Section 10

Science and Innovations

10.1. Innovations in 2020

Innovations in Agriculture

The global agriculture is emerging from stagnation. Investors have begun paying attention to this traditionally conservative sector after the successfully started technological innovation and in the context of food demand forecasts for 2050, when population is expected to grow to 9.6 billion. Among the key innovations are:

- **Sensors.** For example, humidity and soil sensors in crop growing, temperature and motion sensors in livestock farming, telematics to monitor agricultural equipment, sensors controlling fertilizer application and crop conditions;

- **New GM crops.** Gene engineering helped to speed up transformation of sunshine and carbon dioxide by crops into sugar and carbonhydrate and improve productivity of maize, soybean and wheat almost twofold. Despite the protests of GMO opponents, the governments of China and some European countries has eased restrictions on GMO-based food;

- **Synthetic food** created in labs helps to solve the problem of land availability in agriculture. For instance, the biggest meat producers has already shown their interest in lab-grown meat;

- **Robotics technology.** Farms already use robotic milking units, drones and special harvesters. In the future, multitude of farm micro-robots will plow fields, treat soil, weed, irrigate and harvest virtually without the need for human interference;

- **Urban/hydroponic farms** made of new types of polymer film save water and offer conditions for healthy plant growing. Organization of greenhouses in urban areas helps substantially reduce transportation costs. A number of American and European companies have been already producing tomatoes, watermelons, melons and strawberries in such farms;

- **New microbial strains.** With the help of gene engineering technology, scientists develop various microbial strains that enable higher productivity of crops and their resistance to droughts, diseases and pests. New modified types of nitrogen-fixing bacteria pool nitrogen from the atmosphere and make it available for plants in form of fertilizers. Some cotton growers use a microbial treatment of cotton seeds and get 10% surplus to crop yields;

- **Blockchain.** This technology is being used to track food throughout the supply chain, from production, transportation to storage, enabling reduced costs of logistics and faster delivery (including, cross-border one) of perishable produce;

- **RNA interference.** The new technology of inserting ribonucleic acid (RNA) in plant leaves inhibits gene expression for a specified period of time and controls plant behavior. For instance, it can program a plant for protection against drought and pests during its growth. The resulting produce is not gene modified since the technology uses own plant genes;

- **Satellite imagery** provides more data on weather conditions and allows making more accurate analysis on cropped area. It also will enable producing cropland maps without map maker;

- **Uber-based farm.** The technology enables every customer to buy organic vegetables and fruits at their cost directly from producer through an Internet portal. Potential customers calculate their annual needs for agricultural products through an online calculator, order products and the on-line farm finds the closest farmer, who makes customized production. The client may trace the crop production and storage processes via the system.

Source: http://ekois.net/top-10-samyh-peredovyh-tehnologij-kotorye-sdelayut-agropromyshlennyj-kompleks-neuznavaemym/#more-33531

Some of new innovative solutions are described below.

The Edete Precision Technologies (Israel) has patented the mechanical pollination technology. It starts from mechanical harvest of pollen to be stored in a refrigerator during a year. This solves the problem of desynchronization of different crop varieties. Next season, this pollen is distributed with a tractor-pulled mast equipped with about a dozen small cannons that fire precise shots of pollen. This pollinator can work day and night at any temperature and provides 100% pollination of all open flowers. This technology shows promising results on fruit trees.

A **modular robotic platform** that employs the latest information communications technology to examine crops and soils, analyze gathered information and provide clear, actionable information to farmers to support crop management is developed by Yanmar as part of the SMASH Project. One Yanmar's role was also to develop control systems for the multipurpose robotic arm for mobile manipulation (including precision spraying), sensor integration for positioning technologies, and autonomous navigation and software development for the control of the system's mobile base (in collaboration with other partners).

The Small Robot Company (GB) is to launch the world's first autonomous farm robot fleet. One robot, the weed scanning robot, will provide farmers with an individual plant view of fields, capable of detecting broad-leaved weeds in wheat fields and mapping their exact location. The technology also allows weeds to be categorized, in accordance to their environmental benefit, with beneficial weed species identified and not destroyed. Using the mapping data, the second weeding robot will identify these weeds and kill them using electrically charged pulses. The third robot will plant crops autonomously. Its no-till robotics system will help prevent soil erosion and run off, reducing cultivation emissions by up to 90%.

Sananbio, one of largest indoor farming technology providers, launched its **unmanned vertical farming system** Uplift, which automates seeding, transplanting, harvesting, and plant transporting. Uplift can produce 6-8 tons of fresh leafy greens every day in a farm of 5,000 sqm. Uplift's productivity is 6 times that of a 6-layered indoor farm. The increased yield means lowered costs. The water circulation system was upgraded so that 60% of the water can be absorbed by plants and the remaining 40% recycled. Uplift uses PlantKeeper, a proprietary indoor farming management system, to control and monitor environmental factors so farm operators can be updated with real-time growing conditions throughout the farm.

The Israeli Netafim company has developed a drip irrigation system for growing rice to replace the flooded paddies and make rice cultivation more sustainable. The company has just finished a pilot scheme using its technology on 1,000 hectares of rice fields in locations from Europe to southern Asia. The system allows achieving the same yield as under flooding.

The team of researchers from the Leibniz Institute of Plant Genetics and Crop Plant Research (Germany) and the Oxford University (GB) analyzed the **potential for engineering drought-resistant plants** via introduction of Crassulacean acid metabolism (CAM). The team found that vacuolar storage capacity in a leaf is a major factor that limits water-use efficiency during CAM and that the environmental conditions shape the occurrence of different phases of the CAM cycle. The mathematical modeling identified an alternative CAM cycle that involves mitochondrial isocitrate dehydrogenase as a potential contributor to initial carbon fixation at night. The results revealed not only that the water-saving potential of CAM photosynthesis strongly depends on the environment, with the daytime environment more important than that at night, but also that alternative metabolic modes, distinct from those of the naturally occurring CAM cycle, may be beneficial under certain conditions such as during shorter days with less extreme temperatures. This timely work provides valuable insights that will help us prepare for the challenges of growing food crops in increasingly hot and dry temperate environments.

Researchers at the University of Washington have developed a **tiny wireless steerable camera that can also ride aboard an insect**, giving everyone a chance to see an Ant-Man view of the world. This technology can be applied for hard-to-navigate spaces.

Water Treatment and Desalination

A **new type of metal-organic frameworks (MOF)** dubbed PSP-MIL-53 to trap salt and impurities in brackish water and seawater can ease the fresh water shortage, say researchers from the Monash University in Australia. Within 30 minutes, the MOF is able to reduce the total dissolved solids (TDS) in the water from 2,233 parts per million (ppm) to under 500 ppm. That's well below the threshold of 600 ppm that WHO recommends for safe drinking water. The material is able to produce as much as almost 140 l of fresh water per kg of MOF per day. MOF can be quickly and easily cleaned by placing it in sunlight in as little as four minutes. This new technology is faster-acting than other techniques, simpler and requires only sunlight as a source of energy.

A team of the National University of Singapore has developed a sponge-like **hydrogel** capable of desalinating up to 1000 l a day. The zinc-based material absorbs at least 400% of its own weight. The desorption process from the hydrogel, occurring at 55°C (lowest), is triggered by natural sunlight thereby ensuing an external energy-less water harvesting approach. The hydrogel exhibits excellent stability even after 1000 absorption/desorption cycles.

Alternative Energy

Researchers at Linköping University (Sweden) have developed a **molecule that absorbs energy from sunlight and stores it in chemical bonds**. A possible long-term use of the molecule is to capture solar energy efficiently and store it for later consumption. The molecule belongs to a group known as "molecular photoswitches". These are always available in two different forms, isomers, that differ in their chemical structures. One possible area of application for photoswitches is molecular electronics, in which the two forms of the molecule have different electrical conductivities. Most chemical reactions start in a condition where a molecule has high energy and subsequently passes to one with a low energy. Here, the researchers do the opposite – a molecule that has low energy becomes one with high energy.

British company Gravitricity has developed a **system to store excess electricity by using the power of gravity**. The system is based on a vertical shaft up to 1,500 meters deep with weight configurations ranging from 500 to 5,000 tons. The Gravitricity system can be set up to create a peak power between 1 and 20 MW, with an output time of 15 minutes to eight hours. The system is designed to last at least 50 years without cycle limits or degradation. The company claims it has an efficiency of 80 to 90%, with costs below that of a comparable lithium battery system.

Scientists from the University of Twente and the South China Normal University developed a device that can generate **electricity from falling water droplets**. Engineers from the Universities directed charges into the insulating layer of a capacitor using a new electrowetting method, a modification of the ability of liquids to come into contact with a solid surface under the influence of an electric current. An electric current is generated from the action of the droplet when the induced opposing charges are redistributed on the capacitor. The developers have made significant progress - the efficiency of the device was almost 12%, and its efficiency did not deteriorate after 100 days of operation.

Researchers from Rice University (USA) have built a simple new **solar-powered device that can create hydrogen for fuel by splitting water**. The system is made up of a perovskite solar cell, hooked up to electrodes made of a catalyst that electrolyzes the water.

When sunlight hits the solar cell, it produces electricity that powers the catalyst, which then splits the water into oxygen and hydrogen. These bubble up to the surface where they can be collected for use. The sunlight-to-hydrogen efficiency sits at around 6.7%. The solar cell and the electrodes are all in one unit – the solar cell components are encased inside a polymer shell that protects them from water damage while still letting sunlight through. The electrodes sit on the outside where they can split the water. The device can basically be dropped into some water with direct sunlight and left to run for long periods of time, producing hydrogen as needed.

Researchers from University of Illinois develop **multilayered solar panels** with the potential to be 1.5 times more efficient than traditional silicon panels. The team has been working to layer the semiconductor material gallium arsenide phosphide onto silicon because the two materials complement each other. Both materials absorb visible light strongly, but gallium arsenide phosphide does so while generating less waste heat. In contrast, silicon excels at converting energy from the infrared part of the solar spectrum. Tandem solar cells work as a team and take advantage of the best properties of both materials to make a single, more efficient device.

Australian researchers have developed a **highly efficient solar absorbing film** that absorbs sunlight with minimal heat loss and rapidly heats up to 83°C in an open environment. The graphene metamaterial film has great potential for use in solar thermal energy harvesting and conversion, thermophotovoltaics (directly converting heat to electricity), solar seawater desalination, wastewater treatment, light emitters and photodetectors.

The **Air-gen device**, created by American engineers, connects electrodes to the protein nanowires in such a way that electrical current is generated from the water vapor naturally present in the atmosphere. The new technology is said to be non-polluting, renewable, low-cost and can generate power in areas with extremely low humidity. The Air-gen device requires a thin film of protein nanowires less than 10 microns thick. The bottom of the film rests on an electrode, while a smaller electrode that covers only part of the nanowire film sits on top. The film adsorbs water vapor from the atmosphere. A combination of the electrical conductivity and surface chemistry of the protein nanowires, coupled with the fine pores between the nanowires within the film, establishes the conditions that generate an electrical current between the two electrodes. The current generation of Air-gen devices can power small electronics.

Kiwi start-up EMROD has developed **the world's first wireless power transmission**. The technology works by utilizing electromagnetic waves to safely and efficiently transmit energy wirelessly over vast distances. This technology can make the transmission process well faster and cheaper.

The **gravitation water vortex power plant** is a type of micro hydro vortex turbine system which is capable of converting energy in a moving fluid to rotational energy using a low hydraulic head of 0.7-3 m. The micro hydropower plants do not affect the environment and can operate 24 hours a day. The plant operating with a head of 1.5 m and a flow of 1.5 m^3/s can produce 15 kWh. With the higher head and flow, the vortex turbine is capable of generating up to 200 kWh. Multiple micro hydropower plants can be installed along one river with no effect on flow and fauna. At present, the performance of gravitation micro hydropower is tested in Malaysia.

Teams across the United States and Australia have used the strategy, called photochemical upconversion, to change invisible infrared light into "more energetic, visible light" so that it can be used to generate electricity. This is the first time light of this type has been able to be captured, and while the efficiency of the technology needs more work before commercialization is possible, it bodes well for the future of solar power.

10.2. Central Asia Expert Platform on Water Security, Sustainable Development, and Future Studies

In 2020, work on the formation of the Expert Platform on Water Security, Sustainable Development and Future Studies (EP)[82] was continued. The Uzbek ministries and departments have positively responded on the establishment of EP, the Concept Note was approved, the Action Program on Platform development was drafted together with the heads of national teams from CA countries and the priority topics of joint work were identified.

The first meeting of Platform's members with participation of national team leaders from Central Asian countries and SIC ICWC was held on 9 July in a videoconference format to discuss the progress on formation of the Platform and set tasks for the near future. The issues related to Platform development were raised during different events: conference "Green Central Asia" (28 January, Berlin), workshops "Water Diplomacy: A tool for climate action?" as part of the Stockholm Water Week (24 August) and "Introduction of green technologies and innovation in the Aral Sea region within the framework of the new EU strategy for Central Asia: cooperation between Uzbekistan and the European Union" (22 October). The EP website was created (http://www.cawater-info.net/expert-platform/index.htm)

[82] See Water Yearbook 2019 for the idea of establishment, objective and tasks of EP, http://www.cawater-info.net/yearbook/index_e.htm

As part of the UNECE Project "Support to the Network of Russian speaking water management organizations from Eastern Europe, Caucasus and Central Asia" and with inputs from national experts, activities[83] were started on (1) development of a database of experts on water, environment and sustainable development and its activation on the Internet for open use and filling; (2) preparation of a collection of best practices on transboundary water cooperation; (3) analytical studies on "Statements made by the Central Asian countries at the UN General Assembly in 1992-2020: Key highlights and priorities" and "Environment and transboundary cooperation in the statements made by the EECCA countries at the UN General Assembly in 1992-2020".

The aspects of EP development are also included in the work program under the theme 4.7. "Regional mechanisms for the low-carbon, climate-resilient transformation of the energy-water-land nexus in Central Asia" (German Government, International Climate Initiative 2020, partners – OECD, EBRD, UNECE, SIC ICWC). Start of works is planned for autumn 2021.

10.3. Leading research institutes of EECCA countries

Belarus. Republican Unitary Enterprise "Central Research Institute for Complex Use of Water Resources" (CRICUWR)

RUE CRICUWR was established in 1961. It is subordinated to the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (since 1994) and is the back-up organization of the Ministry for development of river basin management plans, inventory of national surface water bodies, schemes and projects of water protection zones and coastal strips of waterways and reservoirs, zones of sanitary protection of surface and groundwater intakes. It performs the functions of the head organization for maintaining the State Water Cadaster (SWC), provides information services to the economic sectors with data on water bodies, water resources, regime, quality, water use and wastewater discharge; exchanges data with neighboring states (on transboundary watercourses) and prepares information materials on water resources and their use for international organizations.

The Institute carries out fundamental and applied research in the area of sustainable water use and water protection, makes inventory of watercourses and lakes using WEB- and GIS technology, studies and makes assessments of watercourses and lakes in the context of climate change; maintains a hydromorphological observation network for rivers and lakes; takes active part in international research cooperation water projects.

Activities in 2020

More than 7,000 large watercourses and lakes, including the Pripyat, Neman, Dnepr and Western Dvina basins, were mapped as part of the 2016-2020 State Program "Environmental conservation and sustainable nature use".

As part of the European Union Water Initiative Plus for Eastern Partnership Countries Plus (EUWI+), Components 2 and 3: (1) a Pripyat River Basin Management Plan was drafted, (2) detailed inventory of springs in the Pripyat basin has been made, with following publication of "Springs of Belarus" and the contest (5 June-15 July) for best survey on small motherland's springs; (3) publications – "Economic tools of water resources and infrastructure management in Belarus: related materials on the EUWI+ Project" and "Implementation of water-related SDGs in the Republic of Belarus" have been launched.

The report on the scope of the Strategic Environmental Assessment (SEA) of the draft Water Resources Management Strategy in the context of climate change until 2030 was prepared. Public consultations were held on 13 March to 2 April and their outcomes were taken into account in the formation of the SEA report.

Representatives of CRICUWR took part in (1) negotiating with the Polish colleagues an Agreement between Belarus and Poland on transboundary water cooperation. The Agreement was signed later on 7 February in Poland; (2) a work meeting (10 September) to discuss implementation of the Water Program of the Clean Baltic Coalition in Belarus for the period of 2021-2023. The proposed interventions include water and wastewater management, water protection and conservation in agriculture, fishery and aquaculture; (2) a meeting (16 October) of the Pripyat Basin Council. The draft Basin management plan and the prospective irrigation development in Gomel province for agriculture adaptation were discussed.

Mass media. Representatives of CRICUWR took part in a broadcast of the First national channel of the Belarus radio and discussed the topical issues on how to save national water resources (10 September, https://www.youtube.com/watch?v=kiA2m41NhNI).

Publications for 2020 are available on http://www.cricuwr.by/static/files/publication2020.pdf

In 2021, RUE CRICUWR will celebrate its 60th anniversary. A number of events are planned in this context, including within the framework of the World Water Day on 22 March and VI International water forum on Belarus' springs.

Source: http://www.cricuwr.by

[83] See Project results on the EP website http://www.cawater-info.net/expert-platform/index.htm

Russia. Russian Research Institute for Integrated Water Management and Protection (RosNIIVKh)

RosNIIVKh was founded in 1969. It consists of the lead institute (FSBI "RosNIIVKh", Yekaterinburg) and branches: Eastern ("VostokNIIVKh", Chita), Far Eastern ("DalNIIVKh", Vladivostok), Kamsky ("KamNIIVKh", Perm), and Bashkir ("BashNIIVKh", Ufa). The Institute includes the Expert Center for the expertise of safety declarations, the branch departments for water management and water technologies (of the Ural State Technological University) and for land and environmental law (of the Ural State Legal Academy), the dissertation committee on geoecology. The Water Museum – opened in 2009 – presents the information on watercourses and lakes, on water development in the Russian Federation, on protection and rational use of water resources.

Activities in 2020

The work was done in the following areas: (1) the Federal Water Resources Agency's research agenda for 2020-2024; (2) proposals on improvement of water monitoring in part of observations over bottom, banks, status and use of water buffer zones; (3) development of guidelines and methodologies for restoration of surface water, research on protection and restoration of water resources and reversion of accumulated environmental damage; (4) updating of methodological recommendations on drafting river basin master plans; (5) revision of a methodology for determination of admissible impact on water resources.

A representative of the Institute was involved in the work of the Federal priority project "Rehabilitation of the Volga River" under the guidance of the Russian Institute for Water Problems. The results of this work were included in the publication "Concept of mitigation of non-point pollution along the Volga River" (V. Polyanin et al., M: Studiya F1, 2020, in Russian).

Capacity building. The Center for Water Professional Development was established at RosNIIVKh to build capacities of the Federal Water Resources Agency and its branches. The Center's curricula includes: safety of hydrotechnical constructions, integrated water resources management, water use regulation, environmental rehabilitation of water sites, etc.

Regional and international cooperation. RosNIIVKh is a member of the European Water Association (EWA), EECCA NWO and the European Center for River Restoration (ECRR). Newsletters[84] ECRRNEWS-1/2020 and ECRRNEWS-2/2020 were published in February and November, respectively.

Institute's representatives took part in (1) a Kuban Basin Water Authority's meeting on the use of percolation lakes to supply the city of Sochi with water (11 August); IV Russian Water Congress (30 September-2 October); XI meeting of the water management working group of the Russian-Chinese Joint Commission on rational use and protection of transboundary water (23 October); a roundtable on drastic solutions on watering the Republic of Kalmykia (December).

Publications. The research-to-practice journal "Water sector of Russia: problems, technologies, management" has been published since 1999. 8 papers of the RosNIIVKh's researchers were included in the Journal. For wider information coverage and more productive academic dialogue, the geography of the editorial board was extended by including scholars from Kazakhstan, Armenia, Uzbekistan, Pakistan, Austria, Great Britain, Italy, Australia and Canada.

Source: https://wrm.ru/frontend/

Tajikistan. State Enterprise "Tajik Research Institute of Water Engineering and Amelioration" (SE "TajikNIIGiM")

SE "TajikNIIGiM" was established in 1978 as a branch of VNIIGIM named after A.N. Kostyakov. The Institute was transformed into SPA "TajikNIIGiM" in 1994 and got the status of state institution in 2007. Since March 2014, the Institute has been functioning under the auspices of the Ministry of Energy and Water Resources of Tajikistan.

The Institute works on reclamation of irrigated land, improvement of operation of irrigation systems; development and implementation of IWRM principles, water-saving technologies for different soil and climatic conditions, and economic mechanisms of water use; training of water and agricultural specialists. The Institutes is also engaged in the development of a unified water development policy (strategy, concept, program) at national and regional levels.

Activities in 2020

SE "TajikNIIGiM" takes part in the EU Project "Central Asian Dialogue to promote intersectoral Water-Energy-Food Financing", Phase II (2020-2023). The first national consultative meeting was held in Tajikistan in the framework of the Project on 15 September. During the meeting of the project's Regional Steering Committee, it was decided to test the Nexus approach through the implementation of 3 small-scale demonstration projects, including in Tajikistan on technical and financial evaluation of pumping stations (Tajikistan) to identify workable solutions to improve stations' performance while taking into account the interests of other sectors of the WEF Nexus.

The Institute's representatives had a meeting with the group of the Central Asian Climate Information Plat-

[84] Joint publication of the Iberian Center for River Restoration (CIREF) and RUE RosNIIVKh as the national centers for river restoration and members of ECRR

form/CACIP (ICARDA). The group showed its readiness to disseminate the Institute's achievements via CACIP (February). The staff of SE "TajikNIIGiM" had a training in operation and functionalities of CACIP (19 October).

The Institute jointly with the Ministry of Energy and Water Resources organized the Republican Research-to-Practice Conference "Water accounting, generation, distribution and use as the main factor of sustainable development in Tajikistan" (21 October).

Source: https://niigim.tj/

Ukraine. Institute of Water Problems and Land Reclamation (IWPLR)

The Institute was founded in 1929 as the Institute of Hydraulic Engineering and Land Reclamation and was renamed to IWPLR in 2011. It works in the system of the National Academy of Agrarian Sciences of Ukraine. There is a postgraduate study at the Institute on agronomy and construction and civil engineering.

Activities in 2020

The Institute carried out comprehensive monitoring to identify the causes of shallowing Shatsky Lakes and developed a set of measures for sustainable watering of the lakes; took part in the development of the conceptual framework for drought management in Ukraine and in the working group on drafting the Strategy for soil zero-degradation.

Researchers of the Institute have been awarded for the development and application of innovation technologies, namely the new technology of water production for rural settlements and agricultural enterprises.

The Director of IWPLR had meetings with (1) the Chairman of Odessa provincial authority to discuss the project "Reconstruction of Lower Dniester irrigation systems in Ukraine", which was included in the list of priority public investment projects, as well as the prospects and capacities of the Danube-Dniester irrigation system; (2) Ambassador of Uzbekistan in Ukraine. The parties discussed the potentials of bilateral water cooperation and reached an agreement to establish dialogue between the Institute and relevant institutions in Uzbekistan in order to develop institutional cooperation and disseminate advanced Ukrainian water technologies in Uzbekistan.

Capacity building. Within the framework of the EU4Business Initiative (EBRD/EU/Valeur-Tech), the Institute: (1) developed training courses on "Irrigation management under drip irrigation and sprinkling", "Organic farming in balanced crop rotation"; (2) held theoretical and practical training in "Irrigation management under drip irrigation and sprinkling" (16-17 March), training in "Organic crop growing in crop rotation focused on technical tomato" (26-28 August), and a webinar "Smart and resilient agriculture" (4 September).

A workshop "Modern technologies and facilities of potato irrigation" (12 March) and a training under FAO Farmer School on field protective forest belts and criteria for their optimization (14 September) were also organized.

Events. Representatives of IWPLR took part in a number of events in 2020, including: International water forum "Yaremche 2020" (28-30 January); meeting of the working group on water security and access to drinking water (13 May); III International research-to-practice conference "Climate change and agriculture: challenges for agrarian science and education" (16 June); Interdepartmental discussion on a need to rehabilitate irrigation and drainage systems in Ukraine and establish irrigation water user unions (9 July); roundtable on irrigation rehabilitation in the risk farming areas (17 July); V International agrotechnology summit (3-4 December); etc.

Source: http://igim.org.ua/

10.4. International Research Institutes Working on Water Issues in Central Asia

In this section, we will present foreign research institutions working on water issues in CA.

The Corvinus Centre for Central Asia Research was established by Corvinus University of Budapest in November 2016. The Center intends to work closely with Central Asian partners to conduct research on key issues of political and economic transformation, making full use of the unique experience of Hungary and other Central-European countries in this area.

The Center places special emphasis on supporting EU decision makers in the development of an effective and realistic Central Asia policy in the political, security and economic fields. It intends actively to cooperate with research institutes in other EU countries to form a network that produces high-quality, comprehensive applied research on Central Asia.

On 3 November 2020, the Centre launched the two-year research program focusing on "Water as a driver of sustainable recovery: economic, institutional and strategic aspects of water resources management in Central Asia".

The Program is implemented by the Centre and supported by the Blue Peace Central Asia initiative (BPCA) of SDC, SIWI, and CAREC.

Source: www.cccar.hu/; www.uni-corvinus.hu/main-page/research/research-centres/corvinus-centre-for-central-asia-research/?lang=en