessment and reduction of natural disaster risk (July 1);

- [Alumni Meeting](#) of the Master program “Integrated Water Resource Management”, where alumni shared their success stories after graduation from the Master’s program and took part in a public speaking seminar (September 6-8, December 18).

GKU’s Natural Resources Institute hosted:

- a round table on the Youth Expedition “From Glaciers to the Aral Sea” to present the research results of the expedition, inform the public on the issues of natural resource use and management in the Aral Sea basin, as well as to show the documentary film about the expedition “[Glaciers 2 Aral](#)” (April 25, Almaty);
- a [training seminar](#) “Legal framework for climate change mitigation and adaptation in Central Asia” with the support of the OSCE Program Office in Nur-Sultan and CAREC as part of the Anniversary Central Asian Leadership Program on Environment for Sustainable Development (September 26-28). The event has been held annually since 2014;
- an [Educational Trip](#) to explore best practices on renewable energy in three Central Asian states (Kazakhstan, Kyrgyzstan, and Uzbekistan) with the support of the German Federal Foreign Office. Students saw in practice technical and technological features of RES, discussed existing challenges and opportunities (June 18-26);
- [Student research competition on sustainable management of natural resources](#) in CA and Afghanistan aimed at building capacities of the young generation in water and land management and environmental protection (May 2018-June 2019);
- [5th CAWg Summer School](#), which introduced into innovative methods and tools for the analysis and monitoring of water and land resources in Central Asia (July 8-19).

Representatives of the UNESCO Chair on IWRM at GKU took part in the following events: “UNESCO water family” [meeting](#) (May 13-14, Paris); 2nd edition of the [International Disaster Risk Management Summer University](#) (June 16-28, Khorog, Tajikistan);

Young Professionals [Booth](#) at the Stockholm World Water Week 2019 (August 24, Stockholm, Sweden). Representatives of GKU and Natural Resources Institute participated [in the meetings of the EU-Central Asia Network for Water Science and Technology](#) (April 1-2, Tashkent; June 24-26, Dushanbe; November 11-15, Bishkek).

GKU students took part in the Summer School “The Basics of Water Management: Integration of Theory, Practice and Research”⁵⁸ (June 10-22, TIAME).

CAY4W:

- “[Eco-talk 2019](#)” business incubator for young eco-entrepreneurs has been launched; it aims to transform innovative ideas into successful eco-business projects. Winners of the project received an in-depth training, during which they were able to improve their practical skills in the field of writing business plans, financial analysis, preparation of public speeches and presentations (December 13-19);
- National and Regional Student [Olympiads](#) on IWRM were held in March-May;
- Winners of the Regional Olympiad participated in the [first Aral Sea Summer School](#) organized to raise awareness of the youth and strengthen understanding of the importance of transboundary water management (August 10-18, Aralsk, Kazakhstan).

Source: UNESCO Chair on IWRM at GKU, <https://dku.kz/>, <http://www.academic-waters.org/en/>

Nazarbayev University

Nazarbayev University (NU) was established in 2010. The University is comprised of 7 Schools, including the [Graduate School of Public Policy’s](#) (GSPP). One of priority fields of the University is water resources management.

Major Events and Activities in 2019

Nazarbayev University and GSPP continued teaching and research activities in the field of water policy and water resource management in Central Asia.

NU has hosted the [Harvard College Project for Asian and International Relations Conferen-](#)

⁵⁸ Organized by USAID, CAREC, Ministry of Water Management of Uzbekistan within the framework of the Smart Waters project

ce (HPAIR) (August 16-20, Nur-Sultan). Experts from GSPP moderated a Session “Humanity’s Next Threat: Loss of Biodiversity”. The panel touched on issues about biodiversity impact in Asia by focusing on the growing need for economic development that could lead to destruction of natural habitats. It also referred to climate change as a prevalent environmental problem and its effects in the form of biodiversity loss. The participants also discussed measures for mitigation of biodiversity losses and feasibility of restoring endangered species (e.g. Siberian tiger in Kazakhstan). The panelists further responded on how biodiversity issues intersect with other societal issues, such as the 2030 Agenda for Sustainable Development Goals (SDGs) and others.

GSPP organized and held:

- courses on “Water Resource Management and Policy” and “Policy and Management of Natural Resources” for doctoral students;
- in cooperation with the [International Water Association](#) (IWA), 2 sessions on urban water management during the Conference “[Risk, Rationality, and Resilience](#)” (October 10-12, Nur-Sultan);

9.1.2. Kyrgyz Republic

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

The Kyrgyz-Russian Slavic University named after B.N. Yeltsin (KRSU) was established in 1993. Education at the University is delivered in 24 fields and specializations. There are 7 faculties, 92 departments, research institutes, and scientific centers, including the Interindustry Scientific Research Center of High-Mountain Dams Monitoring. Water specialists are trained at the Architecture, Design and Construction Faculty, which consists of 9 departments, including Water Resources and Engineering Disciplines Department (WREDD). Bachelors are trained in integrated use and protection of water resources (direction – environmental engineering and water use); hydraulic engineering (direction – construction).

Major Events and Activities in 2019

The national stage of the International Student Olympiad “Integrated Water Resource Mana-

- the 1st GSPP Water Forum with the focus on urban water management. The Forum included a session on the challenges to be met in urban water management in 21st century, and a roundtable discussion was also organized to identify similarities and differences of urban management in different European and Asian countries (October 12, Nur-Sultan).

Experts from GSPP have contributed to a [Position Paper about Water, Energy, Food and Ecosystems \(WEFE\) nexus and SDGs](#). The study aimed to provide evidence-based scientific support to the European policymaking process in the field of WEFE and SDGs worldwide.

Assoc. Prof. Stefanos Xenarios from GSPP has become the Lead Editor of the book [The Aral Sea Basin: Water for Sustainable Development in Central Asia](#) which offers the first multidisciplinary overview of water resources issues and management in the Aral Sea Basin, covering both the Amu Darya and Syr Darya River basins (see “[Publications](#)”).

Source: Nazarbayev University, <https://nu.edu.kz/en/>

gement in Central Asia” took place at KRSU (April 23).

KRSU teachers and students participated in various events:

- UNESCO Regional Workshop on Mobilization of Youth and Young Professionals in Science for Disaster Risk Reduction in Central Asia (March 13-14, Almaty);
- [Second Summer School](#) on “Learning Landscapes through Environmental Research and Monitoring” under the PALESCA⁵⁹ project (July 3-11, UCA Naryn Campus);
- IX International Ecological Olympiad of HEIs in the CIS countries (November 29, Taraz).

Research. WREDD introduced innovative hydro-technical constructions for water intake units (1) on the Tushashu River for service water supply to the Jerooy gold mine in Talas province; for the

⁵⁹ Paleoclimate, Environmental Change and Social Interaction in Central Asia (PALESCA) project, funded by the German Federal Ministry for Education and Research (BMBF)

Cholpon-Ata water supply system reconstruction project in Issyk-Kul province, Kyrgyzstan. Five research papers were published; three articles were prepared for publication.

Source (in Russian): WREDD, www.krsu.edu.kg/index.php?lang=ru

Kyrgyz National Agrarian University named after K. I. Skryabin

The Kyrgyz National Agrarian University named after K.I. Skryabin ([KNAU](#)) was established on the 30th of January 1993 (initially Zoo Veterinary Institute). The University is comprised of 6 faculties, 31 departments, 4 colleges, lyceum school, educational-experimental platform and the Center for Education, Research, and Innovation in the Sokuluk district, Research Institute of Irrigation, and the Research Institute of Veterinary.

Training of personnel for water sector is conducted at the Hydromelioration, Ecology and Land Management Faculty, which is comprised of 6 departments, including: Land Reclamation and Water Resource Management, Mining Hydraulic Engineering and Ecology and Environmental Protection Departments. Bachelors and masters are prepared in the following specializations: land reclamation, rehabilitation and protection; engineering systems for agricultural water supply, watering and drainage; information systems in environmental engineering and water use; water resources and water use; integrated use and protection of water resources; environmental engineering (direction – environmental engineering and water use); hydraulic engineering (direction – engineering).

Major Events and Activities in 2019

KNAU hosted:

- a seminar “Using open GIS data for environmental mapping” for undergraduates, graduates and postgraduates of the Hydromelioration, Ecology and Land Management Faculty with participation of Prof. Wolfgang Struck, University of Natural Resources and Life Sciences, Vienna ([BOKU](#)) (May 6-10);
- a meeting with GIZ representatives on land degradation, sustainable land management, ecosystem services assessment, etc. (September 18);
- practical trainings for students of environmental engineering and water use at the complex of sedimentation tanks on the Alamedin River (October);

- ceremonial meeting dedicated to the 70th anniversary of the Hydromelioration, Ecology and Land Management Faculty (November 6);
- meeting on the theme “T.U. Usubaliev and Water Resources of the Kyrgyz Republic, Irrigation Problems” (November 20);

KNAU teachers and students participated in various events:

- International Winter School 2019 on 12 directions, including water resource management, green economy, natural resource management, innovative technologies and techniques in agriculture (February 11-23, Almaty, KazNAU);
- National stage of the International Student Olympiad “Integrated Water Resource Management in Central Asia” (April 23, KRSU);
- Educational trip “RES – Renewable Energy Trip” organized with the support of the German Federal Foreign Office, with visits to RES facilities in Central Asia and two round tables. The trip started from Almaty and ended in Tashkent. The expedition part of the trip included visits to Kapchagay, Korday, Bishkek, Taraz, Merke, Kyzylorda, Tashkent, Samarkand, Chirchik, Khujand and other settlements (June 18-26);
- [Second Summer School](#) on “Learning Landscapes through Environmental Research and Monitoring” under the PALESCA project (July 3-11, Naryn);
- [Forum](#) “Green Economy – Strong Regions – Sustainable Development of the Country” (November 15, Bishkek);
- Side event “Scientific and Evidence-Based Solutions for Managing Climate Risks and Increasing Resilience to Climate Change in Central Asia” within the framework of the CAMP4ASB project (November 26, Ashgabat);
- Meeting of the Academic Community Network “Personnel, Innovation and Cooperation – Key to Successful Water Sector Development in Central Asia and Afghanistan” (November 27, Ashgabat);
- [Closing Conference](#) for the Central Asia Nexus Dialogue project (November 28, Ashgabat).

Source (in Russian): Land Reclamation and Water Resource Management Department, <http://knau.kg/ru/>

Kyrgyz State University of Construction, Transport and Architecture named after N. Isanov

The Kyrgyz State University of Construction, Transport, and Architecture named after N.I. Isanov ([KSUCTA](#)) was established on the 4th of May 1992 on the base of the Kyrgyz Architecture and Construction Institute. The [University](#) is comprised of 10 institutes and 37 departments, two colleges, 72 branches of departments, international faculties and centers, and the Research Institute.

Specialists for the water sector are prepared at the [Water Supply, Sewerage and Hydraulic Engineering](#) Department. Bachelors are trained in the following fields: water supply and sewerage (direction – construction); water resources and use (direction – environmental engineering and water use), and masters – in water supply and sewage of cities and industrial enterprises; hydraulic engineering (direction – construction); and environmental engineering (direction – environmental engineering and water use).

Students of the department are offered on-the-job training organized in cooperation with governmental organizations and institutions⁶⁰.

Major Events and Activities in the academic year 2018-2019

Teachers, students, and masters of the department participated in various events

- trainings: Economic Tools for Water Management and Governance (June 7-8) and International Water Law (September 19-20)⁶¹; Water Use Payments and Claims and the Role of State Support in Water Management, Support Mechanisms⁶² (September 25, Bishkek);
- 1st Youth Climate Forum of the Kyrgyz Republic: Informative, Environmentally Friendly, and Empirical (November 30, American University of Central Asia);
- Study tours to the automated system of the head structure of Eastern Large Chuy Canal, the Kemin District Water Authority, the Orto-Tokoy reservoir (October 4); in-stream and off-stream Ala-Archa reservoir, WUA



Orto-Tokoy reservoir (spillway tunnel, flood gate, etc.)



In-stream and off-stream Ala-Archa reservoir

Uzun-Kyr in the Issyk-Ata district and the Sokuluk reservoir (October 11);

- International Student internship “How to improve water management and financing in Kyrgyzstan for sustainable future” as part of exchange between universities of Kyrgyzstan and the Netherlands (October 15-26, Bishkek).

KSUCTA participated in the [round table](#) “Green economy and sustainable development in curriculum and research” (June 20) and became a member of the Alliance of Universities of the Kyrgyz Republic for a Green Economy and Sustainable Development.

Source (in Russian): Water Supply, Sewerage, and Hydraulic Engineering Department, www.ksucta.kg/ru/

American University of Central Asia

The American University of Central Asia ([AUCA](#)) was founded in 1993 in Bishkek. AUCA is an inter-

⁶⁰ Kyrgyz Ministry of Agriculture and Land Reclamation, Department of Water Management and Land Reclamation, “Kyrgyzsuudolboor” JSC, Basin and District Water Management Departments, etc.

⁶¹ Within the framework of the Smart Waters project implemented by CAREC with financial support from USAID

⁶² Within the Financial Literacy Week organized by the Kyrgyz Economic University named after M. Ryskulbekov

national, multi-disciplinary learning community. Its curriculum includes the Preparatory Program (New Generation Academy), fourteen undergraduate majors and nine graduate degree programs.

The [Tian Shan Policy Center](#) (TSPC) and [Center for Environment and Development](#) (CED) function at the University.

Major Events and Activities in 2019

AUCA hosted:

- a [round table](#) "Green economy and sustainable development in curriculum and research". The round table participants decided to create a green platform called an Alliance of Universities of the Kyrgyz Republic for a Green Economy and Sustainable Development. CED was appointed its Secretariat (June 20);
- [International Conference](#) "Current and Future State of Water Resource Management and Environmental Issues in Central Asia" (June 24-26);
- a [practical training](#) on the topic "Aarhus Convention – One of the Tools of Access to Justice in Violation of the Environmental Rights of Citizens" (October 25);

9.1.3. Tajikistan

Tajik Agrarian University named after Shirinsho Shotemur

The Tajik Agrarian University named after Shirinsho Shotemur ([TAU](#)) established in 1931 prepares highly qualified experts for agro-industry. Specialists are trained at 10 faculties in 46 fields of bachelor's degree, 35 fields – master's degree, 24 fields – basic doctoral studies (PhD), 13 fields – doctoral studies (DSc). There is the [Center for Advanced Training of Personnel of Agro-Industrial Complex](#) at TAU. Over 1,200-1,400 specialists graduate annually from the Center. In 2019, more than 482 teachers offered training for 10,210 students. TAU prepares water specialists at the [Hydro-melioration Faculty](#) in the following fields: hydraulic engineering; land reclamation, rehabilitation and protection; rational use and protection of water resources; economics and management in the water sector. In 2019, 111 bachelors and 29 masters received their diplomas.

TAU is a member of 5 international consortia. It maintains cooperation with 130 universities all

- International workshops "Water Quality" (November 11-13); "Water, Ecosystems and Energy" (November 13-15);
- a round table dedicated to natural resource accounting in Kyrgyzstan on the example of local pilot projects (November 12);
- 1st Youth Climate Forum of the Kyrgyz Republic: Informative, Environmentally Friendly, and Empirical (November 30).

AUCA staff also participated in a conference organized to discuss land degradation in Kyrgyzstan. Participants were presented with the 2018 National Report of the Kyrgyz Republic on the UN Convention to Combat Desertification prepared by TSPC with the support of the Kyrgyz Ministry of Agriculture, Food Industry and Land Reclamation (April, Bishkek).

TSPC, with the support of the Green Growth Knowledge Platform (GGKP), ELD and GIZ, is implementing a pilot project aimed at studying pasture degradation in the Suusamyр Valley and its restoration using satellite data. Since January 2019 twice a month, TSPC issues the Central Asia [Energy News Digest](#), which contains links to energy related news items from various electronic sources focusing on Central Asia.

Source: www.auca.kg/

over the world, as well as with international organizations under 19 projects.

Major Events and Activities in 2019

TAU hosted:

- VI National Olympiad "Integrated Water Resources Management" (jointly with GKU and under the financial support of WB), with participation of students from 9 universities of Tajikistan. O. Odinaev, a University student, got the first prize. Representatives of the Ministry of Education and Science of the Republic of Tajikistan, SDC, International Secretariat for Water, GWP in the Republic of Tajikistan, DAAD, teachers and students of the University made presentations on: "Empowerment of youth in the field of water in Central Asia", "Water sector reform of the Republic of Tajikistan for 2016-2025", "Reliable information – the basis of management", "Aquifer stock and quality in the Republic of Tajikistan" (May 24);

- International Conference “Water Management – Linkage with Climate and Food” with the support of EU and participation of more than 60 scientists and experts from HEIs and international organizations in Austria, Germany, Islamic Republic of Afghanistan, Spain, Kazakhstan, Kyrgyzstan, Turkey, and Uzbekistan (June 24).

TAU teachers participated and made presentations at various events: Republican Conference on the International Decade of Action “Water for Sustainable Development, 2018-2028” held as part of the Day of the city of Dushanbe; Republican Scientific and Practical Conference “Efficient Use of Water and Land Resources – as a State Strategy for Ensuring Food Security of the Country”; Republican Scientific and Practical Conference “Development of Irrigation and Land Reclamation” (September 26); 7th meeting of the National Commission on Irrigation and Drainage of the Republic of Tajikistan (September 27).

International cooperation. To build the institutional and technical capacity, the Ministry of Energy and Water Resources of Tajikistan, TAU and

9.1.4. Turkmenistan

Turkmen Agricultural University named after S.A.Niyazov

The Agricultural Institute founded in 1930 was renamed into the Turkmen Agricultural University of S.A. Niyazov in 1998.

The University consists of six faculties, 16 departments, and the Farming Research Institute. The Ashgabat, Turkmenabat and Bairamali agro-industrial secondary specialized schools focused on forty areas of specialization and the Research-Production Center of Akhalteke Horse Breeding are in the structure of the University. A training centre of the German company CLAAS Global Sales GmbH is functioning at the University.

Specialists for the water sector are prepared at the Land Reclamation and Hydraulic Engineering Faculty. The Faculty is comprised of the Departments of Land Reclamation, Hydraulic Engineering and Land Management.

Major Events and Activities in 2019

The International Conference on Achievements in the Field of Grain Production was held at the

CAREC signed a [Memorandum](#). One of the focus areas of work will be the establishment of the Innovations and Scientific Research Cluster on Integrated Water Resources Management (March 5).

A meeting was held with the Ambassador of Israel, Mr. Eduard Shapira, where education and scientific cooperation was discussed: Israeli agricultural experts and leading scientists will deliver lectures on topical issues, and specialists of the University will be trained within the framework of the MASHAV program to improve their skills in the field of land reclamation (September 11).

As part of the academic mobility program, students of the Kuzbass State Agricultural Academy of the Russian Federation were trained at the Faculties of Agricultural Mechanization and Hydromelioration.

17 scientific articles on water issues and one monograph “Forecasting Land Reclamation in the Context of Climate Change” were published.

Source: International Communications Division of TAU; <http://www.tajagroun.tj/en/>

Turkmen Agricultural University of S.A. Niyazov (July).

Students and postgraduates of the University participated in the Open International Internet Olympiad and the competition of scientific works among the youth of Turkmenistan.

Teachers, postgraduate students and students of the University conduct research at the agro polygon in the Geoktepe district established under the [Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan](#) project (UNDP, GEF). The agro polygon has its own compact weather station, a laboratory with a set of necessary tools, 6 wells with devices that automatically measure groundwater salinity and level.

Source (in Russian): www.science.gov.tm

Turkmen Agricultural Institute

The Turkmen Agricultural Institute (TAI) was established in 2010 in Dashoguz. The Institute prepares water specialists at the Hydromelioration and Agricultural Mechanization Faculty in the following fields: operation of irrigation and drainage systems; hydrotechnology (water resour-

ces and management). The Institute has a Research and Production Center and the Dashoguz Agro-Industrial Secondary Vocational School, which offers training in eight courses, including hydrotechnology for the water sector.

Major Events and Activities in 2019

A [training](#) on water accounting in the pilot Dashoguz province (April) and a practical seminar on study, operation and maintenance of drip irrigation system were held on the basis of a training farm at TAI (May) for teachers and students within the framework of the Supporting Climate Resilient Livelihoods in Agricultural Communities in Drought-Prone Areas of Turkmenistan [project](#) (UNDP, GEF).

9.1.5. Uzbekistan

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

The Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME) was established first as the Engineering Land Reclamation Faculty at the Hydraulic Facilities Department of the Turkestan State University in 1923. In 1934, the Tashkent Institute of Irrigation and Agricultural Mechanization was established. Initially, there were the Hydromelioration and Mechanization Faculties.

Today TIAME is one of the leading HEIs in Central Asia and known in the world as a first-class academic and scientific institute in the field of water and agriculture. Nowadays, the Institute is comprised of seven faculties ([Hydromelioration](#), [Hydraulic Engineering](#), [Mechanization of Hydromeliorative Works](#), [Agricultural Mechanization](#), [Energy Supply for Agriculture and Water Sector](#), [Land Management](#), and [Organization of Water Management](#)), 36 departments, two lyceums (Yunusabad Academic Lyceum at TIAME, [International House Tashkent Lyceum](#) at TIAME), Innovation and Research Cluster on Water Resource Management, [Center for Advanced Training and Retraining of Pedagogical Staff](#), Research Institute of Agricultural Mechanization, State Unitary Enterprise "Training and Research Center" of TIAME in the Urta-Chirchik district of Tashkent province, "Eco GIS" Center, State Unitary Enterprise "Regional Center for Retraining and Advanced Training of Farm Heads and Staff". TIAME has 2 branches – in Bukhara (established in 2010) and Karshi (2019). The Institute prepares bachelors in 19 specializations, masters – in 16 specializations, and doctors – in 12 specializations.

TAI students participated in the Open International Internet Olympiad and a competition of scientific works among the youth of Turkmenistan.

The TAI's Research and Production Center works on breeding of new high-yield and disease-resistant varieties of cereals, grain legumes, vegetables and other crops adapted to soil and climatic conditions of the country. New varieties have been developed: 2 varieties of winter wheat for cultivation in any region of the country – "Rovachlyk" and "Galkynysh"; "Berkarar" soybean variety; and, "Ainur" variety of tomatoes.

Source (in Russian): www.science.gov.tm

In the history of independent Uzbekistan, TIAME was the first to enter the [QS rating](#) of the best universities in Eastern Europe and Central Asia: the institute is in the 301-350 positions.

Major Events and Activities in 2019

Education process. A new system has been introduced, "[5+1 program](#)", according to which graduate students are trained 1 day a week in specialized classes established on the base of production enterprises: Mechanization of Hydromeliorative Works Department at Suv mash JSC; Pumps and Pumping Stations Department at the Chirchik HPP. The Research Laboratory "[Automation of Technological Processes](#)" was equipped with the support of GIZ with modern training and research facilities in the field of water resources management (quality and quantity) and process automation. [Double degree Master program](#) in Smart Agriculture and Geoinformatics was launched together with the Obuda University in Hungary.

TIAME organized and held:

- a scientific seminar "Measures for Irrigated Land Reclamation in the Republic" for young researchers, undergraduates and students (March 15); XVIII Scientific and Practical Conference of young researchers "Current Challenges in Agriculture and Water Management" (March 28 - April 1); lectures on "Problems of Land Reclamation and Ways Forward" (October 26), "Reservoirs in Uzbekistan and Their Safety" (November 5), etc.: a training seminar "The

importance of Software in Land Cadastre Maintenance”⁶³ (December 6);

- lectures, seminars and courses “Ecology and Problems of Fresh Water all over the World”, “Modern Hydraulic Structures and Their Use” as part of professional development and retraining courses (January 19-21); training seminars for farmers “Advantages of Using Water-Saving Technologies in the Field” (July 8, Samarkand province) and “The Role of Agronomic Operations for High Productivity” (July 20, Khorezm province); within the framework of the EU Program “Sustainable Water Resources Management in Rural Areas in Uzbekistan”, trainings in Geodesy-AutoCAD and Cost estimates for specialists of design institutes (August 5-9); in the application of modern digital levelers Leica Sprinter 250M for teaching staff and employees of BISAS from all provinces of the Republic (December 10-11);
- for students of the TIAME's Karshi branch, a mobile practical training in Geodesy (October 5, Kashkadarya branch of the “Uzdaverloikha” Institute); [open lecture](#) on Geodesy (November 27); [field trips](#) to the Karshi hydroscheme and sewage pumping station (December 4); [mobile lesson](#) on Basics of Agricultural Engineering at Nishon Agroservis MTP LLC (December 10); [mobile lesson](#) on Metrology and Standardization at the Kashkadarya Standardization and Metrology Department of the Uzstandard Agency (December 16);
- International Summer Schools: [Assessment of Water, Energy and Food Security Sustainability for Irrigated Agriculture: Interdisciplinary Approaches in Central Asia](#)⁶⁴ for young researchers and PhDs from Europe, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Afghanistan, Ethiopia, India, Canada, Colombia (April 29 - May 5) and the Basics of Water Resources Management: Integration of Theory, Practice and Research⁶⁵ for the students of GKU and TIAME (June 10-22);
- 2nd stage of the [Republican Olympiad](#) on 4 subjects (May 13-18). The TIAME student

took the 1st place on “Hydrotechnical Reclamation of Agriculture” among 7 participating HEIs;

- events with participation of national and foreign scientists and specialists: XXII International [Scientific Conference](#) “Construction: the Formation of Living Environment” (FORM-2019)⁶⁶ (April 18-21); scientific seminar “Mathematical Modeling for Monitoring and Management of Water Resources and Environment” (July 26-27); International [Scientific and Practical Conference](#) “Science, Education and Innovation for the Agro-Industrial Complex, Problems and Prospects” (November 22).

Participation in events. Teaching staff, students, masters and doctors took part in various events: [International Winter School 2019](#) (February 11-23, Almaty, KazNAU); Youth Forum “Man and Biosphere” (September 15-19, Yanji, PRC), Youth Summit “Climate Change” (September 21-23, New York); Inno Week-2019 (October 29-31, National Exhibition Complex “UzExpoCentre”); [round table](#) “The Future of Water Resources in Central Asia” (November 20, National Library of Uzbekistan); [15th International Specialized Exhibition](#) (November 27-29, Tashkent); [Conference](#)⁶⁷ “Development of Agricultural Value Chain in Marginal Conditions” on the Aral Sea problem (December 19-21, Tashkent).

International cooperation. The following documents were signed: a [cooperation agreement](#) with the German Engineering Consulting and Management for Space Technologies GmbH to enrich the content of the curricula, such as Remote Sensing, GIS technologies, Smart Agriculture, with spatial information characteristic for Uzbekistan (March 9); [Memorandum](#) of Mutual Cooperation with the University of Mississippi (May 14); Memorandum of Understanding with the Research Center for Ecology and Environment of Central Asia (January); agreement on establishment of the Chinese-Uzbek Scientific and Technological Park for Water-Saving Agriculture on the basis of the TIAME's training platform (October 30, Yanling, PRC); [Memorandum](#) of Cooperation with the Polytechnic University of Turin in Italy (November 21).

Meetings were held with Ms. Jiang Yan, Ambassador Extraordinary and Plenipotentiary of

⁶³ In cooperation with the Uzbek State Scientific-Project Institute on Land Management “Uzdaverloikha”

⁶⁴ In cooperation with the Leibniz Centre for Agricultural Landscape Research and with the financial support of the German Volkswagen Foundation

⁶⁵ Organized by USAID, CAREC and Uzbek Ministry of Water Management within the framework of the Smart Waters project

⁶⁶ Organized jointly with the National Research Moscow State University of Civil Engineering (NRU MGSU) and JSC Hydroproject

⁶⁷ Organized by the International Center of Business Assistance (ICBA)

the People's Republic of China to Uzbekistan; Mr. Eduard Shapira, Ambassador Extraordinary and Plenipotentiary of Israel to Uzbekistan; Prof. Dan Shechtman, Nobel Prize Winner in Science; Mr. Eduards Stiprice, Head of EU Delegation to Uzbekistan, foreign delegations and guests.

Research. Together with the scientists of the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences, a mini-meteorological hydrogeological [device](#) for remote data transmission was developed and installed in 10 regions of the Republic of Karakalpakstan. Research was carried out under the state grant "Hydromodule zoning of irrigated land in Khorezm oasis (Khorezm region and southern regions of the Republic of Kazakhstan) and development of science based procedures for cotton watering".

The following events were organized: Republican competition⁶⁸ "Water Problem – the Concern of the Society: No One Should Stay Aside" (March 12-14); demonstration day of projects participating in the Startup Accelerator Water Solutions Innovation Lab⁶⁹ (November 13); an exhibition of innovative developments and projects organized as part of the Youth Week (November 14); meeting in the framework of Climate Insurance, Infrastructure and Management Project in the Central Asian Economic Cooperation Area (December 5).

Capacity building. The teaching staff and students had internships, developed their capacities and studied best practices at the [Moscow State Agrarian University named after K.A. Timiryazev](#) (October 14-18); [Moscow State Land University](#) (September 15-December 15; November 24-December 28; December 1-31); National Academy of Sciences, the Institute for Personnel Training, research institutes and universities of Belarus (November 18-28); Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Federal Agency for Water Resources and Wastewater, as well as state agencies, research institutes of Germany⁷⁰ dealing with water resources and environment (May).

Publications and inventions. 87 monographs, more than 130 articles in international scientific journals included in the Scopus database, 329 articles in foreign journals Web of Science, and more than 500 articles in republican scientific

journals have been published. 15 patents for inventions and utility models, 70 certificates for computer programs and copyrights were got.

Work with mass media. TIAME's teaching staff, doctoral, master's students and bachelors participated in the "Agroinnovation" [TV show](#), which addressed such topics as water use efficiency, application of new innovative technologies in water supply and irrigation systems (November 25).

Awards. The Institute and its scientists were awarded in 5 nominations at the Scopus Award-2019: "The most published University in Science Direct", "For contribution to the development of science", "The most published scientist in Science Direct", "The most active scientist in Scopus", "and "The best author of articles in the social and humanitarian sphere".

Source: TIAME Administration, <http://tiame.uz/>

National University of Uzbekistan named after Mirzo Ulugbek

The National University of Uzbekistan ([NUUZ](#)) was officially established on the 12th of May 1918. Specialists for the water sector are prepared at the [Land Hydrology](#) Department, [Geography and Natural Resources](#) Faculty.

Bachelors are specialized in hydrometeorology and hydrology, and master's students get further education in hydrometeorology, hydrology, and climate change and climate risk assessment. There are also PhD and DSc programs on "Land hydrology. Water resources. Hydrochemistry" at the Department.

The department is mainly staffed by 1 doctor of science, professor, 3 candidates of science, associate professors, 3 PhDs, 2 senior lecturers, 5 lecturers and 5 part-time employees from research organizations.

In the academic year 2018-2019, 182 students studied at the department, including 169 bachelors and 13 masters. 36 bachelors and 5 masters graduated from the department. In the academic year 2019-2020, 47 people were enrolled for bachelor's degree and 18 – for master's degree. 1 external doctoral candidate was enrolled for basic doctorate, and at present 3 can-

⁶⁸ Jointly with the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan, the Ministry of Agriculture of the Republic of Uzbekistan, the EU Programme on Sustainable Management of Water Resources in Rural Areas in Uzbekistan, UNDP Uzbekistan

⁶⁹ Within the framework of the CAREC's Smart Waters project funded by USAID

⁷⁰ Within the UzWaterAware project implemented by CAREC with the support of the European Union

didates are conducting their research. In 1945-2019, the department trained more than 1,300 hydraulic engineers, hydrometeorologic bachelors, as well as about 100 masters in hydrometeorology and hydrology. Today, more than 40 of them have a doctoral degree in science, about 300 – PhD degree.

The Land Hydrology Department cooperates with more than 10 universities, research institutes, regional and international organizations. Those include the [Lomonosov Moscow State University](#), [University of Fribourg](#) in Switzerland, [Potsdam Institute for Climate Impact Research](#), University of Reading in England, Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences, [CAREC](#), [SIC ICWC](#), and others.

Major Events and Activities in 2019

NUUz organized:

- lectures and practical exercises in glaciology for students trained in hydrometeorology and hydrology with the participation of Dr. Tomas Saks and Dr. Martina Barandun under the Memorandum of Cooperation with the University of Fribourg;
- Republican Student Olympiad, where B. Gulmirzaeva took the honorary 1st place in hydrology and hydrometry and D. Yarashev – 2nd place in hydraulics (May, Land Hydrology Department).

Participation in Events

- First International Student Olympiad on Hydrology at the [L.N. Gumilyov Eurasian National University](#). Students of the department O. Mutalova, D. Yarashev, B. Makhmudov, G. Zulpikharov under the supervision of Associate Professor G. Umirzakov and D. Turgunov took honorary 1st place in both team (HydroNUUz) and individual (B. Mahmudov) standings (April 22-23, Nur-Sultan);
- [International Summer School](#) “Glaciological research of the Ala-Archinsk glacier in the Kyrgyz Republic” within the “Girls in Science” project, where D. Kholmatova, the master’s degree student in hydrometeorology, took part (September 1-10).

Research. The department staff carries out 2 projects (fundamental and applied) and participates in 2 international grants together with UzHydromet ([Climatic Box](#). An interactive

website for schoolchildren on climate change; Climate Adaptation and Mitigation Program for Aral Sea Basin, CAMP4ASB); Central Asia Research and Adaptation Water Network – CARAWAN).

Capacity building. A master's degree student S. Shokirova and a student of hydrometeorology O. Mutalova successfully completed an internship at the University of Fribourg (March-April). At the Lomonosov Moscow State University, the winners of the contest announced by the “[El-Yurt Umidi](#)” Foundation, Associate Professor G.Kh. Yunusov and the Department's lecturer J.T. Khamzaeva, students of the Department under the supervision of senior lecturer D.T. Turgunov and J.T. Khamzaeva were trained in hydrometry at the training field area (June 5-16).

Under the supervision of prof. F.Kh. Khikmatova, a doctoral student M. Turgunov successfully defended his thesis for the PhD degree in geographical sciences and was approved for a PhD in “Land hydrology. Water resources. Hydrochemistry”.

Source: Land Hydrology Department, Geography and Natural Resources Faculty, National University of Uzbekistan named after Mirzo Ulugbek

Samarkand State University

The Samarkand State University ([SamSU](#)) was founded in 1927. About 13,000 students study at the University at 14 faculties and 63 departments in 34 educational areas and 40 subject areas of master's degree. There are basic doctoral (PhD) and doctoral (DSc) programs in more than 40 directions. There are Academic Councils for 9 subject areas.

The [Geography and Ecology Faculty](#) has 4 departments, including [Hydrometeorology](#) and Ecology Departments. Currently, the faculty prepares bachelors in 3 subject areas – geography, ecology, hydrometeorology; masters in 4 subject areas – geography, ecology, soil science, and hydrology. The faculty has 500 students and 25 masters.

Major Events and Activities in 2019

SamSU hosted:

- a [scientific and methodological seminar](#) on “Conservation of Biological Diversity and Resources of the Zeravshan Valley”. Presentations were made and following discussions were held on the rational use of natural resources and protection of flora

and fauna in the Zeravshan Valley (May 22, Geography and Ecology Faculty);

- [International Seminar](#)⁷¹ on “Sustainable Pasture Management”, where novel approaches and methods of pasture management and sustainable use of pasture resources were discussed (September 23-24), and a ten-day training course for master students studying pasture ecology (from September 26);
- [International Conference](#) “Problems of Desertification: Dynamics, Assessment, and Solution”. Experts and scientists from Russia, Ukraine, India, Nepal, Kazakhstan, Tajikistan, and Kyrgyzstan took part in the Conference (November 8-9).

International cooperation. A meeting was held with the Prime Minister of the Indian province of Gujarat and the accompanying delegation of entrepreneurs. The [parties agreed](#) to study Indian experience in rational use of natural resources, joint development of energy saving technologies in irrigated agriculture, and use of mineral and organic fertilizers (October 20).

Research. Relevant research areas include: (1) water, climate and other natural resources of Uzbekistan’s geosystems and their rational use; (2) improvement of soil productivity and soil erosion problems.

At present, the following projects are implemented: Study, Evaluation and Mapping of Desertification in Mountain Geosystems Using Reference and Experimental Sites (on the example of Gubdintau Ridge); Environment Problems of the Zeravshan Valley and Conservation of its Biodiversity; Agriculture, Biotechnology, Ecology and Environment Protection; and Analysis of Opportunities for Using Unconventional Energy Sources (Wind, Water and Sun) in Mirzachul Oasis.

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

Karakalpak State University named after Berdakh

The Karakalpak State University named after Berdakh (Berdakh KSU) was founded in 1974 on the basis of Karakalpak State Pedagogical Institute. The University is comprised of 15 faculties (including the faculties of Biology and Geo-

graphy and Natural Resources) and 45 departments. More than 12,600 specialists are trained in 59 subject areas of bachelor’s degree, 32 subject areas of master’s degree, and 18 subject areas of doctoral studies.

The Biology Faculty consists of 3 departments, including Ecology and Soil Science. The department prepares bachelors in ecology and environment protection and soil science; masters – in ecology (by sector and direction); doctoral students (PhD and DSc) – in ecology. In the subject area of ecology and environment protection, the total number of students is 215. In the academic year 2018-2019, 54 bachelors graduated, while 59 ones are to be graduated in the academic year 2019-2020. There are 1 academician, 4 doctors of sciences, 18 candidates, 1 senior lecturer, 32 assistants and trainees at the faculty.

At the Biology Faculty, TEMPUS Ecological Center at the Ecology and Soil Science Department; OTUS Ornithological Club at the Biology Department; EcoCorner, Young Eco-inspectors, and Young Scientist groups are organized.

Major Events and Activities in 2019

Berdakh KSU hosted:

- a meeting on “Rational Use of Drinking Water” (April 9);
- International Scientific Workshop “Ecosystems and Water Resources in the Aral Sea Basin” to inform measures aimed at solving environmental problems and mitigating environmental disaster (April 16-17);
- a training seminar organized in collaboration with GIZ and CIRAD⁷² for students and teachers of the Departments of Biology and Geography and Natural Resources. Reports were made on using LandSat and Spot 6 satellites and conducting surveys, mapping acquired images, monitoring methods during field work, etc. (June 19).

Participation in events. Students and teachers of Berdakh KSU participated in the month’s campaign “Environmental Protection” (November). A student of the Ecology and Soil Science Department N. Rajabova participated in the Republican Olympiad and took the 2nd place in Ecology.

⁷¹ Organized in collaboration with the Utah State University and the University of Nevada, Reno

⁷² Center for International Cooperation in Agronomy and Warm Climate Research

International cooperation. A meeting was held with representatives of the Tokyo University of Agriculture and Technology, International Center for Biosaline Agriculture in Central Asia and South Caucasus, and International Innovation Center for the Aral Sea Basin under the President of the Republic of Uzbekistan to discuss the prospects of cooperation (May 6).

The administration and teachers of Berdakh KSU made presentations at the "Symposium on Bilateral Cooperation: Ecology, Environment and Regional Sustainable Development" organized by the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences (October 11-15, Urumqi). During the event, a roundtable on "Environmental Problem of the Aral Sea Region", research sections on "Biological Resource Research and Development", "Land and Land Use", "Water Resources Management and Sustainable Development", and a

study tour to the Xingjian laboratory were organized. A Memorandum of Cooperation was signed between the Xinjiang Institute of Ecology and Geography and the Berdakh KSU. Finally, the Urumqi Declaration "On the Joint Initiative of China and Uzbekistan for Ecological Restoration of the Aral Sea basin" was adopted.

Research. In the academic year 2018-2019, 7 educational projects of Erasmus+ Program were implemented at Berdakh KSU, including "Enhancing Competencies of Central Asian Universities in Agricultural Policy focused on Environmental Protection & Land Management" and "Environment Protection in Central Asia: Disaster Risk Management with Spatial Methods". The project of applied research of the State Scientific and Technical Program "Game Birds of Karakalpakstan and Their Rational Use" is implemented as well.

Source: Berdakh KSU Administration, <http://karsu.uz/ru/>

9.2. Regional HEIs 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. RTC branches were also established in Almaty (Kazakhstan), Bishkek and Osh (Kyrgyzstan), Dushanbe and Khujand (Tajikistan), and Urgench (Uzbekistan).

Vocational training in the water sector is delivered through short-term thematic courses. Representatives of different water use sectors (energy, ecology, etc.) are invited to training workshops. Leading experts from the region and foreign countries also deliver lectures on specific topics, such as water law and policy, etc.

Major Events in 2019

RTC provided:

- training for managers of the Basin Irrigation System Administrations of Uzbekistan jointly with MWM of Uzbekistan and TIAME (January 14-18, TIAME);
- WUEMoCA ("Water Use Efficiency Monitor in Central Asia") User Forum (November 7,

Tashkent) and regional training "WUEMoCA online information tool for monitoring of land use and water use efficiency in Central Asia" for experts from water management organizations of Central Asian countries and BISAs of Uzbekistan under the third phase of the CAWa project (November 8, TIAME);

- lectures for employees of WCAs and WMOs at seminars organized by EXPERT INFO LLC within the framework of the Horticultural Sector Development Support Project in the Republic of Uzbekistan (October 21-30, Surkhandarya province);
- lectures and practical sessions on "Statistical methods in hydrology and basics of mathematical modeling", "Hydrology of irrigated land", "Ameliorative hydrology" for students of the Geography and Natural Resources Faculty at NUUZ; "Hydraulics (hydrostatics and hydrodynamics)" for students of the Hydromelioration Faculty at TIAME and "International and national water relations and law" for master's students of the Ecology and Water Resource Management Department at TIAME.

An online training course "Water management at the level of WCAs and farms" (<http://mooc.tuit.uz/>) by N.N. Mirzaev) has been prepared.

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

The University of Central Asia (UCA) was founded in 2000 as a private, not for profit, secular university. The mission of UCA is to promote the social and economic development of Central Asia, particularly its mountain communities, by offering an internationally recognized standard of higher education, and enabling the peoples of the region to preserve their rich cultural heritage as assets for the future.

[UCA is comprised of: Undergraduate School of Arts and Sciences \(SAS\)](#), which offers a five-year undergraduate program; [Graduate School of Development](#) consisting of several scientific units, including the [Mountain Societies Research Institute \(MSRI\)](#) and its [Knowledge Hub](#) to serve as a central point for information and data related to mountain societies in the Central Asian region; [School of Professional and Continuing Education \(SPCE\)](#) and Central Asian Faculty Development Program. UCA have formed the Green Community Club – an initiative to promote awareness of ecological issues and encourage participation in environmentally sustainable practices.

Major Events in 2019

UCA's MSRI held:

- a [workshop](#) on “Current Dynamics of the Border Areas in the Fergana Valley” with participation of 40 experts from Kyrgyzstan, Tajikistan, Uzbekistan and the UK (February 13);
- a [public lecture](#)⁷³ on the “Impact Assessment of Grazing and Climatic Factors on Vegetation in Kyrgyzstan”. Delivered by Dr. Maksim Kulikov, who presented the outputs of his research on an assessment of the interactions between soil, vegetation and climatic factors, quantifying them to better predict climate change scenarios (March 18);
- a [four-week](#) “Connecting to Your Discipline” program for preparatory year students through a series of workshops, guest lectures, career panels, interactive activities and field trips, which helped them bet-

ter understand their specializations: Communications and Media, Computer Sciences, Earth and Environmental Sciences, and Economics (from May 6, Naryn and Khorog);

- a [field training](#)⁷⁴ on soil assessment for farmers in three villages in Naryn province; it was aimed at supporting local farmers in tackling the increasing problem of depletion and loss of soil fertility, which affects the yield and has a negative impact on farmers' revenues (June 21);
- [Second International Summer University](#)⁷⁵ on Disaster Risk organized together with the Aga Khan Agency for Habitat (AKAH) and in collaboration with the University of Bern of Switzerland and the University of Natural Resources and Life Sciences in Vienna, with participants from Tajikistan, Kyrgyzstan, Kazakhstan, Pakistan, India and US (June 16-28);
- jointly with German Research Centre for Geosciences (GFZ) a [Second Summer School](#) on “Learning Landscapes through Environmental Research and Monitoring” as a part of the Paleoclimate, Environmental Change and Social Interaction in Central Asia (PALESCA) project (July 3-11, UCA Naryn Campus);
- a [post-graduate Certificate Program](#)⁷⁶ in Natural Resources Management on the following topics: concepts of sustainability and sustainable land management; integrated agricultural management and food systems; livelihoods in rural mountain communities; natural hazards and disaster risk reduction; and climate change. It enrolled faculty members and researchers of Badakhshan University, Bamyan University, Khorog State University and the Aga Khan Foundation (AKF) in Afghanistan (July 15);
- [trainings](#) for Naryn residents to raise their awareness on environmental issues (November 17, Naryn);
- a [workshop](#) on developing cooperation on environment protection issues for stu-

⁷³ Watch the full lecture on: <https://youtu.be/BrYSBGIU2fk>

⁷⁴ As part of the PALESCA project

⁷⁵ As part of the Creating Opportunities in a Safe Environment (Phase II; Fostering Self-Sustained and Resilient Communities) project

⁷⁶ As part of on-going project 'Pathways to Innovation: Strengthening Mathematics, Science, and Economic Policy Capacity in Afghanistan and Central Asia', funded by the International Development Research Centre (IDRC), Canada, and the Aga Khan Foundation Canada

dents from MSRI and the Naryn State University. The event also included a photo exhibition by the Swiss 'Sustainable mountain art' (SMart) initiative on "Glaciers in Agony" (December 12, SPCE, Aarhus Centre).

Representatives from MSRI and SAS delivered presentations at a [workshop](#) on "Water Quality, Water, Ecosystems and Energy" organized by the European Union Central Asia Network for Water Science and Technology (November 11-15).

At an Isfara Small Basin Council meeting, Maksim Kulikov, Research Fellow at UCA's MSRI, [outlined research](#)⁷⁷ on vegetation trends and its relationship to precipitation and water discharge in the Isfara River basin. Such research will be

used as an important tool to navigate the adoption of a new Isfara River basin plan and support improvement of water governance, accounting for climate change, new precipitation dynamics, and vegetation scenarios (November 5).

Dr. Tariq Banuri, Chairman of the Higher Education Commission of the Government of Pakistan, delivered a [lecture](#)⁷⁸ on climate change at UCA (November 18).

As a part of the PALESCA project, UCA released new [study guide](#) for Naryn schools on "Soil Study and Evaluation through Experiments" (in Kyrgyz and Russian languages).

Source:

<https://www.ucentralasia.org/Home/Index/EN>

9.3. Professional Development Courses and Trainings

9.3.1. Professional Development Courses and Trainings in 2019

18-30 March, Hyderabad, India – Training on Integrated Approach to Climate Change Policy Development and Financing for Effective Implementation of SDGs;

25-29 March, Almaty – Regional Training of Trainers on Economic Instruments for Operation of Basin Councils;

8-11 April, Tashkent – Training on "Application of Soil & Water Assessment Tool (SWAT) in Hydrology and Water Resources Management";

20-24 May, Almaty – Workshop "Research Network on Water and Energy in Central Asia" organized by the University of Edinburgh;

3-15 June, Geneva – Summer School in Water Governance: Frameworks and Negotiations by the Geneva Water Hub;

10-15 June, Bishkek – Regional Training Workshop "Technical Recommendations on Stocking and Management of Rangeland Fish Farming";

11-12 June, Almaty – Training Workshop on Rapid Assessments of Wetlands;

12-13 June, Padshaata River basin – Demonstration tour to the Padshaata River basin to celebrate Padshaata River day;

18-19 June, Dushanbe – Training for local bank loan experts, farmers and experts of the National Coordination Units of the CAMP4ASB project in forecast-based methods of quantitative assessment of climate resilience;

18-19 June, Almaty – regional training seminar on gender equality in water management;

26-27 June, Tashkent – Training for local bank loan experts, farmers and experts of the National Coordination Units of the CAMP4ASB project in forecast-based methods of quantitative assessment of climate resilience;

8-19 July, Almaty – CAWa Summer School "Methods and Tools for the Assessment and Monitoring of Central Asian Water and Land Resources" at GKU;

9-10 July, Tashkent – Training course on transition to green economy as part of the Europe-CIS Regional Ministerial Conference on Green Economy organized by the World Green Economy Organization;

12-17 July, Dushanbe – CAWa Seminar "CAWa Tools in Water and Land Management";

16-18 September, Tashkent – Training "Basic Principles of Academic Writing and Peer Review"

⁷⁷ As part of the "Improving Stability and Better Natural Resource Management in Kyrgyzstan and Tajikistan" project, funded by the Conflict Security and Stability (CSSF) Program in Central Asia

⁷⁸ Watch the lecture on YouTube on: <https://youtu.be/VmkyPkxG9s8>

organized by GKU in cooperation with the Central Asian Journal of Water Research with financial support from WB;

21 October-22 December, Geneva – Distance learning course on International Water Law and the Law of Transboundary Aquifers;

9.3.2. Professional Development Courses and Trainings in 2020

21-24 January, Almaty – Regional training on long-term weather forecasting using new methods;

3-8 February, Ashgabat – National Training: Seasonal hydrological forecasting based on RS information on snow cover, development of the program for MODIS satellite image receiver and synchronization with MODSNOW;

2-3 March, Ashgabat – Online national training and installation of long-term weather forecasting software (“synoptic-long-term” software);

4-5 March, Dushanbe – Online national training and installation of long-term weather forecasting software (“synoptic-long-term” software);

16-21 March, Nur-Sultan – National Training: Seasonal hydrological forecasting based on RS information on snow cover, development of the program for MODIS satellite image receiver and synchronization with MODSNOW;

6-7 April, Tashkent – Online national training and installation of long-term weather forecasting software (“synoptic-long-term” software);

6-11 April, Tashkent – National Training: Seasonal hydrological forecasting based on RS informa-

8 November, Tashkent – Regional training “WUEMoCA online information tool for monitoring of land use and water use efficiency in Central Asia” for experts from water management organizations of Central Asian countries and BISAs of Uzbekistan.

tion on snow cover, development of the program for MODIS satellite image receiver and synchronization with MODSNOW;

20-25 April, Almaty – National training on agrometeorological predictive model of bio-productivity (CAMP4ASB project);

27-29 April, Nur-Sultan – Regional Training in Aerological Diagnostic Diagram (CAMP4ASB project);

1-6 June, Almaty – Regional training on a dynamic simulation model of crop growth (CAMP4ASB project);

10-24 June, Tashkent – Summer School for students of GKU (Smart Waters project);

22 June – 03 July, Almaty – Regional hydrological modeling training using the MESH model (CAMP4ASB project);

6-12 July, Samarkand – French-Uzbek Summer School “Remote Sensing of Earth”;

3-15 August, Almaty – XVII International Summer University at GKU.

