

**International Conference of the Eastern
Europe, Caucasus,
and Central Asia Network of Water
Management Organizations
(EECCA NWO)**

**Science and Innovative Technologies for
Water Security**

September 23-24, 2019

Yekaterinburg, Russia

REPORT

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The International Conference of the Eastern Europe, Caucasus and Central Asia Network of Water Management Organizations on “Science and Innovative Technologies for Water Security” was held on 23-24 September 2019 in the city of Yekaterinburg.

The main topics addressed at the Conference included:

- Water security of transboundary water bodies in the context of growing water scarcity;
- Innovation-based water sector development strategy;
- New innovative approaches/ideas to efficient and effective water management;
- Role of science and education for ecologically safe environment and innovative water development.

The opening remarks and welcome speeches were delivered by:

- **Prof. N. Prokhorova**, Director of RosNIIVH
- **Prof. D. Kozlov**, President of EECCA NWO



SESSION 1:

WATER SECURITY OF TRANSBOUNDARY WATER BODIES IN THE CONTEXT OF GROWING WATER SCARCITY

The session was opened by Prof. **V. Dukhovniy** (Director of SIC ICWC/NWO EECCA Secretariat) with the presentation titled “**About the project of re-distribution of the Siberian rivers’ flow to the Aral Sea Basin**”. He presented historical background of the project since 1968 till 1986, when the Soviet Government decided to stop the work on flow re-distribution to Central Asia. Prof. Dukhovniy also provided the rationale for coming back to this matter, namely growing demand and decreased water resources, and also pros and cons on the inter-basin transfer project.

Then, Prof. **D. Kozlov** (President of EECCA NWO/Russia) spoke on “**Safety and operability of hydraulic facilities located along watercourses of big cities (case-study of Moscow agglomeration)**”

Reliability of a hydraulic facility and its operability are the critical factors of its safe operation and, hence, of the whole set of structures belonging to a water-management system of any scale – from small territory and settlement to big metropolitan cities, regions and states. The current water-management system of the metropolitan city is comprised of a network of water bodies and hydraulic facilities. The current expansion of Moscow area and development of new territories requires inventory and inspection of hydraulic and engineering facilities within the metropolitan water infrastructure. To this end, a range of tasks needs to be solved.

M. Makhramov (Head of BWO Amu Darya) reported on the “**Improving water resources management in the Amu Darya Basin in the context of growing water scarcity**”, where he addressed the current difficulties affecting sustainability of water management and water security in Central Asia that are caused, among other things, by climate change. He underlined the need for comprehensive research; water conservation in the region, including through economic incentives, easy taxation and loaning, and penalties for above-limit diversion of water and discharge of wastewater; equipping of relevant organizations and services with necessary tools and facilities for effective monitoring, control and prevention of the negative effects of climate change; and, dissemination of IWRM lessons and enlargement of a network of extension services for water users. Education, training and capacity building at lower level and cultivation of responsibility before water and natural environment are essential. Additionally, the tools for raising public awareness and interest in water should be developed as well.

V. Kirillov (Institute of Water and Ecological Problems, Russian Academy of Sciences) in his report “**On the project of water transfer via a pipeline from Upper Ob to China**” presented options, prospects and challenges of the piped water transfer from the Upper Ob basin to China. In the context of the expected severe water deficit in the Xinjiang Uygur Autonomous Region in China, he showed one option for solution of this problem through the transfer of water from the Upper Ob basin, also via a pipeline. At the same time, the Ob-Irtysh basin also has problems related to water supply and use of different scale and severity. Therefore, given the existing shortage of hydrological and environmental information on the Upper Ob basin, it is necessary to conduct additional comprehensive research and forecast

plausible negative effects on ground-based and aquatic ecosystems and socio-economic situation in the basin.

The presentation “**Impact of flow transfer on hydrological regime of the Argun River and Dalainor Lake**” was made by **A. Shalikovskiy** (Eastern branch of FBGU RosNIIVKH, Russia). The hydrological regime of the border section of the Argun River (270 km) fully depends on runoff from the Chinese territory and on anthropogenic factors, such as regulation of flow in tributaries of the Khailar River, reclamation of land, with annual rate of irrigated area growth from 6 to 10%. Here, one should take into account also climate change in the form of decreased rainfall.

The reporter presented information on the efforts made since 2009 on the prevention of further lowering of water level in Dalainor (Khulun) Lake, negative changes in lake ecosystem, and eutrophication and the reduction of lake water salinity: River and Lake Integration Project, Plan of integrated water management for Dalainor Lake (2017); construction of dams along the Khailar River – Dalainor Lake route to increase flow transfer (2018); construction of a hydropower project on the Zadun River, tributary of the Khailar (ongoing).

Flow transfer and other water measures have led to lowering of runoff in the Argun River and transformation of river water regime. However, the objective of flow transfer – filling of Dalainor Lake with water – has not been achieved yet.

D. Ziganshina (Deputy Director of SIC ICWC) in her presentation “**Water diplomacy, law and science serving to the benefit of water security**” showed that the Central Asian region faces serious challenges related to water security, such as sustainable access to water of good quality for well-being and socio-economic development in the countries, protection from water-born pollution and disasters, and preservation of ecosystems and political stability. The reporter gave short summary on the development of water diplomacy tools and research under umbrella of the Interstate Commission for Water Coordination (ICWC) in Central Asia. She also presented the key future directions of water diplomacy and research.

The presentation “**Adaptation of Central Asian mountains to climate change**” by **I. Dairov** (Regional Mountain Center of Central Asia, Kyrgyzstan) highlighted issues occurring in adaptation to climate change (including scientific, institutional-political, legal-regulatory, and financial ones) and provided recommendations for adaptation in part of institutional framework, policies and laws, awareness raising and capacity building. The reporter pointed to a need for integration of expertise in the region in the field of adaptation, involvement of decision makers in this matter, development and implementation of long-term strategic approaches, with mobilization of internal and external financial resources.

Prof. **N. Kipshakbaev** (Kazakh branch of SIC ICWC, Republic of Kazakhstan) in his presentation on “**Sustainable development of Kazakhstan through water security**” highlighted major problems of the water sector (unsustainable water use, water deficit faced in some regions, progressing growth of water demand, inadequate drinking water quality, insufficient access to centralized water supply) and ways for solution in three areas: increase of available share of natural water; water saving and rational use; efficient interstate cooperation and responsible functioning of interstate institutions.

The following tasks for further sustainable development and water security in Kazakhstan were listed:

- sound water management and governance;
- permanent maintenance of existing water infrastructure;

- building capacities and raising responsibilities of interstate water bodies for transboundary water management;
- strengthening of measures for water source protection, water quality improvement and water exhaustion prevention;
- adoption of advanced water management and conservation technologies.

The Honorary Secretary General of the International Network of Basin Organizations (INBO), who was at the head of this organization for more than 20 years, **J-F. Donzier** introduced the aims and objectives of INBO established in 1994. The Network's membership is comprised of basin organizations, public water agencies, bi- and multilateral cooperation agencies. At present, the Network totals 192 full-fledged members or permanent observers in 88 countries. The reporter also presented information on regional networks and on important water events to be held.



SESSION 2: INNOVATION-BASED WATER SECTOR DEVELOPMENT STRATEGY

S.A. Bekmaganbetov (representative of the Republic of Kazakhstan in EC IFAS) made his report on “**Relevance of establishing the International Water and Energy Consortium of Central Asia as a sustainable regional mechanism for integrated water-energy use**”.

The idea of establishment of an International water-energy consortium of Central Asia was addressed within the framework of the Interstate Council of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan (1997-2000), and the Central Asian Cooperation Organization

(2001-2005), the Eurasian Economic Community (2006-2012) and voiced by the Kazakh President N. Nazarbaev at the Summit of the Heads of IFAS Founder-States (24 August 2018, Turkmenistan), where he underlined the need to come back to this idea. The reporter also voiced the legal framework and position of the country on this matter. It is argued that all the countries will benefit from cooperation and Central Asia will become one of the most stable and flourishing regions in the world.

S. Belyaev (RosNII VH, Russia) presented the **Concept of the State policy on mitigating impacts of non-point pollution sources on surface water**.

He showed key objectives, principles (basin programming, territorial planning, sectoral improvement, state incentives) and mechanisms of implementation of the proposed Concept. This should be within the framework of the general public environmental policy. For coordinated efforts, systemic work and sounder budget spending, the reporter considered it advisable to adopt the proposed Concept or similar one, at least, in the form of guidelines of the Russia's Ministry of Nature.

Then, **K.V. Krutikova** (RosNII VH, Russia) made presentation on **“Progress achieved in the integrated water resources management”**. She gave the analysis of implementation of integrated water resources management in the Russian Federation. Based on the data from IWRM Data Portal, Russia's score is 79 out of 100. Russia is among the countries that are more likely to achieve the global goal or have already achieved it. Based on progress measurement indicators in four areas (1 – favorable conditions: policy, laws, plans and strategies; 2 – institutions and participation: intersectoral coordination, involvement of private sector and other stakeholders in management; 3 – management and decision support tools, data and information exchange; 4 - financing), the reporter showed arguable points in high evaluation of IWRM implementation and made an alternative assessment. Finally, she demonstrated key areas of integrated water resources management development in Russia, including, elaboration of strategies for the achievement of sustainable goals related to water, use of different kinds of resource, and consideration of the ecosystem component of water potential.

L.F. Camilo (St. Thomas University, Columbia) spoke on the **Strategies for adaptation to climate change for sustainable management of water resources of small islands**. He presented results of the study of water system in Saint Andres Island in the Caribbean basin from a holistic view. Population growth and intensive tourism raise the risks for water security and have a negative impact on environment by increasing load on island ecosystems, such as mangroves, coral reefs and water catchments, and causing their degradation. Mr. Camilo made the assessment of water system using a number of indicators (water sources, drinking water supply, wastewater treatment, solid waste management, adaptation to climate and management) and proposed adaptation strategies in order to improve water management in the areas of water security, water quality, ecotourism and administrative regulation. The results can be used in water resources management in small islands all over the world, where economies are mostly based on tourism and where water security is at high risk in the context of climate change.

H.S.Makhkamov (BWO Syrdarya), Experience and Prospects of Automation of Hydraulic Facilities in the Syrdarya River basin.

Automation of hydraulic facilities in the Syrdarya River Basin was undertaken in 1970-1988. These automated systems started to be modernized in 1995.

The presenter provided information on modernization and automation efforts made with the support of donors, including: USAID - in Upper Chirchik hydroscheme (2001, 2015-2016), Kuiganiar hydroscheme (2004); SDC - at the Dustlik canal, South Golodnostepski canal, data transmission system at dam gates and a number of canals (2002), with the data transmitted from these structures to the Central Control station in the city of Tashkent.

He also underlined priorities for further development of automated water control in the Syrdarya basin.

SESSION 3:

NEW INNOVATIVE APPROACHES/IDEAS TO EFFICIENT AND EFFECTIVE WATER MANAGEMENT



Prof. Dukhovny (SIC ICWC / Secretariat EECCA NWO) in his presentation **“Results of application of RS-based methods in water management in Central Asia”** gave short background: starting from aerial mapping in the 1970s till satellite images and drones at present. He presented the new water use efficiency monitoring tool for Central Asia (WUEMoCA) developed jointly by German Institutes and SIC ICWC.

The user may access information on irrigated areas at province or district level, yields of main crops (cotton, wheat, rice, vegetables and fruits) based on satellite data (MODIS 250 m) and climate data in WUEMoCA.

Processing of satellite imagery implies automated upload of images, data processing, classification and biomass estimation, and calculation of crop yields. The assessment of productivity of water and other resources is made through the analysis of RS-based data on crops. It is important that such analysis is conducted at province, district, WUA and even field level. This approach allows doing assessment during the growing season and make appropriate corrections.

I. Djurayev (representative of the Republic of Uzbekistan in EC IFAS) in his presentation “**Prearalie – the zone of environmental innovations and technology**” told about measures and actions taken by Uzbekistan to overcome the consequences of the Aral Sea drying up. Those include the State Program for development in the Aral Sea region over 2017-2021 for a total amount of 8.4 trillion soum and the Comprehensive Development Program for the Muynak region in Karakalpakstan over 2019-2021 for the total cost of 26.97 trillion soum or approx. \$3.2 billion.

The speaker also underlined a range of important initiatives put forward by the Uzbek President Sh. Mirziyoyev at the Summit of the IFAS Founder-States (24 August 2018, Turkmenistan) that would help to “dramatically improve environmental situation in the region”:

- declare the Aral Sea region (Prearalie) the zone of environmental innovations and technology. In this context, the International innovation center of the Aral Sea region was established at the President of Uzbekistan with the support of the Islamic Development bank and the International Center for Biosaline Agriculture (ICBA).
- promote production of desert and fodder plant seedlings. In December 2018 this work was started to plant more than 1 million ha on the dried seabed by the end of 2019.
- create protected nature zones in Prearalie.
- fundamentally improve regional water cooperation. The regional program for rational water use in Central Asia was proposed in this context.
- develop effective scientific cooperation through joint interdisciplinary research, also on the base of SIC ICWC and SIC ICSD.

The consequences of the Aral Sea disaster require consolidation of international efforts. Thus, the International conference for environmental innovations and technology in the Aral Sea region is to be held 24-25 October 2019 in Karakalpakstan, after which Uzbekistan is about to initiate a special resolution of the UN General Assembly on declaration of this region the “Zone of environmental innovations and technologies”.

O. Kazantseva (Eco-TIRAS, Moldova) “**Approaches to assessment of hydropower impacts on river ecosystem services (Dniester River case-study)**”. Dniester is the largest river in Western Ukraine and Moldova. The ongoing deep ecosystem disfunctions caused by hydropower development require coordinated actions of the two states to change the situation by making use of international experience and modern innovative approaches to water management.

The key impacts of hydropower on biodiversity are grouped into direct (loss and fragmentation of natural habitat, direct losses of species, obstacles in fish migration routes, genetic isolation of populations, and invasive species) and indirect ones (deterioration of water quality, changes in hydrological flow and in composition of bed sediments, etc.).

Different approaches to the assessment of hydropower impacts were considered in the presentation using the Dniester River basin as a case-study: EIA standard practices, GEF Guidance Documents to Economic Valuation of Ecosystem Services; economic approaches to ecosystem services; and, the UNEP Millennium Ecosystem. The proposed approaches are not necessarily well-developed and have controversial points; however, they allow valuating ecosystem services in a first approximation.

Yu.V. Krolevetskaya (Far East branch of FBGU RosNIIVKH, Russia) in her presentation **“Information-analytical support of water right licensing (Amur BWA case-study)”** described the stages of development and implementation of the information system for water right licensing in the area of operations of the Amur BWA. She underlined key spheres of information-analytical support and proposed ways for further development of given system to embrace other tasks of multiple water use in the Amur basin district.

I. Nerov (Far East branch of FBGU RosNIIVKH, Russia) **“Information system for hydrological modeling in the Amur River Basin”**

Provision of timely information and analysis to ensure optimal flood bypass by Bureya, Nizhne Bureya and Zeya reservoirs is still very topical. The work on the development of automated hydrological modeling system for the Amur River basin was started in 2018. This modeling system is to provide the automated assessment of an impact of actual and scenario-based (proposed) daily and ten-day discharge from the reservoirs on water levels in the Amur River, the Zeya River, and the Bureya River. The information system is comprised of hydrometeorological and water data import module, database for data storage, web-service for data access, and the unified web-client realizing OpenMI programming interface to couple hydrological models with distributed data sources. Preliminary testing showed high reliability and effectiveness of the developed system.

K.A. Kurganovich (Eastern branch of FBGU RosNIIVKH, Russia) **“RS-based spatial-temporal analysis of intensity of land use in the territories of the Zabaikal Krai subjected to flooding using the deep learning algorithms”**.

To investigate housing structure, microclimate, transport of water and atmospheric pollution in cities and related deterioration of environment, the assessment of changes in urban areas is conducted. This analysis is based on RS-data collected from satellite systems or pilotless aerial vehicles for different years. By present, a lot of satellite images and orthophotomaps have been accumulated for different periods of time.

Decoding of images to analyze intensity of use of flood-prone territories is complicated due to a large body of high-resolution data and requires considerable time and labor inputs. Therefore, it is suggested to automate identification of buildings on the long stretches of settlements by using deep neural network learning algorithms (or artificial intelligence algorithms).

Potential applications of the deep learning algorithms were also demonstrated in the presentation. For instance, those included the tasks of identification of potentially hazardous flood-prone stretches of the Zabaikalie krai.

SESSION 4:

ROLE OF SCIENCE AND EDUCATION FOR ECOLOGICALLY SAFE ENVIRONMENT AND INNOVATIVE WATER DEVELOPMENT

Prof. **S. Ibatullin** (International Training Center for the Safety of Hydraulic Structures, Kazakhstan) “**Forming the common water education space in Central Asia**” made a review of research and education capacities for preparation of water professionals in Central Asia. In particular, he outlined:

- current challenges and future threats, which water managers will face for provision of water security in the Central Asian countries in 2035-2040;
- current capacities of water education in Central Asia, disciplines and curricula, major common problems and estimated needs for water specialists in CA for 2035-2040;
- proposals and recommendations for the development of the common education space and appropriate regulatory framework for arrangement of close cooperation between higher education institutions in Central Asian states.

N. Mamataliev (Kyrgyz National Agrarian University named by Scryabin, Kyrgyzstan) in his presentation “**Preparation of water professionals for Kyrgyzstan sectoral institutions in the context of IWRM**” spoke about the training of young professionals in “Environmental engineering and water use”. The University’s graduates are taught in IWRM basics, mathematical modeling of processes in irrigation systems, as well as conflict resolution theory and practices. Such knowledge allows young professionals to become more sought-after and develop successfully their careers.

A. Fazylov (Institute of Water Problems, Hydropower and Ecology at the Academy of Sciences of Tajikistan) presented the **Status and prospects of training system for the water sector**.

Currently, when knowledge and innovations become the main source of national economic growth, the role of education system is even more important. Thus, it is critical to improve the general water education system, which should prepare highly competent professionals who know design, construction and operation of hydraulic structures and water infrastructure.

The reporter showed the data on age composition of the current staff of water agencies, engagement of young professionals in science and industry, relevant legal framework and water education structure in the republic, and on estimated needs for water specialists. Finally, based on the analysis of current situation, suggestions and recommendations were presented on how to improve the system of education, training and re-training of water professionals.

J.-F. Donzier (International Network of Basin Organizations) in his presentation “**Integrated Water Resource Management**” stated that data and information management is a key issue to develop water management. This is particularly needed for sectoral water management, integrated water sector planning, climate change adaptation, disaster risk reduction, reporting, specific decision making and other water sector activities.

As an example, Mr. Donzier highlighted the operation principles of the Water Information System for Europe (WISE) and the Eau France National Water information system. He also showed the results of a number of implemented projects, including the FFEM Project for the Syr Darya basin in Kazakhstan.



RESOLUTION

EECCA NWO International Conference

“Science and Innovative Technologies for Water Security”

Participants of the Conference of the Eastern Europe, Caucasus and Central Asia Network of Water-Management Organizations (EECCA NWO) gathered together in Yekaterinburg on 23-24 September 2019 to address topical matters related to water security and innovation-based water development and to sum up the results of the year and discuss future tasks of the Network.

The participants have presented detailed reports and exchanged opinions in the following key areas:

- Water security of transboundary water bodies in the context of growing water scarcity;
- Innovation-based water sector development strategy;
- New innovative approaches/ideas to efficient and effective water management;
- Role of science and education for ecologically safe environment and in innovative water development.

Based on the results of discussion, the Conference participants believe that it is necessary:

1. To stress that current water security issues with relation to transboundary waters, especially in the context of their growing scarcity, call the scientific community to search for innovative approaches to solve these issues, including the development of new technological solutions and relevant amendments to laws and regulations in the EECCA countries.

2. To elaborate a long-term water sector development strategy, based on IWRM concept, on better governance, on innovation development and the region's country experience, with account of contemporary challenges.

3. To wider involve science in the development and improvement of the water sector of all EECCA countries,

4. To create integrated information systems to support effective and innovative decisions, based on GIS, remote sensing, databases, and knowledge bases,

5. The role of science and education in the development of the water sector can be increased, first of all, by: improving public curriculum standards; optimizing proportion of lecture, practical and laboratory hours (increase practical work to 30-40%); creating favorable conditions for master and PhD students for their research on the base of water sector's organizations; organizing targeted assessments of training and job needs for the water sector; involving employers in the development and implementation of the public education policies, development and implementation of visiting professorship programs; developing investment projects in the water sector, while taking into account educational aspects in order to increase capacities of young professionals. Establishment of international relevant resource centers at higher educational institutions in CA countries.

6. To focus on achievement of ecologically safe environment and innovation-based development of the water sector by integrating education, science and practices, when developing the initiative on the independent think tank and thinking on subject matter and work directions of the think tank.

7. To pool together efforts of research, water-management and educational institutions for development and application of innovative approaches to effective and efficient water use and to solution of water supply problems, taking into account relevant country experiences.

8. To intensify activity in the area of transboundary water at the regional level based on the strengthening of existing transboundary organizations or international commissions, when they exist, and the support to the creation of new ones, when necessary.

9. Given the current problems of water security (climate change impact, demographic pressure, etc.), to reopen a discussion on a need and applicability in the long-term (2030-2050) of the Chinese experience in inter-basin 'south-north' water transfer and proceed to studies of the transfer of Siberian river flow to Central Asia.

10. To facilitate the elaboration of periodically up-dated River Management Plans, based on a common vision of the future negotiated with all categories of interested stakeholders.

11. To deal with an intersectoral approach involving administrations, all categories of water users and the civil society, based on the information systems and to spray information at all levels, on the appropriate supports, to increase the level of mutual knowledge in the basins.

12. To design the right mechanism to favor the sharing of results with all actors.

13. To note with satisfaction effective and fruitful activity of EECCA NWO over more than decade. With the support of the UN Economic Commission for Europe (UNECE), the Government of the Russian Federation, the Scientific-Information Center of ICWC and the International Network of Basin Organizations, this activity contributed to regular exchange of ideas, information and best practices in various water-related aspects and maintained professional unity and mutual understanding between experts and countries in the region

The following can be highlighted in the Network's activity 2018-2019:

- Organization of the conference for water-management organizations in the EECCA countries - "Water for Land Reclamation, Economic Sectors and Natural Environment in the context of Climate Change" (6-7 November 2018, Tashkent, Uzbekistan);
- Participation of EECCA NWO members in the 17th European "EUROPE-INBO" Conference on implementation of European Water Directives (17-20 June 2019, Lahti, Finland);
- Participation of EECCA NWO members in the 3rd World Irrigation Forum and the 70th meeting of the International Executive Council of the International Commission on Irrigation and Drainage (ICID) (1-7 September 2019, Bali, Indonesia);
- Participation of EECCA NWO members in the International Conference on Water Security: New Technologies, Strategies, Policies and Institutions organized by Center for Water Resources Research, Chinese Academy of Sciences and American Water Resources Association (16-18 September 2019, Beijing, China);
- Production of the Network's information and scientific publications, including EECCA NWO collections of scientific papers "Water for Land Reclamation, Economic Sectors and Natural Environment in the context of Climate Change" (volumes 1 and 2) and "Science and Innovations for Water Security";
- Publication of "Selected treaties on transboundary waters signed by states in Europe and Asia (1992-2019)";

- Preparation and publication of 2018 Water Yearbook “Water in Central Asia and around the Globe”, which covered key water-related events and developments in 2018;
- Preparation and publication of weekly digest “Water economy, irrigation and ecology in Central Asia”, which gives regional highlights in water economy, land reclamation, ecology and energy;
- Further development of the Central Asian knowledge portal - CAWater-Info (cawater-info.net) – as a component of the system of unified tools for IWRM, adapted to specifics of water management in river basins with different degrees of water stress in arid and semi-arid zones of EECCA countries;
- Further development of the e-Atlas of water-management and environmental organizations in EECCA countries.

14. EECCA NWO members plan to take part in the following events:

- 11th World General Assembly of INBO and Marrakech International Summit on Water Security: tapping the benefits of innovative and participative basin management (30 September – 3 October 2019, Marrakech, Morocco)
- International Applied Science Conference “Development of agricultural reclamation and water management system on the base of digital technologies” (23-24 October 2019, Moscow, Russia),
- Next Europe INBO annual meeting in Malta in spring 2020,
- Next World Water Forum to be held in Dakar Senegal in 2021,

15. To strengthen efforts of the Network in the following key areas:

- further development of information space on water management, land reclamation, and nature conservation, including exchange of best practices, experience and knowledge in the area of management;
- organization of training workshops, study-tours and webinars to share experience and information on research, technical and technological base developments and innovation application in water sectors of the EECCA countries, as well as implementation of joint projects;
- development and maintenance of a single integrated water information system among the EECCA countries;
- attraction of basin organizations to the Network.
- Follow-up of the implementation, process and results of the EUWI+ for Eastern Partnership project in 6 countries of Eastern Europe and Caucasus.

16. To appreciate an invaluable contribution of UNECE, the Russian Government, SIC ICWC and the International Network of Basin Organizations to EECCA NWO in part of sharing of knowledge and development of the Knowledge base on water, economy and irrigated agriculture and underline the need for continuation of this work.

17. To hold the next Network’s conference on “Transboundary Cooperation Lessons in EECCA Countries” in 2020 in Tajikistan.

18. To thank:

- UNECE for continued support of the Network, including organization of this Conference;
- Government of the Russian Federation for long-time assistance to the Network's activity;
- FGBU "Russian Research Institute for Multipurpose Water Use and Protection" for organization of the International Scientific-Practical Symposium and the Exhibition "Clean Water of Russian 2019) and for the provided opportunity to hold the EECCA NWO Conference as part of this forum;
- SIC ICWC for preparation and organization of the Conference.

Yekaterinburg

24 September 2019

AGENDA
**International Conference of the Eastern Europe, Caucasus,
 and Central Asia Network of Water Management Organizations
 (EECCA NWO)**

“Science and Innovations for Water Security”

**September 23-24, 2019
 Yekaterinburg, Russia**

23 September

14:00

Official opening

PLENARY SESSION

Welcome speeches:

- **Prof. N.B. Prokhorova** (RosNIIVH) - host institution
- **Prof. D.V.Kozlov**, EECCA NWO President

**SESSION 1. WATER SECURITY OF TRANSBOUNDARY WATER BODIES IN THE
 CONTEXT OF GROWING WATER SCARCITY**

Moderator: **Prof. D.V.Kozlov**, EECCA NWO President

Presentations of country representatives on key aspects:

- *country case-studies on meeting the water security challenges*
- *re-distribution of river run-off*

- V.A. Dukhovny (SIC ICWC / Secretariat EECCA NWO) – On redistribution of the flow of Siberian rivers to the Aral Sea
- Prof. D.V.Kozlov – Safety and operability of hydraulic facilities located along watercourses of big cities (case-study of Moscow agglomeration)
- M.Ya. Makhramov (BWO Amu Darya) – Improving water resources management in the Amu Darya Basin in the context of growing water scarcity

- A.V. Puzanov (Institute of Water and Ecological Problems, Russian Academy of Sciences) – On the project of water transfer via a pipeline from Upper Ob to China
- A.V. Shalikovskiy (Eastern branch of FBGU RosNIIVKH, Russia) – Impact of flow transfer on hydrological regime of the Argun River and Dalainor Lake
- D.R. Ziganshina (SIC ICWC) – Water diplomacy, law and science serving to the benefit of water security
- I. Dairov (Regional Mountain Center, Kyrgyzstan), Adaptation of Mountain Areas of Central Asia to Climate Change
- Prof. N.K. Kipshakbaev (Kazakh branch SIC ICWC, Kazakhstan) - Sustainable development of the Republic of Kazakhstan through water security
- J.-F. Donzier (International Network of Basin Organizations) – About International Network of Basin Organizations

Discussion

Dinner

24 September

9:00

SESSION 2: INNOVATION-BASED WATER SECTOR DEVELOPMENT STRATEGY

Moderators: S.D. Belyaev (RosNIIVH), S.A. Bekmaganbetov (EC IFAS)

Presentations of country representatives on key aspects:

- *country experiences in water innovation projects;*
 - *state policy on mitigation of anthropogenic load on surface water;*
 - *ecological implications of surface water pollution;*
 - *setting benchmarks for allowable water exposure;*
 - *matters related to compensation of damage caused by violations of law on surface water protection from pollution;*
 - *advanced development of science and technology infrastructure of the water sector and application of innovation technologies;*
 - *creating favorable conditions for integrated water resources management system.*
- S.A. Bekmaganbetov (representative of the Republic of Kazakhstan in EC IFAS) – Relevance of establishing the International Water and Energy Consortium of Central Asia as a sustainable regional mechanism for integrated water-energy use
 - S.D. Belyaev (RosNIIVH, Russia) – The concept of the State policy on mitigating impacts of non-point pollution sources on surface water

- K.V. Krutikova (RosNIIVH, Russia) – Progress achieved in the integrated water resources management
- Yu.B. Merzlikina (RosNIIVH, Russia) Water sector digitalization: challenges and opportunities
- L.F.Camilo (St. Thomas University, Columbia), Strategies for adaptation to climate change for sustainable management of water resources of small islands
- H.S.Makhkamov (BWO Syrdarya), Experience and Prospects for Development of Automation of Hydraulic Facilities in the Syrdarya River basin

Discussion

Coffee-break

SESSION 3: NEW INNOVATIVE APPROACHES/IDEAS TO EFFICIENT AND EFFECTIVE WATER MANAGEMENT

Moderators: **V.A. Dukhovny** (SIC ICWC / Secretariat EECCA NWO), **I.O. Nerov** (Far East branch of FBGU RosNIIVKH, Russia)

Presentations of country representatives on key aspects:

- *Role of innovations in improving functioning of agricultural entities*
- *Prospects for the development and improvement of the water sector*
- *Special aspects of innovation development in country scale*

- V.A. Dukhovny (SIC ICWC / Secretariat EECCA NWO) – Results of application of RS-based methods in water management in Central Asia
- I. Djurayev (representative of the Republic of Uzbekistan in EC IFAS) - Prearalie – the zone of environmental innovations and technology
- O.Kazantseva (Eco-TIRAS, Moldova) - Approaches to assessment of hydropower impacts on river ecosystem services (Dniester River case-study)
- Yu.V. Krolevetskaya (Far East branch of FBGU RosNIIVKH, Russia) - Information-analytical support of water right licensing (Amur BWA case-study)
- I.O. Nerov (Far East branch of FBGU RosNIIVKH, Russia) – Information support system for hydrological modeling in the Amur River Basin
- K.A. Kurganovich (Eastern branch of FBGU RosNIIVKH, Russia) – RS-based spatial-temporal analysis of intensity of land use in the territories of the Zabaikal Krai subjected to flooding using the deep learning algorithms

Discussion

Lunch

14:00

SESSION 4: ROLE OF SCIENCE AND EDUCATION FOR ECOLOGICALLY SAFE ENVIRONMENT AND IN INNOVATIVE WATER DEVELOPMENT*Moderators: Prof. S.R. Ibatullin, Prof. Yu. V. Repin**Presentations of country representatives on key aspects:*

- *science as a facilitator of innovations;*
- *better integration of education, science and practices*
- *competence requirements and new standards;*
- *fostering ecologically concerned thinking in higher educational institutions;*
- *science and practices in preparing water professionals;*
- *water and sanitation engineer – ecologist;*
- *training and needs in the water sector;*
- *training facilities and meeting professional expectations;*
- *water sector professional development.*

- Prof. S.R. Ibatullin (International Training Center for the Safety of Hydraulic Structures, Kazakhstan) – Forming the common water education space in Central Asia
- N.P. Mamataliev (Kyrgyz National Agrarian University) – Preparation of water professionals for Kyrgyzstan sectoral institutions in the context of IWRM
- A.R. Fazylov, Z. Kobyuliev (IWP and HE of AS RT, Tajikistan) – Status and prospects of training system for the water sector
- J.-F. Donzier (International Network of Basin Organizations) – Integrated Water Resource Management

Discussion

Closing statements, discussion, and adoption of the EECCA NWO Conference resolution

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“Science and Innovations for Water Security”
September 23-24, 2019 Yekaterinburg, Russia

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