

The impacts of the pandemic on Kazakh-German University education system and introduction of innovative activities and practices on the example of Integrated Water Resources Management Master programme and UNESCO Chair on water resources management activities in Central Asia and Afghanistan

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## Introduction

Established in 1999, Deutsch-Kasachische Universität (DKU)<sup>1</sup> is an international higher education institution in Almaty that offers as part of its academic higher education a Master programme in “Integrated water resources management in Central Asia and Afghanistan”. The UNESCO Chair on Integrated Water Resources Management and Natural Resources Research Institute under DKU are implementing activities aligned with directions of education, capacity building and science in the spheres of water management, climate change, and energy efficiency and aimed at the education and capacity building of youth, practitioners, and academia.

The Covid-19 reshaped the world and induced the governments to make significant changes in economic, sociologic, enterprise and education spheres. Its outbreak stormed through the educational system worldwide, negatively affecting the normal operations of schools and universities. Educational institutions in Central Asia have faced severe challenges to adapt themselves to the new reality they faced. The transformative challenges due to lack of technical capacity, limited facilities, the presence of preventive measures created an extra hurdle for adapting the educational system. Kazakh-German university, however, has picked up the challenge and quickly started coping with the emergency. Both the Educational Master programme in Integrated Water Resources Management and projects of the UNESCO Chair on Water Resources Management switched to the online format without disrupting their studies and activities.

The case study aims at analyzing challenges and issues the university faced during the Coronavirus Pandemic and adjustment and adaptation of the activities in the direction of education, capacity building and science in the spheres of water management, climate change, and energy efficiency through innovative approaches and practices. It introduces an assessment of the current situation and identification of opportunities for the development of the UNESCO Chair on Water Resources Management in Central Asia and the Institute of Natural Resources. The SWOT<sup>2</sup> analysis method was used to assess the quality of educational services, and a report has been drawn up on the current position of the Chair and its future development vectors. The report shares the positive consequences of the global quarantine for the university, and in general.

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<sup>1</sup> The official website of the Kazakh-German University: <https://dku.kz/en/>

<sup>2</sup> The SWOT analysis in this study is defined as a study of the influence of various environmental factors, strengths, and weaknesses of the Chair on its long-term efficiency and the development of recommendations for the Chair's strategic management.

## *Situation Analysis and Background*

Today, higher education is one of the most demanded services in the world. In a rapidly changing world that requires innovative approaches in all life spheres, and there is an increased demand for specialists in various fields who will be ready to accept challenges and assess risks. Many of the educational directions and development strategies are aimed at maximizing the collaboration between the government procurement and training of specialists in certain areas.

In the Central Asian countries, the higher education system has undergone dramatic changes since the adoption of the European Higher Education Area (Bologna Process) initiative, which triggered a review of the methods and means of providing educational services. Currently, the Bologna Process includes 48 countries. The Republic of Kazakhstan became a full member of the European Higher Education Area in 2010, which was a big step towards the development of the education system taking into account European quality standards. However, problems related to the introduction of the mandatory parameters of Bologna Process into the education system are at the development stage in most universities in Kazakhstan, which significantly undermines their competitiveness in comparison with universities in European countries. Currently, there are 129 universities in Kazakhstan.

The Kazakh-German University (DKU) was founded in 1999 on the private initiative of the Public Fund "Kazakhstan-German Cooperation in Education" in order to train specialists according to the German standard. DKU is the only German university in Central Asia and it consists of three faculties training specialists: Faculty of Economics & Business (FEB), Faculty of Engineering & Information Technology (FEIT), and Faculty of World Politics (FWP). Each of the faculties is represented by several educational programs, which are the most relevant and demanded on the labor market (Fig. 1). Each educational program is successfully accredited and includes state and international educational grants. The university also has a dual degree program for undergraduate students, which implies the possibility of obtaining a Kazakhstani and German diploma.

Table. 1: Educational programs of DKU

<b>Educational programmes (EP)</b>	<b>Faculty of Economics and Business</b>	<b>Faculty of Engineering and Information Technology</b>	<b>Faculty of World Politics</b>
Baccalaureate (BA)	Finance Marketing Enterprise management	Telematics Mobile computing Information Engineering in Economics Transport logistics Production logistics Energy and Environmental Technology	International relationships
Number of BA EP	3	6	1
Master's degree (MA)	Finance International enterprise management	Logistics Resource-saving industrial logistics	Management of regional processes

			Integrated water resources management
Number of MA EP	2	2	2
Total number of EP	5	8	3

In 2020, DKU entered TOP-20 educational programs among universities of the Republic of Kazakhstan and was awarded by the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", taking the 5<sup>th</sup> place. It also took the 1<sup>st</sup> place among the TOP-20 leading enterprises of the Republic of Kazakhstan formed based on the financial and economic analysis of enterprises in the indicator «Contribution to the state budget».<sup>3</sup> The universities in Kazakhstan were assessed according to the following criteria: career prospects of graduates, expert review and statistics, as well as students' achievements. Such an achievement is only possible if the strategic goals and objectives are fulfilled, where DKU has success.

In November 2016, a Natural Resources Institute<sup>4</sup> at DKU has become the first in Central Asia to receive UNESCO Chair on Water Resources Management in Central Asia status. Within the Chair the Institute promotes education as well as lack of an integrated system of research and training on water resources management in Central Asia. The priorities of the UNESCO Chair are to improve the education level in the field of water resources management, to develop academic cooperation between universities in Central Asia and foreign universities, as well as to raise awareness about the current issues related to water resources.

To improve cooperation between the Central Asian countries and strengthen knowledge on transboundary water management, the German Federal Foreign Office established the Master's Programme in Integrated Water Resources Management (IWRM MA) at DKU in 2011. The Master's Program is a two-year full-time study program covering interdisciplinary problems of supply, distribution and sustainable use of water resources in Central Asia. The priority goal of the Master's Programme is the exchange of international best practices aimed at helping to solve water and environmental problems at all levels.

Additionally, the IWRM MA educational program focuses on regional cooperation and development prospects for the next generation of water management experts. This programme promotes the development of young professionals working as public sector workers in Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan, and Afghanistan. The students receive the opportunity to not only acquire technical knowledge in the management of their country's water resources, but also learn to understand the social, political, and economic interests of neighboring countries. This interdisciplinary and international approach is the basis of the program and key to solving complex problems related to water management. The content of the Master's Program is

<sup>3</sup> The National Business Rating in the Republic of Kazakhstan  
<https://dku.kz/en/news/view/?slug=DKU+took+1st+place+in+the+TOP+20+leading+enterprises+of+the+Republic+of+Kazakhstan+in+the+National+Business+Rating>

<sup>4</sup> DKU Natural Resources Institute website: <http://www.academic-waters.org/en>

developed in cooperation with the Free University of Berlin (Freie Universität Berlin), which has many years of experience in water management education, including in Central Asia. Professors from the Free University of Berlin as well as experts from the specialized German and Central Asian organizations give classes in profile modules. Annually, about 10-15 Master's Degree students with various specializations in the field of ecology and water resource management study on a grant basis. At the moment, more than 80 people have graduated from the program.

For an objective assessment of the IWRM MA programme and its further development, DKU applied a SWOT analysis method as one of the basic strategic management methods. The conducted SWOT analysis allowed identifying the main strengths and weaknesses of the Master's Program, which allowed considering the factors while adapting the program development strategic plan. The factors of the internal environment of the educational programme have been studied across various planes: organization and management, employment, educational and methodological support, educational process, and logistics. For factor analysis results refer to Table 1.

As can be seen from the Table, the strengths of the Master's Program include its location, status of the international educational program, strong international faculty and development of international cooperation by obtaining funding from leading international organizations. However, with the existing strengths of the Master's Program, special attention in planning should be paid to weaknesses.

As mentioned above, the IWRM Master's Program aims at educating experts in the field of water resources management in the countries of Central Asia and Afghanistan by focusing on public sector workers as its target audience. The programme, however, has a high risk of insufficient enrollment of specialists not satisfying the requirements of the educational process. This is primarily due to the duration of the Master's Program. Most often, state institutions submitting lists of nominated candidates for the IWRM Master's Program from among their employees refuse to keep their jobs whilst their study in the program.

**Table 2: SWOT analysis of the DKU Integrated Water Resources Management Master Programme**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• The University prestige;</li> <li>• Master's Program enrollment competition - demand for IWRM specialty;</li> <li>• Status of international Master's Program and it invites students from Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, and Afghanistan;</li> <li>• Students are nominated by the respective institutions and ministries in the countries that reflects their trust and competence in the IWRM Master programme</li> <li>• Funding from international organizations: 2 grants per country;</li> <li>• Small study groups (10-15 people) for high quality of education;</li> <li>• International educational standards and learning best practices;</li> <li>• Increased prestige of the Master's degree in the</li> </ul>	<ul style="list-style-type: none"> <li>• Long study period (2 years);</li> <li>• Limitations in the number of qualified local research supervisors for Master's degree students;</li> <li>• Extensive educational labor input and material resource expenditures by the educational institution;</li> <li>• Weak potential of advanced technologies in the region;</li> <li>• Some percentage of unemployed graduates;</li> </ul> <p>Remote assistance of international supervisors of Master's theses of the students</p>

educational market; <ul style="list-style-type: none"> <li>• Each Master's degree student has a research supervisor during the entire period of study</li> </ul>	
<b>Opportunities</b>	<b>Threats, obstacles (internal and external)</b>
<ul style="list-style-type: none"> <li>• Competitiveness of the university in the market of educational services in Central Asian countries;</li> <li>• More grant positions for foreign students (more than 2 per country);</li> <li>• Obtaining Master's degree contributes to career growth;</li> <li>• Ensuring the continuity of educating highly qualified specialists;</li> <li>• Opening of two or more groups of students studying in Master's Program;</li> <li>• Dual degree program for the international Master's degree students;</li> <li>• Engaging qualified specialists to supervise Master's theses;</li> </ul> Improvement of distance learning for Master's degree	<ul style="list-style-type: none"> <li>• Relatively high cost of education (KZT 900,000 per year);</li> <li>• Misconception of Master's degree status by the public and employers;</li> <li>• Low motivation of specialists;</li> <li>• Risk of unemployment among graduates;</li> <li>• Limited number of teaching staff with sufficient competencies to supervise master's thesis</li> </ul>

For two years, the students study core disciplines, write a term paper, take pedagogical practice and internship, as well as prepare their master's thesis. During the entire study period, the Master's degree student is supported in the educational process by the department and by the teaching staff. Nevertheless, a number of specialists in the narrow-profile disciplines in Central Asia make it difficult to find supervisors of master's theses. More often, supervisors of master's thesis are the specialists of DKU and flying faculty<sup>5</sup>. Such distribution of teaching staff is explained by the possibility of writing a master's thesis, taking into account local and regional research specifics.

Another problem that should be noted is a low demand for graduate students in the region. This is primarily due to the fact that the process of integrated water resources management is a relatively new direction and does not have strong legal support in Central Asia and Afghanistan. Basically, most of the nominated master students after the completion of the programme, return to their place of work. Below is the percentage of the gradulators employed by different regional institutions and organizations:

- ministries and government departments - 30%
- International organizations - 50%
- Private entrepreneurship - 10%
- Unemployed - 10%

In 2020, due to pandemic, motivation of students and quality of the educational process has been severely impacted, especially in terms of technical support. Unstable Internet connection, low quality of equipment in the countries affected the participation of the students, which caused difficulties for both the university and the students. However, rapid and prompt transition of the entire university to online education made it possible to develop certain competencies and knowledge to teach students online.

The next chapter will present a detailed analysis of the challenges and problems faced by the DKU during the coronavirus pandemic.

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<sup>55</sup> Professors from the universities of Germany

## **Impact of COVID-19 on the work of Kazakh-German University**

According to the Decree on the State of emergency of March 15, 2020 the capital of Kazakhstan, Nur-Sultan, and the former capital city Almaty, were put into quarantine and lockdown right the other day. The Decree imposed substantial restrictions to decrease the spread of the infection through the cities' border. The President, in the Decree on the State of emergency, the special State Commission, the Chief Sanitary Inspector and local executive bodies have introduced several restrictive measures including remote education at schools and universities.

Due to precautionary measures taken against the spread of coronavirus, the method of teaching in a very short period of time radically changed to online version. As for Kazakhstan, the universities also transited to online teaching. Within a few weeks, it became clear that the DKU needed changes, and many administrative, educational and research processes at the university could no longer function successfully as before. In a condition of a remote work-mode, the management of most of the processes at the university needed to be reformed. Such an adaptation was connected with the limited direct 'manager – employee' contacts and a shutdown of the so-called 'manual control'. There was a need to establish automated processes and develop clear instructions that would allow employees to work more independently, and be well-structured having clear functional responsibilities to make the right decisions on their own.

On the other hand, the processes of limiting live 'face to face' communication and remote work have exacerbated the internal processes of development and institutional growth of the organization and made it possible to understand that the old methods of work is already small and rather hinders the growth and development than protects and creates comfortable working conditions. In a way, the outbreak of Coronavirus engendered a new era of changes for the university.

Looking at the general situation with the spread of COVID-19 (starting from mid-2020), the forecasts has been rather pessimistic. The economic impact of the current crisis was quite significant. By some estimates, unemployment has increased by about 500 million jobs globally when comparing the number of hours worked during the pandemic and before this crisis. UNESCO estimated that over 1.5 billion students in 195 countries are unable to attend classes because of COVID-19<sup>6</sup>.

The pandemic has forced the global academic community to turn to new teaching methods including distance and online learning. This has proven challenging for both students and teachers, who had to cope with the negative emotional, physical and economic consequences of the virus while helping to combat its spread.

According to the international experts, the economic downturn affected the universities leading to the following:

- reduced job opportunities for students and graduates who may enter the job marketplace within the next few months;
- possible delays in payment or the inability of students to pay for tuition;

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<sup>6</sup> <https://en.unesco.org/news/13-billion-learners-are-still-affected-school-university-closures-educational-institutions>



- and, most importantly, changes in student behavior in relation to the new procedure and preference for certain programs.

### **Assessment of the short-term and long-term consequences of the crisis for Kazakh-German University**

There was established a Strategic Planning Group at the University in order to adequately and timely respond to existing challenges and make coordinated and long-term decisions. The initial step was to create the Strategic Planning and Change Management (SPCM) group at the university. It included representatives from various departments of administration, faculties, research institutes and other departments and divisions of DKU. The group held regular meetings and a decision was made, in particular, on the need to amend the Strategic Development Plan of the University.

The newly created SPCM group has started to analyze each department and the institution tasks one by one to find and allocate the necessary resources for the implementation of the activities, formulate a valuable end-result for each task. The next important step in the implementation of transformations was the invitation of a professional company to assess and conduct several stages of multi-stage strategic planning. The company also had the task to help to assess the main business processes to fulfill the newly defined goals and objectives of the development of the University and build a more coordinated DKU structure, responsive to the new requirements. For this reason, the staff of the University conducted a preliminary internal assessment to identify the most common threats and urgent challenges that could interfere with the work of the University, and therefore, needed to be addressed to varying degrees.

Among these short and long term consequences of the crisis in various areas, the following have been highlighted:

- General response to a crisis, including developing new strategic plans;
- Strengthening of long-term planning;
- Lack of mobility of the teaching staff, coming from Germany to give guest lectures;
- Lack of mobility of students, including dual degree studies at German Universities;
- strengthening of HR-management ;
- creation of a new system of interactive interaction with students during online learning;
- solving difficulties with practical training of students: laboratory and practical field work;
- Helping academic teaching staff to adapt to a new working psychological state. Since the transition from very intensive long-term live communications with students to online learning with a low-emotional interaction inevitably causes stress in varying degrees;
- Partner cooperation management;
- Management of science and technological development and effective communication with relevant parties of interest;
- Focus on reducing costs and finding new markets.

It was also necessary to take into account that the crisis could significantly affect student mobility in many countries. For example, DKU's international student exchange with partner universities in

Germany and other countries is facing long-term consequences, including a decrease in the number of students, both studying abroad and visiting students.

### **Assessment of the pre-predicted changes**

DKU considered and assessed the projected changes, which can be divided into five categories:

- changes that are urgently needed to address the problem of continuance of education and researches;
- changes necessary to support the employment of students who are already employed or may be employed within the next few months;
- long-term changes, caused by a sudden change in processes, operating mode and the development of new resources;
- changes in the working model of the university in terms of the ability of parents and students to afford higher education; and
- macro-level changes (political and economic changes) needed to promote quality higher education in an era of change.

The university also considered the UN recommendations to ensure a proper response to emerging problems, and highly focused on a) quality, b) relevance and c) efficiency.

Some of the first conclusions that were made:

- In the teaching process, it is necessary to abandon the traditional way of planning and implementing educational programs;
- Adaptation of the teaching processes requires additional sources of funding and increased cooperation with national and regional partners, as well as significant strengthening of interaction with international organizations;
- Even if distance learning would lead to an increase of number of enrolled students, in the aftermath of a pandemic, many students may be reluctant to return to traditional educational models after they have tried alternative educational models at a lower cost and after using more comfortable learning paths;
- The current crisis differs from previous economic downturns in its type, and, due to the availability of alternative, technology-based education models, at relatively lower costs, it allows for a technological leap and rapid expansive growth. And this is one of the drivers that encourage DKU to develop actively.

In particular, the current crisis and changes in labor markets may lead people to use their professional skills to move to another industry where similar knowledge, skills and attitudes are applied. Thus, the share of so-called additional education in the form of various educational programs and courses aimed at improving qualifications and retraining increases.

Additionally, two more important points were noted at the preliminary stage of assessing changes in the conditions of the spread of the coronavirus pandemic:

- Necessity in applying innovative approaches and technologies in all life processes of the University, and
- Strengthening cooperation and partnership both within DKU (between and within departments and divisions of DKU) and among a wide range of partners and stakeholders.

## **Stages of changes in the management and structure of the university**

Strategically, DKU sees itself as an international university with initially bilingual and later trilingual or quadrilingual education. Due to the growing needs of young people, more diverse educational methods, the changing composition of the student community, and the demographic development in Central Asia, creating the flexible forms of education has become the social task which DKU also tries to solve. New unconventional forms of education such as online education or on-the-job education focus on changing life situations and financial abilities of students and help to improve the effectiveness of learning.

DKU as an academic educational institution and employer has some priority goals such as helping people understand and develop the family values, as well as developing healthy conditions for learning, teaching, researching, and working. As part of its international orientation, DKU strives to become more attractive to international students and scientists from different countries. The priority goal is to study in English within specific specialties or separate training modules. This facilitates the exchange of students and associate professors, as well as the attraction of foreign experts to teach and conduct scientific research at the university or in cooperation with the university.

Upon the announcement of the quarantine regime, the university launched a mechanism for the gradual change of the educational system. The Strategic Planning team, together with a professional institutional development company, have developed and are implementing a step-by-step process for conducting strategic planning and making changes to the management and structure of the university.

One of the first meetings was devoted to the discussion of the main strategic goals and objectives and was aimed at the:

1. Necessity to formulate the position of the university development direction for a foreseeable period.
2. development a formula for university success.
3. Identification of updated strategic development goals
4. Assessment of the tasks at the level of university departments
5. Consideration of risks and barriers for strategy implementation
6. Creation of communication for control, coordination, and implementation of the strategy
7. Idea/ thoughts of personal skills of the participants in supporting the university development.
8. Creation and launch of a business process between university departments.
9. Identification of system errors of non-execution of strategy tasks

The university set a general task for the development of the university for a short term. The management and the team have agreed with a common vision and that DKU as a sustainable and open university shall meet national and international standards.

The following trends and drivers significantly influenced the achievement of the set strategic objective:

- Changes to the national standards;

- Changes to the job marketplace;
- Changes to the standards of Ministry of Education and Science of the Republic of Kazakhstan;
- Online learning;
- Closed borders;
- Partner support;
- Internationalization of educational market;
- Economical situation of the state;
- Implementation of digital technologies;
- Self-education trend;
- Teachers' job marketplace;
- Political factor;
- Educational forms.

DKU has also identified four options for possible development scenarios:

1. Stable economy and innovative educational forms
2. Stable economy and old educational forms
3. Unstable economy and innovative educational forms
4. Unstable economy and old educational forms

Further, there were defined the following success formulas:

1. To be in the trend of all innovations and constantly offer innovative solutions for the markets.
2. Improve the business model of the university.
3. Get ready for external challenges through building business processes and changing the organizational culture of the university.
4. Use the internal potential to create the financial stability of the university.

As a result of this multi-stage work, the team identified the following main strategic objectives that would lead the university to success in the short term in any scenario of future development:

1. Creation of a strategic project management system
2. Implementation of international standards;
3. Development of new educational programs and implementation of educational formats;
4. Bringing the university in line with national standards;
5. Raise scientific activity to a new quality level and develop commercialization and technology transfer;
6. Development of a comprehensive HR-strategy;
7. Development of an (effective / working) corporate culture and effective communication
8. Formalization of the most important business processes at the University;
9. Building of the LMS<sup>7</sup> of the university and provision of technological equipment for the university.

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<sup>7</sup> Learning management system is a high-level strategic solution for planning, delivering, and managing all training activities, including e-learning, virtual classrooms, and online courses.

In a way, the COVID-19 served sort of as a catalyst for the process of making changes at DKU. To sum-up here, the implication of the adaptation process and transition period followed the following 3 stages:

**At the first stage**, a short-term development plan was developed with the key employees of the university using the scenario planning method. The university set goals and identified possible drivers for the development of the market and the environment, which can affect the achievement of goals. During the strategic sessions, there were developed scenarios and key success factors that would help the university develop sustainably despite the crisis.

**At the second stage**, the university with the involvement of the key employees, worked out and schematically depicted the business model of the university. Further, on the basis thereof have been prescribed main and auxiliary functions needed for the full-fledged work of the organization. Then an academic block was selected and checked for compliance with the original functions and tasks of the university.

**In the third part** of planning, the human resource management function was diagnosed, and its level and immediate development goals have been determined.

## **Development of new opportunities and unleashing digital transformation in the education sector: case of Kazakh-German University**

During the pandemic and the transition to online education, DKU provided all students with access to the Moodle education platform<sup>8</sup>. Moodle is a course management system (e-learning), also known as a LMS or virtual learning environment providing full access to courses and allowing the students to attend the lectures online. The platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments. The system allows interaction with the teacher at a time convenient for the student.

In addition, several supplementary forms have been introduced into the study system, such as flipped learning<sup>9</sup> and synchronous learning<sup>10</sup> models. The flipped learning model enables the professor to provide materials for independent study at home, and in the face-to-face online sessions. The material is practically consolidated. To maintain this form of classes, all teachers were given the opportunity to prepare video lectures and other materials, which are subsequently used during classes. The synchronous learning model is implemented through the organization of videoconferences by the teacher or webinars for students via Skype, ZOOM. Field research of students was also transferred to a more effective format. New objects of research and the format of its study in small groups made it possible to conduct field trips in compliance with all sanitary safety standards. For an effective conduct of examinations, an online proctoring<sup>11</sup> system was introduced, i.e. system of identity verification and confirmation of the results of passing online exams. The chapter provides a detailed analysis of the process of more effective digital transformation of the educational sector in Kazakhstan with a particular focus on DKU education system.

### ***Development of digital technology in education***

The development of digital technologies in the field of education was dictated by the need and supported by the state and public. Digitalization is understood as a new social situation of ‘digital divide’, ‘digital citizenship, and ‘digital socialization’. Digital educational resources<sup>12</sup> are becoming the basis for the development of information services in the field of education. In 2020 it fundamentally changed the education and organizational structure at DKU. The use of new information and format of communication technologies created a starting condition for further development of digital pedagogy in higher education. Methodically, the digitalization of the education system is based on new educational standards using a new competency-based approach,

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<sup>8</sup> Moodle is a system for creating and managing courses - free software developed based on pedagogical principles, which allows to organize the distance learning process effectively.

<sup>9</sup> Flipped learning is a learning model in which the teacher provides lecture material for self-study online, the knowledge is only practically consolidated during face-to-face classes. Students independently acquire knowledge by watching video lectures and performing self-examination tasks. After self-study of the material, students can discuss the lecture content, put into practice the knowledge gained at home, and consult with the teacher during face-to-face classes.

<sup>10</sup> Synchronous learning is a type of online learning, where interaction between students and teachers takes place in real time. Students can receive information, work with it independently or in groups, discuss it with other participants and teachers from anywhere at the same time.

<sup>11</sup> Online proctoring is a system of identity verification and confirmation of the online exam results.

<sup>12</sup> Digital educational resources are didactic materials on the studied disciplines and/or modules that provide learning in an interactive form: photos, videos, static and dynamic models, virtual reality and interactive modeling objects, audio recordings and other digital educational content.

requiring tools for creating educational materials and effective delivery of the content and knowledge to the students. DKU in line with the universities in Kazakhstan use a two-component information and educational environment (IEE), which combines the resources of international educational platforms with internally developed content contributing to the development of own IT potential.

The effective implementation of the modern digital base of the educational process - the information and educational environment is the basis for the development of any university. Digitalization of higher education changes the qualification requirements for the teaching staff to make sure that the teachers have competency in efficient and appropriate use of the digital technology. The digitalization of the education also leads to profound changes in the labor market. It creates and opportunity to develop an electronic library resources in the universities worldwide, thus, making it available for the students to access the teaching materials of the best teachers and professors.

In analyzing the implication of the distance learning technologies, the university identified both the positive and negative aspects of their use. Positive aspects of using distance learning technologies include:

- Ability to study at an individual pace, freely choosing the time and pace of studying the subjects;
- Flexibility and freedom provided by technology allow students to create customized programs including subjects that student believes is the most important to study;
- Availability - ability to study anytime, anywhere;
- Mobility - interaction with a teacher when necessary and on a specific matter.
- Adaptability -use of modern and relevant technologies in the educational process;
- Social equality - equal educational opportunities regardless of gender, age, nationality, place of residence, health status, etc;
- Creativity - comfortable conditions for creative self-expression of each student;
- Objectivity: various assessment forms make it possible to assess a student's knowledge from different angles, and their number allows intermediate certification to be carried out automatically without a teacher.

Despite many benefits of distance learning technologies, there are several negative aspects:

- Learning is based on self-assimilation of knowledge. Not all students have self-education skills; it requires additional supervision by the educational institution;
- Inability to properly organize educational work: issue of time management;
- Inability of face-to-face testing of the students' knowledge. Exclusion of "live" contact with teachers is a negative point for students with health problems, since quite often this is the only connection with the outside world for them;
- Expensive equipment for distance learning (PC, laptop, Internet access, etc.), which not everyone can afford to buy.

## ***Enrollment***

Applicants applying to the Master's Program shall submit to the university, either via the online registration in the information and software suite 'UNIVER'<sup>13</sup> or through the 'electronic government'<sup>14</sup> web portal a set of documents specified in the "Acceptance of Documents and Enrollment in Higher Educational Institutions for Educational Programs of Postgraduate Education" Standard of Public Services. The Standard of the Public services provides a list of basic requirements for the provision of public services, including description of the process, form, content and result of the services, as well as other details, taking into account the specific nature of the provision of public services.

In the second stage, the enrollment board accepts the package of documents, register them and issue a receipt to the applicant on the date of application. If the applicant provides an incomplete set of documents, the enrollment board may refuse to accept the documents. If applicants submit a full set of documents through the government web portal, the enrollment board in a written form notified the applicants about the acceptance of their documents for admission to the university. After receiving the notification, the applicant shall submit original documents to the enrollment board by August 28 of the calendar year.

Purposes of the e-government portal:

- Simplification of public service provision to the population on the principle of "single window";
- Improving the efficiency of public service provision;
- Creation of a single access point for all information resources of the state bodies: open dialogue with authorities, confidentiality, direct interaction and response between citizens and the state authorities.

Providing all necessary documents for admission through the e-government portal significantly simplifies the work of the university enrollment board.

Applicants to the Master's Program shall pass Comprehensive Test (CT), which includes a foreign language test (English, German or French), including either Kazakh or Russian languages. Additionally, the applicants also shall take an exam in the main subject of the specialty for which they apply. CT applications filled by the applicants to the Master's Program are accepted by the DKU enrollment board or through the information system starting from June 15 to July 15 of the calendar year. CT is conducted in accordance with the comprehensive test rules approved by the order of the Minister of Education and Science of the Republic of Kazakhstan. The test is conducted by the National Testing Center of the Ministry of Education and Science of the Republic of Kazakhstan at CT locations determined by the Ministry of Education and Science of the Republic of Kazakhstan. Based on CT results, the applicant receives an electronic certificate, which can be checked on the website of the National Testing Center of the Ministry of Education and Science of the Republic of Kazakhstan.

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<sup>13</sup> [https://dku.kaznu.kz/abiturient\\_home/index/](https://dku.kaznu.kz/abiturient_home/index/)

<sup>14</sup> The electronic government portal of the Republic of Kazakhstan (eGov) is an informational interactive web portal where public services can be received in electronic form and which is single access point for obtaining the most necessary information about public services, [www.egov.kz](http://www.egov.kz)



### *Development of online courses*

For an effective transition to distance learning, it is necessary to digitize the educational content (lectures, seminars, labs, practical classes, etc.). This is possible through creating online courses for required subjects to be used in blended learning<sup>15</sup>.

The video courses developed by DKU consist of the following steps:

- Designing the course and its elements, methodical adaptation of the existing content;
- Development and approval of course scenario;
- Finalizing slides for the approved design/infographics;
- Video recording of lecture material;
- Video editing: selection of video and sound effects; title screen, subtitles; text and images in the video; background music; color adjustment;
- Voice-over (if necessary);
- Course assembly in Moodle LMS;
- Test task assembly;
- Testing and finalizing the online course.

Planning of the pedagogical scenario involves a clear vision of Massive open online course<sup>16</sup> (MOOC) educational space by the author, his/her ability to identify pedagogical technologies in accordance with specifics of the course target audience, careful design of the content of educational activities. To solve these problems at the design stage, there is a need to prepare a detailed MOOC program, select educational material, prepare assignments, set a threshold for passing each of the assignments, write down a formula for assessing course results, compose video lecture scenarios, prepare a welcome message for students, and develop guidelines for studying the course.

Work formats used in an online course:

- Video tutorial (auto-webinar): a pre-recorded video tutorial or a recording of a past webinar;
- Screencast: capture of screen actions/presentations with voiceover.
- Electronic materials: presentations, instructions, long reads, infographics.
- Audio recordings (podcasts): audio lectures or ready-made podcasts on the topic;
- Synchronous and interactive;
- Webinars: live online lesson where teacher and students can communicate via chat and other interactive webinar room tools;
- Conference calls: online lesson where speaker and participant roles are not distinguished. Both the teacher and students communicate using a video and microphone;
- Chats: this is a separate format for online learning as students can work on joint assignments and projects or discuss the assignment with a teacher in a chat.

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<sup>15</sup> Blended learning is a special learning organization that allows combining classroom learning and modern learning technologies in an electronic distance-learning environment. The learning concept called blended learning also combines efficiency and responsiveness of e-learning with the social aspects of general learning.

<sup>16</sup> Massive open online course is a training course with massive interactive participation using e-learning technologies and open access via the Internet.

- Interactive whiteboard: teacher and student work on an electronic whiteboard simultaneously (for example, Miro) online;
- Online quest or marathon: a course or topic in a game format of a quest with a sequence of lessons, assignments and scores;
- Dialogue simulator, test: a student selects options or responses and receives instant feedback on the correctness of his/her actions;
- When developing the course content, it is necessary to pay attention to the online course structure;
- Course duration. It is necessary to understand whether the course requires a reduction or an increase in the number of total hours;
- Duration of one lesson. The recommended duration for a single video is 10-20 minutes;
- Homework and knowledge assessment format: tests, quizzes, assignments, essays, projects, etc.

To create convenient and interesting lecture materials, it is possible to use e-course authoring software. These are programs and services to create electronic educational materials: courses, tests, questionnaires, quizzes, interactive simulators, video lectures, educational games, etc. When recording video lectures, it is also worth considering that professors need to get prepared psychologically for working with the camera, choose clothes for video recording. Editing takes 2 to 4 weeks per course. It depends on the number of modules, as well as the complexity of models and animations used. Then all video lectures and text materials of the course are sent to the proofreader, who helps prepare the final version. After the course is uploaded to MOOC (Moodle), the course is beta tested for correct operation. There are 15 different modules-video courses prepared for the DKU Master's Degree students.

### ***Educational process***

The current complex epidemiological situation dictated the need to implement modern teaching methods based on the student's independence and the use of a modern format of distance learning. The distance format involves a structured set of electronic educational and methodological documentation, electronic educational resources, teaching and knowledge assessment tools, which contain interrelated educational content. It is also intended for joint use in order to effectively study academic disciplines, courses, different types of practices by students.

These changes will require both the choice of material for the creation of courses and their organization, and management of the educational institution. The resulting educational environment can be implemented in accordance with several algorithms among which the most significant ones include:

- Use of free specialized Internet resources;
- Use of paid platforms for creation of educational content;
- Use of ready-made platform-based solutions hosted in the cloud;
- Creation of hybrid resources based on multiple platforms, etc.

Information and educational environment of the digital education includes:

- Technical resources: computers, tablets, mobile devices, networks, video systems, interactive screens;
- Educational resources: software, electronic educational resources, information and educational portals, distance learning systems, electronic libraries, cloud resources, webinars, teleconferences;
- Process management: distance learning, e-mail, social networks, personal account in the cloud, training form.

For successful digitalization, it is not enough to transform educational materials into electronic form. The use of new information and communication technologies is only the starting condition for further development of digital pedagogy, which assessment criterion will be its usefulness for the students. The introduced innovation, providing a qualitative increase in the efficiency of processes in content and structure of training courses, organizational and structural changes in universities will be of real benefit for students.

When switching to distance learning format, teacher decides to use the available online course in a specific subject or to conduct classes using distance technologies, while any training format is within the approved working curriculum for the subject (syllabus). On its official website or information system, DKU posts information on the terms of online courses, indicating final dates for student registration in online courses.

In addition to the supplementary forms, which have been introduced into the study system and mentioned earlier in this report, the teaching staff also use combined models of distance learning including asynchronous learning<sup>17</sup>, blended learning alternative formats such as lectures in the form of webinars or providing access to lectures previously recorded by teachers, conducting seminars in the form of remote completion of assignments during seminars in accordance with the existing university's schedule, etc.

Offline learning model is learning using software that is disconnected from the network during its use. In other words, it is the interaction between two or more participants of the distance learning process not in real time, but at certain time intervals. The teacher organizing videoconferences or webinars for the academic group (stream) via Skype, Zoom, in accordance with the approved schedule, implements the model of synchronous (simultaneous) learning.

With asynchronous learning, group members and teacher work at different times over a long time period. The main platform is LMS of educational organizations. It is necessary to accurately and in a timely manner complete assignments placed in the corresponding sections of the subject within LMS. It is required to regularly upload scanned copies, screenshots, photographs and other proofs of completed assignments for attendance verification and progress monitoring. The teacher posts all the necessary teaching materials for the subject to the distance course in the educational portal of the university (on Moodle platform).

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<sup>17</sup> Asynchronous learning is a learning format where the process of transferring knowledge or skills does not occur in the same place or at the same time.

It is recommended to spend at least 40% of the duration of classes (40 mins out of 100 mins) online on Zoom/Skype platform. Allocate the remaining time offline for other types of activities using other platforms, including Moodle. It is recommended to conduct lectures online for 20 minutes, but students shall be provided with complete lecture notes. Online classes are held in accordance with the approved schedule. Additionally, the teacher shall provide a link to the video lectures posted on the University's YouTube channel. Recommended duration of the video lecture is 20-30 minutes.

If necessary, the teacher can arrange full-time instruction on the subject. He/she may also use courses (parts of courses) that are publicly available on Oren edX, Coursera, etc. In any case, the teacher shall ensure:

- Availability of high-quality content (online courses, cases, etc.) and provision of electronic library resources, involving monitoring of the educational content;
- Provision of necessary educational content to students in full, maintaining electronic attendance log and recording the student's grades by type of activities (ongoing assessment, Students' Individual Work, midterm examination);
- Continuous improvement of ICT competencies, development of skills to develop own online courses, electronic cases, skills of applying criteria-based assessment of educational achievements of the students.

The student, in turn, with a distance learning format:

- Stays in touch with teachers according to the approved schedule of classes;
- Gets acquainted with the approved academic policy, internal regulations of the university on ongoing assessment, interim and final certification, organization of professional practice, criteria for assessing educational achievements, syllabuses of academic disciplines through available communication means;
- In accordance with the schedule of classes, attends training sessions within electronic or online platforms and other communication systems to receive educational material for the purpose of self-study;
- Independently completes assignments, submits completed assignments to the teacher via the available communication means (platform, e-mail, instant messengers);
- Adheres to the principles of academic integrity when completing assignments.

It should be noted that the productivity of the distance learning system depends not only on the use of modern digital technologies, but also on the awareness of the need for a creative approach, the establishment of interaction between students and teachers within the information space. There is many Internet resources, programs that allow teachers establishing remote communication with students and organizing the learning process in the most productive and sometimes non-standard way:

- Messaging (e-mail, WhatsApp, WeChat, etc.);
- Shared use of documents (Google Docs, IDroo, NoteBookCast, MIRO, Scrumblr, WikiWall interactive online boards, etc.);
- Social networks (VKontakte, Facebook, Instagram, etc.);
- Course management system or virtual learning environment (Moodle, Ilias, ATutor, Claroline, Sakai, TrainingWare Class);

- Video conferencing (Zoom, DingTalk Lite, VooV Meeting, Google Meet, TrueConf, Microsoft Teams, Skype, etc.).

Messaging programs can help organize groups of students and quickly communicate with all participants, sending them not only text information, but also photos, videos, and audio recordings. Shared use of documents allows all participants having a document link work on the same document, both online and at different times. For example, if one need to check a student's assignment, he/she can use Google Docs where students can post their files to (essays, etc.). And virtual whiteboards will help to organize a lesson, because you can upload texts, media, files, draw there, and cursor movements will be seen by all participants (for example, IDroo). Some whiteboards even have options like voice chat and webcam video (like Scratchwork).

The Moodle distance learning environment covers high demand, is free, open, mobile, widespread, etc. The use of this platform in distance learning allows to:

- Satisfy the requirements of the Ministry of Education of the Republic of Kazakhstan;
- Provide the educational process with educational, learning, methodological, reference and other materials that improve the training quality of specialists, as well as systematize such materials;
- Improve the efficiency of managing student's self-work;
- Organize feedback in communication with students.

The Moodle distance learning system contains a wide range of tools for creating, improving, and maintaining courses and their effectiveness. In this system, each teacher is able to select necessary tools for his/her subject to organize the educational process. Distance learning courses developed using the Moodle distance learning tools may include:

- resources - theoretical materials that are used to study at a distance course to be studied in the course sections. Resources can be presented in the form of files of various formats (documents, presentations, etc.) or in the form of links to external sites;
- active elements - organization of activities that go beyond learning using distance course resources. Active elements in the Moodle distance learning system basically mean the organization of communication between distance learning students (forum, chat, messaging, etc.). We can also talk about organizing knowledge testing (tests, assignments, etc.).

The Moodle distance learning system provides users with a great messaging experience. To organize communication, a user of the Moodle distance learning system creates his/her own list of conversation members. Moodle distance learning system has a certain mechanism to search for its users. The teacher, showing his/her own creativity, develops course fragments in various ways, divides the amount of material into didactic units. Theoretical materials are used according to sections and topics of the taught courses in the form of lecture, presentation material. Using the capabilities of information and communication technologies, the teacher not only transfers ready-made and accumulated knowledge, but builds the cognition process (intellectual, emotional, moral) together with the students.

The most significant features of Moodle include the following capabilities:

- Real-time communication between the teacher and students as well as between students themselves;
- Prompt notification of course participants about current or upcoming events of the educational process;
- Exchange of files in any format;
- Evaluation of learning outcomes, including automatic mode;
- Assessment of students' knowledge in various forms, for example, testing, test in a discipline, training course or exam;
- Various individual and group consultations on the types of activities performed;
- Individual work in review process, including completion of individual assignments in practice, course projects, final qualification;
- Monitoring attendance, activity of students, time of their academic work in the network.

This structure of the course allows the teacher to use it not only for independent work of students, but also during classroom studies. We should also note a capability for obtaining additional information. This is possible via hyperlinks explaining important terms, as well as a glossary, which can be entered via a hyperlink from the lecture text or from the start page of the course. The lecture ends with conclusions allowing to generalize the material and to sum it up. It is essential that all of the teaching materials in the Moodle e-learning system can be printed and used, for example, as hand-outs in the classroom. Use of the Moodle e-learning system allows the time for laboratory work to be spent in the more efficient way. In preparation for them, students receive assignments in advance, pass training tests and study the stages of their implementation. In classroom lessons, the teacher advises students on those issues that they could not cope with independently, and accepts the work performed. In the process of completing assignments, students can communicate with each other on forums, chat rooms and exchange personal messages or attachments.

The statistics of monitoring the educational activity of students is accumulated, generalized and systematized. In particular, Moodle creates and stores a portfolio of each student: all the work submitted by him, the teacher's grades and comments, messages on the forum, control over the attendance and activity of students, the time of their academic work online. Such information allows the teacher to implement optimal educational trajectories for each student, timely influence the educational activities of students, correct learning problems, and most importantly, to develop students' understanding and need for systematic independent work.

Thus, the use of the Moodle system in the educational process of higher education allows not only to intensify the training of students, but also lays a solid foundation for their further permanent self-education. At the same time, active use of Moodle requires a lot of organizational work for better efficiency.

All of the above services are certainly of great importance for online learning. However, the best results can be achieved through direct contact with learners. This is possible when using programs for video conferencing, since the teacher can work with a group of students, hear and see them at the same time. Zoom is the definite leader among these programs. As of today this program has, perhaps, the most generous functionality even in the basic version. Zoom is a service for video

conferencing, online meetings and online learning. It allows for large interactive events with video, sound and screens broadcasting (up to 100 participants in the free version of the program). Zoom is customizable to manage large audiences using registration, host controls, polls, Q&A, show of hands, chat, event videos, and more.

One of the Zoom advantages is the ability to set up a conference with a separate ID for each group of students. This means that when connecting to the conference, the student does not immediately get into the virtual room, but only after confirmation of the teacher. During the lesson, the teacher is able to send a student to the Waiting room and then return him to the common virtual room. This feature will be useful, for example, in the case of any game tasks in the classroom, when the student should not be present in the virtual classroom at a certain time. The teacher who organizes the conference also can turn off and, on all microphones, as well as turn off the video and request the students to turn on video, which is also a useful option that allows the teacher to organize the work process in an optimum manner and to control it.

Zoom also has an interactive whiteboard built into the platform, which allows you to avoid using third-party programs and to switch from screen sharing to whiteboard quickly. However, this board has relatively limited options. For example, you cannot upload images to this board. It should be noted that a general Zoom conference room chat allows you to write messages, transfer files to all or one student. However, due to the inconvenience of saving (you need to save the messages in separate files), you can use a Wechat or Whatsapp group to send text messages and files to students during class. To do this, it will be more convenient to install these programs on a computer or use the browser versions.

It should be noted that the above features are present in the basic free version. The only drawback of the free version is that group conferences are limited in time, they can only be held for 40 minutes. This disadvantage is eliminated by switching to the paid version for \$ 14.99 per month.

### ***Examination Period***

The university provides students and teachers an access to online educational technologies through LMS systems for online and offline classes, systems for completing and submitting assignments in electronic form, checking students' work for plagiarism. DKU has defined the following distance learning systems for use: MOODLE online learning system, Indigo testing system, Zoom / Skype software, Proctoring<sup>18</sup>.

There are 4 proctoring systems which could be applied:

- Passive monitoring of software on examinees' computers. It is implemented by tracking the applications which students are using on their PCs and switching to other services during the exam;
- Active software restriction on student computers. For example, the Browser Lock application denies access to other applications during exams;
- Passive video monitoring using software that accesses the students' webcam to record all of the actions directly. In this case the online control takes place without an examiner,

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<sup>18</sup> Proctoring - a procedure for monitoring the process of the online examination.

without participation of a human. Video and sound are recorded, suspicious human behavior is automatically detected and violations are recorded. Gross violation of the rules (substitution of the examinee, copying tasks) automatically block access to the system.

- Active video monitoring. This type of monitoring is implemented similarly to passive one, but with the addition of real-time monitoring. One proctor can monitor several students at the same time.

DKU provides timely technical support of the educational process, including support for students in situations that make it difficult for them to participate in online learning (at the request of a student, the university's technical equipment is provided for temporary free use for the period of the pandemic). If necessary, DKU is able to attract psychologists and other specialists to support students and teachers during online learning and exam period.

When uploading data or educational resources in web spaces, as well as when transferring them to other organizations or individuals, DKU assesses the security level and ensures the confidentiality of the data of students and teachers when using applications and platforms. DKU provides midterm assessment of students through LMS and other online learning platforms in order to assess the achievement of learning outcomes by students in a specific discipline.

In the context of the transition of the higher education system to training with the use of online learning technologies, the following changes are introduced at DKU in the process of midterm assessment: passing the exam in an online format; grading in certain disciplines based on current grades (cumulative assessment method); postponement of the exam with an "I" mark (Incomplete).

DKU uses the following methods to assess the achievement of learning outcomes by students, which include:

- written exams (examinational tasks uploaded to the LMS systems);
- online oral exams;
- remote testing;
- defense of projects / cases / creative assignments performed at home.

In cases when the lack of access to educational resources, the lack of technical means and (or) access to the Internet during the emergency period did not allow the student to fully learn the content of the discipline and complete the relevant tasks, which makes it impossible to assess the achievement of the student's learning outcomes, DKU can provide the possibility of re-studying the discipline with the subsequent passing of the exam in the next academic period, including the summer semester.

If a student has technological problems during the exam (weak Internet, failure to connect to the exam due to the lack of the Internet, etc.), the student is given an "I" mark (Incomplete) and the opportunity to pass the exam with another group or on an extra week, with disregard for the first attempt.



The university develops instructions for conducting oral, written examinations, testing. During all forms of intermediate control (oral/written exams, testing, defense of a project / creative task), a video recording is made. The answer sheet and/or video record shall be kept at the faculty in accordance with the File Register requirements. If during and/or after completion of the exam and watching of videos the case of violation of academic honesty is detected, the examination results may be canceled by the teacher who organizes the exam.

If during the exam (written, oral, testing, defense of projects, etc.) there is a break in communication, the student shall inform the faculty assistant or teacher-examiner, assistant teacher or IT specialist. If reconnection fails, the student shall inform the assistant / teacher again. Reconnection attempts are allowed during the next 10-15 minutes. If the reconnection attempts fail, the exam can be rescheduled to a later time on the same day, as determined by the teacher. Alternatively, the exam can be rescheduled to another date within the re-examination period according to the schedule on the student's application. In this case, the student is given the "I" mark ("incomplete") due to the insufficient technical means and/or the lack of or restricted access to the Internet to pass the exam online.

If a technical failure occurs during an oral exam, the student can reconnect and continue on the exam. If the student managed to answer more than 50% of the question paper before the technological problems with communication had happened (at the discretion of the commission), then after reconnecting he continues to respond to the same question paper. If, before the appearance of technological problems with communication, the student managed to answer less than 50% of the question paper (at the discretion of the commission), or did not start answering at all, then after reconnection he is given a new question paper and additional preparation time is provided.

If a technical failure occurs during a written exam or testing, the student can reconnect and continue on the exam. If the reconnection attempts fail, the exam can be deferred to a later time on the same day, as determined by the teacher. Alternatively, the exam can be deferred to another date within the re-examination period as per the schedule on the student's application. In this case, the student is given the "I" mark ("incomplete") due to the insufficient technical means and/or the lack of or restricted access to the Internet to pass the exam online.

Here is an example of an oral exam procedure. All exam participants receive information on the examination procedure.

The oral exam is carried out on the ZOOM / Skype platform, in case of passing a current exam, the exam shall be taken in the ZOOM Group / Skype Meeting, where regular classes in the discipline were held during the semester. In the case of passing the State exam or a large number of students in the group, new / additional accounts and new ZOOM Groups / Skype Meetings shall be created, where students will be invited by the link. The order of passing the exam by students is determined through the Registration Sheet, which is uploaded by the teachers for the students in advance. A student shall sign up for a specific time to pass the exam. If the registration is carried out in electronic format, the Registration Sheet is closed before the start of the exam.

On the day of the exam the student connects to Zoom / Skype on the specific time which is indicated for him/her in the registration sheet, having previously checked the Internet connection. He/she is obliged to prepare a workplace, a pen, a pencil, blank A4 sheets for writing down the theses of answers. On each A4 sheet used for writing the theses of answers, he/she shall indicate his surname and first name. After completing the preparation for the answer, the student is obliged to show this sheet to the examiner (teacher) / commission members and, upon request, send a photo / scan copy of this sheet to Zoom / Skype chat. The answer sheets can also be uploaded to the educational portal.

The teacher-examiner carries out the distribution of students in advance via the Registration Sheet according to the time of passing the exam. The filled Registration Sheet is provided for students, as well as all members of the commission, the examiner's assistant, if any in advance. The teacher prepares papers with questions in Word / PDF format and uploads them to the Moodle platform in the form of assignments for students. The teacher organizes the possibility of choosing a question paper on the educational portal using the technology of choosing a random number, which can be done in two ways: the first - using a random number generator, the second - prepared versions of question papers are uploaded to the educational portal under a separate number. All question tickets uploaded to the portal are hidden and not publicly available. To choose the ticket, a student is asked to "Tell the number of variant /question paper". The teacher displays the question paper number named by the student on the portal.

The assistant makes a list of students participating in the exam, indicating their ZOOM / Skype accounts. The assistant connects and disconnects each student to the ZOOM Group / Skype Meeting, where the exam takes place, makes a video recording of the entire process of passing the exam. Video recording is made separately for each student and includes instructions, the main answer to the paper, the answer to additional questions. The assistant is making the protocol of the oral examination. The IT specialist is also involved in the process to provide general technical support during the exam, quickly respond to communication failures and other technical problems.

The retention of the educational program ends with the final assessment, which consists of the preparation and defense of the thesis (project) and the passing of a comprehensive examination. The forms of the final certification are determined by the university independently. If necessary, in the conditions of distance educational technology, it is allowed to pass a comprehensive test in the form of a test via the LMS of the university.

The defense of the thesis (project) / master's thesis (project) is carried out online using distance educational technologies according to the approved schedule, by appointment. An off-line defense of a thesis (project) / master's thesis (project) is allowed with the provision of a video recording of the presentation and the report. During the defense of the thesis (project) / master's thesis (project), the student demonstrates the presentation through the screen sharing mode, makes a report (speech) in front of the camera for the commission members and answers oral questions from the commission members. In case of technical problems, the student is asked questions in writing. In this case, the questions of the commission members are voiced by the technical secretary. The student answers verbally or in writing.

The use of the Proctoring system by students during the passing of written exams and examinations in the form of testing is mandatory. If a student fails to use the Proctoring system, the teacher has the right to invalidate the examination work, considering this situation as a violation of the principles of academic honesty.

The identification of a students shall be carried out 30 minutes before the start of the final qualifying examination of the student. The identification of the chairman members of the commission is carried out by the dean of the faculty.

Preparation of the home rooms is carried out before the start of the final assessment procedure. The student has to be alone in the room. Any electronic devices, other than those used directly for final examination, shouldn't be in the room. The student in the online mode shows the room in which he is during the examination. In case of detection of foreign objects/persons, the student shall take them out of the room. In case of refusal, the defense is terminated, the commission by its decision suspends or terminates the final qualifying examination.

The student logs in with his login and password to the LMS or other distance learning system, which provides control over the process of the final qualifying examination. During the final qualifying examination the video recording shall be done. During the final qualifying examination the student shall not leave the view area. The student is prohibited from engaging third parties and (or) providing access to electronic devices to unauthorized persons during the exam. In case of violation by the student and (or) a member of the commission of the principles of academic integrity during the final certification, measures are taken in accordance with the Academic Policy of DKU, and the Code of Academic Integrity of DKU.

The grade is given by the commission using an online survey form (Google form or other similar forms). An online survey form is created for each student and allows commission members to select a grade for a student once. The voting procedure for the conferring of a degree can be carried out in secret or through a peer discussion with the participation of all members of the commission. The technical secretary conducts and records the count of votes of the commission members. Voting for conferring a degree is done using a Google form or other similar form.

After the completion of the comprehensive examination procedure and the defense of the thesis (project) / master's thesis (project), the results of the final certification are announced by publishing the examination sheet on the educational portal.

### ***Online access to the information***

For an effective educational process, teachers and students shall have full access to the library funds of the university. DKU provides its employees and students with access to the following online databases.

1. Access to the databases through the open access to their digital libraries of the partner-university in Germany, like the Technical University of Applied Sciences Wildau;
2. Access to the network folder of DKU: Students and teachers can read and download books that are stored in the DKU network folder. The network folder contains books on economic, technical, political and international relations;

3. Republican Interuniversity Electronic Library (RIEL) (<http://rmebrk.kz/>)- provides full-text access to Kazakhstani magazines, books, textbooks. In addition, the resource provides access to video lectures of Kazakhstani teachers;
4. Grebennikov Publishing House (<https://grebennikon.ru/>)- provides access to the electronic journals Logistics Today, Marketing and Marketing Research, Quality Management, Advertising. Theory and Practice, Project and Program Management;
5. Znanium Publishing House (<https://new.znaniium.com/>) offers its users remote access to more than 38,000 textbooks, monographs, articles, etc;
6. JSTOR ([www.jstor.org](http://www.jstor.org)) is a digital database of full-text scientific journals (in various European languages) and books (in the humanities, in English only). To access, go to the DKU Education Portal and find the JSTOR icon. By clicking the icon, you automatically access JSTOR resources;
7. Science Direkt Publishing House - Science Direkt full-text database is an unrivaled Internet resource for scientific, technical and medical information and contains 25% of the world market for scientific publications. Designed to meet the needs of scientific, educational, commercial and government organizations for information retrieval at a poly-thematic level, the Science Direkt platform provides comprehensive coverage of literature from all areas of science, providing access to more than 2,500 journals and more than 11,000 books from the collection of Elsevier Publishing House, as well as a huge number of journals published by prestigious scientific communities;
8. Scopus Publishing House - the publishing house is the world's largest unified abstract database, which indexes more than 21,000 titles of scientific, technical and medical journals from approximately 5,000 international publishers. The Scopus database, updated daily, includes records up to volume one, the first issue of journals from leading scientific publishers. It provides unrivaled support for research publications and offers links to all published abstracts from the vast volume of available articles;
9. Lan Publishing House - Access to the following content of the Lan Electronic Library System is provided: Access to the collection Social Sciences and Humanities - Publishing House Aspect Press, LAN Electronic Library System; Access to the collection Social Sciences and Humanities - Publishing House Dashkov and K, LAN Electronic Library System; Access to the collection Social Sciences and Humanities - MGIMO Publishing House, LAN Electronic Library System; Access to the collection Social Sciences and Humanities - International Relations Publishing House, LAN Electronic Library System.

The practice of introducing digital technologies affects not only innovations in technological infrastructure of the educational process, but also the modernization of research activities. By virtue to digital technologies, we can confidently speak about the globalization of the scientific world and the active development of academic mobility. In the next chapter the report will present the project implemented within the UNESCO Chair on resources management and Natural resources Institute conducted during the pandemic period.

## **Implication of innovative approaches and practices in the implementation of the UNESCO Chair on Water Resources Management in Central Asia**

Along with the three central themes: Education, Capacity-Building, and Science, the activities of the UNESCO Chair are directed at developing scientific and scholarly research, delivering strong academic programs in the field of IWRM, natural resources management in Central Asian countries, and enhancement of scientific relations between the Institute and international, regional scientific and expert organizations. Despite the harsh restriction due to the outburst of COVID 19, all planned activities of the UNESCO Chair in 2020 have been conducted in due time. However, the format of the implementation was adapted under the new condition. In total 7 projects: 4 regional, 2 national, 1 bilateral level have adjusted the format of the projects' implementation. The following 5 projects have been conducted in an online format:

- Regional Student Olympiad "Sustainable Development Goals"- conducted among bachelor students of Central Asia and Afghanistan;
- Students' research competition on sustainable management of natural resources among MA, Ms. and Ph.D. students from Central Asia and Afghanistan;
- International Green Business school "Eco-Talk";
- Gender Aspects of Water Resources Management in Central Asia and Afghanistan on the Example of a Regional Project;
- Global Disruptive Tech challenge 202: Restoring landscapes in the Aral Sea Region
- Silk Road of Knowledge International conference.

Implication of the measures to comply with all sanitary and epidemiological standards allowed the implementation of the following 2 projects offline:

- Ecosystems, Society and Economics of the Region of Aral Research project;
- Educational Renewable Energy trip in Kazakhstan.

The well-prepared technical capacity of the university allowed implementing the project online by conducting webinars, online trainings, knowledge exchanges events, colloquiums, workshops, seminars, and conferences.

During the offline activities, in order to comply with all sanitary and epidemiological standards, the university followed the preventive measures, such as mandatory passage of a PCR test for the presence of coronavirus infection, daily measurement of body temperature and monitoring of all participants for obvious signs of coronavirus infection as well as mandatory hand sanitizing and wearing masks

### ***UNESCO Chair Online Activities in 2020***

#### **Student Contest on "Sustainable Development Goals" (SDGs)**

**Duration:** The national level is conducted in the period from March to April 2020.

**Partners:** Swiss Agency for Development and Cooperation, World Bank, Global Water

Partnership and the United Nations Economic and Social Commission for Asia and the Pacific

The sustainable development of the region largely depends on the future generation; the educated youth of our region could act as a locomotive in the sustainable development of the Central Asian region. For these reasons, previously known as the “IWRM” (integrated water resources management) the subject matter of the Olympiad has been expanded starting from 2020 and being conducted within the framework of the Sustainable Development Goals developed by the United Nations. The annually conducted student Olympiad serves as a basis for creating conditions for young specialists in Central Asia to communicate with each other and with colleagues from other countries in a language that is understandable to all – the language of progress and professionalism.

The Olympiad addressed the Sustainable Development Goals 6, 7, 9 and 13 and includes the following three sections:

1. Integrated water resources management;
1. Climate change and clean energy;
2. Industrialization, innovation, and infrastructure.

With the support of the Global Water Partnership (GWP), the database of questions for the first section was updated based on the GWP Toolbox. The main goal of the first section is to enable students to learn a tool that is used all over the world. It is expected that the student contest will be a way to develop a dialogue between future specialists about the world practice and aspects of IWRM.

Along with water resources, the topic of climate change is very significant now. The questions in the second section are aimed at improving the understanding of the relationship between greenhouse gas emissions and climate change. It also covers the issues related to the impact of the climate change worldwide with a particular focus on Central Asia, and necessity in taking measures to mitigate the and adapt to climate change as well as developing alternative energy.

To achieve sustainable development and empower people around the world, it is also essential to develop transport, irrigation systems, energy supplies, and information and communication technologies, especially in the era of global digitalization. These aspects of development were available for study and familiarization in the preparation of the third section.



**Picture 1.** Oral exam with the participants of the SDG contest

***Format***

An online format of the event was advantageous in terms of the following:

- participants from various locations across the country were able to attend.
- there was no limitation in number of participants
- no major financial investment was required
- availability of experts to attend the event online from other countries of Central Asian region

At the same time, some drawbacks were:

- offline events are always more efficient and have a bigger impact on participants;
- absence of physical presence provided less opportunities for networking;
- number of registered participants was bigger than the ones who attended;
- online format of written test does not allow to check transparency, although the time provided to answer all the questions was limited by the Google Classroom program.

There is a need to think carefully about what program will fit all the requirements and needs of the event that is planned to be organized. It was important for the program to allow several sections with different set of questions. Considering that there were three thematic scopes of the contest, all participants could choose among these sections.

***Difference between its conduction prior to the Covid-19 and in the face of new reality***

Before the COVID-19, the student contests were carried out in two stages (national and regional) - both events served as opportunities for networking, an exchange between experts, senior researchers, and students, as well as a possibility to organize an excursion, a field trip. During the pandemic, none of the latter was possible, so adjustments to an online format led to innovative solutions, such as Zoom online interviews, online written tests via the Google Classroom platform.

Since all participants had to register online prior to the contest and choose the section of their interest, DKU and the Central Asia Youth for Water network (CAY4W)<sup>19</sup>, as organizers, had to control that students get the right information regarding each section, as well as correct access codes for each of the sections. The tricky part of the whole process is timely communication with all participants, and follow-up on registrations to make sure all students are aware of which steps to follow to get access to the written test. Since all questions were in the format of a multiple choice, at the end of the test all students could see the number of right and wrong answers. Also, this was quite easy to identify finalists of the national level contest without having to check all the test questions personally. However, it is important to make sure that all questions and respective answers are entered to the system correctly.

***Adaptation analyses and faced barriers.***

Due to restrictions imposed because of the pandemic, the student contest had to be re-arranged to be held online. To follow the preventive measures related to COVID-19, in 2020 the event was conducted online, where students had to register online to participate in any of the abovementioned sections. The main barriers were:

- Find a reliable system for conducting an online testing;
- Disseminate updated information about the new (online) form of conduction;
- Establish timely communication with all students willing to participate in the event;
- Connection and limited access to the internet.

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<sup>19</sup> Central Asia Youth for Water network (CAY4W) is a regional network connecting youth (students, young specialists, activists, and enthusiasts) to engage them into the Central Asia water management issues, <http://cay4water.org/> Starting from 2019, the network together with DKU implements the students contest.

The finalists of the regional Olympiad took part in the intensive online school Eco-Talk 2020, as well as in the ESCAP online event “The 4th North and Central Asian Multi-Stakeholder Forum on Implementation of the Sustainable Development”<sup>20</sup>.

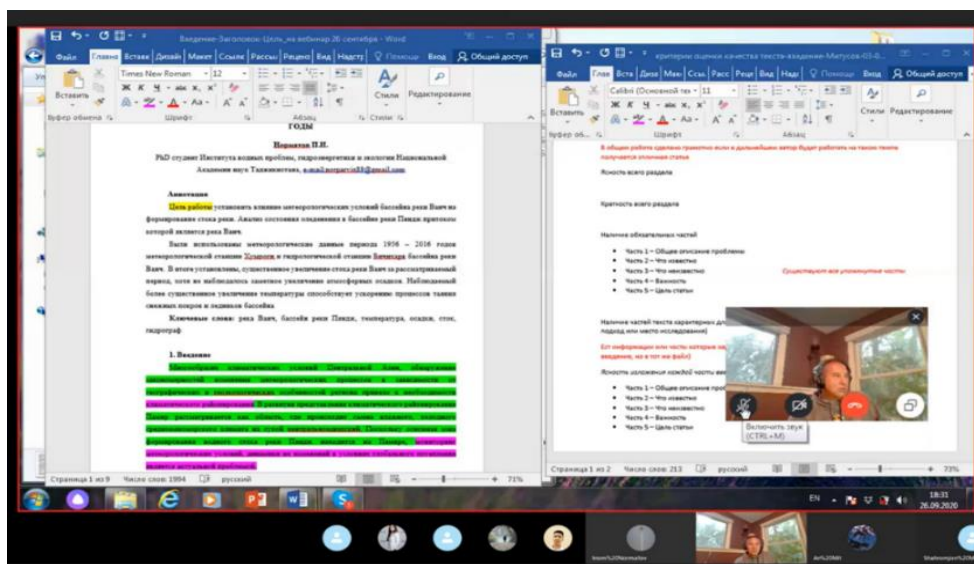
### **Student research competition on sustainable management of natural resources in Central Asia and Afghanistan.**

**Duration:** July 2019- June 2020

**Partners:** The Regional Environmental Centre for Central Asia (CAREC), The United States Agency for International Development, World Bank

The student research competition on sustainable management of natural resources in Central Asia and Afghanistan project aimed at building the capacities of the young generation with specialists in the water, agricultural and environmental protection sectors. The competition is sponsored by the CAREC Smart Waters (USAID) and Climate Adaptation and Mitigation Program for Aral Sea Basin (World Bank) projects.

The main objective of the students' research competition was to train young professionals from Central Asian countries and Afghanistan by enhancing their scientific research skills and participation in applied research. For this reason and in order to equip the students with a scientific knowledge, four international experts have been selected to become their supervisors for the whole period of the project, and assist them in producing one of the main project outcomes, namely, a scientific article of a quality sufficient for submission in the Central Asian Journal of Water Research. The competition winners are provided with financial support to carry out their research in the amount of up to US\$ 1,500.



**Picture 1.** The Online colloquium with the students and supervisors

<sup>20</sup> 4th North and Central Asian Multi-Stakeholder Forum on Implementation of the Sustainable Development: <https://www.youtube.com/watch?t=4460&v=xrKfLvWVNiI&feature=youtu.be>

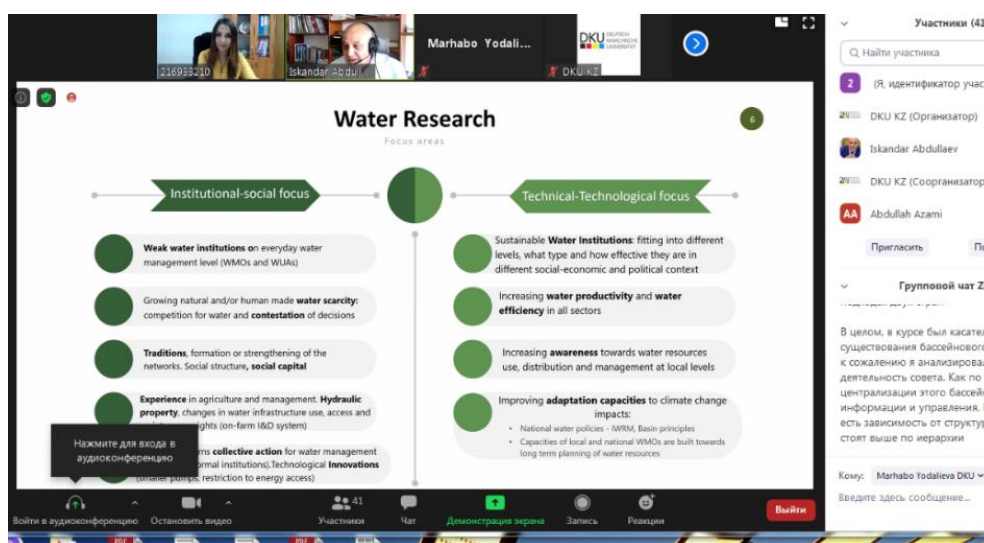


## **Format**

The competition starts from the “Summer school on academic scientific writing”, which is usually organized at the DKU in Almaty. During the summer school special trainings on academic writing are held which help to equip students with needed knowledge to conduct their scientific research. After the summer school, all students go back to their countries and the further communication is conducted in the form regular online colloquiums and webinars. Such kind of platform helped supervisors to control the students’ study process and helped students to work on their research deeply. At the end of the project students had to submit prepared scientific article to the regional Central Asian Journal on Water and take part in the Regional Climate Conference to present their research results.

## ***Difference between its conduction prior to the Covid-19 and in the face of new reality***

The main difference in the conduction of the student research competition during the pandemic situation is the inability to organize the final conference which should have been conducted in Dushanbe in 2020 and “Summer school on academic scientific writing”. It was decided to organize the final event in the online format to give the participants to present their research results. The summer school was also conducted online. The Zoom platform was for conducted the summer school since it allowed providing simultaneous translation and record the training lectures, which have been shared with the participant of the competition.

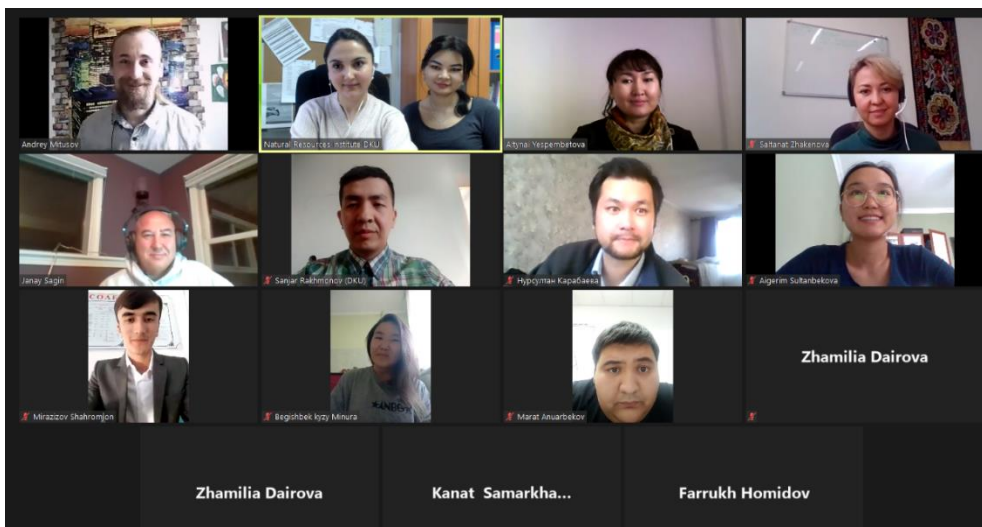


**Picture 2.** The final conference of the student research competition, 11<sup>th</sup> of June

## ***Adaptation analyses and faced barriers.***

The main challenge was the inability to organize the “Summer school on academic scientific writing” in August when the next phase of the project started. It was the biggest challenge during the whole project period since the organizing of the summer school is significant in terms of the future cooperation with participants. The summer school serves as a foundation for fruitful cooperation between students and their international supervisors. They not only get acquainted with each other during the summer school, but also develop their future work plan. Students also actively interact with each other, share their ideas, learn to work in a team etc. During these training students have lectures on such topics as structure of scientific article, data in research, copyrights, plagiarism, and many others.

In addition to the lectures, students were split up into small groups where they discussed their research topics and then presented the main results. Such kind of group works helped students to train team working and presentation skills.



**Picture 3.** The online training on the academic writing, 26<sup>th</sup> of October – 6<sup>th</sup> of November

In 2020, participants lost this opportunity due to the Covid-19 and it was extremely challenging to organize the school on academic writing in the online format. We used the Zoom platform again, but we were forced to shorten the program significantly since it would be hard to hold public’s attention for more than 4 hours online. The lectures also tried to be more interactive and include some tests. An unstable internet connection in some regions of Tajikistan and Uzbekistan created troubles with the regular and qualitative connection of some students.

### **International Green Business School “Eco-Talk”**

**Duration:** June – December 2020

**Partners:** Swiss Agency for Development and Cooperation, European Union – Central Asia Water, Environment and Climate Change Cooperation (WECOOP)

The Green Business School was established by DKU to provide expert and financial support for the development of environmentally sustainable business projects and to stimulate the generation of innovative ideas for green business among young entrepreneurs. In 2020 the School was organized by DKU with the support of the EU project "European Union – Central Asia: Water, Environment and Climate Change Cooperation" (WECOOP), Central Asian Youth for Water Network (CAY4W), and the Swiss Agency for Development and Cooperation (SDC).

During the 3-month intensive studies at the School, the students received the online training from the European and regional experts on the basics of the project cycle, market analysis, budgeting, target audience, soft business skills and specifics of doing green business in the region. The experts provided consultations on water quality and water savings, renewable energy and energy efficiency, environmental management, and eco-innovation in sustainable consumption and production. The training and expert advice has been also provided to the participants helped them develop their green business ideas into project proposals.

Overall, 37 young entrepreneurs took part in the Green Business School this year and presented 16 business projects. The Evaluation Committee comprising of the School’s experts and sponsors identified 4 winners who received the grants in the total amount of USD 6,000 awarded by SDC. The winners will be able to use these grants to develop their own business.

**Format**

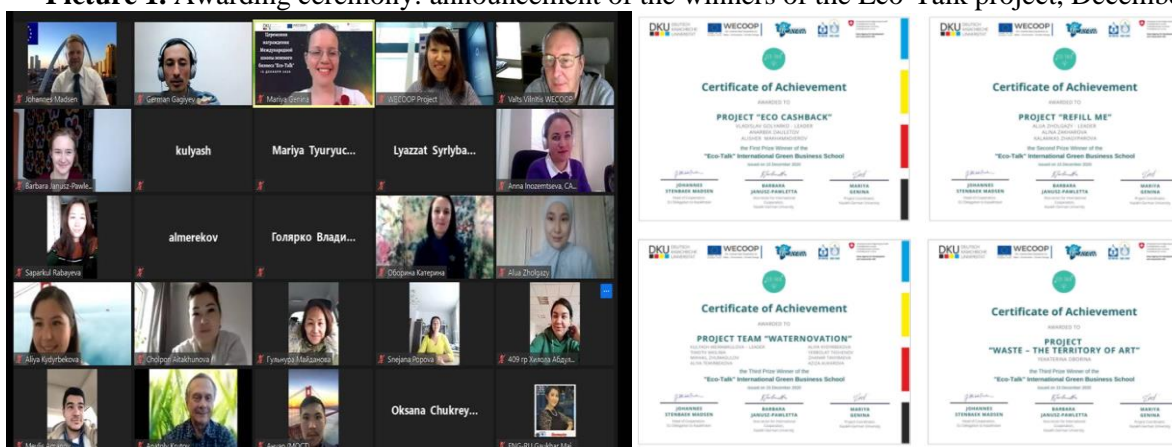
All activities of International Green Business School “Eco-Talk” (GBS) were conducted online due to the COVID-19 pandemic and quarantine.

The activities of the School included:

1. Call for proposals (2 months) - February – May 2020;
2. Practical webinars together with the MOST business incubator - May 25-29, 2020:
  - Webinar 1 - Defining your eco-business product or service (May 25, 2020).
  - Webinar 2 - Identifying your target audience and customer profile (May 27, 2020).
  - Webinar 3 - Defining your market and business model (May 29, 2020).
3. Online mentoring program and intensive training – September-December 2020;
4. Project Presentation Day – December 14, 2020;
5. Award Ceremony – December 15, 2020.

Over the three years of the project’s existence (2018-2020), 74 applications were received from different parts of Central Asia, out of which 27 best project teams have gone through an intensive training program and 11 project teams were awarded with grants.

**Picture 1.** Awarding ceremony: announcement of the winners of the Eco-Talk project, December



***Difference between its conduction prior to the Covid-19 and in the face of new reality***

Advantages and peculiarities of online GBS:

- Online training can be conducted from anywhere;
- Online format can bring together youth from any part of CA and Afghanistan;
- Significant reduction of travel and accommodation expenses;
- More allowable diversity of experts from any part of the world (without having to take into account the corresponding travel/accommodation expenses).

However, such an online format has also disadvantages listed in the table 1.

**Table 1.** Advantages and disadvantages of online form of GBS project conduction

	<b>Advantages</b>	<b>Disadvantages</b>
<b>Participants</b>	<ul style="list-style-type: none"> <li>• Participants were able to connect to webinars from their own countries and workplaces without having to travel to Almaty</li> </ul>	<ul style="list-style-type: none"> <li>• Weak internet connections in some countries limited access to online translations for some participants</li> <li>• Limited opportunities for individual interaction with experts and trainers.</li> </ul>
<b>Format</b>	<ul style="list-style-type: none"> <li>• Better regional coverage (Central Asia) because no need for physical presence</li> <li>• Access for recorded lectures and webinars on Moodle</li> <li>• Possibility to participate from anywhere and convenient schedule</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to engage participants / to keep their focus</li> <li>• Less bonding activities between participants because no face-to-face and team-building activities</li> <li>• Less communication during presentation day with invited guests who represent business, government and non-government organizations</li> </ul>
<b>Expenses</b>	<ul style="list-style-type: none"> <li>• Expenses reduced considerably because all activities were held online using ZOOM and other apps.</li> </ul>	None
<b>Experts</b>	<ul style="list-style-type: none"> <li>• A more cost-effective opportunity to involve diverse number of experts and trainers for the program;</li> <li>• Convenience for experts in terms of training preparation and no logistics expenses.</li> </ul>	<ul style="list-style-type: none"> <li>• Less networking opportunities among program experts and trainers.</li> </ul>

***Adaptation analyses and faced barriers.***

Considering the situation with travel barriers, the whole training course had to move to online learning and communication platforms, such as Zoom, Moodle, WhatsApp, etc. This change has stimulated the organizing team to upgrade the technical and soft skills to keep effective organization and necessary communication levels with experts, partners and participants.

To ensure successful training program results, the organizers had to develop their social and communication skills to engage the GBS participants into School. It was achieved through the regular personal and group communications using messaging platforms and phone. In addition, personal thematic mentoring sessions motivated the participants to get actively involved in the online trainings and practical assignments.

As a final product, the online course on Moodle platform has been created based on the recorded webinars, practical sessions, and homework and expert presentations.

Faced barriers:

- It has been an extra effort to keep participants focused, involved and motivated during the 4-month online coaching;
- Lack of face-to-face activities to develop/build bonds and networking;
- Less interactive format of training;

- Irregular or weak internet connection in countries of CA (especially, Tajikistan and Turkmenistan) constrained the full participation of the participants from those countries. Therefore, all of the webinars were made available in the recorded version.

### **Recommendations, which could be considered by the other institutions while conducting alike events.**

Some of the recommendations for the similar activities taken from the lessons learnt:

- The quality of online training program could be improved by using a bigger number of interactive tools for presentations/webinars;
- Additional online team building and networking activities in small groups can be added to the overall training and coaching programs;
- Ensure regular feedback collection from the participants during and after the program.

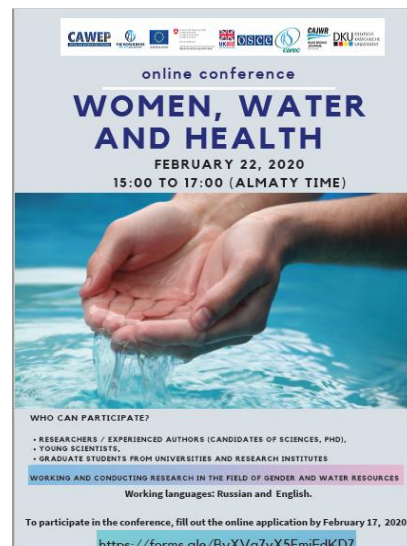
### **Gender aspects of water resource management in Central Asia and Afghanistan: Supporting young female researchers through publication of articles in the Central Asian Journal of Water Research**

**Duration:** October 2019 - June 2020

**Partners:** World Bank

Various studies conducted in the Central Asian region on the gender issues in the field of water resource management identified several gaps including the access of women to information, education and capacity development, including a very limited number of programs designed to support young female researchers (PhD students, aspirants) from universities and research institutes in Central Asia and Afghanistan.

Central Asia Knowledge Network Program supports promoting gender aspects in International Water Resource Management (IWRM) in Central Asia and Afghanistan has initiated a consultancy assignment to address the above-mentioned gaps by providing support to young female researchers from universities and research institutes in Central Asia and Afghanistan through organization of specific activities identified in the scope of work. The research topics covered water, energy, and climate change related issues with a strong focus on gender aspect in water resources management in Central Asia.



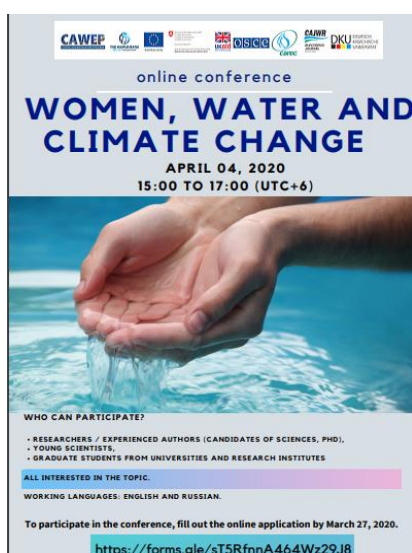
Within the UNESCO Chair and Institute, DKU implemented two components of the project in the following steps:

### **Component 1: Series of online colloquiums**

DKU organized and conducted 6 (six) interactive online events on the following topics:

- Women and water governance at the local, national and transboundary level;
- Women and disaster risk reduction;
- Women, water and climate change;
- Women, water and health;
- Women and water education;
- Women and access to water;

The goal of this series of the events was to enable larger number of students, young scholars, researchers, experts etc. to discuss key gender related problems and recent developments in the field and contribute to the capacity development local communities.



The invitations to take part in the events in capacity of speakers and participants were disseminated among the universities and research institutes in the Republic of Kazakhstan using its network of the partner organizations. The invitations were also disseminated via social media accounts (e.g., Facebook, Twitter, Instagram) to increase potential audiences of each of the event as well as to support broader geographical coverage of the events and other activities implemented within the project. The announcement of each event was also available on the websites of CAKN, DKU and CAJWR (Central Asian Journal of Water Research).

### **Component 2: Scientific and academic writing and research support of young researchers**

DKU prepared and disseminated the training call among the universities and research institutes in Central Asia and Afghanistan using its network of the partner organizations.

During the call period, DKU received and processed more than 25 applications from applicants from Central Asia and Afghanistan. Based on the following evaluation criteria including current position, degree, research proposal and covering of the geographical scope, DKU selected 5 applications to participate in this component of the project. Each selected applicant was assigned to an international supervisor who was guiding and supporting her/him in the process to produce a scientific article submitted and accepted for publication in CAJWR. Selected applicants received field work grants upon submission of their articles to CAJWR.

The list of articles<sup>21</sup>:

- Press coverage of gender distribution of labor in the water sector of Uzbekistan

<sup>21</sup> The pre-prints of the articles are available at: <http://cakn.online/gender-water/>

- Problems and ways of enhancing women's participation in integrated water resources management (IWRM) in Tajikistan: education and employment
- Women's health in relation to water quality in rural areas in the regions of the Republic of Uzbekistan and districts of Tashkent region
- Women's water use issue and mechanization of dekhkan farms - an overview of the problems

### ***Difference between its conduction prior to the Covid-19 and in the face of new reality***

The online format allowed an unlimited number of participants to take part in the webinars. The total number of people who expressed their interest to participate in the events (registered) in a capacity of a presenter or participant reached 568 persons. Intensive social media coverage of the events allowed the organizers to interest participants from countries far beyond Central Asia and Afghanistan. With respect to representatives of the Central Asian countries and Afghanistan who expressed their high interest to participate in the events in a capacity of a presenter or participant, their total number reached 303 persons.

The main core of each event was talks given by experts, practitioners, researchers, young scholars etc. those who are working in the water and gender-related areas. Presenters were invited directly due to their competences and expertise in the event's topic and others expressed their willingness to give a talk via a registration form. All events were held in Russian and English language, with the simultaneous interpretation. All events were recorded and converted to webinars (an on-demand streaming)<sup>22</sup>. The uniqueness of the webinar format in this case is that recordings have been divided to separate lectures. So users can get a direct access to a standalone presentation that they are interested in. Such format eliminates the need to listen a recording of the entire event to get a piece of interested talk. These webinars might be used for teaching purposes, as supporting material, what became essential in today's settings. The recordings also give an opportunity to those who were unable to participate in the events 'live', to post-attend the events.

### ***Adaptation analyses and faced barriers.***

Due to lack of good internet connection, experience of using Zoom or Skype (during the project period), many participants "attend" the events using one account so the number of the participants during event displayed by the software might differ from the real number of participants, therefore the number of registered participants might present more precise picture. The communication activities between selected applicants and their assigned international supervisors were realized online, via emails, Skype, Zoom etc. The schedule, frequency, length of such communication was adjusted to each applicant capabilities and preparedness. Unfortunately, due the COVID-19 situation, one of the applicants decided to withdraw her participation in the middle of the project, thus only 4 articles were produced.

## **Civil Servants Workshop: Climate change, water security and governance**

**Duration:** September 21-22, 2020

**Partners:** Organization for Security and Cooperation in Europe, CAREC

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<sup>22</sup> The recordings are available at: <http://cakn.online/en/gender-water/>

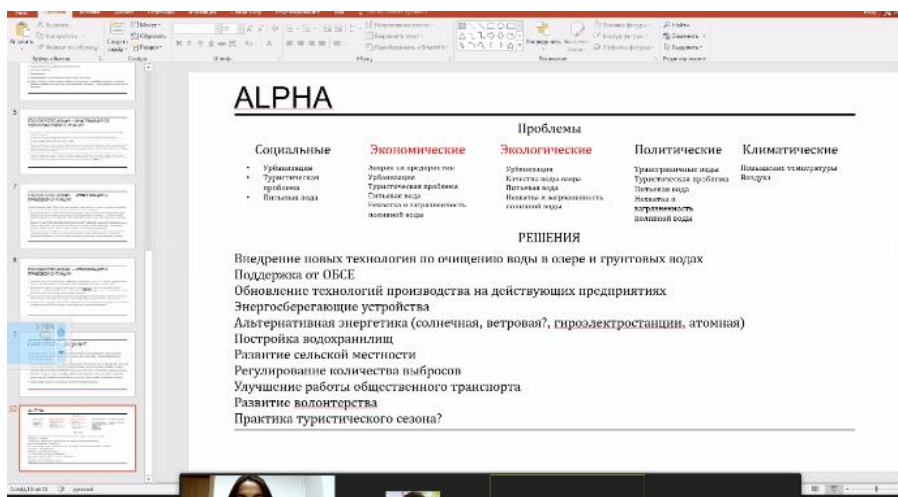
The 2030 agenda for sustainable development with the seventeen sustainable development goals (SDGs), recognized by the governments of Central Asian countries in September 2015, highlights as one of the goals the establishment of inclusive relationships between governments, the private sector and civil society at the global, regional, and local levels, which are built on principles and values, a common vision, and common goals, focused on the interests of humanity and the planet. To address environmental challenges and ensure appropriate action at the political level in Central Asia, DKU in cooperation with partners is conducting on an annual basis a workshop for young professionals and civil servants from Central Asia. The workshop includes both theory and practical component – field visits, competition of target topic-related projects, video- or photo contests, etc.

### ***Format***

The Civil Servants workshop is usually organized for three days which include two-days seminar and 1-day field trip. The training brings together participants from Central Asia to exchange ideas for new model of sustainable growth in Central Asia, improvement of existing cooperation policies and mechanisms on climate change, Nationally Determined Contributions (NDCs) and to discuss climate change and mitigation in the region. The participants are divided into groups and given tasks to share their innovative solutions.

### ***Difference between its conduction prior to the Covid-19 and in the face of new reality***

In switching to the online mode, the Zoom platform has been used as it allows provision of simultaneous translation and covers up to 100 people. Moreover, it was needed to divide all participants into session rooms according to their topics. The main idea was to give them a chance to get acquainted with each other, to have discussions and share their ideas. To make the training more interactive, the trainers prepared the topics for group works, tasks, maps and all extra information in the form of text files in advance, and the presentations and case studies for group works were sent to all participants in advance for their preparation.



**Picture 1.** Groups work presentation during the second day of the workshop, September 22



## Adaptation analyses and faced barriers.

The disadvantage of the online format is the inability of participants to meet and to know each other better during informal conversations, group works and field trips. At the end of the event the special surveys have been prepared and most of the participants expressed their willingness to have offline meetings in the future since they felt lack of communication.

The advantage of the online format is the opportunity to invite speakers from abroad. The invited speakers had time zone differences, nevertheless, they were able to join the meeting to deliver a presentation, have discussions and answer questions from the audience.

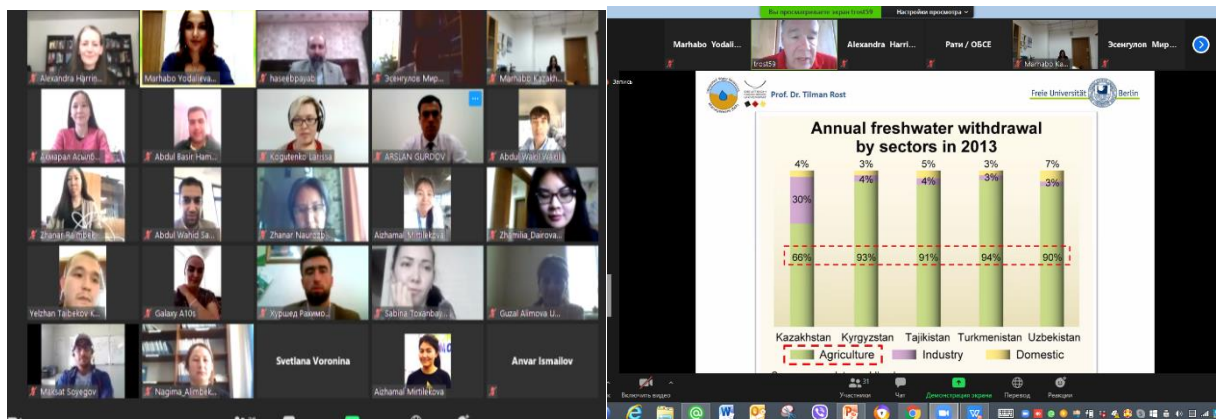
The program was shortened up to 5 hours (including breaks) to avoid long lectures and discussions which would make it too complicated to hold the attention of the participants. The special short movies on the climate change issues were also demonstrated during the breaks and this allowed participants to not lose the connection with the organizers.



*Recommendations, which could be consider by the other institutions while conducting alike events.*

**The following recommendations to organize online events are suggested:**

- Preparation of the detailed instructions on the usage of online platforms (zoom, skype, etc.) to all participants in advance to avoid possible technical issues;
- Development of a program considering special breaks (short movies can be used to not lose the attention) and inclusion of more interactive activities (tests, polls, quizzes etc.);
- Supporting the participants with the poor internet connection by providing working places for them in their countries (for example, ask country partners to support);
- Sharing of all needed information with participants for possible interactive group works in advance.



Picture 2. The first day of the Civil Servants workshop, September 21.

## **Global Disruptive Tech Challenge 2021: Restoring Landscapes in the Aral Sea Region.**

**Duration:** August 2020- June 2021

**Partners:** World Bank

The Challenge project is organized in the form of international competition aimed to identify and support disruptive technologies and innovative approaches to landscape restoration in the Aral Sea region and Central Asia. The Challenge is open to any interested individuals or entities.

It is organized with the support of the Central Asia Water and Energy Program (CAWEP) a multi-donor Trust-Fund financed by the European Union, Switzerland, and the United Kingdom. The challenge is administered by the World Bank under the Resilient Landscape in Central Asia RESILAND CA + Program and is co-implemented by the DKU, Plug and Play and the Global Landscapes Forum (GLF). The project covers the following three steps:

- Selection of participants and pre-Challenge day trainings;
- Challenge day itself;
- Capacity building and mentorship programme for winners.

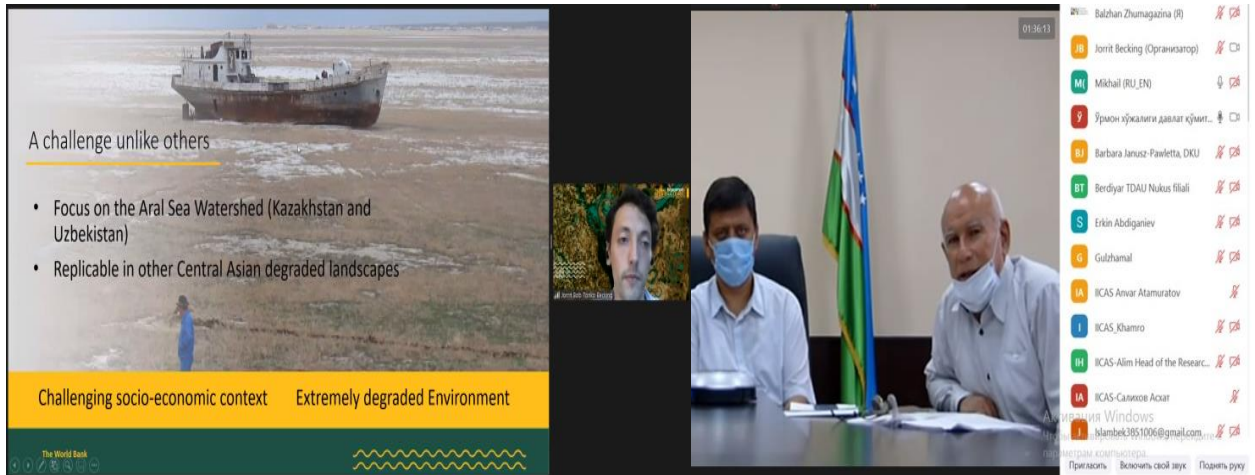
### ***Difference between its conduction prior to the Covid-19 and in the face of new reality (reflect in detailed innovative approaches)***

Online mode of working forced to adapt and use more innovative technologies such as application for communication (ZOOM, TEAMS) as well for ice-breaking <https://www.wonder.me/about-us>. Also, to make conferences more attractive, online-exhibitions became popular where all interested can post their posters and videos.

The main difference in conduction the is webinars and meetings online is no finances needed for the catering and accommodation, travel, and other participations' related expenses. It can save the budget but at the same time there are technical related expenses organization of online communication, meeting, webinars and conferences.



One of the advantages is that there is no waste of time for commuting and people can connect from whenever they want, all they need is steady internet connection. Nevertheless, this format is not as attractive as offline format as people get tired from listening of the computer fast, even if they can relax whenever they want.



**Pictures 1 & 2.** Online meeting webinars with the participants and partners of the project

***Adaptation analyses and faced barriers.***

As the project has been developed after Covid-19 began, the whole project activities were designed for online mode from the very beginning. All meetings, webinars, evaluation have been conducted via ZOOM, TEAMS. Challenge day itself is to be also held online. One of the main barriers faced during meetings and being expect in the future is the lack of live communication between people and building live networking. Another issue is internet connection that sometimes is not efficient enough in the remoted areas. Language barrier is one of the issues and not all applications have interpretation option, and they are sometimes expensive to buy. There is also a health-related concerns to be considered. As workers are working from home, there is a loose of limits and sometimes they are forced to work beyond their usually working house. It can cause troubles with sleeping, changes in their behavior, loss of communication skills.

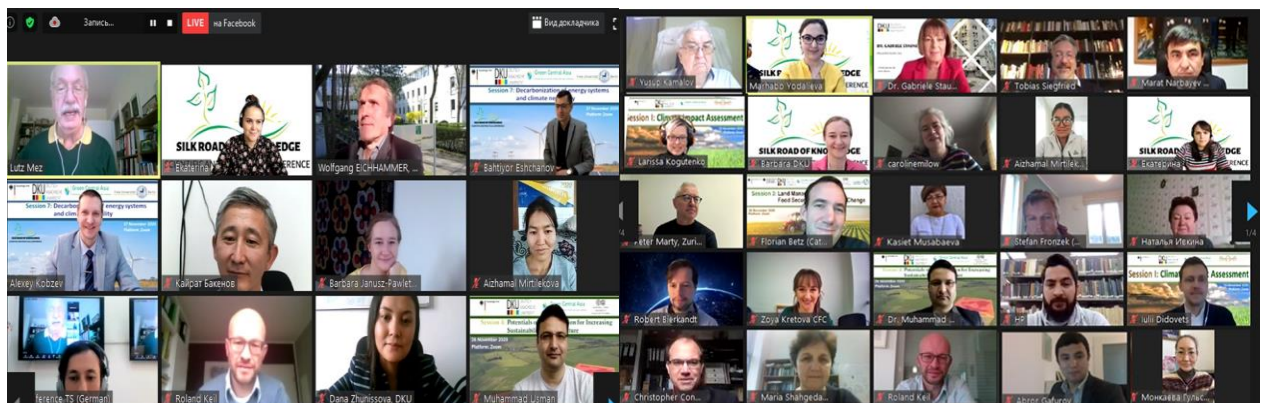
**Silk Road of Knowledge International Conference**

**Duration:** November 25-27, 2020

**Partners:** Ministry of Foreign Affairs of Germany

A Regional Scientific and Practical Online Conference “Silk Road of Knowledge” organizing by DKU with the financial support of the Federal Foreign Office of Germany aimed at:

- Identification of scientific gaps regarding the impact of climate change contributing to the enhancement of constructive regional dialogue in Central Asia (CA);



**Picture 1.** Sessions of the Silk Road of Knowledge Conference

- Knowledge generation covering the impact of climate change on water and land management, food, water and climate security, infrastructure development and energy efficiency practices in Central Asia;
- Awareness-raising about current environmental conditions in Central Asia to strengthen regional cooperation among young and senior scientists through identification of joint research opportunities, publication, and networking.

The Conference set the basis for knowledge transfer of what has been developed in the Berlin process 2009-2019 as well as filling research gaps in future in the frame of Green Central Asia, a regional initiative on climate and security in Central Asia and Afghanistan launched by the Federal Foreign Office in the beginning of 2020.

### ***Format***

The 3 days conference included 7 following thematic sessions in the context of climate change and COVID-19 in Central Asia:

- **Climate Impact Assessment:** presented the state of art of the climate change and climate impact research in the Central Asian region and critical gaps between the current climate related information field and the demand of different local and international stakeholder groups.
- **Water and Climate Change:** addressed the impact of climate on the availability of water resources, water management issues considering the water-food-energy relationship, and water governance in Central Asia.
- **Land Management and Food Security under Climate Change:** addressed contemporary issues of modern optimal farming in the context of climate change, as well as forest landscape restoration, sustainable use of biomass and its impact on food production, as exemplified by Central Asia.
- **Water and Climate Security in Central Asia:** pinpointed the nexus between climate change/water and security in Central Asia, expert views on water security in Central Asia, security-related problems associated with dam projects, as well as opportunities for, and challenges to developing trust in transboundary water governance institutions.
- **Potentials of Digitalization for Increasing Sustainability in Agriculture:** highlighted the technical potentials and existing solutions of digitization and digitalization in irrigation water management.
- **Infrastructure and logistics under Climate Change:** scrutinized investments in infrastructure and logistics under the increasing challenges of climate change in the CA region.
- **Decarbonization of Energy systems and Climate Neutrality:** presented the strategy of Central Asia towards climate neutrality in the context of climate change and fossil fuel emissions and changing the fossil-based energy systems globally.

Within the 3 days Conference, there were conducted 3 preconference session:

- Youth session: Water, Climate and Risks

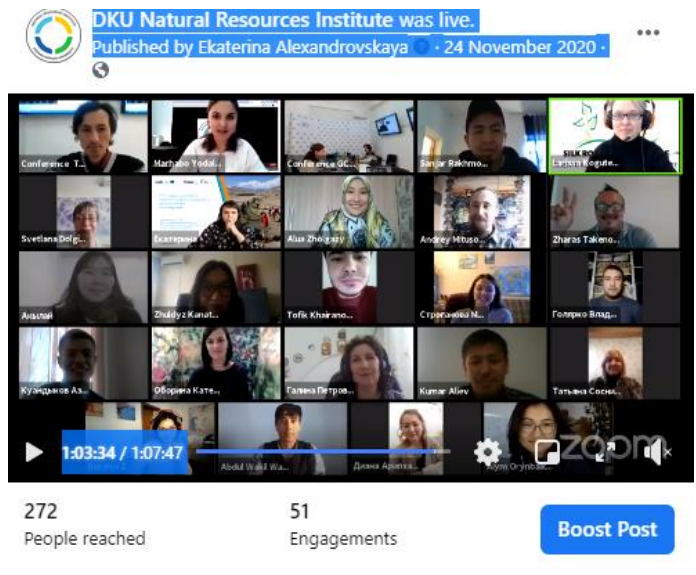


Picture 2. Pre-conference youth session

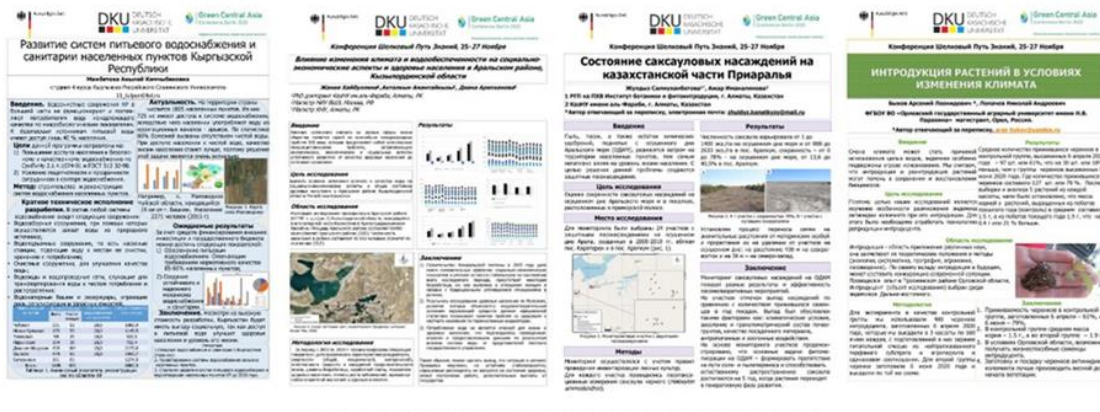
- Poster session

The poster session was a two-hour event, where attendees were given an opportunity to go to the webpage<sup>23</sup> of the conference to preliminarily acquainting themselves with the submitted posters, which covered a wide range of topics covering the topics of climate change, water management, food security, infrastructure development, land management, biodiversity, and energy efficiency practices in CA. Then during poster session online on the Zoom platform with a live broadcast on Facebook, the participants had an opportunity to pose their questions to the authors of the poster. In total, there were 20 posters presentation during the session.

The aim of the youth session was to discuss with the young specialist in sphere of natural resources about the importance of engaging young people in scientific and practical activities on environmental issues in Central Asia. The participant discusses the impact of climate change on the countries of CA and Afghanistan, reducing current risks by optimizing landscape management and water use.



POSTERS GALLERY



Picture 3. Preconference Posters Session

<sup>23</sup> Silk Road of Knowledge Conference webpage: <http://conference.academic-waters.org/>

- UNESCO Water Family: Cooperation in Education and Science in Central Asia



**Picture 4.** Side event of the UNESCO Water Family

The “UNESCO Water Family: Cooperation in Education and Science in Central Asia” was organized in partnership with UNESCO office in Almaty. The UNESCO water-related centres, chairs and committees who work in the area of sustainable management of water resources in Central Asia (CA), discussed their experiences and challenges in conducting their activities, notably during the COVID-19 pandemic and shared lessons learnt on adaptation of their activities under the new reality. The meeting also aimed to facilitate discussion among the UNESCO Water family in CA on regional priorities for the next IHP-IX phase. The following points have been discussed during the session:

- The challenges and opportunities in cooperation under the COVID-19 pandemic;
- Lessons learnt on adaptation of the activities in 2020 and the new vision for 2021;
- Synergies and collaboration within broader UNESCO Water Family in CA, and beyond;
- Bridging education and science in water management in Central Asia.

The participant of the session also discussed the needs for a common approach for promoting better networking and partnership among the UNESCO Water Family - water related research and educational institutions - in the countries of CA and at sub-regional level.

***Adaptation analyses and faced barriers.***

In total there were over 300 participants attending the online event including representatives of government and educational institutions, senior and young scientists, youth organizations, international and regional partners, and civil society organizations active in the field of climate change. When it was decided to conduct the conference in the online format, it was decided to create a group of people, the co-chairs from DKU side to thoroughly prepare for the conference.

The group held biweekly meetings with the partners to the conference, the chairs of the sessions<sup>24</sup> to discuss the preparation processes.

Additionally, there was developed a webpage of the conference, where all the materials of the conference have been uploaded. The Business Zoom platform has been bought in advance for technical check and preparation by the DKU IT person. To cover wider audience, the sessions during the conference have been broadcasted on the Facebook page of the Institute and the webpage of the conference.

### *UNESCO Chair Offline Activities in 2020*

#### **Ecosystems, Society and Economics of the Region of Aral (ESERA)**

**Duration:** April-December 2020

**Partners:** Ministry of Foreign Affairs of Germany

The region of the Aral Sea is one of the most vulnerable part of the region of Central Asia. Climate change puts additional stress on water resources, the agriculture and social sector and will likely have consequences for locals as well as the region as a whole. The problem of the sea itself, the Aral Sea region and their future should have a clear perspective and analysis. There is a need for studying current state of ecosystems, society, and economics, as well as impact the climate change on the region. It is also crucial to raise awareness of the Aral Sea desiccation and how this man-made environmental tragedy continues to affect local population, who had to migrate and leave their homes. Young water leaders are future decision-makers, who will influence development of the Central Asian region and beyond. The activities under this project should contribute to raise awareness and increase the attraction of science and research on issues within environmental and human sciences in the region of Aral.

The overall aim of the project was twofold:

- increase the scientific and research capacity of young researchers through the case studies directed at the regional security of the socio-economical pathway, including the challenges related to biodiversity, water quality, the dramatic changes in agricultural productivity questioning food and social aspects, and
- raise awareness about the importance of cooperation and governance at all levels as a cross-cutting issue crucial for the improvement of socio-economical pathway in Central Asia.

For this reason, the project implemented separate activities within its:

- Scientific component: case study research in the northern Aral Sea;
- Education/capacity building component: Summer school in the Aral Sea.

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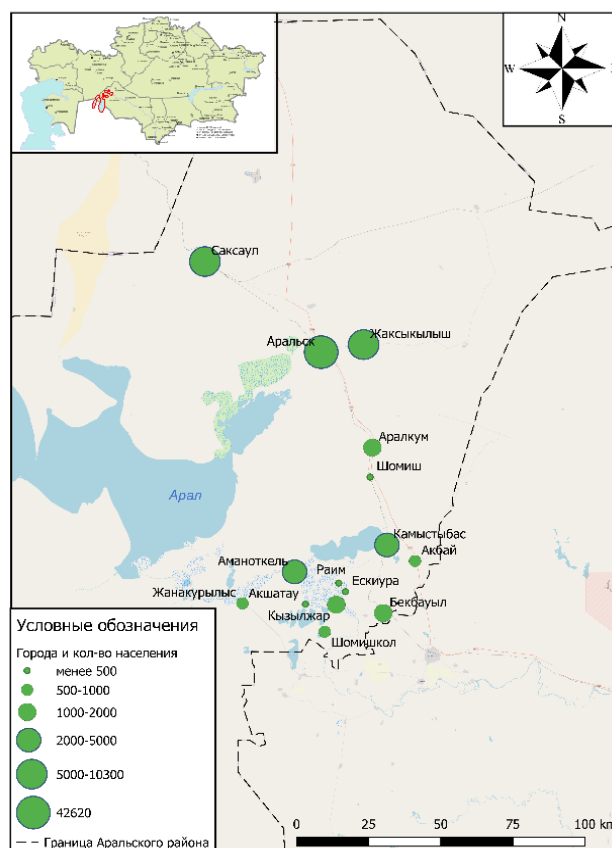
<sup>24</sup> Potsdam institute for climate impact research in Germany, GFZ German Research Centre for Geosciences in Germany, Free University of Berlin, Martin-Luther-Universität Halle-Wittenberg, Central Asia Sustainable Innovation Bureau in Kazakhstan, Central Asia Regional Economic Cooperation Institute in China

## Format

**Scientific component:** The scientific component consisted of different stages that assume application of various methods and approaches. Initially it was planned to implement project in off-line mode with invitation of participants to DKU for the whole project period and conduct joint working process within groups. However, due to the quarantine and following of preventive measures, the preparation and working process was switched to on-line mode. Other changes were conducted within on-site data collection process.

The main objectives of the research component:

- To study the dynamics of the distribution of saxaul and the effectiveness of phytomeliorative measures on the drained bottom of the Aral Sea and in the settlements of the Aral region of the Kyzylorda region.
- Investigate the suitability of delta lakes for the development of aquaculture in the Aral region of the Kyzylorda region.
- Investigate the effectiveness of acoustic fish protection installations located at the Kokaral dam.
- Explore the current state of the socio-economic infrastructure, incl. to give an overall assessment of the impact of climate change on the environmental and socio-economic indicators of the region (population, employment, health care, education, economy);



**Picture 1.** Study areas (in green circles)

During the implementation of the research component, the most relevant research areas in the Aral Sea region have been studied covering geobotany, fisheries and the socio-economic state of the region. They were also provided sanitary masks and antiseptic hand treatment. 6 young specialists, 5 local scientific advisers and 1 foreign scientific writing leader were involved in the research. Based on the results of the field research, the thematic groups developed 5 scientific articles, which were submitted to the CAJWR:

1. Favorableness of climatic conditions of the Aral Sea region for humans
2. State of saxaul plantations in the Kazakh part of the Aral Sea region
3. The current state of fish fauna and the prospects for fishery use of the deltaic lakes of the Syrdarya River.
4. The effectiveness of the hydro acoustic fish protection device installed at the Kokaral dam of the Small Aral Sea



5. Vital activity of the population living in the conditions of a water-ecological crisis: on the example of the Aral district of the Kyzylorda region, Kazakhstan



Picture 2. Fisheries group study area



Picture 3. Botanists group study area

**Education/capacity building component:** Summer School in Northern Aral Sea.

The purpose of the Summer School was to familiarize young specialists with the life of residents, as well as to see with their own eyes the consequences of the disaster on the Aral Sea. The project was based on field excursions for young specialists.

On August 25, the participants arrived in Aralsk, where they met other participants. All the participants came from different cities of Kazakhstan, with different backgrounds and interests, but united by their indifference to the fate of the Aral Sea. The official opening of the Summer School took place in the office of the State Nature Reserve "Barsakelmes". On the same day, the participant had a chance to see the sands of Aralkum, which negatively affect nearby settlements, accelerating the process of desertification, filling up entire buildings and social infrastructure on its way.

Picture 4. Picture from the field visit



Further, the summer school participants visited the Kokaral dam, where they were introduced to the technical characteristics of the dam and its positive impact on the ecological situation and restoration of the fish industry. Then they visited the "Kaskakulan" site, which belongs to the "Barsakelmes" State Natural Reserve, and where we were lucky to see with the herds of freely grazing kulans and gazelles from an incredibly close distance.

One of the participants of the summer school, Dana Kenzhibaeva shared her impressions of the school, noting that

*“On the way to the island of Barsakelmes and upon arrival, we saw a huge desert area in front of us, there were only abandoned houses and remains of equipment, testifying to the once existing human activities here. The island left ambiguous, a mystical and in places frightening experience. ”*

The participants left the Aral with a bunch of impressions and noted that "everyone should go to the Aral and see this place with their own eyes: a place with a different air, other people, nature and a different life."



**Picture 5.** Field Seminars for the student at the Aral Sea Summer School, August

#### ***Adaptation analyses and faced barriers.***

As mentioned earlier, due to the pandemic and state regulation it has been decided to hold the narrowed version of the Second Aral Sea Summer School for residents of Kazakhstan. Controlling the sanitary conditions has provided the safety of project' participants and helped in keeping a comfortable and safe sanitary situation within research working group and participant of the Aral Sea summer school. All preventive measures including the sanitary and safety of participants have been preserved. The participants took COVID-19 test<sup>25</sup> prior to the filed visit to the Aral and participation in the Summer School. The participants temperature was checked on a daily basis whilst their stay in the Aral.

Due to the quarantine situation of COVID-19 it was challenging to keep together the research group during the whole period of the project. The office work, theoretical and practical classes in thematic areas, scientific writing and GIS courses were conducted online. However, the 2-week field work in the settlements of the Aral region, on the territory of the drained bottom of the Aral Sea and on the Kokaral dam were carried out in compliance with the necessary sanitary norms and rules.

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<sup>25</sup> PCR test for COVID-19 - polymerase chain reaction - is an analysis method that shows whether the COVID-19 virus is present in the body right now and exactly in the place where the material for analysis is taken from (this is the nose and / or oropharynx)

The other issue was the borders closure, which did not allow bringing young researchers and specialists from the region of Central Asia to participate both in the field research and summer school.

***Recommendations, which could be consider by the other institutions while conducting alike events.***

***Field researchers***

- On-line mode: Daily on-line seminars once or twice a day in order to keep working environment within the groups;
- Off-line mode: COVID-19 tests for all participants. If COVID-19 test will be positive for someone, the person shall not be accepted to join the offline groups works;
- Preserving of regular sanitary measures, health condition monitoring and keeping social distance.

***Summer Schools:***

- COVID-19 tests for all participants. If COVID-19 test will be positive for someone, the person should not be allowed to join the project's activities;
- Regular sanitary measures, health condition monitoring and keeping social distance.

**Educational trip for young specialists for the study of Renewable Energy Sources Facilities - Renewable Energy Trip 2020**

**Duration:** June – December 2020

**Partners:** The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

In recent years, there has been a global trend towards green energy. Kazakhstan is actively moving in this direction by introducing effective measures and improving laws in the field of renewable energy and energy efficiency, introducing the best experience of European countries and improving the qualifications of its own personnel. There is an increasing attention to the development of the Green Economy and the energy transition. With the adoption of the Law of the Republic of Kazakhstan on “Supporting the Use of Renewable Energy Sources”, the development of energy sector was fully supported at the state level. Further, in 2013, the concept on the transition to the Green economy and the Strategy of Kazakhstan - 2050 outlined ambitious energy goals requiring to increase the share of renewable energy in the total volume of electricity production to 3% by 2020, to 10% by 2030 and 50% by 2050.

To create the necessary conditions and opportunities, DKU closely cooperates with the Department of RES of the Ministry of Energy of the Republic of Kazakhstan, the Solar Power Association of Qasaqstan (SPAQ), other international and regional organizations, and universities in Central Asia. Various projects are being implemented in the areas of formal and additional education. One of the achievements of such cooperation is that a master's program was developed in 2020 in the specialty of Strategic management of renewable energy and energy efficiency at DKU, and the Ministry of Education and Science of the Republic of Kazakhstan licensed this activity. Hopefully, this year DKU will open its doors to new undergraduates. In addition, the University conducts annual expeditions to visit renewable energy stations in Central Asia.

In 2020, in the period from September 21 to September 29, 2020, DKU with the support of the German Society for International Cooperation (GIZ), the Ministry of Environmental Protection of

Germany (BMU), the Ministry of Energy of the Republic of Kazakhstan and with the direct assistance of the Solar Power Association of Qazaqstan (SPAQ), carried out an educational trip to learn the best renewable energy practices - Renewable Energy Trip 2020.

This expedition included not only visits to renewable energy sources (RES) facilities located in Kazakhstan, but also a very active and committed discussion between speakers and participants at the opening and closing round tables held on September 21 and 29, 2020.

**Format**

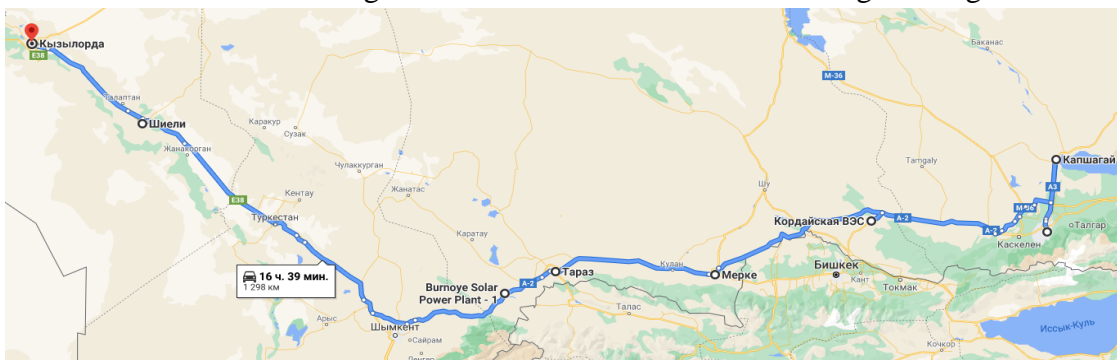
At the roundtable held online with an offline participation of few participants at DKU on September 21, the participants were introduced to each other, and representatives of the Ministry of Energy of the Republic of Kazakhstan, and other national and international organizations and institutions delivered report to the participants of the trip.

**Picture 1.** RES Roundtable at DKU, September 21, 2020

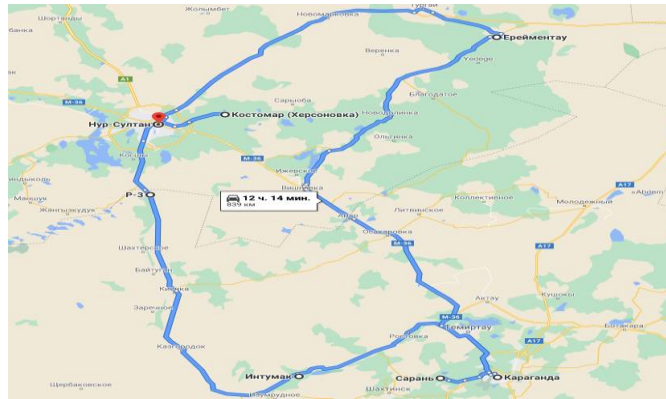
The main topic of the round table was “Economic mechanisms of regulation and support of renewable energy and mitigation of the consequences of climate change in Kazakhstan: the role of the state and international organizations”, highly interested the participants and attracted them to a heated discussion of topical economic issues of regulation and control of the RES sector by the state.



The expedition to RES facilities in Kazakhstan also started the same day and included 2 territorial parts of the trip: the first from Almaty, through Kapchagay, Taraz and to Kyzylorda city; and the second one continued after the flight to Nur-Sultan in Akmola and Karaganda regions.



**Part 1.** From Almaty to Kyzylorda (South of Kazakhstan) [Google map link](#)



**Part 2.** Nur-Sultan – NURA - Intumak - Karaganda - Saran – Yereymentau– Nur-Sultan-Kostomar - Nur-Sultan (Astana EXPO) [Google map link](#)

During the first part of the trip, such stations were visited as the Kapchagay Solar Photoelectric Powerplant (based in the city of Kapchagay, Almaty region), the Korday wind farm (located in the Zhambyl region, Korday region, near the village of Korday), Merken hydroelectric power station (located in the Merken region of the Zhambyl region), Burnoye Solar Photoelectric Powerplant (located in the Zhualyn district of the Zhambyl region), as well as the Baikonur Solar Photoelectric Powerplant (located in the Shieli district of the Kyzylorda region).



**Picture 2.** Participant of the RE trips visiting Solar Photoelectric Powerplant, September 21, 2020

After the first part of the trip, the expedition members arrived in the city of Nur-Sultan, from where they continued their journey to objects in the city of Nura, the HEVEL solar station (Akmola region), the Intumak hydroelectric power station (near the city of Karaganda, the village of Intumak Bukhar-Zhyrau district), Saran Solar Photoelectric Powerplant (located in the city of Saran, Karaganda region), Ereymentau First wind farm (located 3 km from the city of Ereymentau, Akmola region), as well as a wind farm Astana EXPO (Arshalyn district of Akmola region, near the village of Kostomar).

In addition to such a large number of facilities to visit, the participants of the expedition had the opportunity to visit Nazarbayev University, where they introduced to the RES landfill and the experimental site of Nazarbayev University, as well as the zero-energy mosque "Flower of the Highest" in Nur-Sultan.



**Picture 3 & 4:** Field lectures with the participant of the RE trip, September 2020



One of the trip participants, Aizada Ismailova from Nur-Sultan while sharing her impression from the trip, note that

*"It was incredible! Gazillions of impressions and gazillions of emotions. We traveled half the country. Visited both South and North. Visited solar, wind, and hydra power plants! We spoke to engineers and managers. The company was delightful! It was so fun, easy and interesting!"*

The online round table finalizing the trip was held on September 29, 2020. The topic was "The role of business and research / innovation centers in the development of the renewable energy sector." Participants discussed interesting points with representatives of such organizations as the Solar Power Association of Kazakhstan, the Green Finance Center (GFC) at the Astana International Financial Center (AIFC), Saran Photoelectric Type Solar Plant (SES Saran), and got acquainted with the presentations of representatives of Nazarbayev University and Kazakh Research Institute of Energy named after Chokin.

The participant of the trip also shared the results of the trip in the form of outline cases of the best practices for using renewable energy sources, which will be published in the DKU scientific collection of best practices. Another ending result of the trip will be a short film about the trip which will be shared with all the participant after its final version editing and approval.

## **Conclusion:**

The rapid expansion of COVID-19 demonstrated that it is important to build resilience to face various threats in different spheres – from economics to education. The digitalization of the learning process and the transition to remote mode of administration processes revealed several problems and overlapping processes in management at the university. Working on to switch to online learning in a country level created various challenges as many regions in the country faced difficulties like internet access, access to modern technologies and knowledge of teachers in using it. The process of the pandemic and quarantine forced the education providers to adapt to the new norm in the age of COVID-19, thus, pushing the middle and top management of the university to assess the priority and need to use strategic planning approaches, and improve employee performance in a completely different way. However, for the university, the pandemic was rather an opportunity than a disruptor as it enabled the university to rethink and transform its higher education.

Most importantly, the key higher educational institutions have acquired not only an understanding, but also an actual digital transformation of the educational process itself, such as the development and implementation of the admission of applicants in new higher education programs and the qualitative improvement of already operating, positively proven programs. The digital technologies have been highly evaluated as a unique mechanism for the diversified development of a modern higher education institution.

Of course, in the conditions of unprecedented modernization, a modern university is obliged to adapt to preserve its unique qualities and competitive advantages, to competently build a strategy for its development, directions of expert development and scientific research development model. The adaptation of the educational system at DKU required building the capacity of the university personnel in using new software and programmes to interact online with the colleagues and students and conduct the courses/modules online when the switch to online learning and assessment happened overnight. The virus outburst was a good reminder for educational institutions that there is a constant need to modify and innovate its educational system to cope with in the time of coronavirus as well as different situations which could rise in future. The most important thing that should be on the agenda today is adherence to the principles of urgency, timeliness and efficiency of decisions made and DKU has positively succeeded in that.

For the UNESCO Chair and Natural Resources Institute, despite the necessity of conducting most of the educational and science-based activities, the situation also allowed identifying new technologies and methods to use in the long-term perspective. As practice has shown the combination of online and offline formats, even if it does not completely close the gaps in the practical application of knowledge, at least allows other opportunities to be opened that were never even thought of before. Such a format created an opportunity for a quick exchange of experience and knowledge and enhanced the development of digital libraries and digital campuses, thus, expanding the circle of receiving unique information by a wider audience and not only narrow circle of experts and scientists.