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for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

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IKI INTERNATIONAL CLIMATE INITIATIVE

WATER-ENERGY-LAND USE LINKAGES
Nexus solutions for a climate resilient Central Asia

SIC ICWC
Scientific-Information Center
of the Interstate Commission
for Water Coordination
of Central Asia

2022

WATER YEARBOOK:

CENTRAL ASIA AND AROUND THE GLOBE

Tashkent 2023

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2022

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Acknowledgements

This Yearbook was published thanks to contributions from numerous agencies, organizations and individuals. Special thanks are due to:

Ministries and agencies: Ministry of Water Management of the Republic of Uzbekistan (Z. Ishpulatov).

Regional organizations of Central Asia: BWO Amu Darya (M. Makhramov, G. Tilyavova), BWO Syr Darya (O. Kholkhudjaev, F. Irmatov), ICWC Secretariat (U. Nazarov), ICSD Secretariat (B. Mamedov), GEF Agency of IFAS in Uzbekistan (V.I. Sokolov), ED IFAS in Kazakhstan (B. Bekniyaz, U. Akim).

Joint Commissions: CTWC Secretariat at the Ministry of Agriculture of Kazakhstan (I. Akbozova).

Research Institutes: RosNIIVKh (N. Valek), KazNIIVKh (Ye. Tajgaliev, N. Balgabaev), RIIWP (A. Urazkeldiev, A. Petrov).

Higher Education Institutions: AUCA (Ch. Shamshiev, S. Orunbaev), KNAU (P. Ibragimov, Ye. Kalybekova), KGU (B. Janusz-Pawletta, A. Akhmetjanova), Nazarbaev University (Ilesanmi Adesida, Ye. Nurdanbek), Al-Farabi KazNU (Zh. Tuymebaev, F. Jakypova), NIU "TIIAME" (A. Salokhiddinov), National University of Uzbekistan (G. Umirzakov).

International partners: OSCE (S. Ospanova, L. Zuliani), UNECE (S. Radnaaragchaa), INBO (M. Germain-Lupi), Rivers without Boundaries Coalition (E. Simonov), UNRCCA (N. Khudayberganov), GIZ (K. Milow), SDC (A. Gerrits), ADB (K. Yoshida), World Bank (U. Yang, T. Alibekova), Geneva Water Hub and University of Geneva (M. Tignino), GWP (Yu. Yasuda), ICID (I. Bondarik), SIWI (K. Goldie-Ryder, M. Klimes), OECD (M. Griffiths), AFD (V. Caupin).

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All links are correct at time of drafting of the Yearbook.

Prepared and published thanks to the financial support of the project "Regional mechanisms for low-carbon, climate-sustainable transformations in the interrelated issues of energy, water, land in Central Asia", implemented by the OECD, SIC ICWC and UNECE and funded by the Federal Ministry of Environment, Nature Conservation, Germany Nuclear Safety and Consumer Protection of Germany (BMUV) within the framework of the International Climate Initiative (IKI)

Content

List of Abbreviations

ACN	Academic Community Network
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
ALRI	Agency for Land Reclamation and Irrigation (Tajikistan)
ASB	Aral Sea Basin
ASBmm	Aral Sea Basin model
ASBP	Aral Sea Basin Program
AWC	Asia Water Council
BISA	Basin Irrigation System Administration
BWA	Basin Water Authority
BWO	Basin Water Organization
CA	Central Asia
CALPESD	Central Asian Leadership Program of Education for Sustainable Development
CAREC	Regional Environmental Centre for Central Asia
CDW	Collector-drainage water
CIS	Commonwealth of Independent States
CMC ICWC	Coordination Metrological Center of ICWC
CSTO	Collective Security Treaty Organization
CTWC	Chu-Talas Water Commission
DWRLR	Department for Water Resources and Land Reclamation at the Ministry of Agriculture, Food Industry and Land Reclamation (Kyrgyzstan)
EBRD	European Bank for Reconstruction and Development
EC IFAS	Executive Committee of IFAS
ECOSOC	UN Economic and Social Council
ED IFAS	Executive Directorate of IFAS
EECCA NWO	Eastern Europe, Caucasus, and Central Asia Network of Water Management Organizations
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GIZ	German Agency for International Cooperation (Gesellschaft für Internationale Zusammenarbeit)
GWP	Global Water Partnership
ICID	International Commission on Irrigation and Drainage

ICSD	Interstate Commission for Sustainable Development of Central Asia
ICWC	Interstate Commission for Water Coordination of Central Asia
IFAD	International Fund for Agricultural Development
IFAS	International Fund for Saving the Aral Sea
IFCA	Investment Fund for Central Asia
INBO	International Network of Basin Organizations
IsDB	Islamic Development Bank
IUCN	International Union for Conservation of Nature
IWAC	International Water Assessment Center
IWMI	International Water Management Institute
IWRA	International Water Resources Association
IWRM	Integrated Water Resource Management
KR	Kyrgyz Republic
MAEP	Ministry of Agriculture and Environmental Protection (Turkmenistan)
MEGNR	Ministry of Ecology, Geology and Natural Resources (Kazakhstan)
MFA	Ministry of Foreign Affairs
MPHSTF	UN Multi-Partner Human Security Trust Fund for the Aral Sea region in Uzbekistan
MWM	Ministry of Water Management (Uzbekistan)
NASA	National Aeronautics and Space Administration
NHMS	National Hydrometeorological Services
NGO	Non-governmental organization
OECD	Organization for Economic Cooperation and Development
OIC	Organization of Islamic Cooperation
OPEC	Organization of the Petroleum Exporting Countries
OSCE	Organization for Security and Co-operation in Europe
RCH	Regional Center of Hydrology
REAP	Regional Environmental Action Plan for Central Asia
REP4SD-CA	Regional Environmental Program for Sustainable Development in Central Asia
RES	Renewable Energy Sources
RK	Republic of Kazakhstan
RMCCA	Regional Mountain Centre of CA
RT	Republic of Tajikistan
Ruz	Republic of Uzbekistan
RWG	Regional Working Group
SCO	Shanghai Cooperation Organization
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SIC ICSD	Scientific-Information Center of the Interstate Commission for Sustainable Development
SIC ICWC	Scientific-Information Center of the Interstate Commission for Water Coordination
SIWI	Stockholm International Water Institute
SPECA	Special Program for the Central Asian countries

UN	United Nations
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-IHP	UNESCO's Intergovernmental Hydrological Program
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	UN General Assembly
UNIDO	United Nations Industrial Development Organization
UNRCCA	United Nations Regional Centre for Preventive Diplomacy for Central Asia
UNSC	UN Security Council
UN SPAS	UN Special Program for the Aral Sea Basin
USAID	United State Agency for International Development
VNR	Voluntary national review
WB	World Bank
WCA	Water Consumer Association
WHO	World Health Organization
WMO	World Meteorological Organization
WUA	Water User Association
WWC	World Water Council

Preface

Dear readers,

We are pleased to present the sixth edition of the Water Yearbook: Central Asia and Around the Globe. The year 2022 was marked by the 30th anniversary of the Interstate Commission for Water Coordination of Central Asia (ICWC). The Jubilee Conference took stock of ICWC activities and paved the way for future coordinated actions for the integrated and rational use and protection of transboundary water resources.

The other notable big events included also the Second International High-Level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028, the High-Level Central Asian Dialogue on Climate Change and Resilience, and the Fifth Central Asian Expert Forum (Section 1).

In 2022, the IFAS Board held two meetings. The mandate of the current IFAS President Emomali Rahmon was extended to one year by the decision of the Heads of IFAS Founding States made at their 4th Consultative Meeting. The EC IFAS led the work on the institutional and legal improvement of IFAS and the implementation of projects and programs under the ASBP-4. The ICWC held its two regular meetings. The ICSD met in March and passed the chairmanship from the Republic of Uzbekistan to the Republic of Kazakhstan for 2022-2024 (Section 3).

The Central Asian countries continued cooperating within the framework of the Chu-Talas Water Commission between Kazakhstan and Kyrgyzstan, the KazakhUzbek Joint Working Group on Environment Protection and Water Quality in the Syr Darya River Basin, and the joint Turkmen-Uzbek Intergovernmental Commission for Water. Trilateral water arrangements were reached between Kazakhstan, Kyrgyzstan, and Uzbekistan and between Kazakhstan, Tajikistan, and Uzbekistan. The Treaty between Turkmenistan and Kazakhstan on delimitation of the border and fishing zones in the Caspian Sea came into force (Section 4).

The Yearbook presents also the key water developments in the Central Asian countries (Section 5) and all over the world (Section 11), the activities of the United Nations and its agencies (Section 6), international water organizations (Section 7), and international partners (Section 8) in the region.

Such topics as water and environmental education in the region and activities of research institutes in EECCA are highlighted in Sections 9 and 10.

The Thematic Reviews (Section 12) include the analytical information on climate change, progress in achieving the SDGs on IWRM and transboundary water cooperation in CA, the Qosh-Tepa Canal in Afghanistan, the CA countries activity on biodiversity, and the international experience in public-private partnerships in the irrigation sector.

Traditionally, we finalize the Water Yearbook with the list of key publications, the information on Central Asia water awards, risks in 2023, the people we lost in 2022, and the 2023 calendar of events.

In concluding, we express our thanks for all the inputs provided to this joint product.

Editorial team

SECTION 1

2022 Calendar of Events

January

- **January 14-16** – 12th IRENA Assembly, Abu Dhabi, UAE
- **January 17-19** – World future energy summit 2022, Abu Dhabi, UAE
- **January 19** – Online roundtable "Major aspects of sound water use and glacier preservation in Central Asia"
- **January 25** – WWT wastewater 2022, conference & exhibition, Birmingham, UK

February

- **February 2** – World Wetlands Day
- **February 8-10** – E-World Energy & Water, international conference and exhibition, Essen, Germany
- **February 11** – International Day of Women and Girls in Science
- **February 23-25** – International Online Conference "The Silk Road of Knowledge: Science meets Green Policy", Almaty, Kazakhstan
- **February 24-25** – 14th meeting of the Implementation Committee of the Water Convention, Geneva, Switzerland

March

- **March 3** – World Wildlife Day
- **March 3** – CAREC Women in Energy Summit, online
- **March 14** – World Rivers Day
- **March 13-16** – 2nd Asia International Water Week, Labuan Bajo, Indonesia
- **March 21** – International Day of Forests
- **March 21-26** – 9th World Water Forum, Dakar, Senegal
- **March 22** – World Water Day
- **March 22-23** – International exhibition of equipment and technologies for waste management and wastewater treatment, Wasma 2022, Moscow, Russia
- **March 23** – World Meteorological Day
- **March 26** – Day of the Aral Sea
- **March 27-April 2** – 17th IWA Leading Edge Conference on Water and Wastewater Technologies, Reno, Nevada, USA
- **March 30-31** – Conference "Environmental Education for Sustainable Development: State, Challenges and Prospects", Almaty, Kazakhstan, online

April

- **April 17-21** – Singapore International Water Week (SIWW 2022)
- **April 19-23** – Global Soil Week
- **April 20-24** – IE Expo China 2022, Shanghai, China
- **April 22** – International Mother Earth Day
- **April 23-24** – 4th Asia Pacific Water Summit, Kumamoto, Japan
- **April 26-27** – International Central Asian Science-to-Practice Conference "30-years of Water Cooperation among the Central Asian States: Facing the Future", Turkistan, Kazakhstan
- **April 27** – 82nd meeting of ICWC Central Asia, Turkistan, Kazakhstan
- **April 27** – Dialogue II: Sustainable Water Governance in Central Asia amid Climate Vulnerabilities, online

May

- **May 6-8** – Scientific Forum "The Force of Nature N+1" as part of the Stihia Festival, Muynak
- **May 16-18** – Global Water Summit, Madrid, Spain
- **May 22** – International Day for Biological Diversity
- **May 23-27** – 2022 Living Planet Symposium, Bonn, Germany
- **May 25-27** – 6th Annual International Congress and Exhibition: Hydropower Central Asia and Caspian, Dushanbe, Tajikistan

June

- **June 2-4** – Regional Conference "Prospects of Renewables Development in the Central Asia Countries", Dushanbe, Tajikistan
- **June 4** – 3rd Meeting of Water and Climate Leaders, Dushanbe, Tajikistan
- **June 5** – World Environment Day
- **June 6-9** – 2nd International High-Level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028, Dushanbe, Tajikistan
- **June 8** – World Oceans Day
- **June 8-10** – Aquatech China 2022, Shanghai, China
- **June 10** – 2nd Syr Darya River Basin Youth Dialogue, Dushanbe, Tajikistan
- **June 17** – Desertification and Drought Day
- **June 21-23** – VI All-Russian Water Congress, St. Petersburg, Russia
- **June 28-30** – Special event dedicated to the 30th Anniversary of the Water Convention, and Fourth Joint Meeting of the UNECE Working Groups on Integrated Water Resources Management and on Monitoring and Assessment, Tallinn, Estonia

July

- **July 1** – Geneva Water Dialogue, Switzerland
- **July 4-5** – 6th Eurasian Business Forum "Green Energy & Waste Recycling Forum 2022", Nur Sultan, Kazakhstan
- **July 5-15** – High-Level Political Forum on Sustainable Development, New York, USA

August

- **August 8-11** – Asia Water Forum 2022, online
- **August 8-12** – Virtual Conference on Rural and Agricultural Development in the Digital Age, online
- **August 12** – Day of the Caspian Sea
- **August 23-September 1** – World Water Week, Stockholm, Sweden

September

- **September 6-8** – The Green Expo 2022: 28th International Environmental Technology Expo and Conference, Mexico City, Mexico
- **September 11-15** – IWA World Water Congress & Exhibition, Copenhagen, Denmark
- **September 13-15** – ECWATECH 2022, Moscow, Russia
- **September 19** – World Cleanup Day
- **September 27** – First Steering Committee Meeting of the National Policy Dialogue on Integrated Water Resources Management in Uzbekistan, Tashkent, Uzbekistan
- **September 27-29** – WETEX&DSS 2022: 24th exhibition on water, energy technology and environment, Dubai, UAE
- **September 29** – World Maritime Day

October

- **October 3-10** – 24th ICID International Congress on Irrigation and Drainage and 73rd International Executive Council Meeting, Adelaide, Australia
- **October 5-6** – International Scientific-Practical Conference "Water Security – the Basis for Sustainable Development", Dushanbe, Tajikistan
- **October 5-7** – The Ninth "Environment for Europe" Ministerial Conference, Nicosia, Cyprus
- **October 6-7** – Sixth North and Central Asia Multi-Stakeholder Forum on Implementation of the Sustainable Development Goals, Almaty, Kazakhstan
- **October 9-13** – IDA 2022 World Congress, Sydney, Australia

- **October 11-12** – 4th Berlin Climate and Security Conference, online
- **October 15** – International Day of Rural Women
- **October 16-19** – Cairo Water Week, Cairo, Egypt
- **October 17-18** – Global Workshop on Water, Agriculture and Climate Change, Geneva, Switzerland
- **October 17-21** – International Week of Innovative Ideas 2022 "Green innovations for sustainable development" (InnoWeek.Uz-2022), Tashkent, Uzbekistan
- **October 19** – 13th Meeting of the Task Force on Water and Climate, Geneva, Switzerland, hybrid format
- **October 24-27** – Youth for Future: Regional Conference of Youth on Climate Change in Central Asia, Bishkek, Kyrgyzstan
- **October 26-27** – Conference on Water Resource Management for Achieving Food Security in Asia under Climate Change, online

November

- **November 2-3** – International Conference "Hydrodiplomacy: Building and Strengthening Transboundary Water Governance Institutions, Brussels, Belgium
- **November 7-9** – Strengthening Collaboration among Science Networks in Asia and the Pacific Meeting, Jakarta, Indonesia
- **November 7-13** – International Week of Science and Peace
- **November 7-18** – Climate Change Conference – COP27, Sharm El-Sheikh, Egypt
- **November 10** – World Science Day for Peace and Development
- **November 16-17** – SPECA 2022 Economic Forum "Greener and safer future", Almaty, Kazakhstan
- **November 17** – International Conference "Impact of Global Warming on Central Asia: Country Assessments and Approaches and Regional Cooperation Prospects", Tashkent, Uzbekistan
- **November 17-18** – 11th All-Russian Scientific-Practical Conference "Rivers of Siberia and the Far East: Preservation of River Ecosystems in Global Change Age", Khabarovsk, Russia
- **November 22** – 83rd meeting of ICWC Central Asia, Ashgabat, Turkmenistan
- **November 22-24** – Korean International Water Week "Sustainable Water Management for Human and Nature", Daegu, South Korea

December

- **December 2** – High-Level Central Asian Dialogue on Climate Change and Resilience, Tashkent, Uzbekistan
- **December 5** – World Soil Day
- **December 6-12** – UN-Water Summit on Groundwater 2022, Paris, France

- **December 7-19** – Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity, Montreal, Canada
- **December 10-11** – 9th General Assembly of the WWC, Paris, France
- **December 11** – International Mountain Day
- **December 12-13** – 7th Meeting of the Task Force on Water-Energy-Food-Ecosystems Nexus, Geneva, Switzerland, hybrid format
- **December 13** – Central Asian Youth Session "Youth for Youth: Sustainable Development and Innovation", Almaty, Kazakhstan, online
- **December 16** – International Young Scientist Forum "A way to the green Aral Sea: innovation and cooperation", Nukus, Republic of Karakalpakstan
- **December 21-22** – Central Asian Regional Dialogue under the Transformative Futures for Water Security Initiative, Tashkent, Uzbekistan, hybrid format

Major Events in Central Asia

International Central Asian Science-to-Practice Conference "30-years of Water Cooperation among the Central Asian States: Facing the Future", April 26-27, Turkistan, Kazakhstan

The aim of the Conference was to sum up 30 years of ICWC activity in water resources management and related development of interstate cooperation in Central Asia. The Conference brought together about 120 representatives of concerned ministries and departments from the five Central Asian states, executive bodies of ICWC, EC IFAS, as well as water professionals and experts, academia, researchers, students, as well as representatives of international organizations.

The Conference agenda consisted of a plenary session and 4 roundtables: (1) transboundary water cooperation among the Central Asian countries: lessons and next steps, (2) water saving and sound water use in the context of climate change. Aquatic ecosystems: the current state and needs, (3) science and innovations for water security (dedicated to the memory of Prof. V. Dukhovniy), and (4) water future in Central Asia: diversity of opinions.

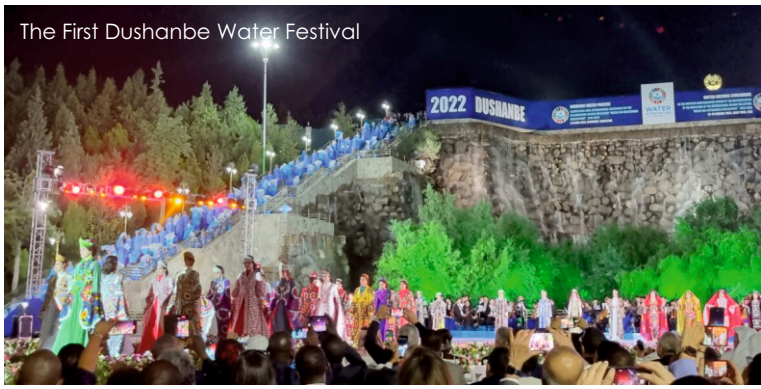
The Conference adopted the Joint Statement by the heads of water agencies of the Central Asian countries and the final Resolution.

Second International High-Level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028[1], June 6-9, Dushanbe, Tajikistan

The Conference entitled "Catalyzing water action and partnership at the local, national, regional and global levels" was held as part of the Dushanbe Water Process. 75 country delegations and more than 100 regional and international organizations, including UN agencies, financing institutions, basin organizations, academia, civil society and the private sector took part in the event.

The Conference agenda was comprised of the plenary session and 12 thematic panels: (1) Increasing water-health nexus to respond to the challenges of the post-COVID world; (2) Promoting IWRM, water efficiency and valuing water; (3) Promoting nature-based water solutions, water quality and ecosystems; (4) Accelerating access to safe WASH conditions, leaving no-one behind; (5) Transboundary water co-operation for economic growth and sustainability; (6) Resilient infrastructure and disaster risk reduction; (7) Advancing water sustainability in urban and rural areas; (8) Accelerating the water-energy-food nexus in post-COVID recovery; (9) Water resources and climate: reinforcing the interlinkages; (10) Improving knowledge, education and communication; (11) Moving out of the water box and promoting cooperation at all levels; (12) Promoting science-based water solutions, tools and technology. The outcomes of the panels were presented at the final session and in a Final Declaration "From Dushanbe 2022 to New York 2023".

Five forums were convened during the Conference: (1) Regional Forum on Water Cooperation in Central Asia co-organized by the EC IFAS and WB in partnership with CAWEP, EU, Switzerland, USAID, GIZ and RECCA; (2) Women Water Forum: Equality, Diversity and Inclusion: Water Unites Us organized by Royal Academy of Sciences for International Trust (RASIT) in cooperation with OSCE, based on the outcomes of the 7th International Women and Girls in Science Day[2]; (3) Youth and Children's Water Forum organized by UNICEF together with EC IFAS, MEWR, WMO, CYS, WYN, WYPW, CAY4W to mobilize children and youth in discussions of possible solutions on water and equal access to it; (4) Indigenous Peoples and Local Communities Forum co-organized by UNDP and UNESCO; (5) Forum on Water and Mountains: Towards Sustainable Development co-organized by UNESCO and UNRCCA (June 6). The outcomes of the Forums were presented at the plenary session.



The First Dushanbe Water Festival

The Conference also offered: (1) the international exhibition "Water for Sustainable Development"; (2) the Water Festival aimed to increase public awareness about the value of water as a vital resource, the careful attitude to water and its conservation for future generations; (3) International marathon with the motto "Water for Sustainable Development"[3], which was to to draw attention of the world community to emerging and existential water challenges, motivate and call for action, mobilize efforts to achieve real change on the ground, as well as promote the Water Decade and the UN 2023 Water Conference.

Youth and Children's Water Forum

[1] First International High-Level Conference was held in Dushanbe on June 20-21, 2018

[2] UNGA declared February 11 as the International Women and Girls in Science Day (A/RES/70/212)

[3] As part of the Global water marathons #RUN BLUE which started on March 22, 2022 on the World Water Day in Australia. 200 marathons involve over 200 million people. The campaign will end on March 22, 2023 on the eve of the UN Water Conference in New York, https://www.youtube.com/watch?v=f0p99_yHJ4w

Youth for Future: Regional Conference of Youth on Climate Change in Central Asia, October 24-27, Bishkek, Kyrgyzstan

The Conference[4] aimed to raise awareness on challenges caused by climate change in Central Asia, including its security implications. The Conference brought together over 50 participants from Central Asia, Afghanistan and Germany.

The agenda included thematic sessions, discussions in plenary and working groups, simulation games, scenario-setting activities, and field visits.

At the conclusion of the conference, participants agreed on a youth statement that reveals the readiness and enthusiasm of young people to act together in combating climate change and adapting to it.

High-Level Central Asian Dialogue on Climate Change and Resilience, December 2, Tashkent, Uzbekistan

The High-Level Central Asian Dialogue entitled "From global knowledge to local solutions: climate resilient institutions in Central Asia" was organized by UNDP jointly with GIZ and in cooperation with Uzhydromet, the Ministry of Foreign Affairs, the Ministry of Agriculture, and the Ministry of Water Management.

More than 120 delegates from five CA countries were engaged in the dialogue.

The Agenda included four sessions on actions to build resilience to climate change and natural disasters in CA, water-energy-food and health nexus approach to achieve SDGs, regional cooperation, and discussion and summary.

The dialogue demonstrated climate policies of the CA states in the context of climate risks and addressed changes in the long-term vision of resilience to climate change and natural disasters through comprehensive climate actions.

Фото: UNDP Uzbekistan

[4] https://www.facebook.com/watch/?v=556066016325542

Fifth Central Asian Expert Forum "Current aspects of regional cooperation on climate change, water use, food security and information and communication technologies in the Central Asian region", December 10, Ashgabat, Turkmenistan

The Forum[5] was organized the Scientific Center for Strategic Studies at the Institute of International Relations (IIR) MFA of Turkmenistan with the assistance of UNRCCA.

The event was attended by heads and experts of the Institutes for Strategic Studies of the CA states, heads and representatives of diplomatic missions, UNRCCA, faculty and students of the IIR MFA, and media.

The goal was to discuss topical issues of regional cooperation, development of common strategic approaches, practical proposals and recommendations for the regional governments in agreed areas.

The Forum consisted of three sessions on cooperation in combating climate change in Central Asia in the light of the decisions of the UN Framework Convention on Climate Change (UNFCCC) and water cooperation in the Aral Sea Basin, food security in the Central Asian region, and problems of ensuring ICT security.

[5] The Forum, initiated together with UNRCCA in 2018, serves as a platform for leading CA think-tanks to discuss the most pressing issues on the regional agenda to widen regional cooperation in key areas

SECTION 2

Situation in Water in the Aral Sea Basin

2.1. Water in the Amu Darya and Syr Darya River Basins

Water Resources

In 2022, the total annual flow in the basins of the Amu Darya and the Syr Darya was 108.43 km^3 or 92% of average long-term annual flow.

Amu Darya Basin

The annual flow in the basin (Amu Darya and Zeravshan rivers) was 68.7 km^3, including 54.4 km^3 at Kerki site of the Amu Darya River (upstream of diversion to the Garagumdarya Canal). The water content of the Amu Darya was estimated at 96% of the norm in the first quarter, 88% in the growing season, and 76% in October-December.

In total, 12.82 km^3 of water were accumulated in Nurek and Tuyamuyun reservoirs by January 2022.

Syr Darya Basin

The annual flow in the basin, including the Naryn, Karadarya, Chirchik and small rivers, equaled 39.73 km^3, of which 23.06 km^3 was the total inflow into three reservoirs, such as Toktogul, Andizhan, and Charvak.

By January 2022, the total accumulation by basin's reservoirs was 17.01 km^3, including 11.58 km^3 in the key reservoirs (Toktogul, Andizhan, and Charvak) located in the flow formation zone.

Operation of Reservoir Hydrosystems

The annual inflow into the Nurek reservoir was 20.87 km^3, including 16.4 km^3 or 79% of annual inflow in the growing season. Water releases from the reservoir equaled 20.86 km^3/year, of which 13.03 km^3 of water were discharged during the growing season.

Because of low flow in the Panj River[6], the annual inflow into the Tuyamuyun reservoir was 18.14 km^3 only or by 5.14 km^3 lower than the forecast. During the growing season the inflow was 12.82 km^3. Annual water releases from the reservoir equaled 17.26 km^3 or 80% of the value planned by the BWO Amu Darya. Accordingly, the discharge of water from the reservoir made up 12.97 km^3 or 79% in the growing season.

The annual inflow into the Toktogul reservoir located on the Naryn River was 13.27 km^3, including 10.43 km^3 (79% of annual inflow) during the growing season. Annual water releases from the reservoir amounted to 12.31 km^3, including 4.68 km^3 (38%) during the growing season. The Toktogul reservoir was filled by 0.96 km^3 and its storage reached 11.06 km^3 by the end of the year.

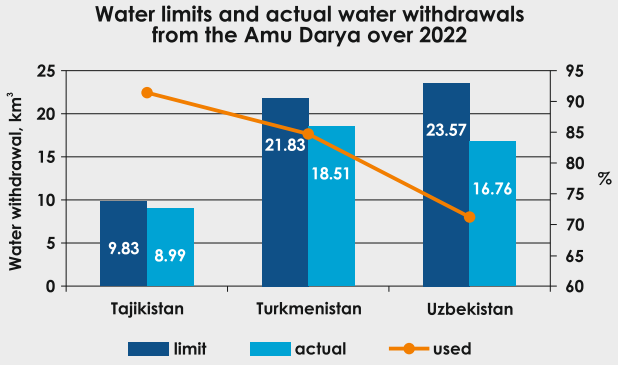
Water Allocation and Water Scarcity

The allocation of water resources between the countries in the basins of the Amu Darya and the Syr Darya (allocation of water withdrawal quotas) is provided by ICWC on a hydrological year basis, i.e. for a period from October to September. Below we show the analysis of water allocation for a calendar year (January-December).

Amu Darya Basin

In 2022, with the limit of water withdrawal from the Amu Darya Basin set at 55.23 km^3, 44.26 km^3 were diverted in fact (31.38 km^3 during the growing season). Thus, 80% of the annual water limit was used, including 79% – in the growing season. Water was allocated between the riparian states as follows:

- **Tajikistan** – with the water limit of 9.83 km^3, the actual water withdrawal was 8.99 km^3;
- **Turkmenistan** – with the water limit of 21.83 km^3, the actual water withdrawal was 18.51 km^3;
- **Uzbekistan** – with the water limit of 23.57 km^3, the actual water withdrawal was 16.76 km^3.



It was estimated in the growing season that water scarcity in the river reach from the Nurek hydropower plant to the Tuyamuyun reservoir (Darganata site) reached 5% for Tajikistan, 7% for Turkmenistan, and 17% for Uzbekistan. Turkmenistan and Uzbekistan received 36% and 41%, respectively, less water than required in the reach from Darganata site to Samanbay site. Increasing water scarcity along the river during the growing season is explained by its unequal distribution over the territory.

Syr Darya Basin

The total water withdrawal in the Syr Darya Basin (up to entry point to the Shardara reservoir) amounted to 13.83 km^3, including 10.17 km^3 during the growing season or 86% of the established limit of water withdrawal into canals. No water was discharged from the Syr Darya into Arnasay.

[6] Lower flow along the Panj River can be explained by the increased water diversion by Afghanistan, improper accounting of water along the main course of the Amu Darya or inaccurate estimation of river flow losses. Thus, thorough examination is needed to find the exact causes of such lowering

86% of the water allocation plan set by the BWO Syr Darya was fulfilled. The water scarcity in the reach from the Toktogul reservoir to the Chardara reservoir was estimated at 8% for Tajikistan, 36% for Kyrgyzstan, and 22% and 12% for Kazakhstan and Uzbekistan, respectively. Higher water scarcity observed in Kyrgyzstan is because of its water needs exceeding the allocated water limit.

Inflow into the Aral Sea Region

According to the Kazakhstan's Committee for Water Resources, in 2022, inflow into the Northern Aral Sea from the Syr Darya was 0.82 km^3. No water was discharged from the Northern Sea into the Large Aral Sea (Eastern body).

Based on SIC's estimates, the South Aral region is supposed to get 8 km^3 from the Amu Darya River in average and wet years and 3.5 km^3 in dry years. In fact, 2.06 km^3 of water was delivered to the South Aral region in 2022.

Meeting the Demands

The table below shows how water demands were met for the CA countries during the growing season.

CA countries	Meeting water demands in growing season, %	
	Amu Darya	Syr Darya
Kazakhstan	–	78
Kyrgyzstan	–	64
Tajikistan	95	82
Turkmenistan	83	–
Uzbekistan	69	88

Source: SIC ICWC using the data from BWO Amu Darya and the BWO Syr Darya

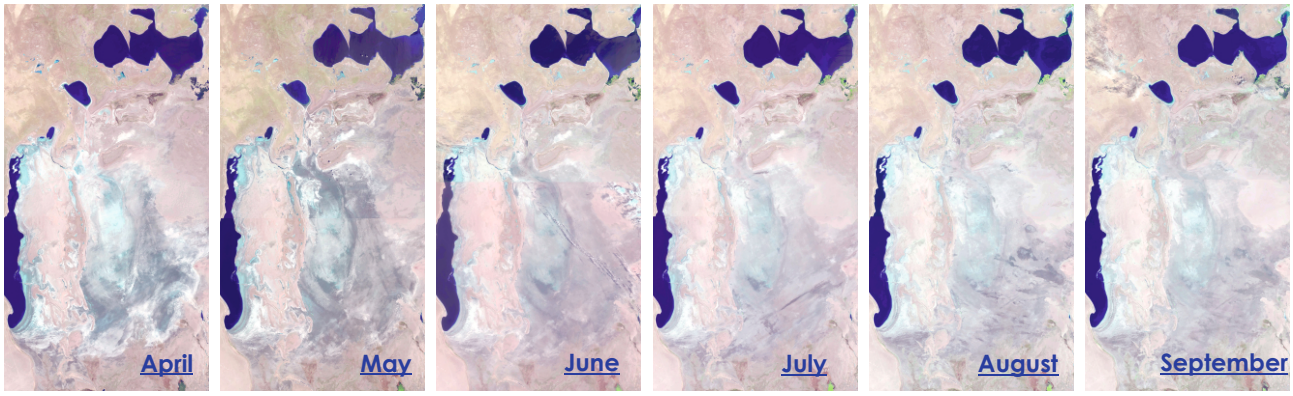
2.2. Large Aral Sea and the Amu Darya Delta

This Section was prepared using the data of the BWO Amu Darya, the Aral Sea Region Delta Authority, and the Uzbek Hydrometeorological Service (UzHydromet) and based on RS-monitoring of Eastern and Western bodies of the Large Aral Sea (LAS) and the lake systems in the Amu Darya River delta using Landsat 8 OLI images (http://cawater-info.net/aral/data/monitoring_amu.htm).

Since 2022, NDVI with the refined threshold values has being used for satellite imagery analysis to identify three surface categories: (1) open water surface, (2) wetland, (3) dryland. Until 2022, the total area of a water body has been determined as the sum of open water surface and wetland areas. However, the problem of detecting wetlands, i.e. the possibility to distinguish them from dry, degraded land, remained open.

The information for 2021 and 2022 on http://cawater-info.net/aral/data/index.htm was updated using the improved methodology. Thus, some differences can be found when making comparison with the data in the past years.

Figure 1. Satellite images of Western and Eastern bodies of the Large Aral Sea, *Landsat 8 OLI (2022)*

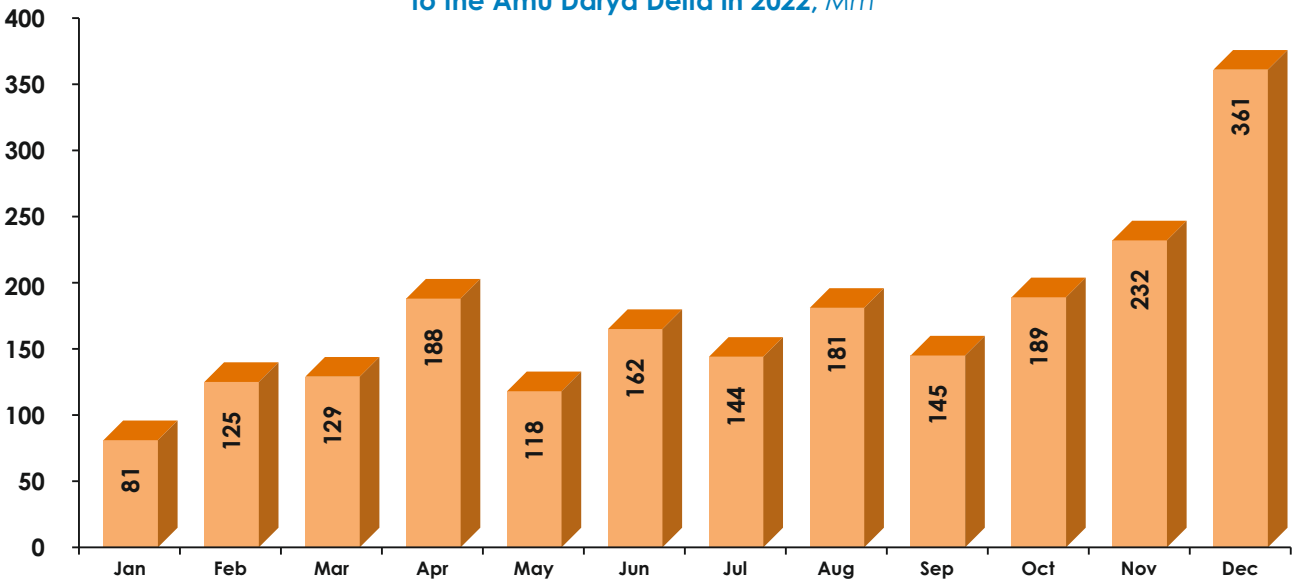


2.2.1. Water Supply to the Amu Darya Delta and the Large Aral Sea

Water Supply to the Amu Darya Delta

According to BWO Amu Darya, in 2022, 2,055 Mm^3 of water (flow from the river and water discharged from canals and collecting drains) reached the Amu Darya delta. This is by 451 Mm^3 more than in 2021.

Figure 2. Dynamics of total water supply to the Amu Darya Delta in 2022, *Mm³*



Source: BWO Amu Darya

Flow from the Main South-Karakalpak collecting drain to the exposed bed of the Large Aral Sea

Bypassing the Amu Darya Delta, 503.5 Mm³ of collector-drainage water flowed towards the exposed bed of the Large Aral Sea from the Main South-Karakalpak (Right-bank) collecting drain (Table 1). This is by 36.15 Mm³ more than in 2021 (467.35 Mm³).

Table 1. Flow from the Main South-Karakalpak collecting drain to the exposed bed of the Large Aral Sea in 2022, *Mm³*

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2022
23	25	31	51.5	54.5	52.5	43.5	42.5	48.5	50.5	45	36	**503.5**

Source: Aral Sea Region Delta Administration at the Ministry of Water Management of Karakalpakstan

Total inflow into the Large Aral Sea

In 2022, the total inflow into the Large Aral Sea (LAS) decreased from 650.35 Mm³ (2021) to 503.5 Mm³. The LAS got water from the Main South Karakalpak collecting drain (SKCD) only. No water was discharged from the Amu Darya River Delta and the Northern Aral Sea (NAS) (Table 2).

Table 2. Total inflow into LAS, *Mm³*

Year	Northern Aral Sea*		South Aral Region		Total discharge into LAS
	Total inflow into NAS from the Syr Darya, Karateren site	Discharge from NAS into LAS	Total inflow into the Amu Darya Delta	Discharge from the Amu Darya Delta into LAS, including flow from Main South Karakalpak coll.drain**	
2021	1196.88	183	1604	467.35	**650.35**
2022	816	0	2055	503.5	**503.5**

* Committee for Water Resources of the Republic of Karakalpakstan;
** Aral Sea Region Delta Administration at the Ministry of Water Management of Karakalpakstan

2.2.2. Open Water Surface and Wetlands in Eastern and Western Parts of the Large Aral Sea

As monitoring and GIS data for 2022 shows, (1) the water surface area in Western part of LAS slightly decreased from 220.0 to 211.8 thousand ha, while the wetland area shrank dramatically (from 284.6 to 9.8 thousand ha), and the dryland area extended 6 fold (from 56.6 to 339.6 thousand ha); (2) the water surface area in Eastern part of LAS decreased from 1.6 to 0.046 thousand ha, dropping to 0.025 thousand ha in July and increasing to 0.145 thousand ha in August. Wetlands shrank a lot from 1,292.38 to 6.1 thousand ha (Table 3).

Table 3. The area of wetlands and open water surface in the Western and Eastern parts of LAS, 2022

Date	Feb 16	Apr 29	May 23	Jun 8	Jul 18	Aug 27	Sep 20	Oct 6
Western part of the Large Aral Sea, ha								
Total area	**561350****							
Wetland	clouds	284,687	5,877	15,446	8,659	4,644	9,834	clouds
Water surface	clouds	220,020	219,193	218,914	216,255	214,563	211,891	clouds
Dryland*	clouds	56,643	336,280	326,990	336,436	342,143	339,625	clouds
Eastern part of the Large Aral Sea, ha								
Total area	**1496824****							
Wetland	clouds	1,292,357	clouds	clouds	5,173	3,845	6,108	clouds
Water surface	clouds	1,624	clouds	clouds	25.38	145	46	clouds
Dryland*	clouds	202,841	clouds	clouds	1,491,626	1,492,834	1,490,670	clouds

** bare soil, rare or dense vegetation*
*** taken as control as of 2016 (Monograph "Aral Sea and the Aral Sea Region". UNESCO, "Complex Print", Tashkent, 2020, http://cawater-info.net/library/rus/aral-sic-icwc-2020.pdf)*

Source: SIC ICWC using the GIS data derived from Landsat 8 OLI images, http://cawater-info.net/aral/data/monitoring_amu.htm

2.2.3. Lake Systems in the Amu Darya Delta

Lake systems in the Amu Darya delta are comprised of small local water bodies in the South Aral region. Overall, as compared to 2021, the hydrological situation deteriorated in 2022.

The actual water area of the lake systems accounted for 5 (February) to 1.5% (October) of the design area (353,644 ha). In the period from February to October, the open water surface area of the lake systems shrank from 23.6 to 6.2 thousand ha, while the area of wetlands, from 101.2 to 45.1 ha (Table 4). The supply of 2,055 Mm3 of water to the Amu Darya delta did not create favorable environment for fishery and ecosystem in such lakes as Sudoche, Rybache, Muynak and Djiltirbas.

The decreased inflow of water from collecting drains into local lakes in the South Aral region was caused by reduced supply of water to the delta of the Amu Darya (Figure 2) during the growing season (Table 5).

[7] According to SIC's research, the South Aral region should receive 8 km^3 of water from the Amu Darya in average and wet years and 3.5 km^3 in dry years (like in 2020) , http://cawater-info.net/biblio/Publicationview.php?KodItem=1179

Table 4. The area of open water surface, wetlands and dryland* within the lake systems in South Aral region in 2022[8], *ha*

Water body	TAWB*, ha	Feb 16			Mar 20			Apr 29			May 23			Jun 24			Jul 18			Aug 27			Sep 20			Oct 6	
		WS	WL	DL**	WS	WL	DL	WS	WL	DL	WS	WL	DL	WS	WL	DL	WS	WL	DL	WS	WL	DL	WS	WL	DL	WS	WL	DL
Sudoche	72,697	8,652	29,296	34,750	9,182	24,280	39,235	9,581	2,105	61,011	9,010	229	63,458	6,375.6	17,801	48,521	4,271	706.3	67,720	1,757	335	70,605	3,239	866	68,592	4,325.5	20,858	47,513
Mejdureche	37,784	3,598	8,374	25,812	2,825	4,638	30,322	1,789	2,769	33,227	1,389	30	36,365	899	331	36,554	597	22	37,165	1,501	22	36,261	1,785	48	35,952	1,528	2,100	34,156
Rybache	11,493	903	2,130	8,460	1,007	803	9,683	790	509	10,195	629	1	10,863	44	631	10,818	0	0.2	11,493	0	0	11,493	0.4	0	11,493	0.2	1,275	10,217
Muynak	16,164	324	3,212	12,629	259	2,733	13,172	36	1,514	14,613	24	3	16,137	7	102	16,055	3	1	16,160	3	0.5	16,161	5.3	3	16,156	5.3	729	15,430
Djiltyrbas, dam-terminated	47,472	7,341	13,575	26,556	7,739	11,425	28,309	5,948	7,184	34,340	4,813	402	42,258	1,618	6,049	39,806	1,286	103	46,083	845	32	46,596	322.2	21.7	47,128	213	5,517	41,743
Djiltyrbas (together with former right and left streams)	98,951	66	30,675	68,210	149	20,224	78,578	196	1,715	97,039	94	6	98,851	0	0	98,951	8	2.5	98,940	7	26.5	98,918	7.4	95	98,848	15	12,242	86,693
Dumalak	16,050	22	5,033	10,995	1	2,981	13,068	0.1	2,012	14,038	0	0	16,050	0	64	15,986	0	0	16,050	0	0	16,050	0	0	16,050	0	481	15,569
Makpalkul	8,684	2,195	1,429	5,059	1,576	1512	5,596	815	1,157	6,712	402	35	8,248	0	189	8,495	573	126	7,985	0	0	8,684	0.1	0	8,684	0	168	8,518
Mashan Karadjar	27,201	308	4,808	22,085	294	3,557	23,350	181	1,988	25,032	34	17	27,150	0.4	499	26,702	8	3	27,190	63	24	27,114	152.6	20	27,028	210	1,207	25,784
Water surface southward of Muynak	9,605	0.5	2,463	7,141	0	420	9,185	0.1	302	9,303	0	9,605	0	0	48	9,557	0	0	9,605	0	0	9,605	0	0.3	9,605	0	475	9,130
Water surface along Kazakhdarya river course	4,752	0	0	4,752	0	522	4,229	0	193	4,559	0	4,752	0	0	0	4,752	0	0	4,752	0	0	4,752	0	0	4,752	0	96	4,655
Zakirkol Lake	2,791	208.5	274	2,309	179	133	2,479	57.8	36	2,697	1	2,790	1	0	0	2,791	0	0	2,791	0	0	2,791	0	0	2,791	0	19	2,772
Total:	**353,644**	**23,618**	**101,269**	**228,758**	**23,211**	**73,228**	**257,206**	**19,394**	**21,484**	**312,766**	**16,396**	**17,870**	**319,381**	**8,944**	**25,714**	**318,988**	**6,746**	**964**	**345,934**	**4,176**	**440**	**349,030**	**5,512**	**1,054**	**347,079**	**6,297**	**45,167**	**302,180**

* *OTAWB – Total area of water body within the boundaries of water surface (WS) and wetlands (WL) of 2016 as mentioned in the "Aral Sea and the Aral Region" monograph*
** *DL – dryland*

[8] *Source: SIC ICWC using the GIS data derived from Landsat 8 OLI images, http://cawater-info.net/aral/data/monitoring_amu.htm*

Table 5. Inflow into local lakes in South Aral region during 2022, *Mm^3*

Water body	Inflow by month												Total over 2022
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Sudoche	13.85	14.61	22.61	29.59	27.09	30.62	26.02	31.13	34.96	30.88	21.23	19,95	**302.54**
Mejdureche	28.04	46.19	60.87	25.36	12.49	22.16	10.42	45.42	24.34	25.84	98.08	122.1	**521.31**
Djiltirbas	5.32	8.53	10.25	14.90	16.10	22.69	26.46	22.48	28.18	38.27	22.93	27.20	**243.31**

Source: Aral Sea Region Delta Administration at the Ministry of Water Management of Karakalpakstan

Conclusion

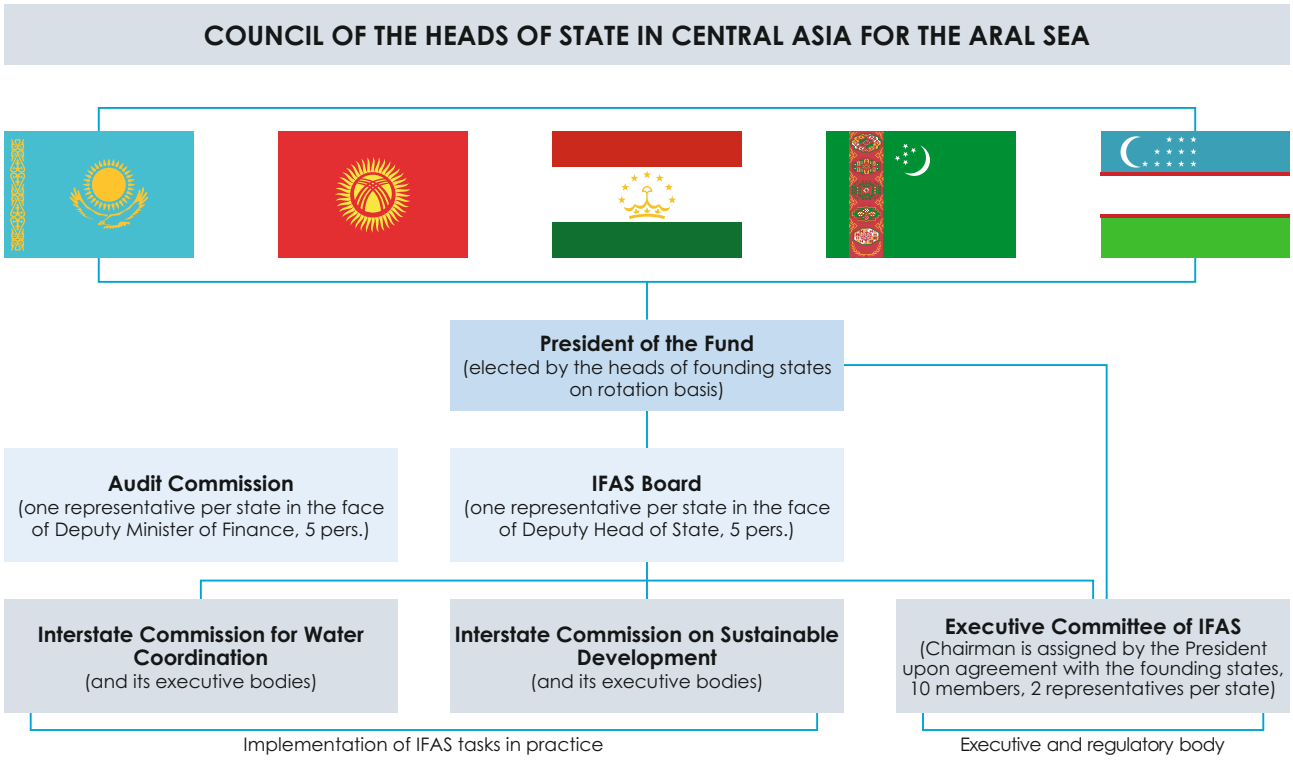
Despite the increased supply of water to the Amu Darya delta and discharge from SKCD as compared to 2021, inflow into LAS decreased in 2022. The areas of water surface and wetlands in Eastern and Western parts of LAS also shrank. Local lakes in the South Aral Region continue suffering from unstable water supply.

SECTION 3

IFAS and its Structural Organizations

3.1. International Fund for Saving the Aral Sea

The International Fund for Saving the Aral Sea (IFAS) was established by a decision of the Heads of CA states on the 4th of January 1993 with the aim of developing and funding environmental and applied research projects and programs in order to improve ecological situation in the areas affected by the Aral Sea catastrophe and address the socioeconomic issues in the region. The organizational setup of IFAS is shown below.



Tajikistan took over the IFAS chairmanship for the period of 2019-2022 in line with the decision of the Second Consultative Meeting of the Heads of CA States (November 29, Tashkent, Uzbekistan). The President of Tajikistan, Emomali Rahmon has been elected as the chairman of IFAS.

3.1.1. Implementation of initiatives of the Presidents of CA States voiced at XII Summit of the Heads of IFAS Founder-States

The Presidents of CA States had put forward important initiatives and proposals at XII Summit of the Founder-States, which was held in the city of Turkmenbashi on the 24th of August 2018. Following the Summit, a Joint Communiqué was adopted. Implementation of the initiatives in 2022 is discussed in the subsections of Executive Committee of IFAS and its National Branches, ICWC of Central Asia and Key Water Developments in the Countries of Central Asia.

3.1.2. IFAS Board

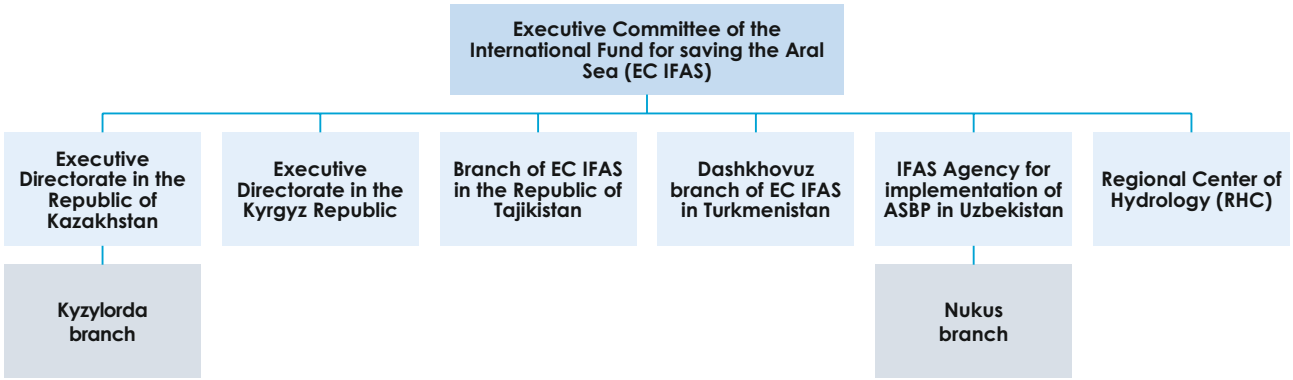
In 2022, 21st (February 22) and 22nd (November 28) **meetings of the IFAS Board** were held in Dushanbe. The following issues were addressed during the meetings: (1) interim results of EC IFAS activities in the period of the chairmanship of Tajikistan; (2) progress on implementation of the ASBP-4; (3) outcomes of the Working Group on Institutional and Legal Improvement of IFAS; (4) preparation of CA countries for the 9th WWF and participation of IFAS in the 2nd International High-Level Conference on the International Decade for Action

"Water for Sustainable Development", 2018-2028; (5) progress on preparation for the UN Water Conference to be held in March 2023 in New York; (6) preparation for the meeting of the Council of the Heads of the IFAS Founding-States in Dushanbe, scheduled for September 14-15, 2023. Members of the Board endorsed the Regional Environmental Program for Sustainable Development in Central Asia, as well as the plan and composition of the Organizing Committee for organization of events dedicated to 30th anniversary of IFAS.

3.2. Executive Committee of IFAS and its National Branches

3.2.1. Executive Committee of IFAS

The Executive Committee of the International Fund for Saving the Aral Sea (EC IFAS) was formed by a decision of the Interstate Council of July 13, 1993. It serves as a platform for dialogue between the CA countries and the international community.



Location of EC IFAS by Country and Year

On September 28, 2020, Mr. Sulton Rakhimzoda was appointed **the Chairman of EC IFAS** by the Decree of the President of IFAS, the President of the Republic of Tajikistan. In 2022, the Heads of IFAS Founding States made a decision at their 4th Consultative Meeting to extend the mandate of the current IFAS President to one year (July 21, Cholpon-Ata, Kyrgyz Republic).

Activity of EC IFAS in 2022

Institutional and legal improvement of IFAS. Activities of the Working Group (WG) on Institutional and Legal Improvement of IFAS continued in 2022. The WG met three times: online on January 27-28; in Almaty, Kazakhstan on June 23-24; and, in Tashkent, Uzbekistan on September 21-22. There were also online task meetings and bilateral consultations. By December 2022, the 2nd *stage* of work focused on "identification of challenges/shortcomings in functions and tasks of IFAS' organizations" was *completed*. The ongoing 3rd *stage* of work is focused on more precise definition of functions of existing and newly established organizations and on reaching agreement on goals and tasks/subtasks of IFAS. Discussions were *initiated on the 4th stage* of work aimed at developing and aligning proposals on the improvement of financing of IFAS governance. EC IFAS reported on WG's activities at the meetings of the IFAS Board.

ASBP-4 was developed in line with the decision of the IFAS Board of January 30, 2018 and approved by the decision of June 29, 2021. The Program consists of the following four focus areas: (1) integrated use of water resources; (2) environmental; (3) socio-economic; (4) improvement of institutional and legal mechanisms. The Program is to be implemented over 2020-2030. The matters related to implementation of programs and projects under ASBP-4 and how to enhance monitoring and coordination of activities of development partners within the framework of ASBP-4 were addressed repeatedly at different events and meetings (see Events).

Events. EC IFAS **organized**: (1) the expedition of young CA scientists extending from the source of the Syr Darya River to the Aral Sea (May 19-31); (2) second and third coordination meetings of EC IFAS with international development partners, where implementation of development projects on ASBP-4 topics and progress on legal and institutional improvement of IFAS were presented; (3) regional workshop "Central Asia towards the UN 2023 Water Conference" (September 20, Tashkent).

In the course of the year, EC IFAS **took part** in a number of global and regional events, including, but not limited to: 2nd Asian International Water Week "Sustainable, clean and sufficient water for all" (March 13-16, online); 9th WWF, where EC IFAS organized the pavilion dedicated to the Aral Sea Basin and a special session entitled "Cooperation of the Central Asian countries to ensure water security in the context of climate change" (Dakar, Senegal); International Central Asian Conference "30-years of Water Cooperation among the Central Asian States: Facing the Future" (Turkistan, Kazakhstan); World Water Week "Seeing the Unseen: The Value of Water", as part of which the Executive Committee organized its booth and a special session "Seeing the unseen: The value of water in development of regional cooperation in Central Asia" (August 31) and had meetings with the Chief of ADB's Water Sector Group, Ms. Neeta Pokhrel (August 29), Rector of IHE-UNESCO Institute in Delft, Mr. Eddy Moors, and the Global Director for the World Bank Group's Water Global Practice, Mr. Saroj Kumar Jha (September 1); the United Nations Climate Change Conference COP27, where representatives of the Executive Committee participated in the: session "Bottom-up approaches to building resilience, adaptive capacity, and financing in water in Asia and the Pacific" (November 8), Eighth meeting of representatives of the ministries of foreign affairs and parliamentarians of the countries of Central Asia "On the way to regional coherence and cooperation of the Central Asian countries in climate policy, finance and implementation of Nationally Determined Contributions (NDCs)" (November 9), met with the Director for Environment, Natural Resources & Agriculture of the ADB's Central and Western Asia Department, Ms. Yasmin Siddiqi (November 10), and organized, together with the Tajik Ministry of Energy and Water Resources, a session entitled "Development of water cooperation between the countries of Central Asia in the context of climate change" (November 14).

At EC IFAS office, chairman Mr. Sulton Rakhimzoda **had meetings** with high-level representatives of the High Level Panel of Experts and Leaders on Water and Natural Disasters (January 18); UNECE (April 6, November 2); World Bank's Central Asian Water and Energy Program (May 17); State Water Committee of Turkmenistan (June 7); Ministry of Foreign Affairs of the Kyrgyz Republic (June 8); OSCE (August 17); UNDP (August 23); GIZ (August 24); and many others.

Source: https://ecifas-tj.org/, https://pt-br.facebook.com/ec.ifas/?ref=page_internal

3.2.2. Regional Center of Hydrology

The Regional Center of Hydrology (RCH) at EC IFAS was established on the 23rd of August 2002 in line with a decision of the IFAS Board to improve the system of hydrometeorological forecasts, environmental monitoring and data exchange between the national hydrometeorological services in the region.

3.2.3. Executive Directorate of IFAS in Kazakhstan

ED IFAS renders assistance in addressing topical issues and coordinating measures to improve water-related, socio-economic and environmental situation in the Kazakhstani part of the Aral Sea basin. The focus areas of its activity and actions are aligned with those of EC IFAS and the ongoing operations are coordinated with the authorized representatives of Kazakhstan in EC IFAS.

Activity in 2022

Projects. Continued grant projects[9] on the **Kazakhstani part of ASB**:

- North Aral Sea Development and Revitalization Project (WB and Government of RK, Kazakhstani part of the Aral Sea Region and Kyzylorda province): the feasibility study developed with the involvement of the Iranian consulting company "Yekom Consulting Engineers" and the Kazgiprovodkhoz Design Institute is to be finalized in April 2023;

- "Environmental Restoration of the Aral Sea"[10] (USAID, $430 thousand) aimed at introducing innovative measures to create an "Oasis" (500 ha) using black saxaul in the Northern Aral Sea zone. To maintain the Oasis, a carbon certificate will be issued for the next 20 years;

- "Complex research assessment of natural and environmental criteria of the Kazakhstani part of the Aral Sea dried bottom (ASDB) using modern technologies of remote sensing and GIS in combination with

[9] more detailed information on the project for 2022 is available on https://kazaral.org/

[10] within the framework of the USAID Regional Water and Vulnerable Environment (WAVE) Activity

ground work"[11]: based on field research (the route covered 2.5 thousand km and 87 key sites for detailed hydrological, soil and geobotanic studies), the Kazakhstani part of ASDB was fully mapped; the generated maps included: GIS-maps of climate characteristics, soil and prevailing formation rock maps, thematic hydrological map indicating levels and salinity of the nearest groundwater sites, and environmental risk zone maps;

- "Research of highly profitable and less moisture-intensive crops in the Aral Sea Region"[12] as part of the international project "Central Asia Sustainable Innovation Bureau (CASIB)" of the Berlin Initiative "Green Central Asia";

- "Studying interdependencies between climate change and degradation of land and water resources in the Aral Sea region" (UNDP Kazakhstan, $50 thousand) aimed at supporting concerned government agencies and departments in preparation of research of climate change, land degradation and water resources in the Kazakhstani part of ASB and development of recommendations for adaptation;

- "From environmental crisis to restoration of prosperity in the Aral Sea region" under the contract with the Regional Center for Ecology and Protection of People's Health in the Aral Sea Region: laboratory analysis of land, water and air are conducted in seven districts of Kyzylorda province; health conditions and harmful effect of environmental disaster on people's health are monitored regularly.

A project proposal entitled "Development of oasis irrigation systems in desert territories of the Kazakhstani part of the Aral Sea region" (on the basis of a demonstration site in Kazalinsk district, Kyzylorga province) was submitted to the Embassy of Germany.

Events. ED IFAS took part in: (1) the roundtable entitled "Challenges and prospects of efficient water use in Kazakhstan and Central Asia: developing the international legal framework of cooperation" (April 22); (2) celebrations of the Aral Sea Day (March 26, Aralsk), the Syr Darya Day (August 23-24) and the International Day of the World Wildlife Fund (September 11, Aralsk); (3) a regional workshop on safety of hydraulic structures in Central Asia (30 November-December 1, Almaty); (4) an expedition from the flow formation zone of the Syr Darya River to the Aral Sea (November 13-17); (5) research expedition[13] to the Northern Aral Sea area in Kyzylorda oblast to study the potential of environmentally safe and sustainable breeding of artemia and other aquaculture (September 19-23); (6) field trip to the Aral district of Kyzylorda oblast (October 21-22). ED IFAS organized an international scientific-practical conference "Environment and Health of Communities in the Aral Sea Region" (October 20, Kyzylorda) and the UNESCO field mission to the Barsakelmes State Nature Reserve to assess the nomination of "Turan Deserts" for the status of the UNESCO World Natural and Cultural Heritage (November 13-17).

Regional and international cooperation. ED IFAS maintains cooperation with international partners, local authorities, NGOs, academia and research institutes in implementation of projects under ASBP-4 and provides expertise for the improvement of IFAS activity.

Since 2020, the Executive Directorate has been contributing to activities of IWAC in Kazakhstan.

ED IFAS in Kazakhstan signed (1) a memorandum of cooperation on the development of water supply and sanitation and construction of a plant for the production of polyethylene pipes for drip irrigation with the Korean consulting company BLE Co., Ltd. (February 28); (2) a MoU with the Kazakhstan International Development Agency (KazAID) (June 30).

Media. Representatives of ED IFAS gave the interview on the topical issues in the Kazakhstani part of ASB (November 6) and took part in discussion of environmental matters on TV "Habar" (November 18).

Source: ED IFAS in RK, https://kazaral.org/

3.2.4. Agency for Implementation of IFAS Projects in Uzbekistan

The GEF Agency of IFAS established in 1998 is a working body of IFAS. It has the status of international organization and accreditation at the MFA of Uzbekistan as a representative body of EC IFAS in Uzbekistan.

Activity in 2022 was in line with the financing plan for actions aimed at elimination of the environmental catastrophe of the Aral Sea, comprehensive socio-economic development in the Aral Sea region and assistance to ASB countries for 2022-2024 (Governmental Decree of 07.02.2022).

Projects in the Aral Sea region are implemented jointly with the Nukus branch of EC IFAS. By the end of 2022, the total amount of financing (from the public budget and the Investment Fund for Development of Uzbekistan – as a contribution to IFAS) amounted to **66.45 billion Soum** (about **$6.0 million**). The grant funds from donors accounted for **$1.2 million** from

[11] as part of the GIZ regional project "Ecologically Oriented Regional Development in the Aral Sea Region" (ECO-ARAL), http://kazaral.org/wp-content/uploads/2021/07/200118-ECO-ARAL-factsheet-EN.pdf

[12] entitled "Kendirtex"

[13] as part of the GIZ regional project "Ecologically Oriented Regional Development in the Aral Sea Region" (ECO-ARAL)

SDC, **€10.9 thousand** and **$26.5 thousand** from GWP, and **€15 thousand** of OSCE's support.

Key ongoing projects:

- "Construction of small local water bodies in the Amu Darya Delta. Phase II": (1) "Reconstruction of the Muynak Canal" – the work on reconstruction of 21.3 km of earthen channel and construction of 3 km of a new section to increase canal's capacity from 25 to 44 m^3/s is to be completed in the first half of 2023; (2) "Reconstruction of a road dam around Maipost Lake and construction of a spillway structure on the Amu Darya River (Akdarya) and measures to prevent canyon formation processes in Domalak Lake" (re-estimated cost – 460.5 billion Soum) – construction of the road dam (10.6 km) and a spillway structure to pass 1,250 m^3/s into the Amu Darya main is to be completed by the end of 2023[14];

- Afforestation: (1) "Protective afforestation in Akhantai site" – on an area of 11,660 ha, 20 km northeastward from the Muynak city; (2) "Protective afforestation in Akkum ridge" – on an area of 2,082 ha northward of the Sudoche lake system;

- National Water Resources Management Project in Uzbekistan, Phase-2 (2020-2023, SDC grant, project site – 13 BISAs, 13 land reclamation field offices, 48 ISAs, and 155 district irrigation divisions): a draft of the Water Code of Uzbekistan have been prepared as part of work of the Interdepartmental Working Group; 13 demonstration sites were organized in farms, online trainings in software-based water use scheduling and webinars on water conservation technologies were conducted; demonstration polygons and laboratories on water conservation technologies were established in 9 professional colleges; users of the TOMCHI mobile application increased to 5 thousand;

- "Monitoring of biodiversity of wetlands in the South Aral Region" (together with the Karakalpak Natural Science Institute under OSCE's support): in the course of two field expeditions, the risk assessment for wetlands in the South Aral region was made and relevant recommendations were developed.

Cooperation through regional projects. The Agency actively cooperates with a number of international projects implemented in ASB, with the financial support of international agencies and banks. The cooperation is focused on exchanges of information and ideas with the teams of such projects.

Formation of an oasis in the Kazakhstani part of the Aral Sea dried bed is continued under the USAID Regional Water and Vulnerable Environment Activity (WAVE) (October 2020 – September 2025, $24.5 million). The Agency of IFAS contributed to the subproject "Training for Government Officials from Central Asia on Water-Energy-Food-Ecosystems Nexus"[15].

The Agency of IFAS (1) contributed[16] to the "Ecologically Oriented Regional Development in the Aral Sea Project"/ECO-ARAL (2021-2024, GIZ) and the "Development of Innovative Climate Resilient Technologies for Monitoring and Controlling of Water Use Efficiency and Impact of Salinization on Crop Productivity and Livelihood in Aral Sea region" (2021-2025, JICA); (2) developed the rationale for the project "Conservation and sustainable management of lakes, wetlands, and riparian corridors as pillars of a resilient and land degradation neutral Aral basin landscape supporting sustainable livelihoods" (2022-2026, UNDP-GEF, $3,552,968), Component I. "Coordinated water resources management as a basis for achieving land degradation neutrality and biodiversity conservation"; (3) presented the information on the current situation in water in the Aral Sea region for "Water, Agriculture and Forestry Development in Northern Karakalpakstan" and "Climate Adaptation and Mitigation Program for Aral Sea Basin"/ CAMP4ASB (WB).

Activities in support of IFAS. The GEF Agency of IFAS took part in briefings and coordination meetings of EC IFAS and its organizations, as well as in activities of the working group on institutional and legal improvement of IFAS (see details in EC IFAS).

Political and civil engagement. The GEF Agency of IFAS took part in (1) 6 meetings of the Uzbek Parliament's Senate Committee on the Aral Sea region development and ecology[17]; (2) meetings of the Community Council at the State Environmental Committee of Uzbekistan; (3) activity of the Ecological Party of Uzbekistan[18] and the Ecological Movement of Uzbekistan.

During the year, at the request of ministries and agencies, the GEF Agency of IFAS prepared proposals and analytical materials on the improvement of regional cooperation in water sharing in ASB, situation in water in the Aral Sea region, transboundary water cooperation, water-energy issues, situation around water use in Afghanistan, etc.

International cooperation. The GEF Agency of IFAS cooperated with the Uzbek branch of SIC ICSD; KOICA and GGGI on the "Green Rehabilitation Investment Project for Karakalpakstan Republic to address impacts of the Aral Sea crisis"; ADB and CAREC in preparation of the Water Pillar under the 2030 CAREC Strategy, etc.

In support of the Global Water Partnership (**GWP**), the GEF Agency of IFAS provides administrative management and facilitates implementation of the annual

[14] given the additional money from the Fund for development and reconstruction of the Republic of Uzbekistan allocated in line with Presidential decree of 31.08.2022

[15] the DKU-coordinated Project started on 2 December 2021

[16] the Head of GEF Agency of IFAS, Mr. V. Sokolov is a member of the Steering Committee

[17] Mr. V. Sokolov is a Deputy Chairman of the Committee's Expert Council

[18] Mr. V. Sokolov is a member of the Executive Committee

work program of the National Water Partnership of Uzbekistan. In particular, the following events were organized: (1) (1) international workshop within the framework of the Future DAMS project in Central Asia: application of Python Water Resources ("Pywr") model in CA for technical assessment of water and energy solutions (March 28); (2) a workshop for discussion of the impact of drought on agriculture and other spheres of activity (April); (3) a workshop for incorporation of IWRM principles in development of the National Water Strategy of Uzbekistan for 2024-2026 (December 6-7). The GEF Agency of IFAS participated in Learning Labs on IWRM (GWP Toolbox) (June 20-22, Jakarta, Indonesia).

The GEF Agency of IFAS is an active member of the Asia Water Council (AWC)[19]. Mr. Sokolov took part in (1) two AWC Board of Council meetings; (2) the water project business forum as part of the 2nd AIWW – a project proposal titled "Monitoring of the ecosystem around the Western part of the Aral Sea" was presented there – and the fourth Asia National Assembly Water Consultative Board (AAWC) meeting (March 14-16, Labuan Bajo, Indonesia); (3) events of the Korea International Water Week "Sustainable Water Management for Humans and Nature" (November 22-24, Daegu, South Korea).

The Agency also took part in the ICID's 24th Congress and 73rd International Executive Committee meeting (October 3-6, Adelaide, Australia). Mr. V. Sokolov became a member of the Working Group on the Aral Sea.

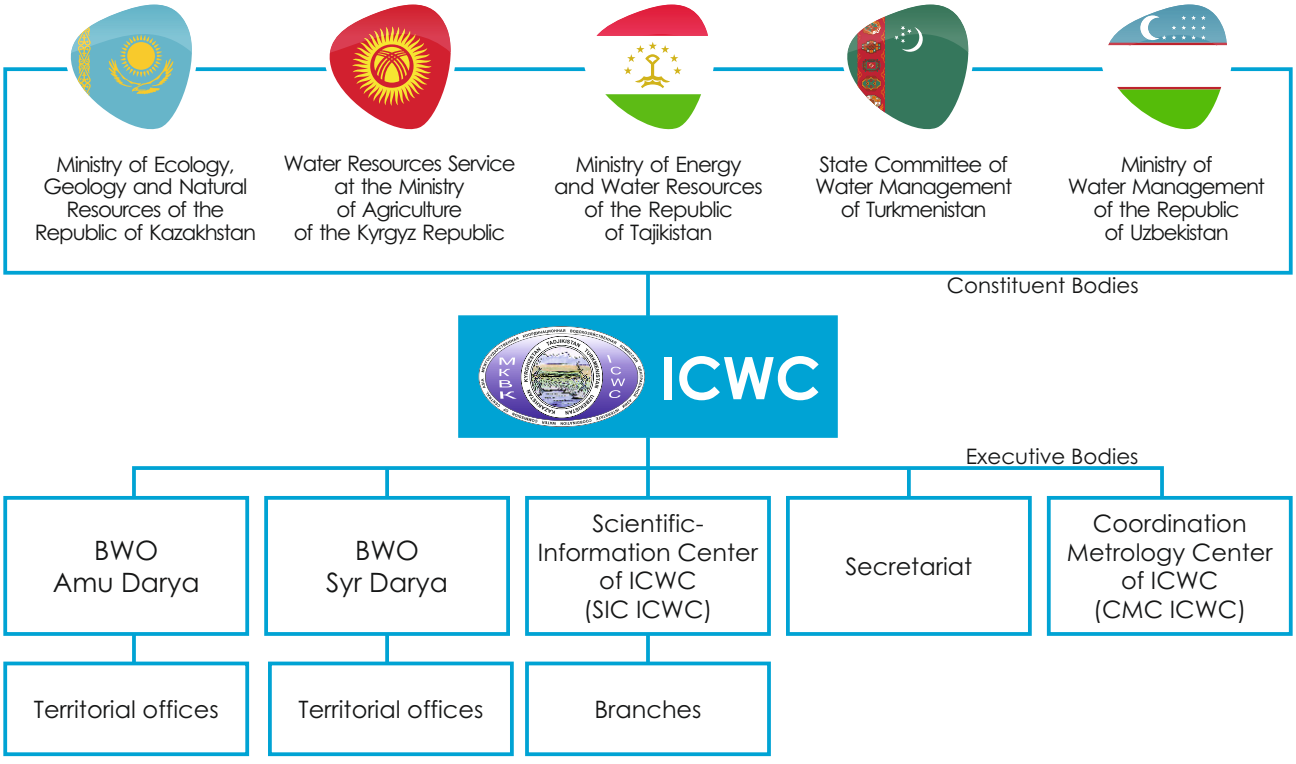
Media outreach. Events organized by the GEF Agency of IFAS were covered in media and on the web. Those included, in particular: the interview to the Chinese information portal China's Caixin Media, TV channels of Uzbekistan-24 and Dunyo, "Sreda.uz" Ecoportal.

Stories from the Salt of Land/Water Formula series were uploaded on the UzTREND information portal: on farmers and water saving technologies, on groundwater, etc.

Source: GEF Agency of IFAS, Report on Activity of the Agency of IFAS, https://aral.uz/doc/Report_of_Agency_2022.pdf

3.3. ICWC of Central Asia

The Interstate Commission for Water Coordination in Central Asia (ICWC) is a regional body of the CA states that deals with the issues related to control, efficient use and protection of water in the interstate sources of the Aral Sea basin and implements the jointly developed programs on the basis of cooperation and mutual respect for the parties' interests. The Commission was formed on February 18, 1992. The organizational set-up of ICWC is shown in the diagram below.



[19] Mr. V. Sokolov was elected Chairman of the AWC Special Committee on water-energy-food nexus and became a member of AWC Board of Council for 2019-2023

ICWC members in 2022

Serik S. Kojaniyazov, *(since January 27, 2021)* Vice-Minister of Ecology, Geology and Natural Resources	***Djamshed Sh. Shoimzoda,*** *(since November 3, 2020)* First Deputy Minister of Energy and Water Resources	***Guizgeldy N. Baijanov,*** *(since February 7, 2020)* Chairman of the State Committee of Water Management	***Shavkat R. Khamraev*** *(since 2005)* Minister of Water Management
Serikaly M. Mukatayev, *(since September 14, 2022)* Vice-Minister of Ecology, Geology and Natural Resources		***Durdi M. Genjiyev,*** *(since September 9, 2022)* Chairman of the State Committee of Water Management	

3.3.1. ICWC meetings

In 2021, ICWC had two meetings: 82nd meeting (April 27, Turkistan, Kazakhstan) and 83rd meeting (November 22, Ashgabat, Turkmenistan). ICWC members from Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan[20], as well as executive bodies (SIC ICWC, Secretariat of ICWC, BWO Amu Darya and BWO Syr Darya) and invited persons took part in those meetings.

Agenda. The main items on the agenda of the meetings were the **limits/quotas of water withdrawals and the operation regimes of reservoir cascades** in the Syr Darya and the Amu Darya basins (use of such water quotas in the past period and their approval for the next period).

Based on the information provided by BWO Syr Darya and BWO Amu Darya, the Commission summarized the **results of water quota use** in the *non-growing season 2021-2022* (82nd meeting) and the *growing season 2022* (83rd meeting). The members made decision on the matter raised by the Kazakh party regarding the **inconsistencies in river flow along the reach from the Toktogul reservoir to the Shardara reservoir** (82nd and 83rd meetings).

For the growing season 2022 (82nd meeting), the **limits/quotas of country water withdrawals** were approved only for the Syr Darya River Basin; BWO Amu Darya and BWO Syr Darya informed on **forecast operation regimes for the reservoir cascades** in the both rivers. It was decided that on the basis of the updated data on water availability, the members would agree additionally, by the end of May, on operation regimes of reservoir cascade and the country water withdrawal limits/quotas.

BWO Syr Darya informed on the measures taken by the parties to ensure additional discharges from the reservoirs during the growing season. Also, BWO Syr Darya shall regularly inform the Tajik side about the protocols signed regarding the operation regime of the Toktogul reservoir, since the operation regime of the Bakhri Tojik reservoir, among other things, depends on the implementation of these protocol decisions.

For the non-growing season 2022-2023 (83rd meeting), the **limits/quotas** of country water withdrawals were **approved** and the proposed by BWO Amu Darya and BWO Syr Darya forecast operation regimes for the reservoir cascades in the both rivers were taken into account. Turkmen and Uzbek sides agreed to form a Working Group for water withdrawals from the Amu Darya river for Surkhandarya province, Uzbekistan. Decisions on water withdrawals for Surkhandarya province shall be accepted by the conclusion of the Working Group and with notification of the Tajik side.

At the 82nd and 83rd meetings, ICWC members took into account the information by SIC ICWC on *progress in implementation of proposals and initiatives put forward at the Summit of the Heads of IFAS founder states*. It was decided that "ICWC members and

[20] since the 68th meeting, representatives of the Kyrgyz Republic have not taken part in ICWC activity

ICWC executive bodies shall make stronger efforts for implementation of the initiatives raised by the IFAS founder-states and inform regularly the ICWC members" (83rd meeting).

At the 82nd meeting: (1) Ms. Dinara Ziganshina was appointed the Director of SIC ICWC; (2) E. Nisanbayev, R. Bobokalonov, G. Bayjanov, and R. Giniyatullin were awarded the title "Honorary ICWC member".

3.3.2. Activities of ICWC Executive Bodies in 2022

Executive bodies of ICWC

BWO Amu Darya — Responsible for routine management and distribution of water resources among the riparian states, timely and reliable delivery of water, according to the agreed limits, to users, and provision of sanitary and environmental flow for Prearalie and the Aral Sea. Established in September 1, 1987, with the headquarters in Urgench and four territorial divisions.

BWO Syr Darya — Responsible for routine management and distribution of water resources among the riparian states, timely and reliable delivery of water, according to the agreed limits, to users, and provision of sanitary and environmental flow for Prearalie and the Aral Sea. Established in September 1, 1987, with the headquarters in Tashkent and four territorial divisions.

ICWC Secretariat — Responsible for fulfillment of ICWC assignments, preparation, together with other executive bodies, of programs, measures and draft decisions for ICWC meetings, control over the flow of funds from ICWC founding states for financing of ICWC executive bodies (allocated for field operations, capital repairs, etc.), and coordination of international contacts. Established by the decision of the 6th ICWC meeting on the 10th of October 1993 in Dushanbe.

SIC ICWC — Responsible for backstopping of ICWC activities on regional and global stages. Contributes to transboundary water cooperation and sustainable water management in Central Asia through information support, training, networking, research, and expertise. Established on the 5th of December 1992, with the headquarters in Tashkent and 3 branches.

CMC ICWC — Coordinates and implements technological policy in the field of metrological support to ICWC programs and decisions on the use, protection and accounting of water resources in sources and systems. Established on the 23rd October 1999, with the headquarters in Bishkek.

BWO Amu Darya

Activity in 2022

BWO Amu Darya continued working on distribution of water among the states, control in real-time regime of observance of the established water withdrawal limits/quotas (see Water in the Amu Darya and the Syr Darya River Basins) and on modernization and operation of waterworks facilities under its responsibility.

BWO Amu Darya contributed to two ICWC meetings (see ICWC meetings). Also, 13 meetings were held among the heads of water management organizations responsible for the river's lower reaches to address water allocation matters. In the course of the year, BWO Amu Darya maintained cooperation with national water agencies of Tajikistan, Turkmenistan, and Uzbekistan, national hydrometeorological services, SIC ICWC, IWMI.

Source: BWO Amu Darya

BWO Syr Darya

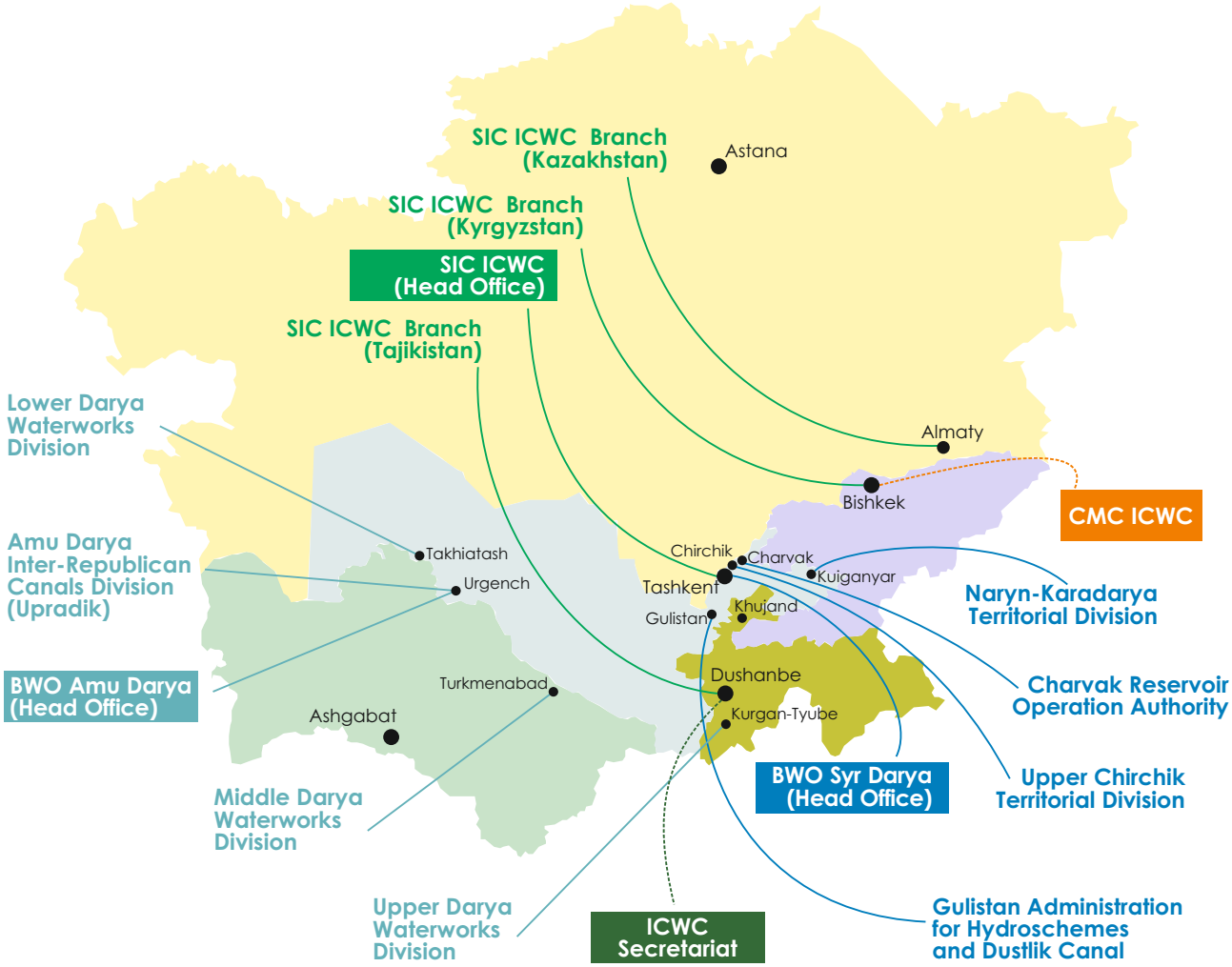
Activity in 2022

BWO Syr Darya and its territorial branches kept maintaining waterworks facilities, including canals, gauging stations, communication facilities, buildings and other structures under responsibility of the organization to ensure the sound use of water resources and trouble-free and sustainable supply of water to user-states.

Collective governance. In 2022, representative of the Republic of Kazakhstan, deputy head of BWO Syr Darya, Mr. M.E. Imangaliyev, based on his mandate, was engaged in BWO's activities and took part in organization of working meetings between Kazakhstani and Uzbekistani representatives of water agencies on the matters related to transboundary water management.

ICWC meetings. BWO Syr Darya took part in preparation of 82nd and 83rd ICWC meetings. The reports on

Location of Executive Bodies



forecast and actual operation regimes of the Naryn-Syrdarya cascade of reservoirs and the limits/quotas of country water withdrawals for: (1) the growing season 2022, with account of the expected average water availability (forecast and actual), and (2) the non-growing seasons 2021-2022 (actual) and 2022-2023 (forecast) were submitted for consideration and approval. BWO Syr Darya used in their reports the forecast and actual data from UzHydromet, CDC "Energy", Ministry of Water Management of Uzbekistan, and Ministry of Ecology, Geology and Natural Resources of Kazakhstan. See more details in "ICWC meetings".

Repair and rehabilitation of hydraulic structures were performed in line with the approved plan by the territorial branches of BWO, including the mechanical cleaning of canals.

Reconstruction and modernization. As part of an investment program, the construction work under Reconstruction and modernization of the Dustlik Canal headwork in Tashkent province, Stage 1 was completed and Stage 2 of this project was started.

ASBP-4. The financing is sought for the following project proposals included in the ASBP-4: 1.3. "Provision of dam and large hydraulic structure safety in Central Asia: capacity building and regional cooperation"; 1.6. "Automation of water distribution, accounting and monitoring in the Syr Darya Basin. Development of national water information systems as the basis for the regional information system."

Source: BWO Syr Darya

ICWC Secretariat

Activity in 2022

The ICWC Secretariat together with other executive bodies took part in organization of the two meetings of ICWC (see ICWC meetings), fulfillment of decisions and assignments of ICWC.

The Secretariat hosted the roundtable "Achievement of Sustainable Development Goals and the tasks related to water and sanitation with the involvement of women in Tajikistan" (July, Dushanbe) and took part in: (1) the 9th World Water Forum as a member of the Organizing Committee for a session on the sidelines of the Forum; (2) a national workshop on coordination of

the water reform (June, MEWR RT, UNDP); (3) marathon "Run Blue"[21] (May 15-June 10, Tajikistan); (4) training in nexus approaches for CA universities (November 7-11, Almaty, Kazakhstan); (5) COP 27.

On the occasion of the 30th anniversary of ICWC, representatives of the ICWC Secretariat were awarded badges "For contribution to saving the Aral" (April 26, Turkistan, Kazakhstan).

Source: ICWC Secretariat

Scientific-Information Center of ICWC

Activity in 2022

ICWC meetings. SIC together with other ICWC bodies took part in preparation of: (1) two meetings (82nd and 83rd, see ICWC meetings); (2) International Central Asian Science-to-Practice Conference "30-years of Water Cooperation among the Central Asian States: Facing the Future". 5 banners, 4 collections of papers and 2 leaflets were prepared for this event (April 26-27, Turkistan). SIC took active part in fulfillment of ICWC decisions and instructions.

Implementation of initiatives of IFAS Heads. SIC was involved in implementation of activities following the joint communique adopted at the Summit of the Heads of IFAS founder states and the initiatives of Presidents of CA states and reported on SIC's contribution at ICWC meetings in part of automation of gauging stations, search for potential format of water-energy regulation, development of methodologies and analytical materials on IWRM, water conservation, sound water use and water accounting, organization of field expeditions and RS-based monitoring of the Aral Sea exposed bed, water diplomacy and scientific cooperation, on participation in activities of working groups for implementation of ASBP-4 and improvement of IFAS (the information is available in ICWC bulletins, issues 83-94).

Regional Information System on Land and Water in the Aral Sea Basin (CAWater-IS). The IS was populated by the information in part of: (1) Economic block on Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan for 2021; (2) Amu Darya, Syr Darya, Kashkadarya, Surkhandarya, Chirchik, and Karadarya rivers for 2020-2021; (3) inflow to the Aral Sea and the Amu Darya delta for the growing season 2022 and non-growing season 2021-2022; (4) analysis of situation in water in the Amu Darya and Syr Darya river basins for the growing season 2022 and non-growing season 2021-2022; (5) results of RS-based monitoring of lakes and wetlands in the Aral Sea and the Aral Sea region. You can see details in Section 2. A prototype of the regional information system (GIS-interface) was finalized for the small basin of the Amu Darya River.

Analytics. Every ten days, analysis reports on basin situation were published on the SIC ICWC web-site in sections "Water-related situation in the Amu Darya River Basin" and "Water-related situation in the Syr Darya River Basin". Technical, information and expert assistance was rendered to national and regional organizations through timely provision on their request of relevant materials on key water issues: draft Water Code of Uzbekistan, regional sustainable water supply; situation in water in the Zarafshan River basin; drip irrigation development; water charges; public-private partnership; water-energy issues; climate change; and, development of cooperation between the CA countries and Afghanistan. Potential impact of construction and operation of the Qosh Tepa irrigation canal in Afghanistan on water supply in the riparian countries of the Amu Darya is assessed now.

Information and publications. The Center continued providing support to ICWC by publishing and disseminating information materials and by further developing databases and the knowledge base, analytical tools and models, such as the ASB management model (ASBmm) and the WUEMoCA tool, and regional web-resources, including the CA water and environment knowledge portal (CAWater-Info), ICWC, SIC ICWC, and EECCA NWO web-sites.

Information on the CAWater-Info web-portal exceeded **75 Gb**, over **2 million** visits were registered in 2022, and **1104** new entries were added to the knowledge base. SIC issued **25 publications**. The web-page dedicated to scientific heritage of Prof. V. Dukhovniy was opened on http://sic.icwc-aral.uz/scientific_heritage_of_prof_dukhovny.htm.

Research and development. SIC staff carried out research and developed tools in support of decision making as part of its research activity and within the framework of projects. In 2022, 7 new project contracts were signed and 8 projects were implemented (under contracts with OECD, UNRCCA, ADB, UNESCO, Ministry of Innovations of Uzbekistan, Martin Luther University Halle-Wittenberg). Also, research efforts and assessments were conducted with the involvement of CA experts under umbrella of the Expert Platform on Water Security, Sustainable Deve-

[21] on the occasion of the International Decade for Action "Water for Sustainable Development", 2018-2028 and the 2023 UN Water Conference, Guli Mina, ecoactivist and President of the "Thirst" Fund initiated a marathon in several countries all over the world

lopment and Future Studies. Based on the research results, 17 articles, including 3 ones in international journals and 14 ones in Uzbekistan, were published by SIC staff. The research was carried out in the following key areas:

Transboundary cooperation and regional organizations. The review was made of institutional and financial forms of cooperation on water and hydropower in CA (with the OECD support and the involvement of experts from CA countries), followed by issue of a discussion paper. SIC led drafting the position paper "9th World Water forum: Central Asia for peace and development. Priorities, actions and challenges for the future", which was approved by the IFAS Board.

A paper on strategic partnership between Tajikistan and Uzbekistan on the Zarafshan River Basin was prepared. SIC made assessments of: (1) trends in water law reforms in the CA countries (published in Chinese Journal of Environmental Law); (2) practices of water allocation in the Amu Darya basin since 1991 till 2015 (published in the book "Water allocation and agriculture: transition from open to regulated access").

Water planning and regulation through improved data and tools. SIC assists the CA countries and international partners in regular monitoring of transboundary rivers and provision of early warning. As part of UNRCCA project "Drafting of Aral Sea Basin Transboundary Water Early Warning Bulletins", 4 e-bulletins containing the information on the current situation in the Syr Darya and Amu Darya basins and the forecast for next month were issued (March-April, April-May, May-June, June-July).

"E-rules of Intra-Annual Flow Regulation in the Amu Darya River Basin" were developed jointly with the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences (IGSNRR, CAS) as part of the project under contract with the Ministry of Innovations of Uzbekistan. This E-rules package includes the database, models and routines, as well as recommendations for composing river water balances and drafting rules for flow regulation by reservoirs. The research methods and results were presented in the SIC ICWC Collection of Scientific Papers (issue 18) and in proceedings of the roundtable held in the memory of Prof. V. Dukhovniy on August 16.

The challenges of IWRM planning and the scientific, practical and innovation issues of water management were summarized also in the SIC ICWC Collection of Scientific Papers, issue 18 and the above proceedings.

Water, energy, land and ecosystem nexus. SIC made preparations for the IKI-funded project on the energy-water-land nexus transformation in Central Asia with the OECD support. In particular, jointly with experts from the CA countries, the Center mapped: (1) key stakeholders in Central Asia, relevant to the scope of the energy-water-land nexus; (2) ongoing initiatives in the water-energy-food/land nexus in Central Asia; and organized meetings with potential partners for development of project work packages.

Water security. SIC with the UNESCO support has developed a new methodology for assessment of water security focusing on administrative territories and national goals set in national programs and strategies. The methodology was tested in Khorezm, Navoiy and Samarkand provinces of Uzbekistan and recommendations were drafted for the improvement of water security (see Uzbekistan Water Security Outlook 2020).

Adaptation of water and land use to the changing context. The Center started research on adaptation of a modern system for water and land resources monitoring and water balance (water requirement) modeling in the conditions of the Aral Sea region with a view of combating salinization and increasing land productivity as part of the Uzbek-Japan Joint International Research Development Program SATREPS-2020. In particular, pilot field sites were selected in Karauzyak, Muynak and Ellikala regions and work was started on testing the REQWAT model for calculation of crop water requirements and monitoring of cotton and sesame development and growth.

Under the contract with the Martin Luther University Halle-Wittenberg, the data on agricultural droughts in CA have been analyzed. In particular, for the period of 2000-2022 the comparison was made between: (1) water availability indicators (deviation of water delivery to a district from the average delivery to districts in Uzbekistan) and drought indicators; (2) estimated and actual crop yields.

Improvement of water accounting. The Center summarized the results of analysis and assessments of water losses in irrigation networks and state of water accounting along the inter-farm canals of the TCT Agrocluster and developed a methodology for assessment of water losses in reservoirs of Tuyamuyun waterworks facility (SIC ICWC Collection of Scientific Papers, issue 18).

Environmental issues. SIC continued studying conditions of the exposed bed of the Aral Sea and in the Aral Sea region and, in particular, it published: results of the study of environmental conditions of lakes and wetlands in the South Aral Region (SIC ICWC Collection of Scientific Papers, issue 18) and of salt formations in the soil of the exposed seabed (Moscow University journal, issue 3, 2022). The results of RS and GIS-based monitoring of changes in green areas in the Tashkent city were presented in the SIC ICWC Collection of Scientific Papers, issue 18 and recommendations for the assessment of sanitary flow along the Syr Darya River were developed.

Water financing. Assessment of the water investment environment in Uzbekistan was made under a

sub-contract with DHInfrastructure for the regional ADB project "COVID-19 Infection Prevention and Control through an Integrated Water, Sanitation, Hygiene, and Health Approach". The results of the study of international experience in public-private partnerships in the water sector and the comparative analysis of pricing methods for irrigation services of water user associations were presented in SIC's publications as well.

Water, heritage and culture. SIC has started studying new areas of knowledge. Following participation in a series of seminars organized by the ICOMOS International Scientific Committee on Water and Heritage, SIC has begun preparing its contribution on "Water and Heritage in Central Asia on the example of development of the Hunger Steppe." Jointly with researchers from the IHE-UNESCO Institute for Water Education and the University of Amsterdam, SIC is also studying cultural and emotional aspects that influence transboundary water cooperation.

Capacity building and training. The web-site developed by SIC on capacity building and training was further enriched and populated. SIC's experts offered lectures and practical classes for master's students at TIIAME, GKU, held training and round-tables (see Regional Training Center at SIC ICWC). Preparation arrangements were started for: the thematic session on water diplomacy within the framework of the International Conference "Silk Road of Knowledge: Science meets Green Policy", jointly with IHE and the Konrad Adenauer Foundation (February 23-24, 2023), session and policy brief for the UN Water Conference (March 22-24, 2023); the training workshop "IWRM at transboundary level in the context of climate change" for the staff of BWO Syr Darya branches as part of celebrations of the 30th anniversary of IFAS (February 23-24, 2023); and, training courses on water policy and strategic planning in the context of climate change organized by IFAS and IHE (February-June 2023).

With the financial support of SIC ICWC, a drawing and video contest was organized on the theme "Water is a priceless gift" among 1-4 grade pupils at Euroasia school (April 18).

Collaboration is maintained with scientific journals: Dinara Ziganshina is a publishing editor on water governance and law of the Central Asian Journal of Water Research (CAJWR); Sherzod Muminov is a member of the editorial team of the e-journal "Actuarial Finance and Accounting" issued by the Tashkent State Economic University.

SIC staff improved its qualifications through training in 24 online workshops.

Events. SIC leadership and staff represented their organization at more than 30 national, regional and international conferences, workshops, and round-tables, including the 9th WWF in Senegal (see list of events in the 2022 Calendar of Events).

Regional and international cooperation. SIC ICWC has become a member of the WWC Board of Governors (www.worldwatercouncil.org/en/board-mandate-2023-2025) and the Expert consultative council of the Project "Water Efficient Allocation in a Central Asian Transboundary River Basin" (WE-ACT)[22], took part in the working group on institutional and legal improvement of IFAS and in the organizing committee of the CA session at 9th WWF. SIC ICWC continues cooperating with UNECE[23], ICID[24], OECD, UNESCO, ADB, EECCA NWO, WWC, SDC, GIZ, IICAS and many others.

SIC continues issuing Water Yearbook: Central Asia and around the Globe as its contribution to coordination of water actions among countries and partners.

Media. Interviews were given to the Kazakh TV-channel "Khabar 24" (May 9, www.youtube.com/watch?v=JlDbd3Stv8Q), online journal "One world"[25] – It's less about the available volume of water and more about the timing of how it's shared, the MA'NO Expert Center on the development of international humanitarian cooperation in CIS countries (August 30), and UWEC on "International law and exceptional circumstances" (October 4). D. Ziganshina recorded the podcast on "Women in hydrodiplomacy" upon request of OSCE.

Source: SIC ICWC

3.4. ICSD of Central Asia

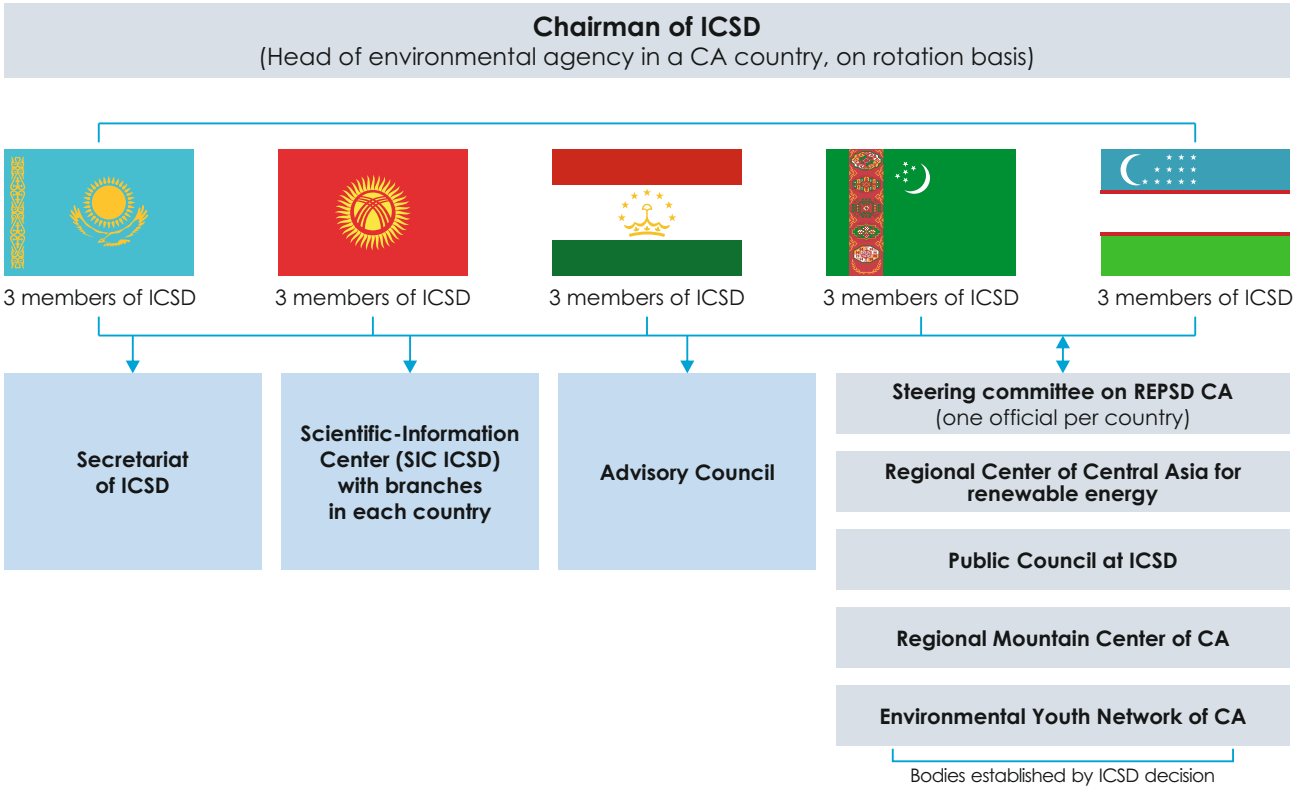
The Interstate Commission on Sustainable Development (ICSD) was established by the decision of the Interstate Council for the Aral Sea Basin in 1993. It is entrusted with the mission of coordination and management of regional cooperation in the field of environmental protection and sustainable development of the CA states. The organizational setup of ICSD and location of its executive bodies are shown in the figures below.

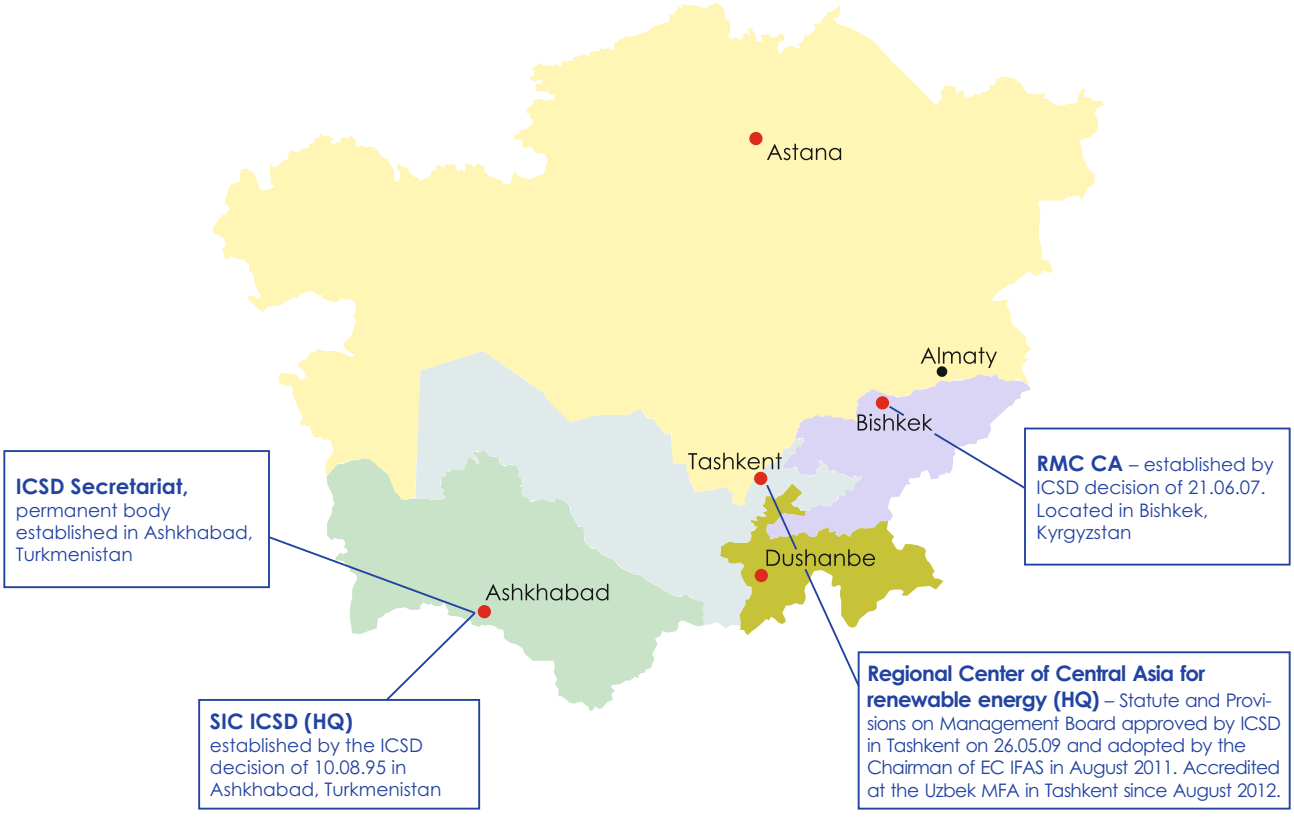
[22] implemented by 13 institutions under general coordination by the Technical University of Munich within the framework of the EU Horizon Program

[23] D. Ziganshina is a member of the Implementation Committee of the Water Convention

[24] SIC ICWC coordinates activity of the ICID working group for the countries under the socio-economic transformation – WG-IDSST

[25] the SDC Magazine for development and cooperation





The Republic of Uzbekistan was chairing ICSD over 2020-2021 (30th ICSD meeting, October 24, 2019, Nukus). At the regular ICSD meeting on March 18, 2022, the chairmanship[26] was passed from the Republic of Uzbekistan to the Republic of Kazakhstan for 2022-2024.

[26] the ministers of environmental agencies chair ICSD on rotational basis every 2 years

Activity in 2022

The primary task is to strengthen legal, institutional and technical framework of ICSD and its bodies. This task is fulfilled by the EC IFAS working group, where the Secretariat of ICSD is involved also.

Regional Environmental Program for Sustainable Development (REP4SD) in Central Asia. REP4SD[27] was approved at the meeting of the IFAS Board on February 22, 2022 in Dushanbe. The Program is based on the ongoing in CA processes aimed at achieving SDGs, implementing UN environmental conventions, developing green economy and adapting to climate change. The framework character of the Program is to promote regional environmental cooperation in CA until 2030.

REP4SD includes over 40 agreed **regional cooperation priorities** grouped by environmental SDGs. The **Roadmap** of REP4SD developed jointly with UNEP ranks the priorities of implementation. **High priority actions include**: (1) development[28] of indicators to fully measure implementation of the Roadmap and the Regional strategy on adaptation to climate change; (2) preparation and implementation of regional programs and projects funded by GEF, GCF and other donors[29]; (3) issues under the education-related SDG 4. There is a need for standardization of education disciplines in the area of ecology and sustainable development, for preparation of highly skilled professionals, and building human and institutional capacities of relevant ministries and agencies; (4) implementation of SDG 15 and UN conventions on desertification and biodiversity; (5) monitoring of glaciers and climate risks, as well as development of green economy principles.

Events. A regular ICSD meeting was held on March 18 online. Kazakhstan presented the work plan for the period of its chairmanship and the Roadmap of REP4SD was approved, based on the developed indicators and monitoring mechanism. The participants also approved the revisited Statute of the SIC ICSD and discussed the opening of a regional center for waste management and other matters related to environmental cooperation in the region.

Source: Secretariat of ICSD

[27] this was preceded by huge efforts, starting from the ministerial conference "Environment for Europe" in 2016, where ICSD took voluntary obligations to update the Regional program as part of the Batumi green economy initiative. See more in 2021 Water Yearbook, Section 3.4, http://www.cawater-info.net/yearbook/index_e.htm

[28] implemented jointly with GIZ as part of the Integrative Land Use Management Approaches for Central Asia Program (ILUMA) and the Green Central Asia Program

[29] climate financing for the region can be attracted also through international organizations. Memorandums of cooperation for implementation of REP4SD were concluded with UNEP, UNECE, CAREC and GIZ

SECTION 4

Bilateral Water Cooperation between the Countries of Central Asia

4.1. Kazakhstan – Kyrgyzstan

High-level contacts

The President of Kazakhstan paid an **official visit** to the Kyrgyz Republic on May 26. A joint statement was adopted and 13 agreements and memorandums were signed in the course of the visit. The President of Kazakhstan called for stronger investment cooperation by searching for mutually beneficial proposals and forming a list of promising projects, among which could be the joint construction of hydropower facilities in Kyrgyzstan, in particular, Kambarata-1. In the course of negotiations the presidents also addressed the water diplomacy and enhanced IT cooperation aspects.

The President of the Kyrgyz Republic had **working visits** to Kazakhstan to take part in the VI Summit of member states of the Conference on Interaction and Cooperation in Central Asia (CICA) (October 13, Astana), a meeting of the Council of CIS States and the Summit of Heads of State "Central Asia – Russia" (October 14, Astana), and the first "Central Asia – European Union" Summit (October 27, Astana).

In the course of **telephone conversations** in 2022, the Presidents discussed the prospects for Kazakhstan-Kyrgyzstan strategic partnership focusing on more active trade and economic cooperation on the international stage.

Cooperation within the Chu-Talas Water Commission

Bilateral water relations between Kazakhstan and Kyrgyzstan are regulated by the Agreement on the Use of Water Management Facilities of Intergovernmental Status on the Chu and Talas Rivers (January 21, 2000). The Chu-Talas Water Commission (CTWC) is a joint body, the mission of which is to ensure the joint operation of the water facilities of interstate use and estimate operational costs required for their safe and reliable operation.

Meetings. Over the period from 2006 to 2022, 31 Commission's meetings were held. In 2022, the Commission had two meetings:

30th meeting (April 20, Taraz, Kazakhstan). The agenda included: (1) approval of the schedule of water delivery from the interstate water facilities on the Chu and Talas Rivers for the growing season 2022; (2) scope of work completed in 2021 at the interstate water facilities; (3) approval of the list and quantity of repair and rehabilitation work for 2022; (4) increasing Kazakhstan's shared financing for O&M of the interstate water facilities. The Kyrgyzstani party provided information on difficulties resulting from Kazakhstan's water withdrawals from the Aspara/Ashmara River.

The parties also discussed the following matters: (1) safety of the Kirov dam and, in particular, preparatory work for the replacement of a cone valve of the dam; (2) amendments and additions to the 2000 Agreement: the CTWC Secretariat submitted for consideration a draft Joint Statement on the "2022-2030 Strategic Action Program for the Chu and Talas River Basins".[30]

31st meeting (December 7, Bishkek, Kyrgyzstan). The parties discussed: (1) outcomes of the growing season 2022; (2) completed repair and rehabilitation of interstate water facilities on the Chu and Talas Rivers. The Kyrgyzstani side of the Secretariat reported on the endorsement of the "Action plan for the Chu and Talas River Basins in the Kyrgyz Republic for 2022-2030." UNECE representatives informed on measures under the Water Convention in 2022-2023 and on national water policy dialogues held in Kazakhstan and Kyrgyzstan.

Working groups and other activities. The Working Group on environment protection (WGEP) took 3 seasonal water samples in the Chu and Talas rivers in 2022. The Group's Kyrgyz team made an assessment of the needs for conservation of globally important wetlands in the Chu River basin (in the Kyrgyzstani territory).

At its 10th meeting in November in Bishkek, WGEP discussed the results of: (1) monitoring of surface water quality of the Chu and Talas rivers in 2022, including seasonal coordinated water samplings, (2) hydrometeorological monitoring at gauging stations and weather stations in the river basins over 2016-2021. The Parties discussed possibilities for the development of an Environmental Atlas for the Chu River basin, including the plant and animal habitats, etc. Finally, the work plan for 2023 was adopted. The WGEP work results and joint decisions were submitted to the 31st CTWC meeting for discussion in December 2022.

Source: CTWC Secretariat

Trilateral water-related arrangements (Kazakhstan-Kyrgyzstan-Uzbekistan)

The heads of water and energy ministries of Kazakhstan, Kyrgyzstan, and Uzbekistan met on March 7 to address the matters of water and energy cooperation. In order to avoid emptying of the Toktogul reservoir down to a critical level and to ensure electricity supplies in the growing season in 2022-2023 within the framework of the Protocol on electricity exchanges between Kyrgyzstan and Kazakhstan of March 2, 2021 and the Protocol on mutual electricity supplies between Kyrgyzstan and Uzbekistan of March 11, 2021, the Parties have agreed that: 1) the Uzbek party would ensure electricity transit from Turkmenistan to Kyrgyzstan in 2022 and supply 500 MkWh of electricity to Kyrgyzstan in 2023 as part of electricity exchange, with the following equivalent return in 2024-2025; 2) the Kazakh party will supply 1050 MkWh of electricity at $0.027 to Kyrgyzstan in 2022-2023; 3) the Kyrgyz party will release water from the Uchkurgan HPP under a mutually agreed schedule during the growing season.

[30] the 2022-2030 Strategic Action Program for the Chu and Talas River Basins was approved by protocol decision of the 28th CTWC meeting

4.2. Kazakhstan – Tajikistan

High-level contacts

On May 13, the President of Tajikistan has discussed with the speaker of the Kazakhstani Senate the political, trade and economic aspects of cooperation and the inter-parliamentary relations.

The President of Tajikistan had **working visits** to Astana to take part in the summits of CICA (October 13, Astana), CIS and "Central Asia – Russia" (October 14, Astana), and the first "Central Asia – European Union" meeting (October 27, Astana).

In the course of **telephone conversations** in 2022, the Presidents discussed the prospects for strengthening bilateral cooperation in trade, economic, investment and cultural spheres.

Trilateral water-related arrangements (Kazakhstan, Tajikistan, Uzbekistan)

On June 8, the Kazakh, Tajik and Uzbek parties held a working meeting to reach an agreement on the operation regime of the Bakhri Tojik Reservoir for the period from June to August 2022. Upon the request of the Uzbek and Kazakh parties, the Tajik party has agreed to release additional quantities of water from the reservoir.

To mitigate the negative impact of the additional "emptying" on intake structures of the reservoir and maintain embankments, the Uzbek and Kazakh parties have agreed on specific measures for non-reimbursable material or technical support to the Tajik side.

4.3. Kazakhstan – Turkmenistan

High-level contacts

The President of Turkmenistan paid a **state visit** to Kazakhstan on October 15. The Heads of State signed a joint statement, where, among other things, they recognized the importance of coordinated actions in solving environmental problems, confirmed the need to consolidate efforts for socio-economic and environmental improvement in the Aral Sea and the Caspian Sea basins in an integrated manner, expressed their readiness to facilitate joint efforts on institutional and legal improvement of the IFAS, taking into account the interests of all the CA countries, and declared that transboundary water was the common asset of the people in the region.

A number of documents on mutual understanding and cooperation have been signed. Those included the Memorandums between the ministries of energy, agriculture and environment of the two republics.

The President of Turkmenistan also had **working visits** to Kazakhstan to take part in a meeting of the Council of CIS States and the Summit of Heads of State "Central Asia – Russia" (October 14, Astana).

The President of Kazakhstan paid a **working visit** to Turkmenistan to take part in the sixth Summit of the Heads of Caspian States, on the sidelines of which he met with the President of Turkmenistan (June 29, Ashgabat).

The Kazakhstani President honored H.E. Berdymukhamedov with the highest award of Kazakhstan – the order of Altyn Qyran.

In the course of **telephone conversations**, the Presidents discussed the prospects for energy cooperation, increasing mutual trade, and strengthening partnership in the industrial sphere (February 14), multidimensional relationships (March 15), trade and economic ties and cultural and humanitarian cooperation (May 17).

Other bilateral arrangements

The Treaty signed in 2021 between Turkmenistan and Kazakhstan on delimitation of the border and fishing zones in the Caspian Sea came into force on November 28, 2022.

4.4. Kazakhstan – Uzbekistan

High-level contacts

The President of Kazakhstan paid a **state visit** to Uzbekistan on December 21-22. The key topics addressed during the talks included the matters related to extended relations in political, trade and economic, energy, transportation and logistics, agricultural, water and other spheres. The visit resulted in the signing of the Treaty on Allied Relations, the Treaty on the Demarcation of the Uzbek-Kazakh State Border and 15 documents envisioning further expansion of multifaceted cooperation. The Heads of State reaffirmed their readiness to continue cooperation in transboundary water sharing in the spirit of mutual respect and trust and to strengthen joint efforts for mitigating the negative consequences of the Aral Sea tragedy.

The President of Uzbekistan had **working visits** to Kazakhstan to take part in the CICA Summit (October 13, Astana), a meeting of the Council of CIS States and the Summit of Heads of State "Central Asia – Russia" (October 14, Astana), the "Central Asia – European Union" Summit (October 27, Astana). As part of these visits, the presidents of the two countries discussed the matters of bilateral cooperation, including increasing trade, joint investment projects in industry, energy, transport, logistics, agriculture and other sectors.

In the course of **telephone conversations**, the presidents talked on extended cooperation, joint projects, bilateral investment, transport-communication, research and education and cultural collaboration, stability and sustainable development of Karakalpakstan, etc.

Bilateral working group on water

The joint Kazakh-Uzbek working group for facilitating water cooperation did not gathered in 2022. The working group had several meetings in the past: December 2016 (Tashkent), Fenruary 2017 (Shymkent), April 2017 (Tashkent), November (Astana) and May 2018 (Kyzylorda), February 2019 and November 2019 (Almaty).

Kazakh-Uzbek Joint Working Group (Commission) on Environment Protection and Water Quality in the Syr Darya River Basin

The Kazakh-Uzbek Joint Working Group (Commission) on Environment Protection and Water Quality in the Syr Darya River Basin (hereinafter Working Group) is formed of experts from Uzbekistan and Kazakhstan in line with the 2017-2019 Strategy for Economic Cooperation between Kazakhstan and Uzbekistan and the 1997 Agreement between the Government of the Republic of Kazakhstan and the Government of the Republic of Uzbekistan on cooperation in the field of environmental protection and management.

Meetings. By 1 January 2023, the Working Group had five meetings: on September 27-28, 2018 in Tashkent; on November 7-8, 2019 in Nur Sultan; on December 24, 2020 in the video-conference format; on December 13, 2021 in Almaty; and, on December 14-15, 2022 in Tashkent.

The fifth meeting was attended by national experts representing environmental, geology, health care, emergency, hydrometeorology, and water sectors from Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan and international experts and representatives of CAREC. The meeting was co-chaired by the Deputy Chairman of the Uzbekistan State Committee for Ecology and Environment Protection, Mr. Kazbekov and the Chairman of the Committee for Environmental Regulation and Control at the Kazakhstan Ministry of Ecology, Geology and Natural Resources, Mr. Zholdosov.

The Parties discussed progress on the work plan, including quarterly water sampling from the Syr Darya, analysis of samples and data exchange. The Parties informed each other on the results of their activities in 2022 regarding public monitoring of pollution sources that affected water quality and relevant measures taken. The participants discussed also the outcomes of bilateral working meetings on joint analysis of water samples in laboratories and capacity building in public monitoring (exchange of experience) using the pollution sources in the Syr Darya River basin as case studies. A review of water quality along the Syr Darya River in the territory of Uzbekistan for 2018-2022 was also presented. The information on the results of the regional project "Development of joint measures to prevent and respond to pollution of the Syr Darya River in emergency situations" was presented as well. Finally, the work plan for 2023 was adopted. It included the joint plan of pollution countermeasures in the Syr Darya and Keles rivers and follow up on establishment of a **joint quadripartite working group** for Syr Darya water quality analysis.

Source: State Committee of RUz for Ecology and Environment Protection

Trilateral water-related arrangements

See Subsection 4.1. Kazakhstan-Kyrgyzstan and Subsection 4.2. Kazakhstan-Tajikistan.

4.5. Kyrgyzstan – Tajikistan

High-level contacts

The President of Tajikistan paid a **working meeting** to the Kyrgyz Republic to take part in the fourth Consultative meeting of the Heads of CA States (July 21, Cholpon-Ata), on the sidelines of which the heads of Kyrgyzstan and Tajikistan had a meeting. The parties underlined the importance of coordinated transboundary water use within the border areas. They reached an agreement to resume work of the Inter-

departmental Tajikistan-Kyrgyzstan working group on bilateral water use. Also, the Presidents discussed activities of the IFAS in light of Tajikistan's chairmanship of the Fund and supported the continuation of consequent efforts for institutional and legal improvement of the IFAS, while taking into account the interests of all the countries in the region. The parties agreed to step up activities of the existing mechanisms of bilateral cooperation, including the work of the Intergovernmental commission for bilateral cooperation and the Intergovernmental commission on delimitation and demarcation of the Tajik-Kyrgyz border.

The issues of delimitation and demarcation of the Tajik-Kyrgyz border were discussed by the Presidents of Kyrgyzstan and Tajikistan on the sidelines of the SCO summit (September 16, Samarkand) and the CICA meeting (October 13, Astana). The Heads of State agreed to resolve emerging issues exclusively by political and diplomatic means and again step up activities of relevant working groups on border delimitation and demarcation and on topographic and legal matters.

In the course of **telephone conversations**, the presidents addressed the key points of bilateral cooperation (June 30, July 27).

4.6. Kyrgyzstan – Turkmenistan

High-level contacts

The President of Turkmenistan paid a **working visit** to the Kyrgyz Republic to take part in the fourth Consultative meeting of the Heads of CA States, on the sidelines of which he had a meeting with the President of Kyrgyzstan. The parties discussed the prospects for bilateral partnership in the context of implementation of previously reached agreements and their socio-economic priorities (July 21, Cholpon-Ata).

Meetings also took place on the sidelines of: (1) the meeting of the Council of Heads of State of the Organization of Turkic States – between the President of Kyrgyzstan and the Chairman of the Turkmenistan Parliament's Upper chamber (November 11, Samarkand), and (2) the Inter-parliament Forum of the Central Asian States and the Russian Federation – between the President of Turkmenistan and the Chairman of the Kyrgyzstan's Supreme Council (May 12, Ashgabat).

In the course of **telephone conversations**, the country leaders agreed to continue delivering on joint plans for further expansion of political and economic ties (March 15).

4.7. Kyrgyzstan – Uzbekistan

High-level contacts

The President of Uzbekistan paid a **working visit** to Kyrgyzstan to participate in the fourth Consultative meeting of the Heads of CA States (July 20-21).

The President of Kyrgyzstan had **working visits** to Uzbekistan to take part in: (1) the 22nd meeting of the Council of SCO Heads of State (September 14-16, Samarkand), on the sidelines of which the presidents of Kyrgyzstan and Uzbekistan discussed the construction of China-Kyrgyzstan-Uzbekistan railroad and the Kambarata-1 hydroproject and the water cooperation between the countries; (2) 9th meeting of the summit of the Organization of Turkic States (November 10-11, Samarkand).

During **telephone talks**, the presidents of Uzbekistan and Kyrgyzstan discussed the launch of the Uzbek-Kyrgyz development fund, acceleration of infrastructure projects (Kambarata-1 hydroproject and China-Kyrgyzstan-Uzbekistan railroad), and expansion of industrial cooperation (April 8); implementation of agreements on the state border, increasing trade, deepening industrial cooperation, and promoting joint infrastructure projects in transport and energy spheres (May 19).

Bilateral water-related arrangements

In November, another round of political consultations between the RUz and the Kyrgyz Republic took place in Bishkek (November 3). The following documents were signed as a result of the consultations:

(1) Treaty between Uzbekistan and Kyrgyzstan on individual sections of the Uzbek-Kyrgyz border[31,32]: the Treaty defines the total of 302.29 km of the border line (35 sections). Uzbekistan gets 4,957 ha within an area of the Andizhan reservoir and an additional 19.5 ha for maintenance and protection of the dam, while Kyrgyzstan gets 1019 ha of pasture land as compensation. Also, 12,849 ha of the Govasai site are transferred to Kyrgyzstan as compensation for the unbuilt Kempirabad Canal on the left bank of the Andizhan reservoir. Additionally, the Kyrgyz side shall not build hydraulic and other structures that obstruct the natural flow of the Govasai River and shall avoid technical pollution of water. It was agreed that joint water management of the Andizhan reservoir and a section of Chashma spring in the Sokh district should be regulated by separate agreements.

(2) Agreement between the Government of Uzbekistan and the Cabinet of Ministers of the Kyrgyz Republic on joint water management of the Andizhan (Kem-

[31] ratified by the Law ZRU-804 of 30.11.2022

[32] ZKR 110 of 28.11.2022

pirabad) reservoir[33,34]: the Agreement establishes the Joint Commission on joint water management, approves its regulations, and determines the authorized bodies responsible for implementation of the agreement. Measures to be taken by Uzbekistan and Kyrgyzstan for safe operation of the reservoir were agreed as well. The Uzbek side undertakes to maintain the water level in the reservoir at a level not higher than 900 meters to ensure free access to and use of water by Kyrgyz citizens (watering animals, irrigation, and fishing) and not to install engineering facilities around the reservoir. In turn, the Kyrgyz party will arrange water protection zones and ensure compliance with the water use regime.

(3) Agreement between the Ministry of Water Management of Uzbekistan and the Water Resources Service at the Ministry of Agriculture of Kyrgyzstan on water cooperation.

Meetings of the Working group on water management

A work meeting was held between the Uzbekistan Ministry of Water Management and the Kyrgyzstan Water Resources Service in Ala-Buka district of Jalal-Abad province, Kyrgyz Republic (May 18). The parties discussed: (1) draft Regulations on the joint water commission; (2) matters related to sharing the Orto-Tokoy (Kasansay) reservoir; and, (3) operation of water facilities located in the border area.

The **first meeting of the joint water commission** between the Ministry of Water Management and the Water Resources Service was held in Bulan Sogottu village, Issyk-Kul province (August 19).

The parties approved the regulations of the joint commission and discussed the draft Agreement on water cooperation and other relevant matters.

Source: MWM Ruz

Trilateral water-related arrangements (Kazakhstan-Kyrgyzstan-Uzbekistan)

See Subsection 4.1. Kazakhstan-Kyrgyzstan.

4.8. Tajikistan – Turkmenistan

High-level contacts

The President of Turkmenistan had a meeting with the Chairman of the Supreme Council of Tajikistan who visited Turkmenistan as part of the Inter-parliament Forum of the Central Asian States and the Russian Federation (May 12, Ashgabat).

During **telephone talks**, the country leaders commended the expansion of trade and economic cooperation, cultural-humanitarian and parliamentary relations and other aspects of strategic partnership between the two countries (March 15, January 27, 2023).

During the **political consultations** between the foreign ministries of Turkmenistan and Tajikistan, the sides exchanged views on the current state of and prospects for bilateral relations in the political, economic and legal spheres, expressed their readiness to improve the legal framework for cooperation, expand trade and economic ties, and develop transport links between the two countries (November 10, Ashgabat).

Bilateral working groups

The 11th meeting of the Joint Turkmenistan-Tajikistan Inter-governmental Commission on Trade-Economic and Science-Technological Cooperation was held in Ashgabat on November 9-10. The participants have discussed the key aspects of cooperation in energy, industry, agriculture and water, as well as joint activities in transport domain. The parties also underlined a need to form a bilateral Business council, open trading houses, and enlarge the Intergovernmental Commission.

4.9. Tajikistan – Uzbekistan

High-level contacts

The President of Tajikistan paid an official visit to Uzbekistan on June 2-3. The leaders discussed such points as enhanced bilateral ties and substantial expansion of the cooperation agenda. The ceremony of launching the construction of the Javan Hydroproject on the Zarafshan River was held as well. The Presidents signed the Declaration on strengthening eternal friendship and alliance. At the level of governments, ministries and agencies of the two countries, 11 documents were signed to further enhance the multifaceted Uzbek-Tajik cooperation.

The presidents of Tajikistan and Uzbekistan had **bilateral talks** on the sidelines of the meeting of the Council of CIS States and the Summit of Heads of State "Central Asia – Russia" (October 14, Astana) and the fourth Consultative meeting of the Heads of CA States (July 21, Cholpon-Ata). They discussed the cooperation aspects on trade, industry, agriculture, energy, transportation and logistics.

[33] ratified by the Law ZRU-805 of 30.11.2022

[34] ZKR 111 of 28.11.2022

In the course of **telephone conversations** the country leaders addressed the urgent matters of country relationships, friendship, good neighborliness and strategic partnership, focusing on implementation of the agreements reached before and on regional security.

Meetings of the Working Group on integrated transboundary water use in Central Asia

The Working group did not gather in 2022.

Cooperation on the Zarafshan River

In June, as part of the state visit of the President of Tajikistan to Uzbekistan, construction of the Yavan Hydroproject on the Zarafshan River was launched. The estimated cost of the project is $282 million, while the expected generation is 700-800 MkWh.

Trilateral water-related arrangements (Kazakhstan, Tajikistan, Uzbekistan)

See Subsection 4.2. Kazakhstan-Tajikistan.

4.10. Turkmenistan – Uzbekistan

High-level contacts

The President of Turkmenistan paid a **state visit** to Uzbekistan on July 14-15. In the course of the meeting, a number of documents were signed. Those covered all aspects of country cooperation, including the Agreement between the Governments of Turkmenistan and Uzbekistan on management, protection and sound use of water resources along the Amu Darya River. The document provides for coordination of hydraulic construction or reconstruction efforts. Also, it states that "… the use of water resources in the Amu Darya River basin should be guided by the international law and the interests of all riparian countries."

Following the talks, the Presidents made a joint statement, where, among other things, they "…commended the work of the Inter-governmental Commission for Water and welcomed the outcome of its second meeting…" and noted "… the importance of continuing constructive dialogue on equitable and sound transboundary water use in Central Asia."

The Parties: (1) "… consider the International Fund for Saving the Aral Sea (IFAS) to be a universal platform for joint implementation of environmental and scientific-technological projects and programs aimed at environmental rehabilitation of regions affected by the Aral Sea disaster"; (2) will "…facilitate the work in this format, while considering such an approach as an important element for achieving sustainable development in CA"; (3) "…underlined the need for relevant agencies of the two countries to work closer together to mitigate global climate change processes, develop and undertake joint measures for prevention and control of natural and man-made hazards."

They also "underlined the importance of the regional program "Green Agenda for Central Asia" launched during the Third Consultative Meeting of the Heads of Central Asian States..."

The President of Turkmenistan had a **working visit** to Uzbekistan to take part in the SCO Summit (September 15) as an honorary guest. In the course of the meeting, the leaders discussed priority areas of cooperation, which was successfully developed on both bilateral and regional scale.

The President of Uzbekistan paid an **official visit** to Turkmenistan on October 20. The parties discussed bilateral cooperation in trade-economic, energy, transportation-logistics, water, agrarian and other spheres. A number of documents were signed, including the Agreement on scientific and technological cooperation on hydrometeorology, the Plan of actions for further expansion of agricultural cooperation.

In the course of **telephone conversations** the Presidents discussed key points of bilateral cooperation.

Bilateral commissions and working groups

The second meeting of the joint Turkmen-Uzbek Intergovernmental Commission for Water led by the Deputy Chairman of the Cabinet of Ministers of Turkmenistan, A. Yazmyradov and the Deputy Prime-Minister of Uzbekistan, Sh. Ganiev was held on July 1 in Dashoguz, Turkmenistan. The participants discussed such matters as organization of joint water monitoring along the Amu Darya River through automation of water accounting and data transmission, joint bank protection and river training work, inventory of interstate waterworks facilities, border crossing, conditions of the Tuyamuyun reservoir, etc.

On July 1, 2022, the first consultative meeting of the heads of water agencies of Uzbekistan and Turkmenistan was held in Dashoguz, Turkmenistan. The Turkmen delegation was headed by the Chairman of the State Committee for Water Management, G. Baydjanov, and the Uzbek delegation was led by the Minister of Water Management, Sh. Khamrayev. The parties discussed the issues related to operation of the Tuyamuyun hydroscheme.

Source: MWM Ruz

Trilateral Commission for the lower Amu Darya

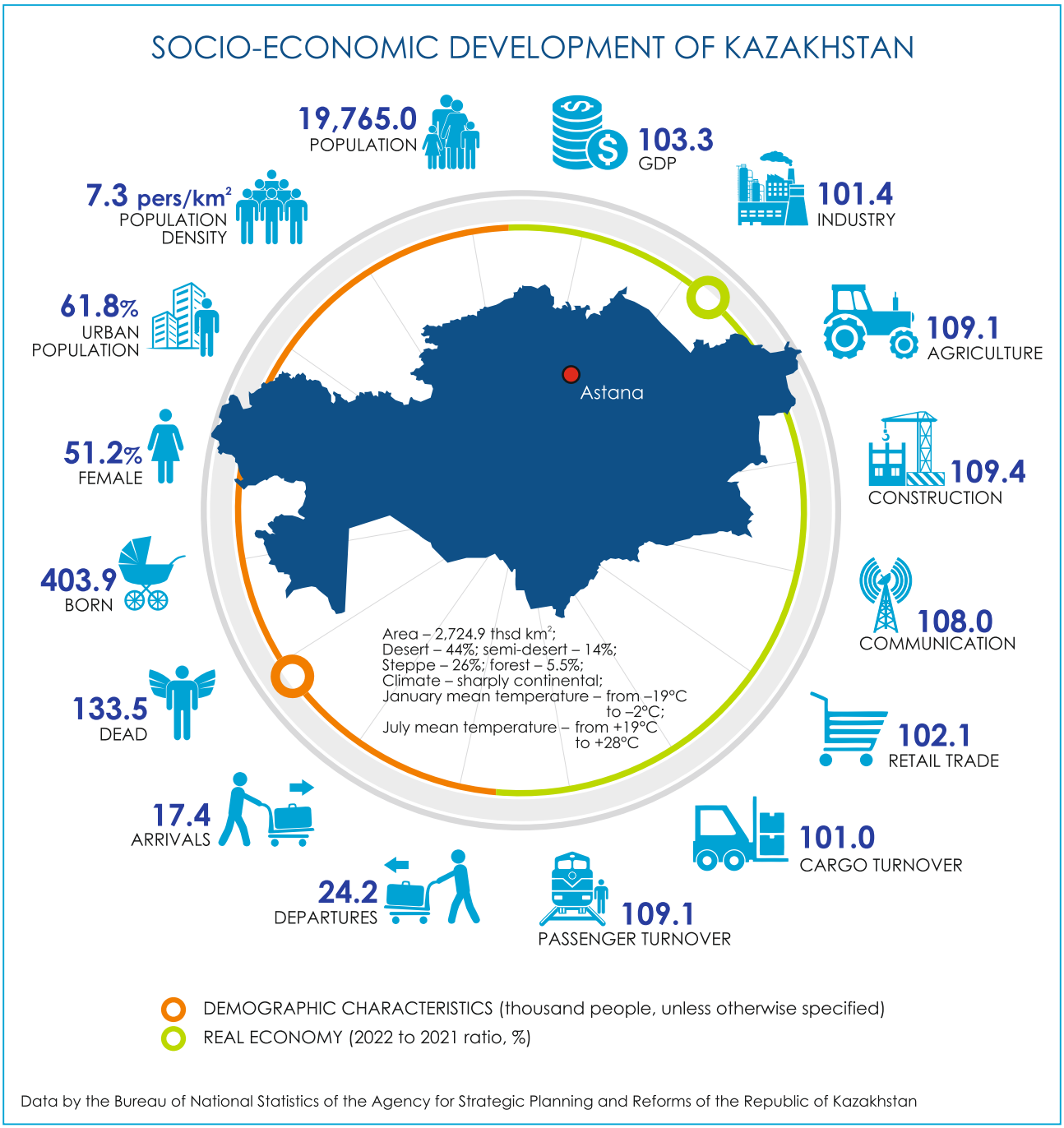
Water cooperation between Uzbekistan and Turkmenistan is also maintained within the framework of the trilateral Commission on water allocation in the lower Amu Darya, which includes BWO Amu Darya as well. In 2022, the Commission had 12 meetings. By January 2023, the Commission gathered 237 times in total.

Source: BWO Amu Darya

SECTION 5

Key Water Developments in the Countries of Central Asia

5.1. Kazakhstan



Data by the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan

Water Sector

Water resources. There are 85 thousand rivers, with the largest of them being the Irtysh, Ishim, Ural, Syr Darya, Ile, Chu, Tobol, and 48 thousand large and small lakes in Kazakhstan.

The largest lakes are the Caspian Sea and the Aral Sea, followed by Balkhash, Zaisan and Alakol lakes. Glaciers are one of major sources of river water.

The average annual river runoff is 102.3 km^3/year, of which 54.5 km^3/year is local runoff and 47.8 km^3/year flows from the Central Asian states, Russia and China.

In the future, taking into account the forecast growth of population, livestock and industrial production, water consumption will increase to 29.7 km^3.

According to forecasts, by 2030, internal river resources will decrease from 102.3 km^3 to 99.4 km^3, including due to the reduced inflow from neighboring countries, from 47.8 km^3 to 46.5 km^3.

In this context, the country could be short of 23.2 km^3, which is comparable to the total annual water withdrawal by the population and economic sectors.

Latest developments in legislation. To improve the water management system, the **Water Council of**

Kazakhstan[35,36] was established. The Ministry of Ecology, Geology and Natural Resources was set as the Council's working body.

Public hearings were organized on consultation documents[37] of the regulatory policy of the **Water Code** (new edition)[38] and the draft Law "On amendments and additions to some legislative acts on water protection and use"[39]. In the new edition it is proposed to clearly define the competencies of state bodies on water accounting and monitoring; to establish a hydrological center for generalization of all data, assessment and forecasts; to provide economic incentives for water conservation, etc.

Meetings of the Water Council of Kazakhstan. During the meetings, the Council addressed: (1) the issues of electricity exchange with the Kyrgyz Republic and water supply in the southern provinces of Kazakhstan (March 11); (2) the integrated water sector development plan (September 10); (3) the Draft Concept for Development of the Water Management System for 2023-2029[40] and progress in preparation for the republican meeting on water sector reformation. The document defines the 2 main focus areas: (1) improved water supply and demand management for sustainable development (October 15); (2) draft integrated water development plan for 2023-2025, which envisages a new Water Code, the strengthened position of the country in the negotiation process on transboundary rivers, a research center for water, economic mechanisms for regulation of water use in place, development of water infrastructure, etc. (December 13).

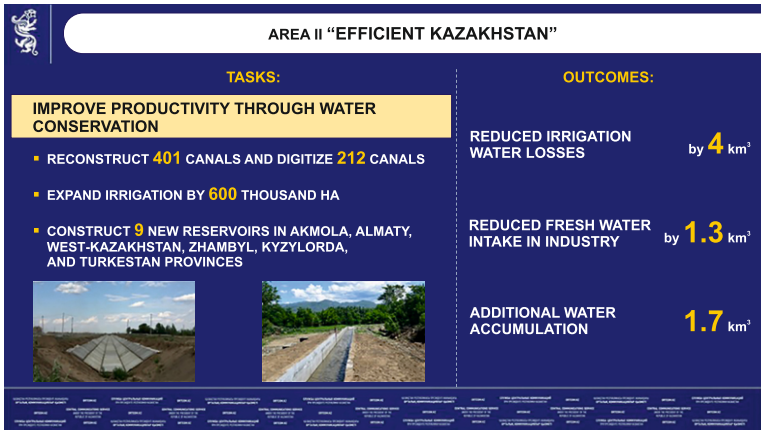
Results of the growing season. According to the MEGNR, the growing season was smooth: about 11.6 km^3 of the total water withdrawal was used for regular irrigation, including 97% of water allocated to 5 southern provinces – Almaty, Zhambyl, Turkestan, Kyzylorda and Zhetysu, having the total irrigated area of 1.61 million ha (73% of the total country area).

To ensure smooth growing season, the MEGNR takes a set of external and internal measures. Within the framework of trilateral cooperation (Kazakhstan, Tajikistan, and Uzbekistan): (1) 330 million m^3 of water was delivered along the Dostyk Canal in summer in exchange of commodity and electricity supplies to Kyrgyzstan. In April, water supply schedules were approved and signed for the Chu (500 million m^3) and Talas (220 million m^3) basins. The inflow to the Shardara reservoir was expected to be 3.9 billion m^3 under the agreed forecast operation mode of the Naryn-Syr Darya reservoir cascade. The actual inflow was 4 billion m^3; (2) the water discharged from the Toktogul reservoir was passed through the Bakhri Tojik reservoir under an agreement reached with Tajikistan and the terms of drawdown of the reservoir were also agreed.

The internal measures included: repair and rehabilitation of 5,322 outlet structures in transboundary river basins; reconstruction and cleaning of 1,512 km of main and inter-farm canals that reduced water losses by more than 450 million m^3; procurement of 67 pump stations for drainage water reuse; and, automation of gauging stations on 89 canals. In the southern provinces, 1,030 km of canals were cleaned, water-saving technologies were applied on 107,000 ha, the acreage of waterintensive crops was reduced, and water rotation and sequencing were organized.

Projects. Within the framework of the **national "Green Kazakhstan" project**[41] (second focus area – "Efficient Kazakhstan"[42]), it is planned to reduce irrigation water losses by 4 km^3 and decrease freshwater industrial intake by 1.3 km^3 by reconstructing 401 canals and digitizing 212 canals until 2025.

Measures are envisaged to increase irrigated land area by 600 thousand ha. For additional irrigation sources, construction of 9 new reservoirs capable to store 1.7 km^3 is planned.



Source: https://primeminister.kz/ru/news/reviews/za-schet-realizacii-nacproekta-zhasyl-kazakstan-budet-sozdano-poryadka-60-tys-rabochih-mest-s-brekeshev-2691926

[35] the composition of the Water Council was amended in line with the order of the Prime Minister of the Republic of Kazakhstan, No.158-p of 04.10.22 (put into effect since October 4, 2022)

[36] Order of the Prime Minister of the Republic of Kazakhstan, No.141-p of 18.12.2015 "On Establishment of the Interagency Council on Water Resource Management in Kazakhstan" is no longer in force

[37] guidelines for solution of problems in the water sector. The development of the new Water Code was ordered by the Head of State and its updating was included in the National Development Plan

[38] draft Water Code of RK is put up for discussion, January 2023 https://www.gov.kz/memleket/entities/ecogeo/documents/details/401554?lang=ru

[39] draft law (January 2023) is available on https://online.zakon.kz/Document/?doc_id=39129497&pos=3;-106#pos=3;-106

[40] developed by MEGNR. The approved draft "Concept for Development of Water Resource Management System for 2023-2029" includes four main objectives: increasing water productivity, improving water quality, resilience and water management

[41] approved by the Resolution of President of RK, No. 731 of 12.10.2021 and includes 11 tasks, for which 19 indicators and 48 measures are set

[42] the main goal is the sustainable use of natural resources, primarily water, and reduction of energy intensity of the economy

RSE "Kazvodkhoz" of the Committee for Water Resources has got financing from the (1) IDB for the "Rehabilitation of irrigation and drainage" project ($143 million) in Almaty (Koksu, Aksu, Eskelda and Alakol districts on a total area of 35.4 thousand ha) and South Kazakhstan (Makhtaaral and Shardara districts on a total area of 101 thousand ha) provinces; (2) EDB to reconstruct 310 water facilities in Zhambyl province (Zhambyl, Bayzak, Zhualyn, Merken and Korday districts). The total area is 53.9 thousand ha, while the cost of contract work is more than 25 billion KZT. 65% of work has been completed by far. The project is to be finalized in 2023.

Ongoing projects: (1) "The governance of groundwater resources in transboundary aquifers (GGRETA)"[43], which aims to strengthen the joint management of the Tashkent area Transboundary Aquifer (TBA) through scientific cooperation and development of a joint mathematical model for TBA as a basis for cooperation between the countries. The forecast analysis of the operation of the Tashkent area TBA revealed a significant decrease in the level of fossil groundwater and the depletion of surface reservoirs in the areas of groundwater intake. The high rates of water consumption endanger the water quality of the Tashkent area TBA[44], as well as the availability of a unique source of artesian water and its preservation for future generations. Experts warn that the rate of depletion requires urgent joint action and implementation of the recommendations made in the analysis. Representatives of the MEGNR and the Uzbek State Committee for Geology and Mineral Resources at their meeting in Almaty considered the Roadmap on protection and sustainable use of mineral waters in the Tashkent area TBA and the transfer of the mathematical model to the relevant state bodies of Kazakhstan and Uzbekistan for its practical use (November 2); (2) USAID regional water and vulnerable environment activity ($21.5 million, October 2020-September 2025), aimed at strengthening regional water cooperation between the CA countries; (3) "Second irrigation and drainage improvement project in the Republic of Kazakhstan" (WB, $343.01 million, June 2013-October 2023) to support farmers in the project areas.

Events. The MEGNR supported: (1) the roundtable on "Problems and prospects of efficient water use in Kazakhstan and CA: development of the international legal framework for cooperation" (April 22); (2) 2nd regional high-level policy dialogue on the "Energy-Water-Land Use Nexus in Central Asia"[45] (June 16); (3) regional seminar "International experience of transboundary water allocation and prospects for cooperation development on water sharing in CA"[46] (November 2); (4) regional workshop on safety of hydraulic facilities in CA[47] (November 30).

The Kazakh delegation took part in the: (1) 4th joint meeting of the Working Groups on IWRM and on Monitoring and Assessment marking the 30th anniversary of the Water Convention (June 28-29, Tallinn); (2) 1st meeting of the WMO RA II Coordination Panel on Hydrology and Water Resources (October 31-November 1, Vientiane, Lao PDR); (3) WMO Regional Association IV conference (November 2-4, Geneva).

Regional and international cooperation. The Vice-Ministers of Kazakhstan and Tajikistan discussed the water-related situation in the Syr Darya River basin and agreed on the operation mode of the Bakhri Tojik reservoir in the non-growing (2021-2022) and growing seasons (2022) (February 22).

The Minister of Energy, Geology and Natural Resources had meetings with: (1) the Minister of Water Management of Uzbekistan and discussed the joint efforts to improve water supply in the middle and lower reaches of the Syr Darya River, the signature of the Agreement between the governments on joint management and use of transboundary water bodies, the establishment of a bilateral commission for water cooperation at the level of prime ministers of the two countries; agreements were reached on joint measures to increase inflow to the Shardara reservoir and ensure stable water delivery along the interstate "Dostyk" Canal; consultations were held on the establishment of the Central Asian Water And Energy Consortium and the joint hydropower construction (February 9, Tashkent); (2) the Minister of Tourism of Israel and addressed the aspects of integration of Israeli technologies in water management, the environmental regulation, and the development of joint projects (July 12); (3) the Ambassador of Iran and talked on the matters related to the Framework Convention for the Protection of the Marine Environment of the Caspian Sea and water cooperation (July 15).

The following events were held: (1) 3rd session of the Kazakhstan-Russia Commission on Preservation of the Ecosystem of the Transboundary Zhayik River basin (April 21, Omsk); (2) 9th meeting of the Kazakhstan-China Commission for Environmental Cooperation (October 13, online); (3) 12th (30th) meeting of the Kazakhstan-Russia Commission on Joint Transboundary Water Use and Protection (November 17, Tyumen); (4) 10th meeting of the Working Group on Environmental Protection (WGEP) under the Secretariat of the Chu-Talas Water Commission (November 18, Bishkek).

[43] implemented by the UNESCO International Hydrological Program (IHP) in close cooperation with the UNESCO International Groundwater Resources Assessment Center (IGRAC), the International Union for Conservation of Nature (IUCN) and field project teams

[44] The small, southeastern part of the aquifer is located in the Tashkent province of Uzbekistan, and the larger, northwestern part is located in the Shymkent province of Kazakhstan. The study area is densely populated, especially in Uzbekistan

[45] together with the OECD within the framework of the forthcoming regional project "Regional mechanisms for low-carbon, climate-resilient transformation of the energy-water-land nexus in Central Asia", which will be funded by the International Climate Initiative of the German Federal Ministry for Environment and implemented by a consortium of partners (OECD, UNECE, EBRD and SIC ICWC). The project is expected to start in the first half of 2023 and will last for 5 years

[46] with the financial support from the Ministry of Agriculture and Forestry of Finland

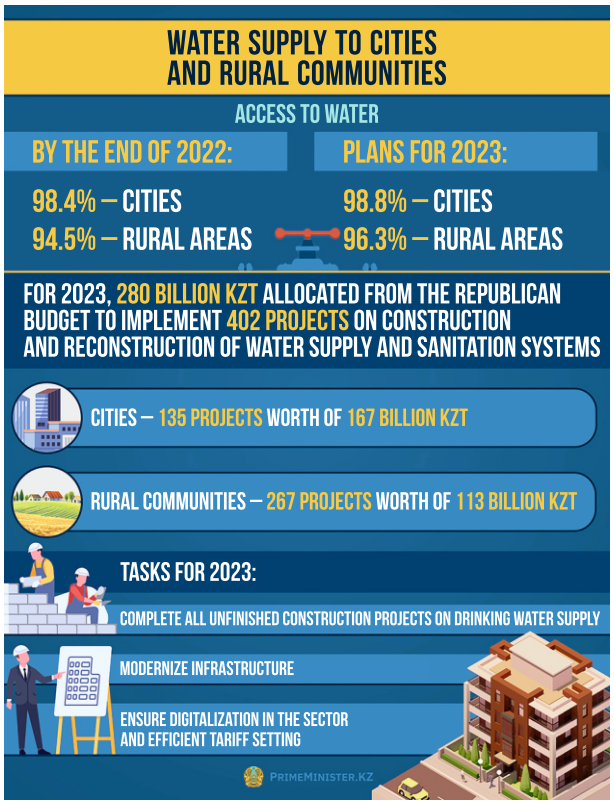
[47] organized by the IWAC in cooperation with the Slovak Water Management Enterprise (Vodohospodarska vystavba) and with the financial support from the WB (CAWEP) and official support from the Slovak Ministry of Environment

The agreement was signed between the Governments of the Republic of Kazakhstan and the People's Republic of China on joint management and operation of an intake structure on the transboundary Sumba River (September 14).

Drinking Water Supply

By present, 96.8% of the country population (urban – 98.4%, rural – 94.5%) has access to drinking water thanks to implementation of national programs[48]. This means that 19.1 million people out of 19.7 million are fully provided with water. The lowest figures are in Kostanay, Akmola, and North-Kazakhstan provinces. The task is to reach 100% access to drinking water by the end of 2025. The MEGNR plans to implement 8 projects for construction and reconstruction of clustered water mains (CWM), which will provide safe drinking water to 41 rural communities of 22.3 thousand people and improve water supply to 52 rural communities of 33 thousand people.

Currently, there are 15.5 thousand-km long 76 CWMs, of which 39 CWMs (13.4 thousand km) are under the property of the Republic. 6.1 billion KZT are allocated for construction and reconstruction of CWMs in Almaty, Atyrau, Karaganda, Kyzylorda, Mangistau and North-Kazakhstan provinces. This work is to be completed in 2023-2024.



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Agriculture

In Kazakhstan, 1.4 million ha of irrigated land produce crops, the bulk (1.2 million ha) of which is located in the southern regions. The task is bring 610 thousand ha of land used as rainfed due to lack of water sources back into production and develop additional 1.5 million ha of new irrigated area.

In 2023, the total crop acreage will reach 23.4 million ha, which is 68.6 thousand ha more than in 2022. It is planned to increase grain and leguminous crop acreage by 117 thousand ha, fodder crops – by 36.5 thousand ha, and sugar beet – by 6.7 thousand ha.

Latest developments in legislation. Approved: (1) Food Security Plan of the Republic of Kazakhstan for 2022-2024 (PPRK No.178 of 31.03.2022), which makes provisions, among others, for the expansion of the acreage of highly profitable crops; the increase in coverage of irrigated land by water-saving technologies to 265 thousand ha in 2022, 300 thousand ha in 2023, and 373 thousand ha in 2024; construction of a modern irrigation system manufacturing plant in 2024; development of a national extension service, reaching up to 25% of agro-industry entities by 2025, etc.; (2) 2022 Action Program of the Government of Kazakhstan and the roadmap for the Program (PPRK No.241 of 25.04.2022).

Adopted: (1) Presidential Decree (PRK No.1 of 26.11.2022) "On the Concept[49] of Rural Development in the Republic of Kazakhstan for 2023-2027"; (2) Government Decree (PPRK No.726 of 22.09.2022) "On approval of the Master Plan for sugar industry development in the Republic of Kazakhstan for 2022-2026", including a number of measures for sound water use and application of water-saving technologies.

Amendments and additions were made to the Regulations on the Kazakhstan Ministry of Agriculture[50].

Public discussions are initiated on draft Government Decrees: "On amendments and additions to the Resolution of the Government of Kazakhstan No.960 of December 30, 2021 "On approval of the Concept for Agro-Industrial Development in the Republic of Kazakhstan for 2021-2030"; "On approval of the Master Plan for Development of Crop Selection and Seed Production in the Republic of Kazakhstan for 2023-2027."

An updated draft of the Concept for Agro-Industrial Development up to 2030 is under development. It sets the following main objectives among others: increase labor productivity in the sector 2 times; increase agricultural exports 3 times; and, achieve food self-sufficiency at the level of at least 90%. It is also planned to increase investments on average 2.5 times in fixed assets of agriculture.

[48] National project "Strong regions –drivers of country's development", "Village is a country cradle" Project, etc.

[49] The Concept was approved by PPRK No.270 of 28.03.2023

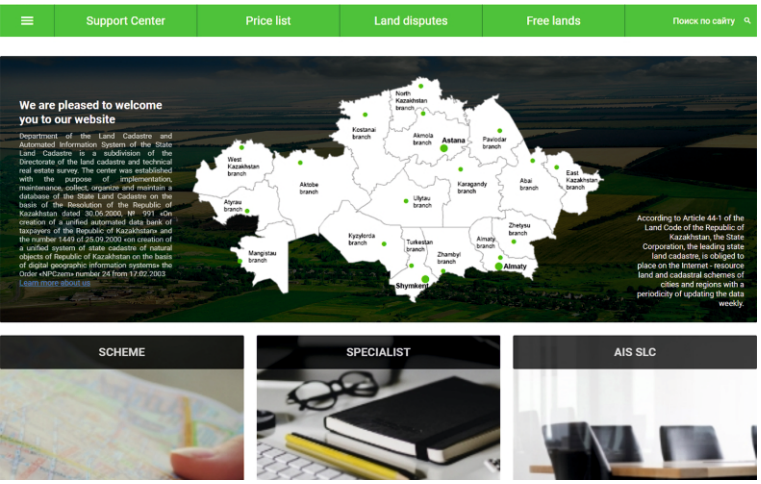
[50] approved by PPRK No.310 of 06.04.2005

New appointments. E.Sh. Karashukeyev was appointed the Minister of Agriculture (PPRK No.756 of 11.01.2022).

The 2022 results. The gross agricultural production increased by 9.1% to 9.3 trillion KZT. Grain harvests increased by 44% and reached 17 million tons. Over 13.2 million tons of agricultural products were exported.

The subsidies to agro-industry amounted to 450 billion KZT or 139 billion KZT more than in 2021; the financing of field work increased from 110 to 220 billion KZT. 270 investment projects worth of 241 billion KZT were put into operation. As a result, investments in fixed assets of agriculture increased by 6.7% to 853.5 billion KZT, and those in food production – by 15.7% to 140.6 billion KZT. In the Global Food Security Index, the country ranked 32nd out of 113 countries, improving its position by 9 points.

Since the beginning of the year, it became possible to track the ownership of agricultural land plots online (with indication of all grounds and normative legal acts) through the automated information system of the State Land Cadastre (AIS SLC, http://aisgzk.kz/). The geoservice (jerkarta.gharysh.kz) – an interactive map of land returned to the state – has been launched.



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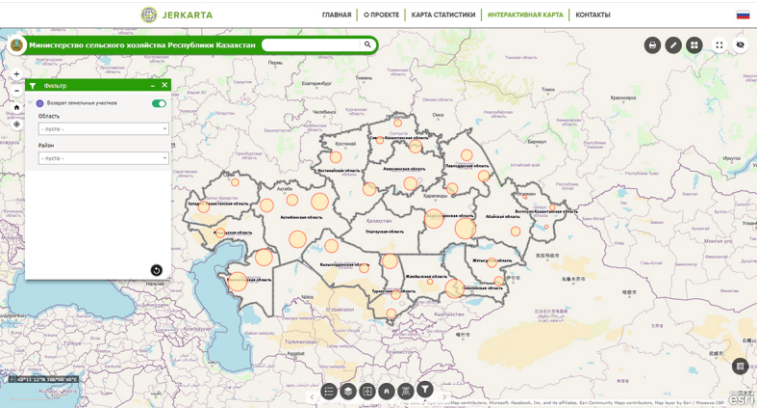


Source: https://jerkarta.gharysh.kz/ru/map

Projects and capacity building. As part of the "Enhancement of postgraduate studies on sustainable agriculture and future farming systems"/SAGRIS project (EU under ERASMUS+, 2020-2023), the second block seminars and study tours were held on different modules: (1) "SMART agriculture and digitalization" (February 28-March 4, June 17-27); (2) "Crop and livestock systems under climate change" (June 6-10, October 23-November 5); (3) "Advanced research methods" (December 5-8); (4) "Transdisciplinary research methods for sustainable agriculture" (May 11-20).

NASEC[51] launched the "Promotion of sustainable food systems and improved ecosystems services in Northern Kazakhstan landscape" project (UNDP, 2021-2023) to reduce degradation of productive agricultural land and associated high value ecosystems. GEF allocates grants for $10 million 467 thousand.

For UNDP projects and FAO work on agriculture and food, see the United Nations and its Specialized Agencies.

NASEC continued developing the National Bank of Plant Genetic Resources to collect all samples of crops and their wild relatives in a single repository and the national program "Plant breeding-2.0 KZ". Agrarian universities developed under NASEC supervision a new system of training in digitalization of processes, automation of agricultural data collection and transmission, which is based on modern information technologies and aims to integrate with the global information and education process.

The round table "Key challenges of agro-industry development in Kazakhstan and their solution" was held at the Kazakh Research Institute of Agriculture and Plant Growing at NASEC (June 14).

Events. The following events took place: (1) international agro-industrial conference "Asia Grains&Oils Conference 2022" (April 7, Nur-Sultan); (2) specialized exhibition "Kazakhstan Field Day"/Jańa Dala/Green Day-2022" (July 13-14, Akmola province); (3) international agricultural exhibition "KazAgro/KazFarm-2022" (October 12-14, Astana).

International cooperation. The Minister of Agriculture discussed the matters of bilateral agro-industrial cooperation with agricultural ministers of: (1) Russia (June 17, Saint Petersburg, Russia); (2) Kyrgyzstan (October 29, Almaty, Kazakhstan); (3) Uzbekistan, with the following signature of the Cooperation Program for trade and joint investment agro-industrial projects (December 22, Tashkent, Uzbekistan).

A number of documents were signed also between Kazakhstan and Iran, including the Memo on delivery of 1 million t of grain crops to IRI from the 2022-2023 harvest.

[51] Non-profit JSC "National Agrarian Science and Educational Centre" at the Kazakh MA was founded in 2015 to promote innovative development of national agro-industry

Energy

By January 1, 2022, about 190 stations on the national, industrial and regional scales have produced electricity production in Kazakhstan. Their total installed capacity is 23,957.3 MW, while the available capacity is 19,004 MW in winter and 17,364.5 MW in summer.

The current depreciation of thermal and hydro-power plants (TPP and HPP), excluding RES, is about 57.5%. About 55.5% of generation equipment at the stations is more than 30 years old, including TPPs – 10,620 MW (55%), HPPs – 1,729.3 MW (62%).

It is planned to: (1) modernize a number of existing generating assets and commission new ones to produce additional 11.7 GW; (2) increase the share of renewable energy to 12.5% in the total generation; (3) reduce depreciation of energy grids to 47%; and, (4) finalize the formation of a unified energy system in the republic.

The 2022 results.[52] Energy generation amounted to 112.8 billion kWh (1,582 million kWh less than in 2021); the plan for the current year is 114.9 billion kWh.

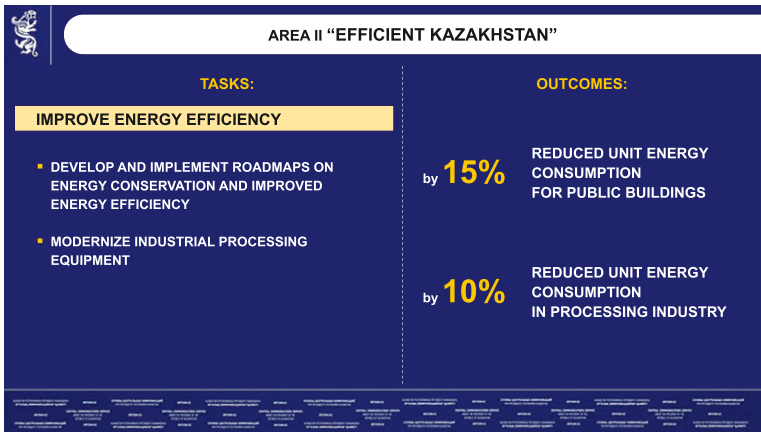
Renewable energy generation is 5.11 billion kWh (2,411 million kWh by wind, 1,763 million kWh by solar; and, 934 million kWh by hydro) or 4.53% of the total energy generation (it is planned to increase this figure to 5% in 2023).

The 2022 showed a 945.7 million kWh or 0.8% decrease in electricity consumption compared to 2021. Power export to the Russian Federation amounted to 1,257.6 million kWh, while the import from this country was 1,142.9 million kWh.

The Kazakhstan Ministry of Energy has developed: (1) a draft "Concept for Energy Development in the Republic of Kazakhstan until 2035", including reformation of the electricity market by transferring to a new model on the base of centralized energy trade; a package of law amendments was prepared as a first stage of implementation of this vision (September 26); (2) the Energy budget of the Republic of Kazakhstan until 2035, as part of which further development of the energy sector, including forecasts for power production and consumption was modeled. Power consumption in the country will grow to 152.9 billion kWh, with the annual average growth rate of 2.7% since 2021. Additional 17.5 GW will need to be commissioned by 2035 to cover the needs of economic sectors and population. The "Tariff in Exchange for Investment" program is under development; it will allow reconstructing, modernizing and expanding existing assets of power producing organizations. It is estimated that investments in the sector will amount to 400 billion KZT annually. In 2023, a **digital energy platform** will be put into operation to manage risks and track technical conditions of plants.

Energy efficiency. Energy saving and improved energy efficiency are among the key objectives of the modernization of national infrastructure.

As part of the **national "Green Kazakhstan" project** (second focus area – "Efficient Kazakhstan"), the tasks are to reduce energy consumption in state-financed organizations and increase energy efficiency in industrial entities, including processing industries.



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Latest developments in legislation. The "Concept for Development of the Fuel and Energy Sector in the Republic of Kazakhstan for 2022-2026" was approved (PPRK No.931 of 21.11.2022).

A law on thermal power[53] that envisages the transition to a new market model for centralized buying and sale of electricity, as well as the introduction of a real-time balancing energy market is to be adopted. These measures will reduce imbalances in the energy system and offset the impact of high tariffs on new energy sources.

New appointments. B.U. Akchulakov was appointed the Minister of Energy (UPRK No.756 of 11.01.2022) and A.G. Khasenov became a Vice-Minister (January 15).

Hydropower

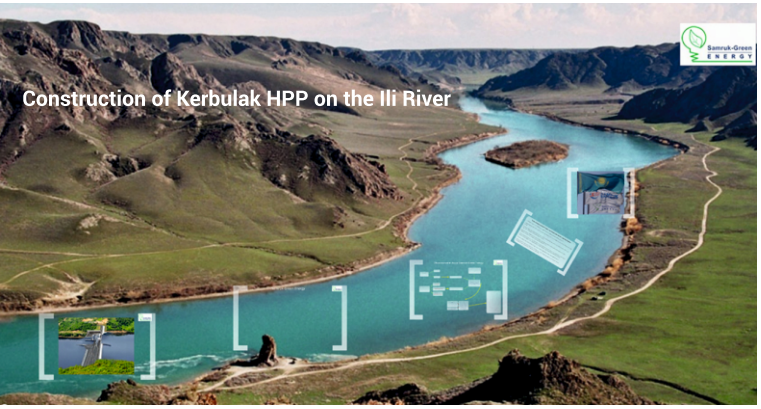
All HPPs in the country generate cumulatively 8-9 billion kWh on average per year. The total hydropower potential is 170 billion kWh a year, of which 62 billion kWh are technically feasible, whereas 30 billion kWh are viewed as economically feasible. Hydropower accounts for about 9% of the total energy generation. The country continues to implement the 2020-2030 Hydropower Development Plan.

Construction and modernization of HPPs. Design specifications and estimates were prepared for a vibration control system of hydraulic units at the Kapshagay HPP[54]. To increase its regulation capacity up to

[52] Analytical review for 2022, https://www.samruk-energy.kz/en/press-center/analytical-review#2022

[53] see the draft law on https://legalacts.egov.kz/npa/view?id=14186048

[54] HPP (design capacity – 434 MW) on the Ili River in Almaty province. Constructed in 1980. Operated by Almaty Power Plants JSC



Source: https://prezi.com/earnhjwgowdt/samruk-green-energy/

300 MW, the Samruk-Kazyna Fund and JSC Samruk-Energy implement the "Construction of counter-regulating Kerbulak HPP on the Ili River" project (2021-2026, 40 MW).

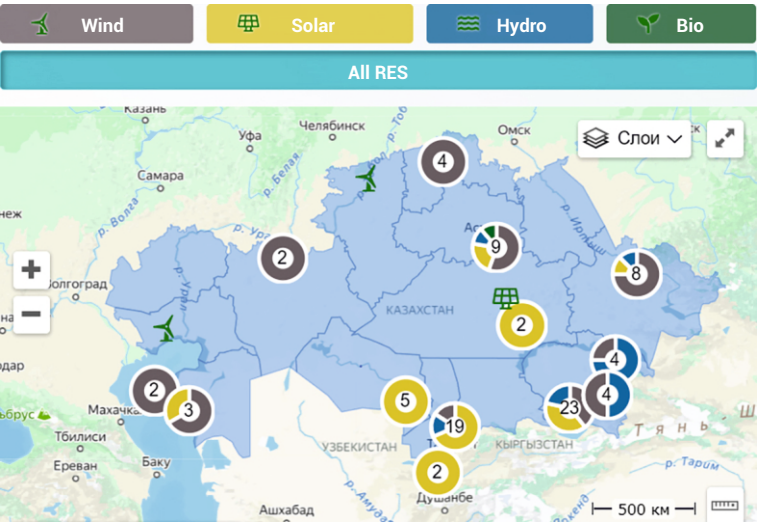
The work is underway on the investment project, which is aimed to increase power generation at the Moynak HPP[55] by 100 million kWh per year.

The project involves transferring a portion of the Kensu River flow to the Bestyubinsk reservoir to extend the regulation capacities in Almaty province.

At Shardara HPP[56], power generation reached the installed capacity of 126 MW for the first time after reconstruction; all 4 hydropower units are operational.

Alternative energy sources

RES facilities in Kazakhstan



Source: https://rfc.kz/vie/yamaps, https://qazaqgreen.com/map/

There are 130 RES facilities with the installed capacity of 2,400 MW (46 wind plants – 958 MW; 44 solar plants – 1,148 MW; 37 hydro – 280 MW; 3 bio – 1.77 MW).

The Concept of Transition to Green Economy in Kazakhstan[57] and the 2050 Strategy of Kazakhstan set the goals to bring the share of RES in the country's energy budget to 6% in 2025, 15% in 2030, and 50% in 2050.

In 2022, 12 RES projects, with the total capacity of 385 MW were implemented.

In 2023, 15 new 257-MW RES projects are planned to be commissioned.

Small HPPs. AO Samruk-Energy conducts the pre-design work on **HPP-29 on the Shelek River**.

For the Almaty Power Plants JSC "Reconstruction and modernization of the cascade of HPPs"[58] project (2022-2028), the feasibility study is developed.

The current and future water balance in the basin of the Big Almatinka River is drafted for the period up to 2040 to this end.

The Board of Directors of the AO Samruk-Energy decided to start the project investment phase in 2023.

Wind power. New wind stations were installed: (1) 100-MW "Abay-1" in Abay province; (2) 60-MW wind power plant in Almaty province[59].

The WPPs will generate 225.7 million kWh to reduce GHG emissions to 206 thousand t and replace about 89 thousand t of conventional fuel per year.

Memoranda/Agreements were signed with:

(1) the Construction Corporation of China Ltd. to cooperate on implementation of the second project phase, with the expansion of the Shelek Corridor WPP and increasing its capacity up to 300 MW;

(2) Masdar (UAE) and KIDF to develop a project for the construction of WPPs in Zhambyl and/or Turkestan provinces. Construction is planned for 2025;

(3) ACWA Power (Saudi Arabia) to construct and operate 1-GW WPP in Zhetysu province (Dzungarian Gate). Construction is planned for 2025;

(4) TotalEnergies for implementation of 1-GW wind project near Mirny settlement in Zhambyl province in 2024-2026.

[55] The 300-MW Moynak HPP is located on the Sharyn River in Raiymbek district of Almaty province. It was built in 2012 as part of the "State program of accelerated industrial-innovative development" and in line with the "Program for Energy Development in the Republic of Kazakhstan until 2030". The design average annual energy generation is 1.027 billion kWh

[56] Shardara HPP in the middle reaches of the Syr Darya River (South-Kazakhstan province) was commissioned in 1967. Installed capacity - 126 MW. The program of full modernization was completed in 2020 by AO Samruk-Energy

[57] UPRK No.577 of 30.05.2013

[58] cascade of small HPPs on the Big and Small Almatinka Rivers in Almaty province. Construction started in 1943. Operated by Almaty Power Plants JSC

[59] project was implemented by AO Energy-Samruk in partnership with the Power Construction Corporation of China Ltd

Solar power. The following solar stations were commissioned: (1) 4.95-MW "Ushtobe" plant, with planned annual generation of more than 7 million kWh for Ushtobe town in Almaty province; (2) 50-MW "Aisha kunshuak" plant in Auliekol village, Zhambyl province, etc.

Events. The Kazakh delegation took part in the: (1) 13th session of the International Renewable Energy Agency/IRENA Assembly (January 14-15, Abu Dhabi, UAE); (2) 27th Baku Energy Week (June 1-3, Baku, Azerbaijan); (3) 2nd meeting of Energy Ministers of the SCO Member States (June 24, Tashkent, Uzbekistan); (4) 60th meeting of the CIS Electric Power Council (July 14, Nur-Sultan, Kazakhstan); (5) conference "Kazakhstan-German hydrogen cooperation: status quo and prospects"[60] (September 7).

Environment and climate change

Latest developments in legislation. To form the legal framework of state policy on flora preservation, protection, restoration and use, the following laws were adopted:

(1) "On the flora" (No.183-VII of 02.01.2023);

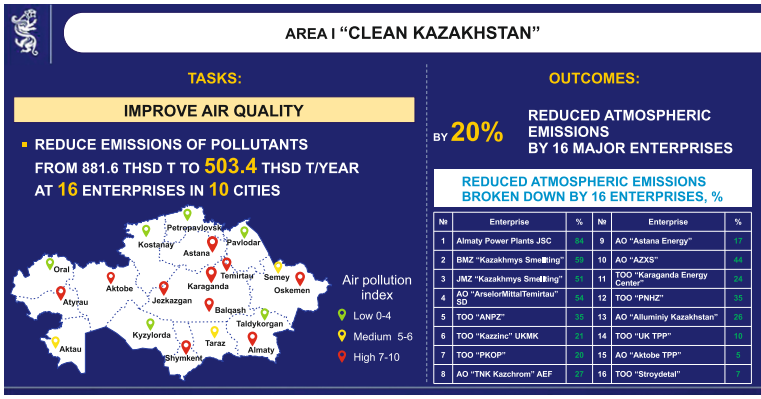
(2) "On amendments and additions to some legislative acts of the Republic of Kazakhstan on the flora and specially protected natural territories" (No.184-VII of 02.01.2023);

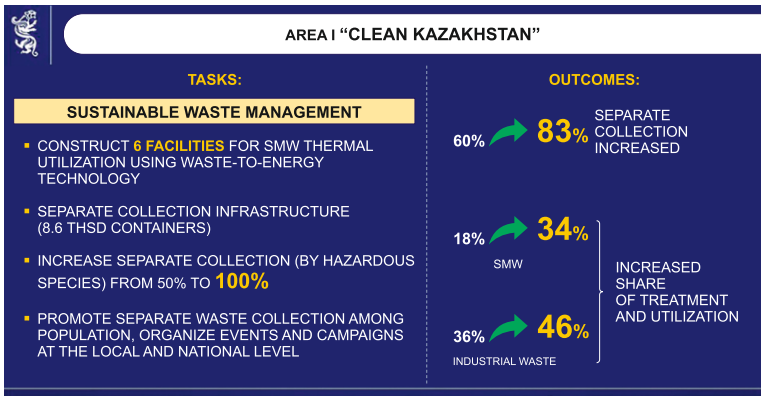
(3) "On amendments and additions to the Criminal Code and the Code on Criminal Procedure of the Republic of Kazakhstan on strengthening responsibility for environmental offences and manifestations of vandalism" (No.186-VII of 03.01.2023);

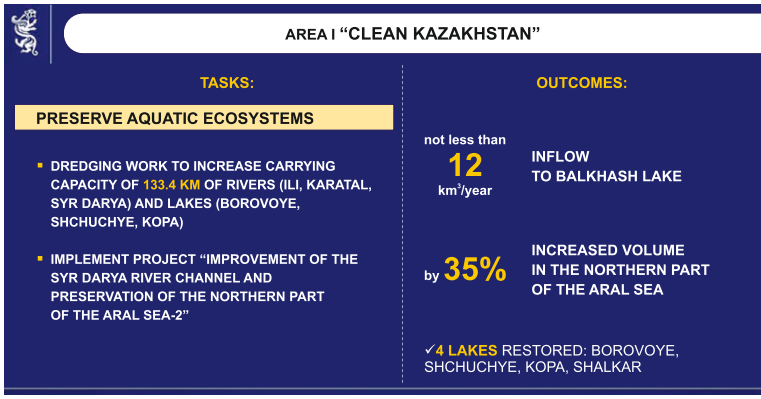
(4) "On amendments and additions to the Code on Administrative Offences of the Republic of Kazakhstan on strengthening administrative responsibility for environmental offenses and manifestations of vandalism" (No.187-VII of 03.01.2023).

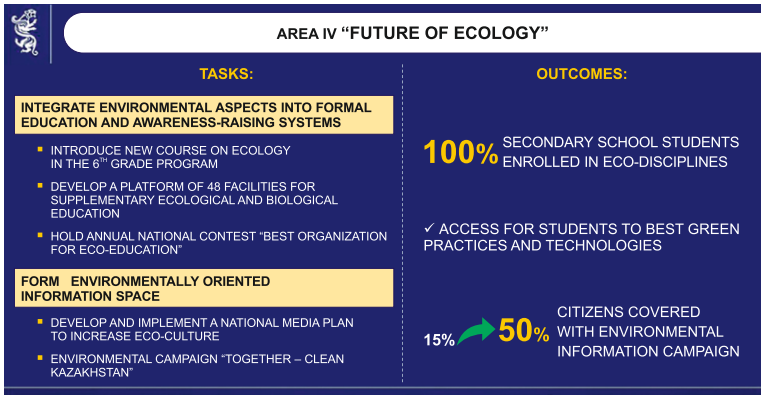
Projects. During implementation of the "Sustainable Forest Management" (GEF/UNDP) project, the Concept of High Conservation Value Forests (HCVF) for Kazakhstan and the Guidelines on HCVF identification, assessment and management were developed. The Program of additional environmental education was prepared and implemented for schoolchildren of 6-8 grades.

The national "Green Kazakhstan" project is ongoing (first area "Clean Kazakhstan"[61] contributes to addressing major environmental issues, fourth one – "Future of Ecology"[62] – to improving eco-education).









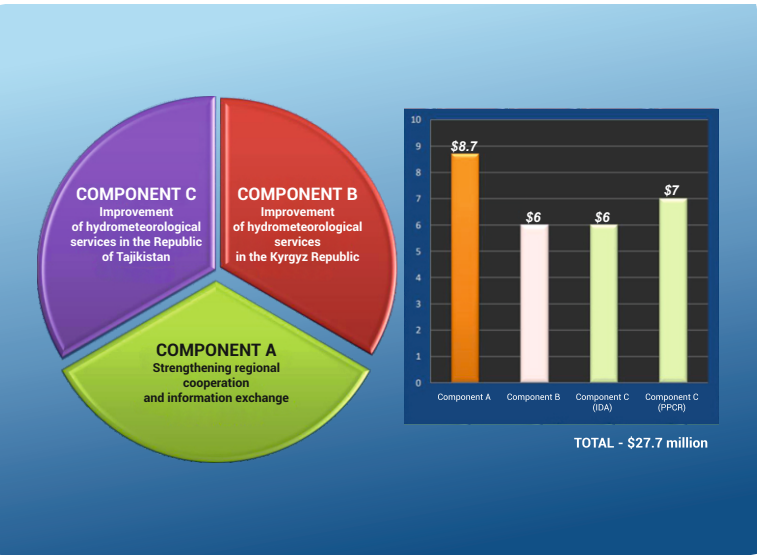
Source: https://primeminister.kz/ru/news/reviews/za-schet-realizacii-nacproekta-zhasyl-kazakstan-budet-sozdano-poryadka-60-tys-rabochih-mest-s-brekeshev-2691926

[60] with the support of the German Energy Agency DENA and the representative office of the German Economy in Central Asia within the framework of the Kazakhstan-Germany Energy Dialogue. The Kazakh ME is developing the "Concept of hydrogen energy development strategy". An agreement has been reached with DENA energy agency to provide support

[61] contributes to addressing major environmental issues such as improving air quality and waste management and preserving the aquatic ecosystems in the country

[62] aimed at improving the level of eco-products and culture of the population

The regional "Central Asia Hydrometeorology Modernization" project was continued (WB, stage I: September 1, 2011-December 31, 2018, stage II: January 1, 2019-March 30, 2023); the key tasks are as follows: (1) rehabilitation of infrastructure and human capacity; (2) dealing with climate change effects; (3) support of economic development in water, agriculture, energy and transportation. The implementation progress for 2022, work program and action plan for 2023 were discussed by the CA countries at the annual meeting of the project Steering Committee (November 24, Almaty).



The large-scale afforestation was continued: 239 million trees were planted on 166 thousand ha in 2022, and additional 409 million trees are planned on 188 thousand ha in 2023. The afforestation work is underway on the dried bed of the Aral Sea on 250 thousand ha.

As part of the "Environmental Restoration of the Aral Sea I" project (ERAS-I)[63] (USAID, $35 million, October 2021 – September 2024), about 200 thousand seedlings of black saxaul planted on 18 plots (5 ha each) are under monitoring.

Based on the survival and plant growth, the most effective and efficient afforestation practices will be identified. A field station was constructed; work has been commenced on a borehole well to provide irrigation to the site.

For UNDP projects, see United Nations and its Specialized Agencies, and https://www.undp.org/kazakhstan/projects.

Events. In 2022, the National Hydrometeorological Service of Kazakhstan celebrated its 100th anniversary (May 30). RSE "KazHydromet" opened access to the: (1) State Climate Cadastre, which consists of 3 parts: meteorological monthly reference books; meteorological yearbooks; reference books on climate in Kazakhstan; (2) meteorological database.

The following events were held: (1) environmental campaigns – "Birge – taza Qazaqstan" (Together for Clean Kazakhstan) (March), world clean-up day "Think globally, act locally" (September 17), "No littering in nature!" (October); (2) international conference on environmental protection (June 3, Mangistau); (3) regional youth conference on climate and water in Central Asia (RCOY Central Asia) (October 24-27, Astana).

The Kazakh delegation took part in the: (1) 34th session of the International Coordinating Council of the UNESCO Man and the Biosphere Program, which approved the decision to include the Burabay national park (Akmola province) and the Markakol state nature reserve (East-Kazakhstan province) in the UNESCO World Network of Biosphere Reserves[64] (June 13-17, Paris, France); (2) international conference "Climate migration in Central Asia: challenges and solutions" (October 19, Tashkent, Uzbekistan); (3) Global Climate Change Conference (COP27), where the MoU on strategic partnership on sustainable raw materials, batteries and green hydrogen value chains and the Framework Agreement with Fortescue Future Industries[65] on the implementation of green hydrogen production projects in several regions of the country, including Atyrau and Mangistau provinces, were signed (November 7-18, Sharm el-Sheikh, Egypt); (4) 7th ESCAP ministerial conference on environment and development (November 30, Bangkok, Thailand).

International cooperation. The MEGNR RK signed the MoUs: (1) on forestry cooperation with the Committee of Forestry and Wildlife and the General Directorate of Forestry of the Ministry of Agriculture and Forestry of the Republic of Turkey and on environmental cooperation with the Ministry of Environment, Urban Development and Climate Change of the Republic of Turkey (May 10-11, Ankara, Turkey); (2) on environmental cooperation with the Ministry of Environment of the Czech Republic (October 3, Prague, Czech Republic); (3) on forestry with the State Committee on Forestry of the Republic of Uzbekistan. The Agreement between the Governments of Kazakhstan and Uzbekistan on environmental cooperation was also signed (December 21-22, Tashkent, Uzbekistan), see Bilateral Water Cooperation between the Countries of Central Asia.

SDGs in Kazakhstan

Kazakhstan ranked 65 among 163 countries in the annual sustainable development rating.

[63] implemented by the USAID "Regional Water and Environment" project with the assistance of ED-IFAS in the Republic of Kazakhstan in close cooperation with the MEGNR RK and local executive bodies

[64] Biosphere reserves are the areas of terrestrial and coastal/marine ecosystems, or a combination thereof, which are internationally recognized within the framework of UNESCO's Program on Man and the Biosphere (MAB)

[65] global clean energy company, https://ffi.com.au/

Events. In the course of the year, the following events were held: (1) 2nd Regional SDG summit "Beyond COVID – towards just recovery in Central Asia" (June 16, Almaty); (2) field seminars to promote SDGs (March 13-April 15, throughout Kazakhstan); (3) seminar on localization of SDGs and Mission 2030 business game (March 29, Almaty); (4) 6th North and Central Asia multi-stakeholder forum on implementation of the Sustainable Development Goals (October 6-7, Almaty).

Kazakhstan delegations participated in the: (1) UN High-level Political Forum on SDGs (July 5-15, New York, USA), where Kazakhstan presented its second Voluntary National Review on the implementation of SDGs[66]; (2) roundtable "Accelerating achievement of SDGs by 2030: addressing on-going crises and overcoming challenges" (July 14, New York); (3) side-event "Localizing SDGs in Kazakhstan: partnership for present and future generations" (July 15, New York).

Emergencies and Disasters

Over 13 thousand natural and anthropogenic emergencies were registered throughout the country in 2022. The damage from natural disasters was estimated at 36,663.73 million KZT. As a result of floods and showers in spring and summer, houses and crops were flooded, livestock died, and roadbeds were destroyed.

Preventive measures. As part of implementation of the Comprehensive Plan for Mudflow, Landslide and Avalanche Safety for 2020-2024, construction of mudflow retaining dams on the Aksai and Ayusai rivers was continued to protect the population of Almaty and Almaty provinces and minimize economic damage from mudflows. Kazakhstan, together with PRC, is also constructing the Chukurbulak mudflow retaining dam, as well as protective structures on the Khorgos River. Ongoing activities: (1) cleaning of river beds, lakes, drainage channels and ditch networks; (2) bank protection on rivers in West-Kazakhstan, Karaganda, Atyrau provinces and Almaty city; (3) republican test of the civil warning system; (4) construction of drainage channels.

Projects. Within the framework of the "Improving the methodology and practice of disaster risk monitoring and assessment using innovative ICT" project (OSCE): disaster risk monitoring and assessment of high-altitude breakthrough lakes was carried out in the basin of the Ulken River (Almaty) using innovative ICT; proposals to reduce the risk of emergencies, "Recommendations on methodology and practice of disaster risk monitoring, assessment and evaluation using ICT", and an interactive map of the Ulken River basin were developed; an interim narrative report with annexes was prepared.

Events. The delegation of Kazakhstan participated in the: (1) regional forum of heads of emergency agencies of the CA countries (October 4-6, Dushanbe, Tajikistan); (2) 55th session of the Executive Council and the 25th session of the General Assembly of the International Civil Defense Organization (November 22-24, Abu Dhabi, UAE); (3) events on building resilience to disasters and climate change in CA (November 28-29, Brussels, Belgium); (4) 8th summit of ministers of emergency situations of the Organization of Turkic States (December 21, Ankara, Turkey).

Foreign Policy and International Cooperation

In 2022, the Head of State paid state, official and working visits to the PRC, Russian Federation, Uzbekistan, Qatar, Turkey, IRI, Saudi Arabia, USA, France, Azerbaijan, Kyrgyzstan, UAE, Turkmenistan, and Armenia.

Development of alliances and strategic partnerships. In May, K.-J. Tokayev paid an official visit to Kyrgyzstan, where: (1) a number of bilateral cooperation documents were signed; (2) aspects of the Kazakh-stan-Kyrgyzstan strategic partnership were discussed, with a special focus paid to expanding ties in the political, trade and economic, cultural and humanitarian spheres; (2) issues on the regional agenda were addressed (May 26, Bishkek, Kyrgyzstan), see Bilateral Water Cooperation between the Countries of Central Asia.

In December, the President of Kazakhstan paid a state visit to Uzbekistan (December 21-22, Tashkent, Uzbekistan), in the course of which: (1) aspects of the Kazakh-Uzbek strategic partnership, energy cooperation, transboundary river sharing, international and regional agenda were discussed; (2) Agreement on Allied Relations between RK and RUz and a number of other bilateral cooperation documents were signed; (3) a ceremony was held to launch the construction

[66] First Voluntary National Review presented at the UN High-Level Political Forum on July 9-18, 2019 New York, USA

of joint facilities (December 22); a joint media briefing was held (December 22). See Bilateral Water Cooperation between the Countries of Central Asia.

The President of Kazakhstan also took part in the: (1) CSTO meetings; (2) summits "Central Asia-China" (January 25, online) and "Central Asia-India" (January 27, online); (3) EAEU meetings; (4) 6th Caspian summit, which resulted in the adoption of the Communiqué (June 29, Ashgabat, Turkmenistan); (5) 4th consultative meeting of the Heads of States of Central Asia (July 21, Cholpon-Ata, Kyrgyzstan); (6) meeting of the SCO Council of Heads of State in a narrow and expanded formats (September 16, Samarkand, Uzbekistan); (7) summit of the Organization of Turkic States (November 11, Samarkand, Uzbekistan).

Kazakhstan hosted: the Central Asia-Russia summit (October 14, Astana); 1st meeting of the Heads of State of CA and EU (October 27, Astana). The delegation of Kazakhstan participated in the international conference "Afghanistan: security and economic development" (July 25-26, Tashkent, Uzbekistan).

Chairmanship in international organizations. Kazakhstan held the presidency of CIS in 2022[67] and organized meetings of the CIS Council of Heads of State (October 14, Astana), Council of Heads of Government (October 28, Astana), Council of Ministers of Foreign Affairs (October 12, Astana). The 77th session of the UNGA adopted a special resolution on "Cooperation between the United Nations and the Commonwealth of Independent States"[68], which was introduced for discussion by Kazakhstan and supported by the UN Member States (November 21, New York, USA). In addition, the President participated in informal meetings of the Heads of CIS Member States (October 7 and December 26, Saint Petersburg, Russia).

As part of its chairmanship in the CICA, Kazakhstan hosted an informal ministerial meeting (21 September, New York, USA), the CICA 30th anniversary meeting (5 October, Astana), and the 6th anniversary CICA summit (October 12-13, Astana). The 6th summit resulted in the adoption of a number of documents, including the Astana Statement. Kazakhstan's chairmanship in the CICA was extended until 2024.

Promotion of the national interests and reinforcement of the country's image. Kazakhstan actively cooperates with the OIC, UN, EU, OSCE, ECO and others.

In 2022, the Kazakh MFA and the Office of the UN Resident Coordinator jointly held an international conference "30 years of Kazakhstan's accession to the United Nations" (March 2, Astana). At the 76th session of the UNGA, Kazakhstan was elected to the UN Human Rights Council for 2022-2024 (October 14, 2021, New York, USA). Priority areas of Kazakhstan's work in the Council include promoting gender equality and women's empowerment, ensuring inclusive and universal education, and others. Speaking at the 77th session of the UNGA, K.-J.Tokayev noted: "We intend to work together with all stakeholders to address a pressing regional agenda that includes climate change, the Aral Sea, rational use of water resources, … we consider it important to establish the UN Regional Centre for SDGs for Central Asia and Afghanistan in Almaty" (September 20, New York, USA). The President of Kazakhstan participated in the Global Food Security Summit (September 21, New York, USA).

At the 7th meeting of the ESCAP Committee on Environment and Development, Vice-Minister of Ecology, Geology and Natural Resources Z. Suleymenova was elected Vice-Chair of the Committee and made a country presentation under the agenda item "Protecting our planet through regional cooperation and solidarity in Asia and the Pacific" (November 29-December 1, Bangkok, Thailand).

Sources:

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https://inbusiness.kz/ru

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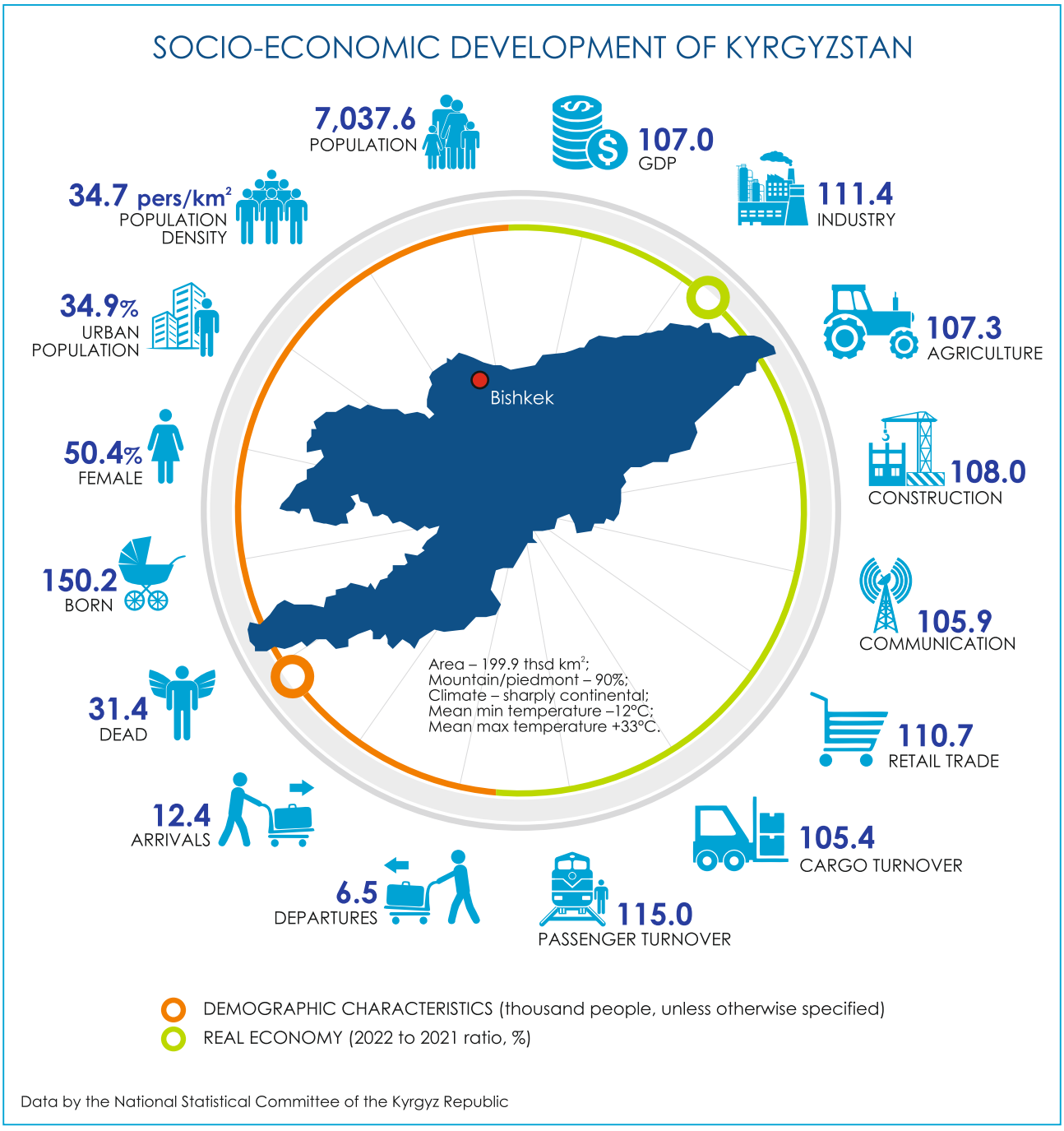
https://centrasia.org

[67] in 2023, the chairmanship of CIS will pass to KR

[68] 39th plenary meeting

5.2. Kyrgyz Republic



Data by the National Statistical Committee of the Kyrgyz Republic

Water Sector

Water resources. The total available water resources in the Kyrgyz Republic are estimated at 2,458 km^3, including 650 km^3 (26.4%) in glaciers, 1,745 km^3 (71%) in lakes, 13 km^3 (0.5%) as potentially usable groundwater and mineral thermal resources, and 44.5 to 51.9 km^3 (2%) as average annual river runoff. The total annual volume of renewable water resources is estimated at 46.5 km^3. The country has over 3,500 watercourses, including 30 large rivers. The average annual river runoff formed in the country is 44.5 km^3 and reaches 47.2 km^3 if return water is included.

Water management system. 956.3 million KGS was allocated for repair and rehabilitation of public water facilities[69] that are under responsibility of the Water Resources Service (WRS). 125.7 km of 236.8-km canals and collector-drainage systems were repaired, 40.4 km were coated and 773.2 km were mechanically cleaned. 590 hydraulic structures, 307 gauging stations, and 105 pumping stations underwent repair.

[69] Resolution of the Kyrgyz Cabinet of Ministers "On state support to national irrigation", No.76-p of 18.02.2022

The first stage of construction of the Algakadam irrigation canal (Kadamzhay, Batken province) was completed[70]. The 27.8-km canal will irrigate 4,200 ha. The tentative project cost is 634.2 million KGS that will be covered by the republican budget and OO "Algakadam".

Projects. Ongoing projects:

- "Additional financing to the National Water Resources Management Project"/AF NWRMP (WB, SDC) – a number of trainings was held: (1) "Capacity building of personnel from CWA[71], BWA[72], and DWA[73] in implementation of the 2TP-Vodkhoz water information system" (March 1-2, WRS, Bishkek; March 17-18, 29-30, Osh CWA); (2) Management, operation and maintenance (MO&M) of inter-farm systems of WUA Unions (March 17, Chu CWA, Bishkek); (3) "Improved water use efficiency" and "Determination of MO&M cost needs for the irrigation investment plan in 30 selected irrigation and drainage systems" – for personnel of the Water Use and Repair and Construction Departments of CWA and DWA in southern region, as well as Chu, Issyk-Kul, Talas and Naryn CWAs (May 25-26, Osh; May 31-June 1, Chu CWA); (4) "Capacity building of specialists from CWA, BWA, and DWA in implementation of an online database on water use" (May 25-26, May 30-June 1, November 3-4, WRS, Bishkek); (5) "Establishment and development of 30 public water councils (PWC)" (October 14, Chu CWA) and a series of trainings to build capacities of 30 PWCs established under the project (4th quarter, Taraz, Karaol, Naryn, Osh, and Kadamzhay cities); (6) "MO&M of inter-farm systems in the WUA Unions" (November 15, WRS and November 17, Osh CWA), etc.

The following project activities were organized: (1) discussion on the draft national irrigation and drainage policy (June 23, Chu CWA); (2) technical meeting on installation of instrumentation and control of the irrigation system on the Western Big Chu Canal[74] (July 21, WRS, Bishkek); (3) workshop "Capacity building of personnel at the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic and specialized agencies on basin approach to water management" (November 29, Bishkek).

- "National Water Resources Management Project" (SDC, WB) – (1) the Water Resources Service developed a draft of 2040 National Water Strategy[75]; (2) territorial boundaries of the main Kyrgyz river basins were identified to implement the basin approach to water resources management.

- project "Climate change and disaster-resilient water resources sector" (ADB, $43.6 million, 2019-2025), which aims at improvement of infrastructure resilience to climate change and natural disasters and at water security. Project components: (1) modernization of irrigation infrastructure (four inter-farm irrigation canals – "Right branch" in Nooken Bazar-Korgon districts of Zhalal-Abad province, "Saparbaevo 1 and 2" in Nookta district of Osh province, "Kozho Kaiyr" in Kadamzhay district of Batken province, "Osmon" in Chu district of Chu province – and on-farm canals in the above locations); (2) enhancement of irrigation system and agricultural land management; (3) improvement of disaster risk management capacity at the national level (training of target WUA members and farmers in methods of crop storage and marketing, rational use of irrigation water, drip irrigation, greenhouse farming, administrative and financial management, etc.). The project progress report is available on https://water-climate.kg/?page_id=1505&lang=en.

- "USAID regional water and vulnerable environment activity" (USAID, $21.5 million, August 2022-July 2025) aimed to strengthen regional capacity to manage shared water resources and mitigate environmental risks in the Syr Darya and Amu Darya River basins. The following events were organized: (1) Syr Darya River Day in the republic (August 25, Osh); (2) a meeting of the Network of Academic Societies, where the opportunities for integrating concepts of IRWM and the Water-Energy-Food-Environment (WEFE) Nexus into curricula were discussed and a Community of Practice that will serve as an online knowledge repository and discussion platform for water specialists in the region was launched (November 10, Bishkek).

Agreements were signed with (1) EBRD (€17.87 million) for the "Climate-resilient water supply in the Kyrgyz Republic"[76] project, which envisages modernization and reconstruction of the Aravan-Ak-Buura canal in Osh province; (2) WB to support the "Climate resilient water services" project (WB, $100 million, 2022-2028)[77,78,79] which envisages rehabilitation of three existing irrigation and drainage systems in the Kara Darya-Syr Darya-Amu Darya River basins (Osh, Batken and part of Zhalal-Abad provinces); rehabilitation of exis-

[70] the project is implemented by "Algakadam" NGO based on PPP

[71] Central Water Administration

[72] Basin Water Administration

[73] District Water Administration

[74] largest main canal in Kyrgyzstan, Chu Valley, https://www.water.gov.kg/index.php?option=com_k2&view=item&id=1160:irrigatsionnye-obekty-gotovyatsya-k-polivnomu-sezonu&Itemid=1437&lang=ru

[75] Presidential Decree No.23 of 10.02.2023 approved the National Water Strategy of the Kyrgyz Republic until 2040

[76] draft loan and grant agreement on the project between KR and EBRD was approved by the PKM KR No.360-p of 28.06.2022 and No.532-p of 04.10.2022

[77] project aims to: (1) improve access to climate-resilient water services in selected river basins and (2) strengthen institutional capacity for climate-resilient water resource management at local and national levels

[78] Draft Financing Agreement between the Kyrgyz Republic and IDA approved by the PKM KR No.205-p of 15.04.22, the draft law on ratification of the Agreement was sent for a vote. The project officially went into effect on October 31

[79] for project documents, see the link https://www.water.gov.kg/index.php?option=com_content&view=article&id=449&Itemid=1562&lang=ru

ting and construction of new water supply, sewerage and treatment facilities[80] in Kyzyl-Suu, Bokonbaevo and Kadzhi-Say villages (Issyk-Kul province), and construction of water supply systems with connection of households in 38 villages of Batken province.

In January 2023, a pilot project will be launched on organization of integrated maintenance and development of irrigation systems, drinking water supply systems, as well as pasture management in aiyl aymaks in Naryn province (PKM KR No.713 of 26.12.2022). Implementation is also considered in aiyl aymaks of other provinces.

For UNDP projects, see "United Nations and its Specialized Agencies".

International cooperation. The draft agreement between the Government of Kyrgyzstan and the Government of Uzbekistan on joint water management of the Kempirabad (Andizhan) reservoir (Resolution of KM KR No.596-p of 02.11.2022) and the conclusion of the Kyrgyz Cabinet of Ministers to the Agreement (Resolution of KM KR No.615-p of 11.11.2022) were approved; the relevant law of the Kyrgyz Republic on ratification of the agreement was adopted later (ZKR No.111 of 28.11.2022). The draft cooperation agreement was adopted between the Kyrgyz and Uzbek water agencies (Resolution of KM KR No.593-p of 02.11.2022).

Events. The Kyrgyz delegation participated in the: (1) 2nd high-level international conference on the International Decade for Action "Water for Sustainable Development, 2018-2028" (June 6-9, Dushanbe, Tajikistan); (2) World Water Week "Seeing the unseen: the value of water" (August 23-September 1, Stockholm, Sweden, online); (3) IWA World Water Congress & Exhibition (September 11-15, Copenhagen, Denmark); (4) 7th meeting of the Task Force on Water-Food-Energy-Ecosystems Nexus (December 12-13, Geneva, hybrid format).

Drinking Water Supply

According to the State Agency of Architecture, Construction and Housing and Communal Services[81], 82 treatment and drinking water supply facilities were put into operation; drinking water supply systems were constructed in 39 villages in Chu, Issyk-Kul, Zhalal-Abad, Osh, Batken, and Naryn provinces, and 90,808 people were provided with drinking water. Nevertheless, water supply problems remain in 1,873 villages, in particular, 346 villages lack drinking water supply pipes, the latter need to be replaced in 470 villages and require partial rehabilitation in the remaining villages.

Public administration reforms. The **Department of Construction and Engineering Infrastructure** was formed at the State Agency of Architecture, Construction and Housing and Communal Services. This is the legal successor of the Department of Housing and Civil Construction and the Department of Drinking Water Supply and Sewerage under Gosstroy (PKM KR No.260 of 20.05.2022). The new Department is responsible for construction, reconstruction, overhaul and operation of centralized drinking water supply, water disposal and sewage treatment facilities in rural areas and cities of district significance, etc.

Latest developments in legislation. Draft Government resolution on drinking water supply and sanitation was put out for public discussion.

Projects and programs. In Bishkek, it is planned to implement the "Digital Water Utility" project, which will implement a unified system for management and optimization of operation of urban water supply facilities through installation of water meters and GIS system at the central dispatch center.

Nine international donors financed water supply and sanitation projects in Kyrgyzstan[82]. In particular, (1) **WB** allocated $62.6 million for construction of water mains in 95 villages of Chu, Osh and Issyk-Kul provinces: the work was completed in 54 settlements, including 14 settlements in 2022; (2) **IsDB** allocated $23 million for construction of water mains in 25 villages in Zhalal-Abad province: the work was completed in 21 villages, including 11 villages in 2022; (3) **IsDB** and **Saudi Fund for Development** allocated $60 million to provide drinking water to 44 villages in Batken province and 17 villages in Talas province; (4) **ADB's** $32.9 million will be used to provide drinking water to 43 villages in Naryn province[83]; (5) **EBRD's** €192.012 million will be used to construct and rehabilitate sewerage treatment and drinking water supply facilities in 20 towns and 8 villages in 2023-2025. In 2022, funding was approved for the WB "Climate resilient water services" project (see details above). To repay the loans, the state intends to raise tariffs per 1 m^3 of drinking water from 10.5 to 22.7 KGS in cities and from 8.8 to 30.8 KGS in villages.

The "Cholpon-Ata Water" project is underway[84] (EBRD, €5.1 million).

The water supply systems were inaugurated in: (1) Kara-Zhygach village of Alamudun district, Chu province (project "Sustainable rural water supply and sanitation development", WB, IDA); (2) Besh-Moynok, Toboy and Zhar-Kyshtak villages in Suzak district of Zhalal-Abad province (project "Rural water supply and sanitation improvement", IsDB). For more infor-

[80] the responsible agency for this part of work is the State Agency of Architecture, Construction and Housing and Communal Services under the KM KR

[81] meeting of the Committee of Zhogorku Kenesh on agrarian policy, water resources, ecology and regional development of January 23, 2023

[82] information of the State Agency of Architecture, Construction and Housing and Communal Services at the meeting of the Committee of Zhogorku Kenesh on agrarian policy, water resources, ecology and regional development on January 23, 2023

[83] Rural water supply and sanitation development program in Naryn Province, 2020-2027

[84] Resolution of KM KR No.231-p of 28.04.2022

mation on project activities of the Community Development and Investment Agency in 2022, see https://www.aris.kg/index.php?lang=ru.

The Board of the Eurasian Fund for Stabilization and Development approved the conclusion ($30.8 million) on the preliminary application for an investment loan to finance the project "Improved water supply and sanitation in rural settlements of Osh province in the Kyrgyz Republic" and the concept of this project.

Agriculture

Irrigated area. According to the State Statistics Committee of the Kyrgyz Republic, the total crop acreage reached 1,228.8 thousand ha, which is 2.5 thousand ha more compared to 2021. As the cropping patterns, grain crops are grown on 579.9 thousand ha (47.2% of all crop area), pulses – on 57.1 thousand ha (4.6%), oilseeds – on 17.9 thousand ha (1.5%), cotton – on 21.6 thousand ha (1.8%), tobacco – on 0.47 thousand ha (0.03%), sugar beet – on 9 thousand ha (0.7%), potatoes – on 74.2 thousand ha (6%), vegetable and forage crops – on 55.3 thousand ha (4.5%) and 390 thousand ha (31.7%), respectively, and other crops (rice, cucurbits, etc.) – on 23.3 thousand ha (2%).

Production. Compared to the same period of 2021, the gross yield of crops increased significantly: barley – 2 times, wheat – 1.6 times, sugar beet – 20%, cotton – 14%, tobacco – 10%, oilseeds – 10%, corn for grain – 5%, vegetables – 4%, and fruits and berries – 3%.

Latest developments in legislation. Amendments were made to: (1) Government Resolution PKM KR No.116 of 06.08.2021 "On subdivisions and organizations of the Ministry of Agriculture, Water Management and Regional Development of the Kyrgyz Republic" (PKM KR No.114 of 04.03.2022, No.434 of 01.08.2022); (2) Land Code of KR, Forest Code of KR, Law "On transfer (transformation) of land plots", Law "On pastures", etc. (ZKR No.6 of 20.01.2022, No.22 of 01.04.2022, No.84 of 05.08.2022, No.85 of 05.08.2022); (3) Government Resolution PKM KR No.309 of 17.12.2021 "On agroindustry development in the Kyrgyz Republic" (PKM KR No.494 of 09.09.2022). According to Government Resolution PKM KR No.82 of 18.02.2022 "On development of agriscience in breeding livestock and irrigation", the Kyrgyz Research Institute for Irrigation was transferred to the Kyrgyz Ministry of Agriculture, its Charter was approved, changes were made to the structure and management of the Research Institute, etc.

The following laws and resolutions were adopted: Law No.21 of 01.04.2022 "On regulation of land relations"; Decree UP 109 of 08.04.2022 "On measures to prevent and suppress the facts of illegal unauthorized seizure of lands"; Resolution PKM KR No.291 of 31.05.2022 "On approval of the Regulations on the procedure for land amnesty"; Resolution PKM KR No.137 of 11.03.2022 "On measures to ensure food security and support domestic agricultural producers and peasant (farm) households in the Kyrgyz Republic" (read with PKM KR No.249 of 30.04.2022, No.479 of 01.09.2022, No.717 of 28.12.2022).

Projects. The "Agriculture financing-10"[85] project was approved (PKM KR No.3-p of 12.01.2022) to provide domestic agricultural producers with concessional loans for the development of crop and livestock production and agroindustry. As of 24.11.2022, 8,336 rural commodity producers received loans for 4,774.77 million KGS.

Ongoing projects: (1) "Support to development of a green agriculture by local communities"/GoGreen (EU) to contribute to the climate change mitigation through the development of a model of agricultural value chain; (2) "Agriculture productivity and nutrition improvement"/APNIP (US $38 million, GAFSP[86], WB, 2015-2023) to improve food security of rural households in selected areas throughout the country.

For UNDP projects, activities of IFAD in rural development and FAO in agriculture and food in Kyrgyzstan, see "United Nations and its Specialized Agencies".

Energy

Latest developments in legislation. The "Concept for restructuring the energy sector management system in the Kyrgyz Republic" was approved; it aims to ensure effective management of energy sector and reliable energy supply to consumers and to improve energy services (Resolution No.51-p of 08.02.2022). Law No.49 "On renewable energy sources" was adopted on 30.06.2022; it establishes legal, institutional, economic and financial framework, mechanisms for regulating relations between the state, producers, suppliers and consumers of RES.

The following documents were approved: (1) conclusion of the Kyrgyz Cabinet of Ministers on the draft law on "amendments to the law of the Kyrgyz Republic on electricity" (Resolution No. 391 of 02.06.2022); (2) draft financing agreement between Kyrgyzstan and IDA (WB) on the project "Modernization and sustainable development of the electricity sector" (Resolution No.528-p of 04.10.2022).

Hydropower construction and modernization. The "Electric Power Plants" JSC woks on the projects: (1) "Reconstruction of At-Bashi HPP" (Naryn province, Swiss Confederation Government); (2) "Commissioning of the second hydrounit of Kambarata-2"[87] (Zhalal-Abad province, EDB); (3) "Toktogul HPP rehabilitation" (France III Switzerland Consortium) – the 4th

[85] cycle of projects implemented by the Kyrgyz Government since 2013. During this period, 120,794 economic entities received loans for a total amount of 51.73 billion KGS

[86] Global Agriculture and Food Security Program

[87] ZKR No.120 of 16.12.2022 ratifies an additional agreement No.2 to the Agreement on granting an investment loan from the Eurasian Fund for Stabilization and Development to finance the "Commissioning of the second hydro unit of Kambarata-2 HPP" project between the KR and EDB of 28.02.2017, signed on 15.04.2022

hydrounit at a nominal capacity of 350 MW was commissioned. An agreement was signed on replacement of all hydrounits.

In Naryn province, the project "Construction and operation of 100-MW Kulanak HPP" was launched. The project will include a reservoir and a 27-m dam. The construction will last 4 years.

An Organization Committee was formed to study offers of potential investors for construction, commissioning and operation of the **Kambarata-1 HPP**[88] on the Naryn River. The project envisages construction of a 256-meter-high dam, a 1,860-MW HPP to generate 5.6 billion kWh of power, and a 5.4-billion m^3 reservoir. As of 06.01.2023, the Ministers of Energy of Kazakhstan, Kyrgyzstan and Uzbekistan singed a roadmap to implement the project (Bishkek).

The "Electric Power Plants" JSC and Kazakh Orient Trade Investment Company signed a Memorandum of understanding and cooperation on the project "Construction and operation of Kazarman reservoir cascade on the Naryn River", consisting of 4 HPPs (Alabuga HPP, Karabulun-1 HPP, Karabulun-2 HPP, Toguztorouz HPP) with a total capacity of 1,160 MW. The estimated cost is over $1 billion, and the implementation period is 5-6 years.

For the construction of power transmission lines under the CASA-1000 project[89], access roads were built to the construction sites of 1,217 (97.9%) poles, ditches were dug for poles, 1,202 (96.7%) poles were reinforced and concreted, 969 (78%) poles were installed, and 83.9 km (18.4%) of electrical wiring was installed as of 24.12.2022. A 500-kV substation is under construction at the Datka substation in Zhalal-Abad province.

Alternative energy

In 2022, 43 companies received 61 certificates of RES facilities for a total planned capacity of 1,059.3 MW (small hydro – 411.3 MW; solar – 298 MW; wind – 50 MW; geothermal – 300 MW)[90]. These companies will be included in the public Register of RES facilities.

The project "Renewable Energy Development in Kyrgyzstan" is at the preparation stage; it will focus on the development and reconstruction of small hydropower, preparation of a pilot solar project, including grid reinforcement, and technical assistance for preparation of the Kambarata-1 project.

Small hydropower. Construction of the small 25-MW "Bala-Saruu"[91] HPP (Kirov reservoir, Talas province) was started for an average generation of 92 million kWh.

Kyrgyzstan signed: (1) an agreement with the Hungarian-Kyrgyz Development Fund and the Hungarian company "A-Hid" on the design of small hydro in Kyrgyzstan; (2) a contract with the Consortium of companies – Russian "IGHolding Rus" JSC, Kyrgyz CJSC Inkraft and Canadian i-Energy Power Expert Consulting Inc. on the design of Chon-Kemin-1 HPP on the Chon-Kemin River in Chu province; (3) a Memorandum of understanding and a roadmap for implementation of small Karakul project on the Kara-Suu River in Zhalal-Abad province with Japanese Muroo Systems Co. The construction cost is estimated at US $25 million, a design capacity at 18 MW and an average annual generation at 110 million kWh.

Nuclear energy. By the Resolution No.513-p of 27.09.2022 a draft roadmap was approved on the development of cooperation between Kyrgyzstan and Russia regarding the feasibility of construction of a low-capacity nuclear power plant on the territory of the Republic.

Environment and Climate Change

On the initiative[92] of Kyrgyzstan, the 77th session of the UNGA adopted a resolution "Sustainable mountain development"[93] (December 14, New York, USA) declaring 2023-2027 as the "Five-year action plan for the development of mountain regions". The five-year action plan opens the opportunities to attract grants and investments in the economies of mountain countries, including Kyrgyzstan; will promote the development of a green economy and technologies, science and education for sustainable mountain development, biodiversity conservation and disaster prevention in mountain regions.

Public administration reforms. "Kyrgyzgeologiya", "Central Laboratory" and the Interindustry Training Center under the State Agency for Geology and Subsoil Use of the Ministry of Energy and Industry[94] were transferred to the Ministry of Natural Resources, Ecology and Technical Supervision/MNRETS (PKM KR No.231 of 26.04.2022).

Latest developments in legislation: (1) UP KR No.17 of 31.01.2022 "On declaring 2022 the Year of Mountain Ecosystem Protection and Climate Resilience". A roadmap was approved (PKM KR No.95-p of 01.03.2022), within the framework of which the national campaigns "Zhashyl Muras" (Green Heritage) were conducted (article 1), "Zhashyl Muras" Internet platform is developed (article 15); (2) UP KR No.131 of 26.04.2022 "On

[88] Resolution of KM KR No.304-p of 31.05.2022

[89] CASA-1000 project aims to connect the energy systems of Central and South Asia – Kyrgyzstan, Tajikistan, Afghanistan and Pakistan and to develop mechanisms for selling electricity in line with international standards

[90] in 2021, 20 companies received 48 certificates of RES facilities for a total planned capacity of 643.55 MW (small HPPs – 333.45 MW; solar stations – 300 MW; floating photovoltaic power plants – 0.1 MW; wind stations – 10 MW)

[91] Resolution of the Chairman of KM KR No. 173-p of 06.04.2022

[92] address by the President of Kyrgyzstan at the General Debate of the 76th session of the UNGA on September 21, 2021

[93] "Resolutions and Decisions adopted at the 77th session of the UNGA", vol. 1, pp. 747-755

[94] Ministry of Energy of the Kyrgyz Republic, UP KR No.425 of 12.10.21, PKM KR No.242 of 06.11. 2021

urgent measures to preserve the ecology of Lake Issyk-Kul", which also entrusts the Kyrgyz Cabinet of Ministers with development and approval of the comprehensive state program "Protection of Lake Issyk-Kul and socio-economic development of the Issyk-Kul biosphere zone for 2023-2026"; (3) UP KR No.305 of 06.09.2022 "On National Clean-up Day and the action plan for the creation of an effective infrastructure for household waste management for 2023-2025" aimed at implementing policies on environmental protection, rational use of natural resources, and improvement of sanitary and environmental conditions.

Projects. Kick-off workshops and meetings were held within the framework of the initiated projects: (1) "Climate change and resilience in Central Asia" (EU/UNDP) aimed at supporting climate-resilient development in Fergana Valley, the border areas of Kyrgyzstan, Tajikistan and Uzbekistan (May 31); (2) "Climate services and diversification of climate sensitive livelihoods to empower food insecure and vulnerable communities in Kyrgyzstan" (GCF) (September 8); (3) "Strengthening resilience and adaptive capacity of natural ecosystems and local communities" implemented with the support of the Critical Ecosystems Partnership Fund (CEPF) in Zhalal-Abad province, Chychkan gorge (March 22-24; July 23, December 9-10, Toktogul).

The Gosstroy and French company EGIS signed a contract to finalize the feasibility study and to develop design and estimate documentation for a project aimed at improving the infrastructure of Cholpon-Ata and nearby villages with the ADB support.

For UNDP projects, see "United Nations and its Specialized Agencies".

International cooperation. The MNRETS: (1) signed Memorandums of understanding and cooperation on environmental protection with the Ministry of Ecology and Natural Resources of Azerbaijan (October 11) and the UAE Ministry of Climate Change and Environment (October 31); (2) held meetings with the Head of the EU Delegation and Ambassador Extraordinary and Plenipotentiary of France to the Kyrgyz Republic (February 2); Head of the OSCE (February 4); Director of the UNEP European Office for Biodiversity Conservation in High Mountain Ecosystem in the KR-UNEP format (February 9); Swiss delegation (March 10); WB officials (March 18).

Draft Memorandum of understanding between the MNRETS and the Ministry of Environment, Water and Agriculture of Saudi Arabia was approved by the Decree of the Cabinet of Ministers No. 642-p of 23.11.2022.

Events. Kyrgyzstan hosted (1) the regional conference "Central Asian dialogue on readiness for climate finance through partnership engagement" (April 12-13, Bishkek); (2) a meeting on Environmental Performance Review III (EPR) (May 16, Bishkek).

As part of the environmental campaign "National Clean-up Day", a nationwide clean-up day was organized throughout the country (October 8).

The Kyrgyz delegation participated in the: (1) 3rd meeting of the heads of the SCO environmental ministries and agencies (May 24, Tashkent, Uzbekistan); (2) COP27, where Kyrgyzstan, together with Iceland and Chile, co-founded the high-level international initiative "Group of Friends of Cryosphere" to protect and preserve glaciers of mountainous countries, Antarctica and the Arctic from negative climate impacts (November 7-18, Sharm el Sheikh, Egypt); (3) 2nd Central Asian forum "Cooperation to foster low emissions and climate resilient development in Central Asia" (November 24-25, Almaty, Kazakhstan).

SDG in Kyrgyzstan

According to the National Development Strategy of the Kyrgyz Republic for 2018-2040[95], the country will strive to achieve the adopted SDGs by 2030. Kyrgyzstan was ranked 48 among 163 countries in the annual sustainable development rating.

The "Statistics of Sustainable Development Goals in the Kyrgyz Republic" and "Sustainable Development Goals and Gender in the Kyrgyz Republic" were published.

Emergencies

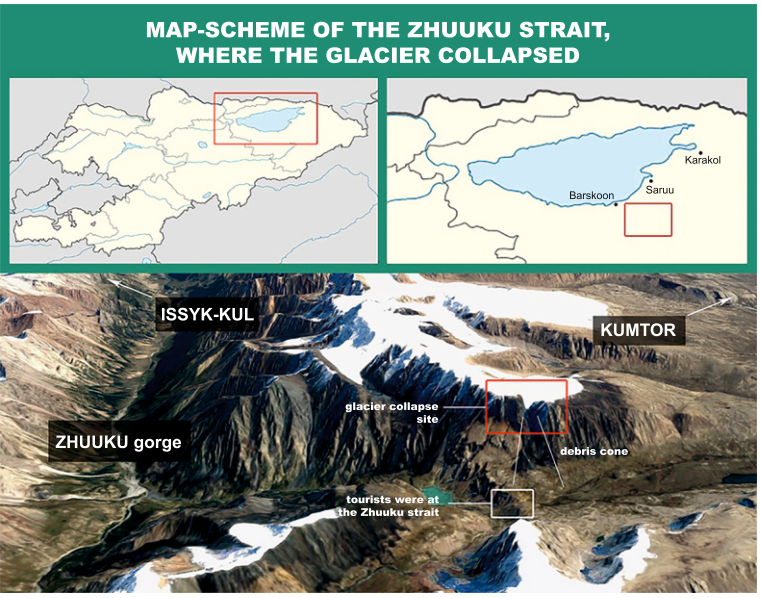
The "Concept for comprehensive protection of the population and territories of the Kyrgyz Republic from emergencies for 2018-2030"[96], adopted to accomplish the Sendai Framework Program, is under implementation. A Mid-term Review of the implementation of the Sendai Framework for Disaster Risk Reduction

[95] Approved by the Presidential Decree No.221 on 31.10.2018
[96] Approved by PP KR No.58 on 29.01.2018

2015-2030 in the Kyrgyz Republic was prepared and discussed under the Kyrgyz MES with technical and financial support of WFP, UNISDR and UNDP in the Kyrgyz Republic (October 13).

Latest developments in legislation. (1) Resolution of the Cabinet of Ministers No.70-p of 17.02.2022 to strengthen the capacities of the Kyrgyz MES; (2) Law of KR No.116 of 07.12.2022 "On amendments to the Law of the Kyrgyz Republic "On granting privileges in the repayment of concessional long-term loans to people living in settlements in high mountainous and remote areas of the Kyrgyz Republic, affected by natural disasters, who received loans in the period from 2002 onwards".

Natural disasters. The glacier collapse occurred in the mountains of Issyk-Kul province on the Zhuuku strait at the Terskey Ala-Too ridge. The estimated melted glacial mass is more than 2 million m^3 (July 8).



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In 2022, 59 emergencies were registered, including 23 mudflows and 2 floods. Due to heavy rains in spring and summer, mudflows flooded houses, and crops and roadbeds were destroyed in Naryn, Batkent, Talas, Issyk-Kul, Osh, and Zhalal-Abad provinces.

Preventive measures. To prevent emergencies related to groundwater level rise and reduce disaster risks, ditch systems and mudflow channels are cleaned, and dams and banks are strengthened.

Projects. Under the projects: (1) "Enhancing resilience in Kyrgyzstan"/ERIK (WB), 2 drones DJI Matrice 300 RTK were bought and trainings were held on their use for monitoring of natural hazards (March 4-6, Bishkek) and on modeling the movement of rockslides, landslides and mudflows using Flow-R software (June 1-6, Osh); support was provided for implementation of a distance learning system at the Center for Training and Retraining of Civil Protection Specialists under the Kyrgyz MES; a web portal of the Unified system for integrated monitoring and forecasting of emergency situations (www.ucmfs.mes.kg) was developed to provide the Kyrgyz population with access to forecast information on potential dangerous natural processes and phenomena in the country; (2) "Landslide risk management in the Kyrgyz Republic" ($39 million, ABD, implementation term – 6 years), the draft law was approved on ratification of loan and grant agreements with the ADB; (3) "Institutionalization of the methodology for damage and loss assessment in agriculture of the Kyrgyz Republic" (FAO), the starting national technical workshop (February 11, Bishkek) and simulation exercises to test the methodology for assessing damage and losses associated with agricultural disasters (22-26 May, pilot sites) were held.

International cooperation. The draft Agreement was approved between the Cabinet of Ministers of the Kyrgyz Republic and the Government of the Republic of Uzbekistan on cooperation on emergencies prevention and elimination (RKM No.346-p of 23.06.2022).

The MES of KR and RK conducted an online joint training on control alerting of on-duty services in response to emergencies on the example of cross-border wildfires for the CICA member states. Representatives of emergency services from Azerbaijan, Bangladesh, Iran, China, Russia, Tajikistan, and Thailand attended the event.

The evaluation mission[97] of the UN "CADRI Initiative (CADRI)" international experts conducted a diagnosis of disaster risk management capacity in eight priority sectors of the Kyrgyz Republic: agriculture, environment, health, social protection, water and sanitation, education, transportation, telecommunications and tourism (February 21-March 3). A report was prepared based on the results of the evaluation. Recommendation on capacity diagnosis will inform the review and update of the national strategic vision for DRR, the 2023-2027 strategic cooperation framework document with the UN, and will be integrated into sector plans, national and local level strategic documents for DRR and CCA.

Events. The month dedicated to the "Disaster Risk Reduction Day" (September 6-October 5); safety lesson for schoolchildren (June); roundtable "Glaciers of the mountain regions of Central Asia in a changing climate" (November 25, Bishkek) were held.

The Kyrgyz delegation participated in the: (1) regional forum of emergency ministers of the Central Asia republics. The participants discussed how to coordinate actions for strengthening regional cooperation on DRR, combating climate change, and implemen-

[97] evaluation was conducted by a multidisciplinary team of international experts from UNICEF, UNDP, UNISDR, FAO, the CADRI Secretariat and a national team comprising representatives of MES, the National Platform Secretariat and the UN Country Team in the Kyrgyz Republic, including FAO, OCHA, UNDP, UNICEF, UNFPA, WFP, WHO, UNESCO and IOM

tation of the Sendai Program and the Strategy for development of DRR cooperation in CA for 2022-2030 and the matters related to formation of early warning systems and emergency information sharing (October 4-6, Dushanbe, Tajikistan); (2) 8th Summit of emergency ministers of the OTS member states (December 21, Ankara, Turkey).

The Center for Monitoring and Forecasting of Emergency Situations conducted the training for officers of MES of the Kyrgyz Republic on the use of GIS technologies and mapping in emergencies jointly with the British non-governmental organization MapAction (May 23-27).

The 19th edition of the "Monitoring and forecasting of hazardous processes and phenomena in the Kyrgyz Republic" was published.

Foreign Policy and International Cooperation

Working and official visits. In 2022, the Kyrgyz President paid state and working visits to China (February), Azerbaijan (April), Russia (May, December), UAE (May, October), Uzbekistan (September, November), Turkey (September), Kazakhstan (October), Armenia (November), Qatar (December).

The President **held meetings** with the: *Presidents* of Kazakhstan (May), Tajikistan (July), Uzbekistan (September), Azerbaijan (October); *Prime Ministers* of Kazakhstan (April), Uzbekistan (September); *Vice Premier* of the State Council of the PRC (December); *Ministers* of the Eurasian Economic Commission for Integration and Macroeconomics (February), Foreign Affairs of the Kingdom of Saudi Arabia (March), Investment and Foreign Trade of Uzbekistan (April), Foreign Economic Relations and Foreign Affairs of Hungary (May), Economy of UAE (June), Foreign Affairs of PRC (August), Foreign Affairs of Uzbekistan (November), Internal Affairs of Turkey (November); *Ambassadors* of Germany (March), USA (December); UN Deputy Secretary-General (June); ADB *Vice President* (April); WB *Managing Director* of Operations (September); Directors General of the Asia Operations Department of the Saudi Fund for Development (February); *Secretaries-General* of the SCO (May), CSTO (September), and OTS (November).

Most significant events in the Kyrgyz foreign policy in 2022

The foreign policy of the Kyrgyz Republic is focused on active cooperation with neighboring states on: delimitation and demarcation of the state border; creation of indivisible security space and rebuilding of trust in the CA region; achievement of environmental security; adaptation to climate change and cooperation with international climate funds to initiate joint projects for preserving glaciers, forests and biodiversity; better preparedness for natural disasters; ensuring of access to clean drinking water; construction of RES facilities, primarily hydropower; promotion of water-energy diplomacy, etc.

Development of alliances and strategic partnerships. The Kyrgyz Republic strengthens and deepens cooperation with the CA states. Kyrgyzstan chaired the **4th consultative meeting of the Heads of State of CA**, where: (1) a joint statement was adopted; (2) a Treaty of Friendship, Good-Neighborliness and Cooperation for the Development of Central Asia in the 21st Century was signed. Among other things, it is said that: "…the Parties unite and coordinate efforts in environmental restoration in the Aral Sea basin and Aral Sea region, cooperate on development and implementation of international and regional programs in this field... Shall take necessary efforts to improve the legal and institutional framework of the International Fund for Saving the Aral Sea, taking into account the interests of all Central Asian states" (Article 19); (3) a decision of the Heads of the IFAS Founder States was signed to extend E. Rakhmon's term as the IFAS President; (4) the Concept for cooperation of the CA states in multilateral format, the "Green Agenda for CA" and the roadmap for regional cooperation development for 2022-2024 were approved (July 21, Cholpon-Ata).

The Kyrgyz delegation participated in the anniversary meeting of the heads of CSTO member states (May 16); international conference "Afghanistan: security and economic development" (July 25-26, Tashkent, Uzbekistan); summit "Central Asia-Russia" (October 14, Astana, Kazakhstan); extraordinary session of the CSTO Collective Security Council (October 28, online).

Within the framework of **CIS**, Kyrgyzstan participated in the meetings of: (1) the Council of Heads of State, following which the Chairmanship will be passed to Kyrgyzstan in 2023 (October 14, Astana, Kazakhstan); (2) the Council of Heads of Government (May 20, online; October 28, Astana, Kazakhstan); (3) the Council of CIS Foreign Ministers (May 13, Dushanbe, Tajikistan; October 12, Astana, Kazakhstan); (4) the CIS Economic Council (March 18, Moscow, Russia; June 10, Nur-Sultan, Kazakhstan; September 23, Moscow, Russia; December 2, online), as well as in the informal summit of the Heads of State (December 26, Saint Petersburg, Russia).

Within the framework of **SCO**, the President participated in a meeting of the Council of Heads of SCO member states (September 16, Samarkand, Uzbekistan). The Chairman of the Cabinet of Ministers participated in the 21st meeting of the Council of Heads of Government (Prime Ministers) of the SCO member states (November 1, online).

The Kyrgyz Republic, **as the chairing country of the EAEU in 2022**, hosted the 1st Eurasian economic forum (May 26, Bishkek), a meeting of the Supreme Eurasian Economic Council with the participation of the heads of EAEU state (May 27, December 9, Bishkek), CIS and EAEU Youth Forum (August 25-26, Cholpon-Ata), and a meeting of the Eurasian Intergovernmental Council (August 25-26, Cholpon-Ata). Moreover, NGOs held an international forum "The Bishkek Initiative for closing biolaboratories in the EAEU countries, funded by non-aligned countries" (June 9, Bishkek).

Promotion of the national interests and reinforcement of the country's image. The Kyrgyz Republic is actively engaged with the UN, EU, OSCE, OIC, and ECO.

On the initiative of Kyrgyzstan, the participants of the 76th session of the UNGA unanimously adopted a Resolution[98] declaring 2022 the International Year of Mountain Development.

The Permanent Mission of the Kyrgyz Republic to the UN made a presentation of the concept of the "Five-year action plan for development of mountain regions" (May 24, New York, USA)[99]. Ahead of the 77th session of the UNGA, the Kyrgyz delegation organized a high-level meeting on sustainable mountain development (September 19, New York, USA). The Resolution on "Sustainable mountain development" declaring 2023-2027 as the "Five-year action plan for development of mountain regions" was adopted at the 77th session of the UNGA (December 14, New York, USA).

The Minister of Foreign Affairs of the Kyrgyz Republic participated in the ministerial meeting in the C5+1 format on the sidelines of the 77th session (September 22, New York, USA), the annual consultative meeting of foreign ministers of the OIC member states (September 22), the meeting of foreign ministers of landlocked developing countries, where in particular he emphasized a need to promote the principles of green economy and the RES projects, including hydropower (September 22).

For the first time, Kyrgyzstan was elected to the Steering Committee of the Mountain Partnership at the 6th Global Meeting of Mountain Partnership (September 26-29, Aspen, USA).

The Kyrgyz President took part in the: (1) summit "Central Asian States-China" (January 25, online); (2) 1st summit "India-Central Asia" (January 27, online); (3) 4th Asia-Pacific water summit "Water for sustainable development – new generation and best practices" (April 23, online); (4) 6th CICA Summit (October 12-13, Astana, Kazakhstan); (5) 1st EU-Central Asian leaders' meeting (October 27, Astana, Kazakhstan); (6) meeting of the 9th Summit of the Heads of State of OTS (November 10-11, Samarkand Uzbekistan).

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Ministry of Finance (https://www.minfin.kg/index.php);

Ministry of Energy (https://minenergo.gov.kg/);

Ministry of Natural Resources, Environment and Technical Supervision (https://mnr.gov.kg/ru/);

Ministry of Emergency Situations (https://mchs.gov.kg/);

National Energy Holding (http://energo.gov.kg);

Water Resources Service (https://www.water.gov.kg/index.php?lang=ru);

National Statistical Committee (http://www.stat.kg/ru/)

Information agencies and sites:

https://knews.kg

https://kabar.kg/

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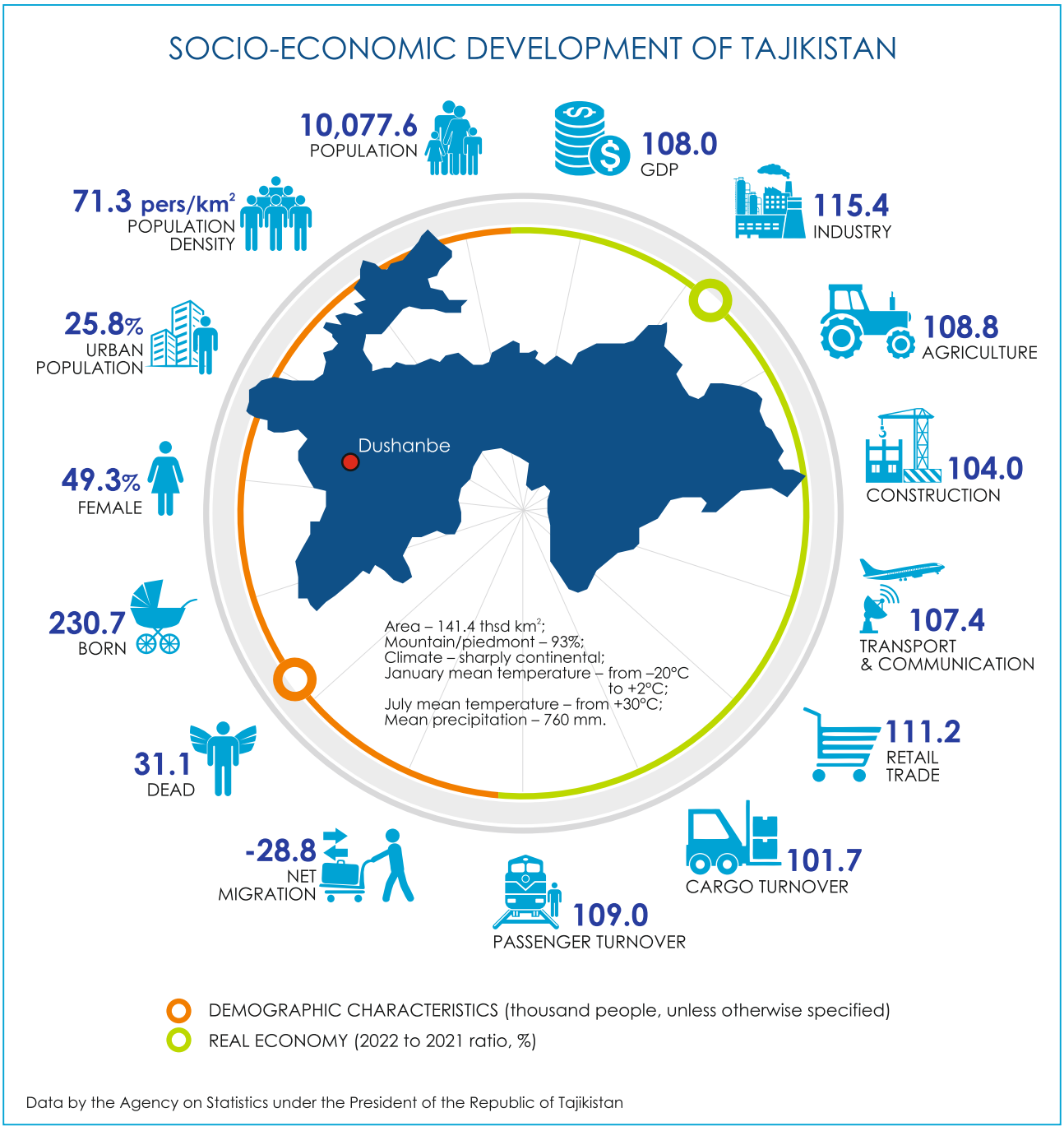
https://www.facebook.com/mchs.gov.kg

[98] 52nd plenary meeting, December 16, 2021, p.6

[99] Within five years, the Kyrgyz Republic intends to promote a wide range of initiatives in the field of environmental protection, disaster management, health care development, sustainable access of mountain communities to electricity, education, science, and culture in mountain countries

5.3. Tajikistan



Data by the Agency on Statistics under the President of the Republic of Tajikistan

Water Sector

Water resources. Tajikistan has got water resources from glaciers, rivers, lakes, reservoirs and groundwater.

There are 14,509 glaciers with the total glaciation area of 11,146 km^2 (approx. 8% of the country's area) and the total glacial volume of about 845 km^3. 947 rivers stretching to more than 28,500 km flow across the country.

The average annual river runoff is 64 km^3/year (including 80% of the Amu Darya River and 1% of the Syr Darya River) or 55.4% of the average long-term annual surface runoff in the Aral Sea Basin.

Tajikistan possesses about 1,300 lakes covering 705 km^2. The lakes contain over 46.3 km^3 of water, including 20 km^3 of freshwater. There are 11 operational reservoirs, with the total water surface area of 664 km^2 and the total capacity of 15,344 km^3, which is equivalent to 13% of the average long-term annual runoff in the Aral Sea Basin. The potential groundwater stock is 18.7 m^3/year, while usable groundwater resources are estimated at 2.8 km^3/year.

The main water consumers in Tajikistan are irrigated agriculture, which accounts for 85% of the total water use, household and drinking water supply – 5%, industry – 5%, fishery – 2%, and other sectors – 3%.

Latest developments in legislation. The "2022-2027 State Program[100] on development of new irrigated land and reclamation of land withdrawn from agricultural production" and the Action Plan for its implementation were approved (PP RT No.90 of 01.03.2022).

New appointments. B.T. Zukhurzoda was appointed Deputy Director of the Agency for Land Reclamation and Irrigation under the Government of Tajikistan (UP No.171 of 11.04.2022); M.B. Rakhmatzoda – Head of the Center for implementation of the Irrigation of the Danghara Valley Project (UP No.170 of 11.04.2022).

2016-2025 Water Sector Reformation Program[101] and projects. According to MEWR[102], since 2016, 2,693 million TJS have been used by the Program, including 597 million TJS in 2022. In 2022, (1) a new Water Code and amended laws "On drinking water and drinking water supply"[103] and "On Water User Associations"[104], as well as 17 by-laws regulating the water sector **were adopted**; the National Water Strategy of the Republic of Tajikistan up to 2030, the basin plans for water resource management in the Syr Darya, Zerafshan, Panj, Kafirnigan, Isfara and Isfana River basins, and the Programs for rehabilitation of industrial water supply systems and their equipment with water meters **were developed**; the large-scale work **was undertaken** to assess conditions of the water supply and sanitation sector for development of the 2030 State Program for water supply and sanitation; (2) basin zones and 5 basin organizations under the MEWR **were set**; 5 basin councils for the Syr Darya, Zeravshan, Panj, Vakhsh, and Kafirnigan River basins **were established**; the work was initiated for the improvement of management structure in the water supply and sanitation sector.

The "Procedure and method for drafting water balances" was approved[105] (Resolution of MEWR No.45 of 01.12.2022). The "State program on water supply and sanitation until 2030" and the "Concept for the support of water education in Tajikistan by 2030"[106] were developed.

Projects implemented in the water sector under the Reformation Program, *million $*

No.	Name	Quantity	Total cost	Funds used in 2022	Funds used since the project started	Remaining funds
1	Ongoing projects	26	460	58	146	314
	including public investment projects:					
2	Projects on drinking water supply and sanitation	7	243	28	62	181
3	Projects on irrigation and land reclamation	4	165	22	52	113
	including technical assistance projects:					
4	Other projects on drinking water supply, irrigation, water quality and bank reinforcement	15	52	7	32	20

Source: Information of MEWR

In the land reclamation and irrigation (+bank reinforcement) sphere, 4 projects are currently underway. The total cost is $165 million, of which about 80% is allocated for infrastructure rehabilitation and construction. In 2022, $22 million were used.

The following projects were continued: (1) "National water resource management in Tajikistan"/NWRM[107] (SDC, CHF 6.4 million, 2018-2023); (2) "Water resource management in the Panj River basin"[108] (ADB) to increase agricultural production and food security through improved water resources management; (3) "USAID regional water and vulnerable environment activity" (2020-2025) aimed at strengthening water cooperation among the CA countries to enhance stability, economic prosperity and sustainable ecosystems.

To support MEWR in the Reformation Program, the project "Integrated rural development (IRD)/"To-

[100] Program implementation coordinator – Agency for Land Reclamation and Irrigation under the Government of RT

[101] Approved by PP RT No.791 of 30.12.2015

[102] 16th meeting of the Coordinating Council of the National Water Policy Dialogue on IWRM in Tajikistan, February 15, 2023, https://unece.org/environmental-policy/events/16th-meeting-steering-committee-national-policy-dialogue-iwrm-republic

[103] as amended by ZRT No.1483 of 02.01.2018

[104] ZRT No.1668 of 02.01.2020

[105] developed with the support of UNECE in line with Article 34 (part 3), Water Code of RT

[106] developed by MEWR with participation of other concerned ministries and agencies, with the support of USAID regional water and environment activity/WAVE

[107] implemented by a consortium of organizations: HELVETAS Swiss Intercooperation, Acted, GIZ

[108] see project documents on https://www.adb.org/projects/47181-002/main

wards rural inclusive growth and economic resilience (TRIGGER)"[109] (BMZ, EU, and GIZ, 2019-2024) concluded a cooperation agreement with UNDP[110]. The partnership will focus on: (1) improvement of knowledge coordination and management in the water sector among all stakeholders; (2) awareness raising on the reform process and building of ownership; (3) engagement of personnel from MEWR in global reform developments; (4) improvement and development of the legal framework of the reform; (5) promotion of IWRM and gender, planning, and risk management; (6) integration of policies related to water, climate, energy, food and biodiversity through a nexus system.

The Government of Tajikistan and ADB signed a $30-million grant agreement to modernize the Yavan irrigation and drainage system in the lower basin of the Vakhsh River. The lower house of the Parliament ratified the agreement (April). The project will improve agricultural and water use productivity and empower women in land and water management.

The WB Board of Executive Directors approved the IDA grant of $30 million for the project "Strengthening water and irrigation management"[111] aimed at (i) strengthening capacity for water resource planning and irrigation management in Tajikistan and (ii) improving performance of selected irrigation schemes in the Vakhsh and Zerafshan River basins.

For UNDP projects, see "United Nations and its Specialized Agencies".

Events. The fowling events were organized: (1) 2nd International High-level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6-9, Dushanbe, Tajikistan), see "2022 Calendar of Events"; (2) First Geneva Water Dialogue and workshop on water and disaster risk reduction with participation of the Permanent Mission of Tajikistan to the UN (July 1, Switzerland); (3) 9th meeting of the National Commission on Irrigation and Drainage of the Republic of Tajikistan (December 8, Dushanbe).

The delegation of MEWR took part in the: 9th World Water Forum and meetings on the margins of the Forum (March 21-26, Dakar, Republic of Senegal); (2) 4th Asia-Pacific Water Summit (April 13-24, Kumamoto, Japan); (3) 2022 Petersburg International Economic Forum (June 16, Saint Petersburg); (4) High-level Symposium on Water and 3 roundtables "Synergies between SDG6 and SDG14 – an integrated vision of the whole hydrological cycle: strengthening cross-sectoral approaches to accelerate implementation of related targets, including financing and governance", "Water and Sanitation Services bridging SDG6 and SDG14" and "Existing successful and innovative partnerships to support the implementation of SDG6 and 14: challenges, opportunities and actions" under the UN Ocean Conference (June 27, Lisbon, Portugal); (5) World Water Week "Seeing the unseen: the value of water" (August 28, Stockholm, Sweden).

Drinking Water Supply

Projects. In the water supply and sanitation sector, 7 projects worth of $243 million are underway. $28 million were used in 2022. This resulted in commissioning of: (1) new drinking water supply networks in Khujand city (project by "Sadaf" SUE, 2 million TJS), Gazantarak village in Sogd province (with the support of the Tajik Government), villages of Kabadiyan, Shakhri and Farkhor districts ("Tajikistan prosperity" project, 2018-2023, USAID, Aga Khan Foundation); (2) 1,000-m^3 tank for water supply in Buston city (tripartite between the SUE "Housing and Communal Services of RT", EBRD and the "Rehabilitation of water supply systems in northern cities of Tajikistan" project).

The loan agreement was ratified between the Republic of Tajikistan and EBRD on the "Fayzabad Water and wastewater" project (Resolution of MNMO RT No.789 of 29.06.2022).

Agreements were signed (1) with EU to start allocating €29 million in grants, of which €14 million is earmarked for rural drinking water supply; (2) with EBRD for more than €8 million to restore key water supply and sewerage infrastructure in Kulyab city – more than 100,000 residents will have access to improved water supply and sanitation services, and water losses will be reduced to 35%. Grants were approved: (1) by the WB Board of Executive Directors for $45 million to finance the "Water supply and sanitation" investment project in Khatlon province; (2) by ADB for additional financing of $38 million to improve water supply and sewerage systems in Dushanbe city. It is expected that 125,000 people will get 24/7 piped water supply, and 500,000 people will benefit from improved sewerage.

EBRD and SECO will provide €4.4 million for modernization of water supply networks in Fayzabad district, Rasht Valley.

Agriculture

Agricultural production. In 2022, the total agricultural output accounted for 49.2 billion TJS, which is 8% more than in 2021. Production of grain amounted to 1.6 million tons, potatoes – 1 million tons, and vegetables and fruits – 3.2 million tons.

[109] an integral part of the EU Rural Development Program II (RDP II) aimed at supporting agrarian reform, sustainable and efficient water use, increasing agricultural production in selected target areas and strengthening natural resource management, https://www.youtube.com/watch?v=0KVr0uz791c

[110] approved by PP RT No.791 of 30.12.2015

[111] for information on environmental and social aspects of the proposed project, please refer to https://alri.tj/en/strengthening-water-and-irrigation-management-project-tajikistan. Estimated implementation period is 2022-2027, https://www.alri.tj/ru/proekt-ustojchivoj-irrigacii-v-tadzhikistane?spetial=Y

Agricultural export. In 2022, Tajikistan exported 191.2 thousand tons of agricultural commodities (17.6 thousand tons less than in 2021) to 20 countries (92% – CIS countries, 8% – other countries) for $54.3 million ($17.6 million more than a year earlier). In particular, the country exported 76.6 thousand tons of vegetables, 54.5 thousand tons of fruits, and 52.4 thousand tons of dried fruits.

Gross Domestic Product (GDP) amounted to 115.7 billion TJS (over $11.3 billion), which is 8% more than in 2021. The inflation rate was 4.2%, which is 3.8% less than in the last year.

Latest developments in legislation. The "2022-2027 State Program for development of new irrigated land and reclamation of land withdrawn from agricultural production" was approved (PP RT No.90 of 01.03.2022). The law was adopted "On state support to agro-industry of the Republic of Tajikistan" (No.1866 of 18.03.2022); it determined the institutional, legal and economic framework of state support to agro-industry and envisages regulation and sustainable management of the latter.

The rates of land and single agricultural tax were approved for 2022-2026 for the cadastral zones of the republic, including mountainous zones (PP RT No.206 of 27.04.2022).

New appointments: (1) S.G. Karimzoda was appointed Minister of Agriculture (UP RT No.322 of 26.01.2022); (2) M.B. Mirzozoda – First Deputy Minister (PP RT No.5 of 26.01.2022); (3) Dj. Nosirzoda – Deputy Minister (PP RT No.285 of 10.06.2022).

Projects and international cooperation. As part of the "Towards rural inclusive growth and economic resilience"/TRIGGER Project, aimed, inter alia, at increasing the added value of agricultural production in Tajikistan, a series of trainings for trainers was held to develop knowledge and skills of project partners, rural advisors and agronomists to raise farmers' awareness of climate change and integration of adaptation measures, especially in the Zerafshan and Rasht River valleys (March-April). Support was provided to the Tajik delegation for a study tour to South Korea (November 13-20).

As part of the Feed the Future program, the "Tajikistan agriculture and land governance activity" addresses the root causes of poverty, hunger and malnutrition through agricultural development and increased sustainability of rural communities in 12 districts of Khatlon province (Balkhi, Dusti, Zhayhun, Zhami, Khurasan, Kushoniyon, Nosiri Khusrav, Kubadiyan, Levakand, Shakhritus, Vakhsh and Yavan).

The WB approved an additional grant of $50 million for the "Strengthening resilience of agriculture sector" project[112], which will support the procurement and distribution of seeds, fertilizers and compact machines to vulnerable farmers, including women farmers.

Memorandum of cooperation was signed between the Ministry of Agriculture and: (1) the Ministry of Agriculture of Egypt (March); (2) the Irkutsk State Agrarian University named after A.A. Ezhevsky, Russian Federation (March).

For UNDP projects, IFAD and FAO activities in Kyrgyzstan see "United Nations and its Specialized Agencies".

Energy

Energy production and export. In 2022, the total electricity production in Tajikistan increased to 21.4 billion kWh, which is 775.7 million kWh (3.8%) more than in 2021. Electricity exports reached more than 2.5 billion kWh, which is 118.4 million kWh (5%) more than in 2021. In just eleven months, the country raised more than $103 million, which is 10.2% more than in the same period of 2021 (about $93.5 million).

Public administration reforms. The public entity "Mechanized Construction and Repair of Hydraulic Structures" was established at the Agency for Land Reclamation and Irrigation under the Government of Tajikistan (PP RT No.615 of 29.12.2022).

Latest developments in legislation: (1) electricity and heat tariffs were approved for different groups of consumers (PP RT No.449 of 31.08.2022)[113]; (2) state financial support was provided to the "Barki Tojik" OSHC by reducing the debt to the "Sangtuda-1 HPP" OJSC by 282.4 million TJS, which accumulated due to purchase of electricity (PP RT No.605 of 20.12.2022).

New appointments: M.Sh. Asozoda was appointed Chairman of the "Barki Tojik" OSHC (PP RT No.12 of 27.01.2022), A.A. Kurbonzoda – Deputy Chairman (PP RT No.13 of 27.01.2022); S.A. Kholmukhamadzoda (PP RT No.286 of 10.06.2022) and M.B. Safarzoda (PP RT No.287 of 10.06.2022) were appointed Deputy Ministers of Energy and Water Resources; T. Gafurzoda – Head of the State Service on Supervision of Hydraulic Structure Safety (PP RT No.345 of 25.06.2022).

Projects and international cooperation. As part of the "Project Vanch I: improving quality of life through reliable power supply" (Royal Norwegian Ministry of Foreign Affairs (RNMFA) in cooperation with Aga Khan Foundation and Pamir Energy, 2020-2022), the construction of the remaining 25 km of 110-kV transmission line was completed in Vanch-Darvaz district; now it connects the regional electricity grid of GBAO to the national grid of Tajikistan.

The WB is currently financing 25 projects in Tajikistan for a total of $1.3 billion. An additional grant of $80

[112] WB Board of Executive Directors approved $58 million in grant financing from the IDA for the project for more resilient and sustainable agricultural sector

[113] as amended by PP RT No.593 of 01.12.2022

million was approved under an ongoing project on rehabilitation of electricity facilities.

EU also allocates €15 million to support the country's energy sector.

Alternative Energy

In Tajikistan, the hydropower potential is estimated at 527 billion kWh per year. However, existing capacities allow generating only 18 billion kWh of electricity per year (less than 5% of the potential). At the same time, the share of hydropower in the country's fuel and energy budget is more than 95%. About 300 small HPPs have been built in the country, and another 600 small HPPs can be built.

The gross potential of solar energy is estimated at 1,822,894 MW (4,790.6 million TFOE/year); the technical potential is 1,493.7 MW (3.92 million TFOE/year); the economically viable potential is 545.2 MW (1.49 million TFOE/year). Wind energy potential is 60,167 MW (163 TFOE/year). The efficiency of wind plants was 55% in July and 100% in January.

Renewable energy of Tajikistan, *million TFOE*

Resources	Gross potential	Technical potential	Economic potential
Hydropower (total)	*179.2*	*107.4*	*107.4*
incl. small hydro	*62.7*	*20.3*	*20.3*
Solar	*4,790.6*	*3.92*	*1.49*
Biomass	*4.25*	*4.25*	*1.12*
Wind	*16.3*	*10.12*	*5.06*
Geothermal	*0.04*	*0.04*	*0.04*
TOTAL (excl. large hydropower)	*5,020.595*	*38.63*	*27.95*

Source: https://www.asiaplustj.info/ru/news/tajikistan/economic/20220811/eabr-dast-37-mln-dlya-stroitelstva-11-solnechnih-stantsii-v-armenii

In his address to the Parliament at the end of 2021, the President of Tajikistan stated the need for wider use of solar and wind energy. Accordingly, by Presidential Decree No.432 of 19.08.2022 the draft Agreement between the RT and EU on financing the "Sustainable energy support program in Tajikistan" for €15 million was approved.

The delegation of Tajikistan presented information on the: (1) country's potential for generating environmentally clean energy and contribution to the reduction of harmful emissions by expanding energy ties with the countries in the region that use conventional energy during the ministerial panel session "Building a strong foundation for a resilient and sustainable energy and water services sector" (May 9, Abu Dhabi, UAE); (2) relevance of global transition to clean and sustainable energy at the "Uzbekistan 2022" Energy Forum and a number of working meetings during the event (June 23-24, Tashkent);(3) development of a solar power project and other alternative energy projects during the 60th meeting of the CIS Energy Council (July 14, Nur-Sultan).

Hydropower Construction and Modernization

Yavan HPP. Tajikistan and Uzbekistan started construction of a 140-MW hydropower plant on the Zeravshan River. The plant will generate 700-800 million kWh per year (July).

Rogun HPP[114]. In 2022, 3.2 billion TJS were allocated from the state budget for construction work. The Ministry of Finance was instructed to replenish the authorized capital of the "Rogun HPP" OJSC at the expense of the Stabilization Fund for Economic Development by 200 million TJS (at about $20 million).

The excavation work is further continued to prepare main basins and access routes to them, flatten the site and reinforcing mountains to a level of 1,552 m. Tunneling, reinforcement of water delivery, concreting, construction and mounting work are underway in the site of the main dam. Efforts on the dam body, including in head- and tail-water parts and in the core of the dam are continued.

Since the start of operation (November 2018, September 2019), two hydrounits generated more than 4.6 billion kWh of electricity.

[114] Rogun HPP will be the largest one in Central Asia, with the installed capacity of 3.6 thousand MW and the annual electricity output of 13 to 17 KWh, after the plant is fully commissioned


Photo: Press service of the President of RT, https://asiaplustj.info/ru/news/tajikistan/economic/20221124/pravitelstvo-tadzhikistana-poruchilo-napravit-na-dostroiku-roguna-dopolnitelnie-20-mln

Small Sebzor HPP[115]. As part of bilateral cooperation between Germany and Tajikistan, an agreement was signed on additional financing of the construction for €17.4 million (May). Consequently, the total financing of the project will amount to €53 million. The HPP will generate up to 77.6 GWh of electricity per year and will improve access to sustainable, reliable and affordable electricity for the rural population in GBAO.

A contract was signed between the "TGEM" OJSC and Pamir Energy to construct 3 km of road, machine hall, and water intake, install 3 km of pipelines and deliver hydraulic equipment to the run-of-river plant (December).

Sarband HPP[116]. The 49-MW 3rd unit was commissioned, reconstruction of 220- and 110-kV power substations was completed, and work is underway on reconstruction of hydrounit 1 (March). After the complete reconstruction, the capacity of the HPP will increase to 270 MW, and the service at the plant and power supply will be significantly improved.

Nurek HPP[117]. In 2022, the first 375-MW unit was commissioned as part of the first phase of reconstruction. It is expected that the new unit will generate 1,380 GWh per year, which is 135 GWh more than by previous unit (October). An agreement was signed with the WB to finance ($65 million) the second phase of the "Nurek HPP rehabilitation" project; the allocated funds will be used, inter alia, for reconstruction of the remaining 6 units, overhaul of nodes of hydroturbine, etc. (May).

Kairakkum HPP[118]. Reconstruction of the HPP is 80% complete – three units were replaced, work was completed on the precise design and production of turbines, generators, transformers, auxiliary system, water gates of main turbine, construction part of the project for units 5 and 6; research and preparatory work was finished.

CASA-1000

Construction at the Sangtuda converter substation is over 98% complete, while general construction is 90% complete. The installation of major electrical components is underway, and all seven main converter transformers were assembled. The following interventions are in progress: (1) construction work to upgrade two substation sites along the CASA-1000 route

[115] 11-MW HPP is under construction in Roshtkala district of Gorno-Badakhshan Autonomous Region (GBAO)

[116] construction of the Sarband HPP (design capacity of 240 MW) was launched in 1956. It is one of the 6 operating HPPs on the Vakhsh River. Rehabilitation under the "Sarband HPP reconstruction" Project was started in 2016

[117] it is part of the Vakhsh cascade. Construction was started in 1961. Dam height -300 m, capacity - 3 thousand MW. It covers more than 50% of the total annual energy demand in Tajikistan. Reconstruction was started in 2019

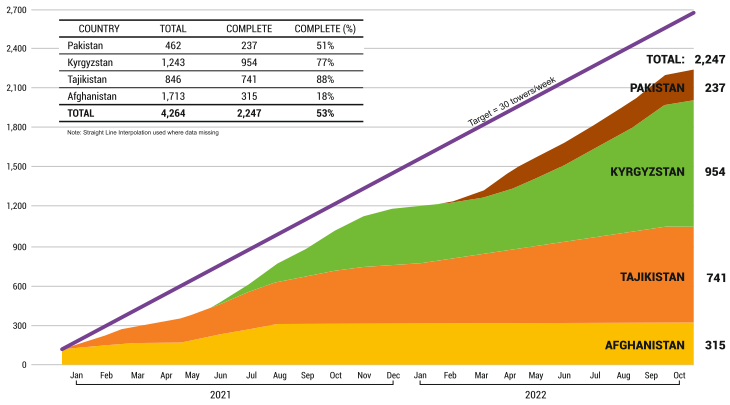
[118] it is part of the Naryn-Syrdarya reservoir cascade. Construction was started in 1951, reconstruction – in 2020 ($200 million, ADB, Investment Bank of Europe), after completion of which, by 2023, the capacity is expected to increase from 126 to 176 MW, power generation – up to 38%

(Sughd-500 and Regar-500); (2) construction of transmission towers along the entire length of the CASA-1000 system in the country, while construction of the HVDC line from Sangtuda to the Afghan border is fully completed.

CASA-1000 interactive map

Source: https://www.casa-1000.org/construction/

CASA-1000 Tower Construction by Country, *(21 01 01 - 22 10 12)*



Source: https://www.casa-1000.org/construction/

Climate Change, Glaciers and Environmental Protection

At the initiative of Tajikistan, the 53rd plenary meeting of the 77th UNGA session unanimously adopted the resolution "International Year of Glaciers' Preservation, 2025"[119] (December 14, New York, USA). The resolution: (1) "…declares 2025 the International Year of Glaciers' Preservation and to proclaim 21 March of each year the World Day for Glaciers, to be observed starting in 2025"; (2) "…invites Governments, intergovernmental and non-governmental organizations, major groups, other relevant stakeholders and donors to voluntarily contribute to the trust fund in support of activities for glaciers' preservation, to be coordinated by the Secretary-General, in partnership with relevant agencies of the United Nations system…"; (3) "…welcomes the generous offer of the Government of Tajikistan to convene an international conference dedicated to glaciers' preservation in Tajikistan in 2025…".

Latest developments in legislation. The "Strategy for green economy development in the Republic of Tajikistan for 2023-2037" was approved with the aim to develop green economy, adapt to climate change, reduce greenhouse gas emissions, efficiently use natural resources, and mobilize capital and energy-saving technologies (PP RT No.482 of 30.09.2022).

New appointments. N.I. Nazarzoda was appointed Deputy Director of the Forestry Agency under the Government of Tajikistan (UP RT No.172 of 11.04.2022).

Projects. The "Technology-based adaptation to climate change in rural Tajikistan and Kyrgyzstan" (2019-2022)[120] project was completed: (1) the developed Geoportal provides access to up-to-date geographic information of Tajikistan and enables national partners and other stakeholders to explore and share it with each other; an Earth Observation Laboratory and unified metadata standards consistent with the system in place in Kyrgyzstan were established; (2) legal and regulatory framework was improved, and a working group was established to promote and develop the National Spatial Data Infrastructure initiative; (3) training was conducted in GIS, RS, digital data management, cloud analysis of climate data and satellite image processing, etc.; (4) a detailed site assessment was conducted, and local climate change adaptation plans were drafted for pilot districts of the project (Penjikent, Khovali, Muminabad, Vakhdat and Rudaki districts).

The eco-technological "ClimIT" (Switzerland) project was launched[121]; in the first phase, students will get technical skills in graphic design and will study modules on environment and waste management, while in the second phase, they will work together with experienced mentors to develop a package of communication materials and initiatives aimed at raising public awareness and reducing plastic use in Dushanbe. The following events were organized in Dushanbe: (1) kick-off seminar (June 3); (2) meeting with the Swiss Ambassador to Tajikistan (December 8); (3) courses on graphic design, digital marketing, and UX/UI design.

[119] Resolutions and decisions adopted by the General Assembly during its 77th session, vol. 1, pp. 540-543

[120] with the financial support from the German Ministry of Economic Cooperation and Development under the German Climate and Technology Initiative. Implemented by GIZ with the support of the Committee for Emergency Situations and Civil Defense of Tajikistan, Fazo Design and Research Institute (DRI) and the State Committee on Land Management and Geodesy

[121] by Ilmkhona Skills Accelerator, Youth Environmental Center together with Risha Solutions, with the financial support from the Government of Switzerland

The information on other projects is available on http://tajnature.tj/ru/services/projects/.

For UNDP projects, see "United Nations and its Specialized Agencies".

International cooperation. As part of the official visit of the President of Tajikistan to Uzbekistan, 15 documents on bilateral cooperation were signed, including the Memorandum on cooperation on environmental protection and rational environment management between the Committee for Environmental Protection under the Government of Tajikistan and the State Committee for Ecology of Uzbekistan[122].

Events. As part of the Green Climate Action month (August 21-September 17), the following events were held: eco-podcast series "Listen Green", training "Joint mapping in Tajikistan" (August 23, Dushanbe), roundtable "Potential for development of cross-border cooperation in protected natural areas between the Republic of Tajikistan and the Republic of Uzbekistan" (August 31, Dushanbe), "Clean environment is a guarantee of human health" campaign (September 3, Dushanbe).

Source: Committee for Environmental Protection under the Government of Tajikistan

The following events were organized in Dushanbe: workshop on NDCs monitoring (July 26-29); national meeting and workshop on "Accelerating transition to circular economy in 2021-2024" (September 6-7); meeting of representatives of the Committee for Environmental Protection and UNECE on the results of the 3rd Environmental Performance Review and preparation of the 4th Review (November 22); roundtable on preparation of a new (third) edition of the Red Book of Tajikistan (November 29); roundtable "Outcomes of the 27th Conference of the Parties, UN Model Convention on Climate Change" (December 6); roundtable on implementation of the "Strategy for green economy development in the Republic of Tajikistan for 2023-2037" with broad participation of representatives of ministries, agencies and development partners (December 14); consultation meeting "Supporting the implementation of Tajikistan's NDCs" (December 21); roundtable "Glaciers of Tajikistan is the Ice Heart of Asia" at the branch of the Lomonosov Moscow State University (December 29).

As part of the "Comprehensive State Program for environmental education in the Republic of Tajikistan for 2021-2025"[123], the following events were organized: (1) mobile information tour in the tourist-resort complex "Temurmalik Island" (August, Sogd province); (2) lessons, talks and meetings on environmental topics (September 28, Dushanbe); (3) meeting with students of the Tajik Technical University named after academician M.S. Osimi (November, Khujand); (4) training for representatives of the education sector, teachers of ecological and life sciences (November, Kanibadam); (5) winter ecological camp (November 30-December 3, Gulistan); (6) interdepartmental conference on the Program (December 15, Dushanbe); (7) training "Clean environment for children and adolescents" (December 22, Dushanbe).

The delegation of Tajikistan took part in the (1) high-level thematic debate "Moment of Nature" (July 19, New York, USA); (2) 9th Environment for Europe Ministerial Conference (October 5-7, Nicosia, Cyprus); (3) UN Climate Conference/COP 27 (November 7-18, Sharm el Sheikh, Egypt).

SDG in Tajikistan

Tajikistan and the UN signed the "Sustainable Development Cooperation Framework for 2023-2026" (7 June, Dushanbe).

Source: https://dashboards.sdgindex.org/profiles/tajikistan

[122] Ministry of Natural Resources of the Republic of Uzbekistan (UP RUz No.UP-269 of 21.12.2022)

[123] Resolution of the Government of the Republic of Tajikistan No.116 of 3.04.2021

Tajikistan was ranked 78 among 163 countries in the annual sustainable development rating.

Emergencies and Natural Disasters

Latest developments in legislation. The "Medium-term State Program for protection of population and territories from emergencies for 2023-2028" and 2023-2025 Action Plan for implementation of the Program were approved (PP RT No.630 of 29.12.2022). The key priorities of the Program include: (1) public awareness of DRR; (2) development of institutional and legal framework for this system; (3) attraction of investments from international organizations and the state budget to ensure earthquake-resistant construction; (4) training of the population and rescuers in responding to emergencies.

Natural disasters. In 2022, 697 emergencies were registered (359 in 2021), including 46 natural disasters (52 in 2021); the damage to the country's economy amounted to almost 53.3 million TJS. Heavy rains in RRS, GBAO, Sogd and Khatlon provinces resulted in mudflows that damaged houses, crops, livestock, and roadbeds.

Preventive measures. Hydraulic facilities were enforced to ensure accident-free operation in case of emergencies on the territory of the Kayrakkum reservoir (Tajik Sea) in Sogd province; mudflow protection structures and a flood control dam were rehabilitated in Ayni makhalla of Shurob Isfara rural jamoat. In Khatlon province, engineering and technical measures were taken to prepare rivers for unimpeded passage of mudflows and to prevent flooding during heavy rainfall and intensive melting of glaciers; work was organized to prevent the harmful effects of mudflows, landslides and water rise in rivers.

Projects. Within the framework of the "National disaster risk management" project (ADB) aimed at supporting the efforts of the Government of Tajikistan to reduce economic losses due to natural disasters, the following events were held: (1) training course "Disaster risk reduction training to develop the curriculum strategy with the Ministry of Education of the Republic of Tajikistan" (February 2-5); (2) workshop on climate impacts and adaptation (November); (3) workshop on development of a monitoring and information system to implement the "National strategy for disaster risk reduction for 2019-2030" (November 29). ADB approved a $30-million grant complementing the ongoing project to strengthen disaster risk management in Tajikistan.

As part of the "Strengthening disaster resilience and accelerating implementation of Sendai Framework for Disaster Risk Reduction in Central Asia" project (EU), the following events were held: (1) two workshops on self-assessment (May 17-18, Dushanbe); (2) workshop on the use of DesInventar-Sendai disaster information management software (July 20-21, Dushanbe); (3) regional forum of emergency ministers of the Central Asia republics on disaster risk reduction: strengthening the resilience of the Central Asian region to disasters (October 4-6, Dushanbe); (4) children's drawing contest as part of the International Day for Disaster Reduction (October 13, Dushanbe); (5) project final meeting (February 15, 2023, Almaty, Kazakhstan).

The "Tajikistan preparedness and resilience to disasters" project is about to start (WB, IDA, $50 million, 2022-2027); it envisages investments in building the resilience of key infrastructure to natural hazards, improving climate risk mitigation and building national capacity for disaster risk management and climate change adaptation.

International cooperation. The delegation of Tajikistan took part in the 25th session of the General Assembly of the International Civil Defense Organization, where the Chairman of the Committee for Emergency Situations of Tajikistan signed: (1) a Memorandum of cooperation on emergency management and response with the National Emergency Crisis and Disasters Management Authority of the UAE Supreme Council for National Security; (2) Memorandum of understanding with the Disaster and Emergency Management Authority of Turkey (November 22-24, Abu Dhabi, UAE).

Events. The delegation of Tajikistan took part in the: (1) 7th Session of the Global Platform for Disaster Risk Reduction (May 23-28, Bali, Indonesia); (2) 34th meeting of the Interstate Council on Natural and Man-Caused Emergency Situations (November 25, online, Baku, Azerbaijan); (3) High-Level Central Asian dialogue "From global knowledge to local solutions: climate resilient institutions in Central Asia" (December 2, Tashkent, Uzbekistan).

Foreign Policy and International Cooperation

Working and official visits. In 2022, the President E. Rakhmon paid official and working visits to Egypt, Iran, Uzbekistan, Pakistan, China, Russia, Kazakhstan, Kyrgyzstan and Armenia, where the matters of bilateral cooperation and achieved results were discussed.

Development of alliances and strategic partnerships. E. Rakhmon paid an official visit to Uzbekistan in June, where: (1) 15 documents on bilateral cooperation were signed; (2) cooperation aspects, including water and energy use, were discussed; (3) a wide range of regional and international security issues, including problems in Afghanistan were considered, etc.; (4) a launching ceremony of the joint Tajikistan-Uzbekistan project on hydro construction in the Zerafshan River basin was held (June 2-3). See "Bilateral Water Cooperation between the Countries of Central Asia".

The President of Tajikistan took part in the: (1) CSTO meetings (May 16, Moscow, Russian Federation and November 23, Yerevan, Armenia); (2) 4th Consultative Meeting of the Heads of CA States[124] (July 21, Cholpon-Ata, Kyrgyzstan); (3) meeting of the Council of Heads of SCO States (September 16, Samarkand, Uzbekistan); (4) CIS informal meetings (October 7 and December 26, Saint Petersburg, Russia); (5) 6th CICA Summit (October 13, Astana, Kazakhstan); (6) 1st summit

[124] 5th Consultative Meeting of the Heads of CA States is planned for September 14-15, 2023 in Dushanbe together with the regular meeting of the Council of Heads of IFAS founder states

"Central Asia+Russia" (October 14, Astana, Kazakhstan); (7) 1st EU-Central Asian leaders' meeting (October 27, Astana, Kazakhstan).

Foreign investments. According to the results of 2022, the inflow of direct investments from other countries to the republic amounted to about $430 million, of which 85% were directed to mining, 13% – production and processing, 1.7% – construction and other spheres. 21 new agreements were signed with development partners to implement public investment projects totaling over $717 million. As of January 2023, 72 public investment projects worth $4 billion are implemented in the country.

Chairmanship in IFAS. As part IFAS chairmanship: (1) meetings of the Board of IFAS were held; the Board addressed topical aspects of the Fund's activities and prospects for further cooperation between the founder-states within the Organization (February 22 and November 28, Dushanbe); (2) the Working Group on institutional and legal improvement of IFAS continued its activity. See "International Fund for Saving the Aral Sea".

Promotion of the national interests and reinforcement of the country's image. Tajikistan is the holder of the important global "Dushanbe Water Process", under which the 2nd International High-Level Conference on the International Decade for Action[125,126] "Water for Sustainable Development", 2018-2028 was held towards the UN Water Conference 2023 (June 6-9, Dushanbe).

The Republic of Tajikistan and the Kingdom of the Netherlands, being co-chairs (UNGA Resolution No.75/212) of the UN Water Conference 2023, held sessions and symposia on the forthcoming conference at high-level regional and international events: (1) 9th World Water Forum (March 21-26, Dakar, Senegal); (2) 4th Asia-Pacific Water Summit (April 23-24, Kumamoto, Japan); (3) High-level symposium on water at the UN Ocean Conference (June 24-July 1, Lisbon, Portugal); (4) World Water Week (August 23-September 1, Stockholm, Switzerland); (5) Cairo Water Week (October 16-19, Cairo, Egypt); (6) Social forum of the Human Rights Council "Water for human rights and sustainable development" (November 3, Geneva, Switzerland); (7) Conference on climate change (November 7-18, Sharm el-Sheikh, Egypt).

Moreover, Tajikistan and the Netherlands together with the UN country offices organized: a seminar (February 2, Dushanbe), a session (April 5, Geneva, Switzerland), the First Geneva Water Dialogue (July 1, Geneva, Switzerland), the Dialogue "UN Water Conference 2023 – public-private partnerships for scaling" (October 24, New York, USA), briefing (December 2, Dushanbe), etc.

At the opening session of the preparatory meeting for the UN 2023 Water Conference, the President of Tajikistan noted: "…The Dushanbe Conference brought the outcomes of different regional and global event platforms together, elaborated key messages for the New York Conference and laid down a genuine framework for promoting one of its major results – "Water Action Agenda"… The topics of the interactive dialogues that refer to the critical challenges of the water sector have been developed by Tajikistan and the Netherlands following consultations with member states and stakeholders… At the same time, from our point of view, the "Water Action Agenda" needs new and innovative commitments and actions..." (October 25, online).

At the general debate of the 77th UNGA session, the Foreign Minister of Tajikistan emphasized that the impact of climate change on water resources "…is another crucial topic that requires our concerted efforts. Along with the increase in mudflows and floods, water scarcities and droughts, and changes in the hydrological cycle, today the accelerated melting of glaciers, the primary sources of fresh water on the planet, is of great concern. To this end, Tajikistan is actively promoting an integrated approach to addressing water and climate issues, including within the Water and Climate Coalition…" (September 24, New York, USA). At the initiative of Tajikistan, the 53rd plenary meeting of the 77th UNGA session unanimously adopted the resolution "International Year of Glaciers' Preservation, 2025" (see above "Climate Change, Glaciers and Environmental Protection").

Tajikistan hosted the 3rd meeting of the Water and Climate Coalition leaders, which resulted in the approval of the "Action plan for integrated water and climate agenda" (4 June, Dushanbe).

The delegation of Tajikistan took part in the 4th joint meeting of the Working Groups on Integrated Water Resources Management (IWRM) and on Monitoring and Assessment, marking the 30th anniversary of the Water Convention (28-30 July, Tallinn, Estonia).

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Agency for Hydrometeorology (http://www.meteo.tj/)
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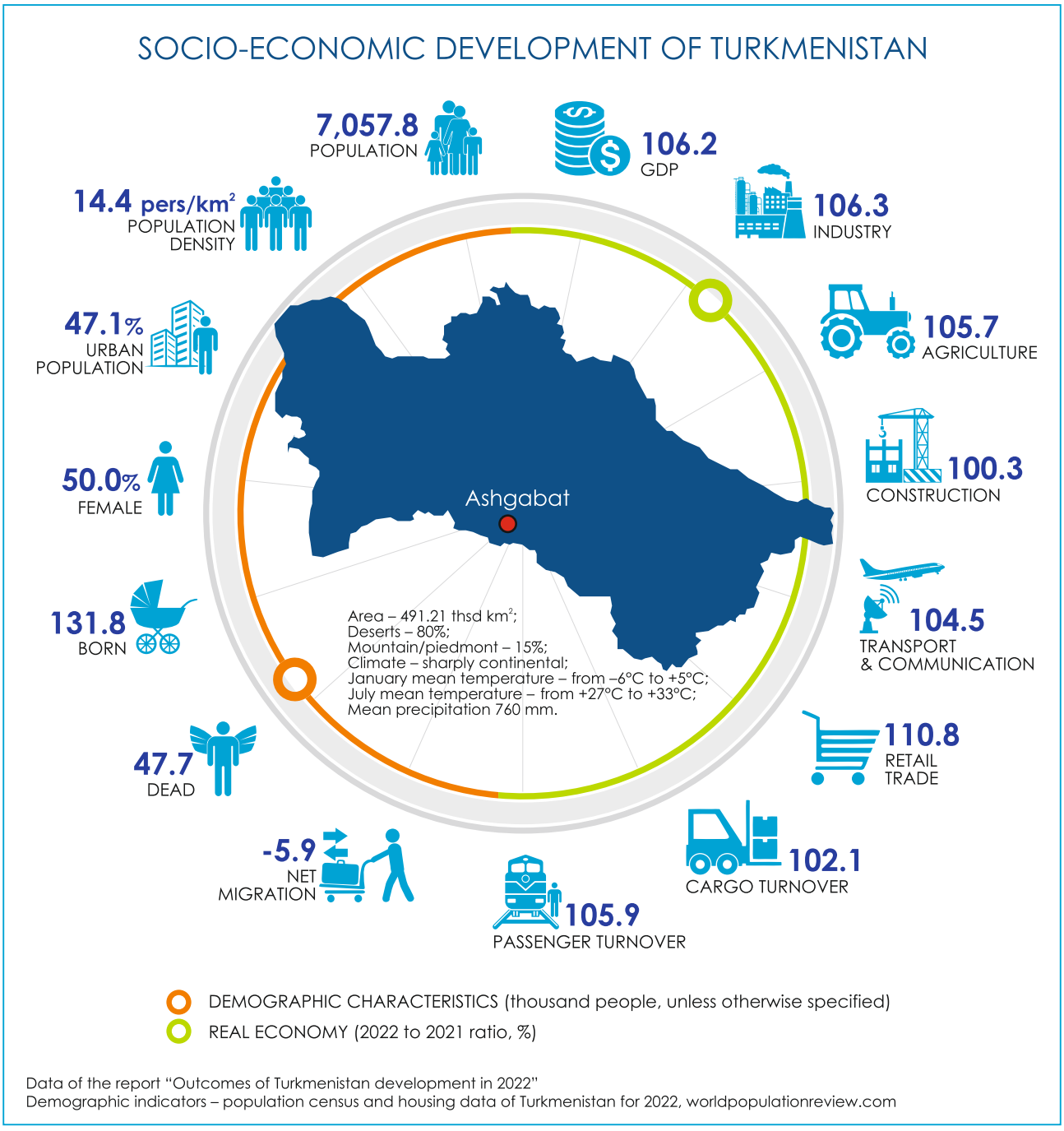
[125] 1st International High-level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 was held on June 20-21 in Dushanbe. The Conference adopted the Final Declaration

[126] For the Conference, see "2022 Calendar of Events"

5.4. Turkmenistan



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Water Sector

Water resources. The total volume of water resources of Turkmenistan is comprised of the surface runoff of the Amu Darya (88%), Murgab (6.5%), Tedjen (3.5%), and Atrek, Sumbar and Chandyr (1.4%) rivers, as well as the small watercourses of the northeast slopes of Copet-dag (0.6%), and the insignificant groundwater resources and collector-drainage waters. All large rivers of Turkmenistan are transboundary, i.e. 95% of surface water in the water balance of Turkmenistan is formed outside the country.

Programs. The efforts under the Socio-Economic Development Program for 2019-2025, which envisaged measures for water saving, augmentation of water stock, prevention of salinization and reclamation of agricultural land, were continued. The focus is put on application of advanced irrigation and water use methods and on creation of additional water reserves. In particular, the second phase[127] of the new 1.6-billion m^3 reservoir which is to replace the heavily silted Zeyid reservoir – the largest one in the country – is under construction and the third phase is at design stage. The total capacity of the reservoir will be 3.8 billion m^3.

[127] Project's first phase was completed in 2015. The water storage is 1.2 billion m^3

Efforts are continued as part of implementation of the concept for development of the Turkmen Lake Altyn Asyr region in 2019-2025.

Projects. In the course of the demonstration project "Tuyamuyun Hydroscheme" implemented by Turkmenistan and Uzbekistan within the framework of the EU-funded project "Nexus Dialogue in Central Asia" (Phase 2, CAREC), the project's technical working group held three meetings (February 15, October 26, December 5); consultants from "Deltares" and "Tipping Point Resources Group" offered technical solutions for utilization of silt in the Ruslovoye reservoir, the regional steering committee was presented with the results of comprehensive assessments (Urgench, Uzbekistan).

As part of the USAID Regional Water and Vulnerable Environment Activity, the following events were organized: (1) a workshop on methods and software for long-term water and energy planning for representatives of Turkmenistan ministries; (2) training on an automated water monitoring system to be installed on the Karakum River, for experts of the State Committee for Water Management and other water agencies; (3) the Water-Energy-Food-Environment (WEFE) Nexus simulation game; (4) training on legislative changes regarding water use and new water development strategies and how to ensure financial sustainability of Small Basin Council (SBC) of the Murghab River for the representatives of the State Committee for Water Management and members of SBC.

On UNDP projects see United Nations and its Specialized Agencies.

International cooperation. A regular meeting of the joint Turkmen-Uzbek Intergovernmental Commission for Water[128] and a meeting of water ministers of Turkmenistan and Uzbekistan were held on July 1-2 in Dashoguz, Turkmenistan. As a result, a memorandum of cooperation was signed. See "Bilateral Water Cooperation between the Countries of Central Asia".

A bilateral Agreement between the governments of the two countries on management, protection and sound use of the Amu Darya River water was signed in the course of the state visit of President Serdar Berdimukhamedov to Uzbekistan (July 14-15, Tashkent). See "Bilateral Water Cooperation between the Countries of Central Asia".

The ICWC member from Turkmenistan participated at the 82nd meeting of ICWC (April 27, Turkistan, Kazakhstan). The 83rd meeting of ICWC was held in Ashgabat (November 22). Representatives of WG from Turkmenistan took part in the IFAS Board meetings. See "International Fund for Saving the Aral Sea".

Drinking water supply. Implementation of the "General Clean Water Program" is underway. A new water treatment facility capable of treating 20 thousand m^3 a day was launched in Baherden etrap of Ahal province. The facility covers an area of 4.2 ha. The process of water treatment, disinfection and preparation for water supply is controlled and monitored automatically.

The hydrogeological field office of the "Turkmengeologiya" State Corporation explores groundwater, assesses its reserves, and observes conditions of operating wells. In 2022, the hydrogeological field office found drinking water deposits on an area of 130.8 km^2 in Lebap velayat and registered them as Turkmenabad aquifer.

Events. The Turkmenistan delegation took part in: the 4th Asia-Pacific Water Summit (April 23, online); the Central Asian International Scientific-Practical Conference "30 years of Water Cooperation in Central Asia: facing the future" (April 26-27, Turkistan, Kazakhstan); 2nd International High-Level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6-9, Dushanbe, Tajikistan).

Agriculture

At year-end, farmers of Turkmenistan fulfilled the state order for wheat and rice production for 1.5 million tons and 82.5 thousand tons, respectively. The cost of 1 ton of wheat harvested above the state order was priced at 1,600 Turkmenistani manat. Local private producers have been receiving land plots for growing crops from the 'state order' list in line with the established procedure.

Latest developments in legislation. In line with the laws amending and supplementing the Land Code[129] (of 17.04.2022 and 05.12.2022), a new paragraph was added to Article 46 and stated that "The irrigated land of daykhan associations of at least 10 ha is transferred for a long-term rent for growing wheat and cotton under the state order" (para.4); Article 65 was re-written as "…The acreage of agricultural land transferred for a long-term rent is determined procee-

[128] Agreement on the Joint Turkmen-Uzbek Intergovernmental Commission for Water of 26 May 2021

[129] Law 243-P of 25.10.2004

ding from the following conditions: the integrity of cultivated land and the effective sharing of land" (para.2). The law amending and adding the Law on plan quarantine[130] was adopted on May 8.

Agroindustry reformation and modernization. The work is underway in line with the Resolution of the People's Council of Turkmenistan (Khalk Maslakhaty) "On further reformation of the agricultural sector" (of September 25, 2018) and the Socio-Economic Development Program for 2019-2025. A new program "Revival of a powerful state: National program for socio-economic development of Turkmenistan for 2022-2052" was adopted.

Comprehensive measures are taken to re-structure agriculture, develop new rural economic relations, ensure sound use of land and water resources, and improve soil fertility and crop yields. In line with the presidential decree on economic incentives for producers of wheat, cotton and sugar beet (No.269 of 23.09.2022), the format of economic incentives (No.524-Ö/314 of 7 October 2022) was adopted and the rules of seed production in Turkmenistan were approved.

Local researchers developed new types of fertilizers (bio- and NPS-fertilizer) and presented an innovative technology for soil bio-fertilization in order to reduce salinity of cultivated land. Medium-fiber cotton varieties, such as Akhal-5, Yoloten-52, Yoloten-54, Dashoguz-150, Ashgabat-140, and Garashsyzlyk-30, thin-fiber cotton "Yoloten-56", and soft and hard winter wheat, barley, soybeans, and grapes bred in 2018-2021 are tested in crop-breeding stations.

Projects. The project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan" (UNDP/GEF) has been completed. The following events were organized in 2022: (1) a workshop to build gender-sensitive adaptation capacities (February 21); (2) a working meeting to discuss the curriculum on IWRM (February 22, online); (3) concluding meeting, where the main project achievements were discussed (April). The analysis of the national strategic documents was published to determine opportunities for integrating gender aspects into planning of adaptation activities in water and agricultural sectors of Turkmenistan.

As part of the Project "Integrated natural resources management in drought-prone and salt-affected agricultural production landscapes in Central Asia and Turkey" (FAO/GEF): a training in salinized land mapping was held jointly with the Global Soil Partnership (April 26-28, online); agricultural equipment and machines were bought and shipped; modern hothouses were put into operation in the training farm polygon of the Turkmenistan Agricultural Institute, the forestry authority of Dashoguz province, the Daykhan association "Yerbent" (Bokurdak village, Central Karakum), and field laboratory equipment was procured for rapid analyses.

On FAO projects in Turkmenistan, see "United Nations and its Specialized Agencies".

International cooperation. On August 5-6, a meeting was held between the leadership of the Ministry of Agriculture and the State Committee for Water Management, representatives of relevant subdivisions of Turkmenistan and the Uzbek delegation led by the Deputy Minister of Agriculture with the purpose of further extending cooperation on agriculture and water (Ashgabat).

The delegation of Turkmenistan, as an observer state of the Organization of Turkic States (OTS) took part in the 1st meeting of agricultural ministers of OTS and the Turk Agro-Forum (July 4, Tashkent, Uzbekistan).

Energy

12 state power plants, with the total installed capacity of 6,511.2 MW, are operated by the Ministry of Energy. In January-November, electricity production in the country grew by 110.1% and exports increased by 129.7%.

National strategies and programs. The work on implementation of the State Program for Energy Saving for 2018-2024, the Program of energy diplomacy development for 2021-2025 and the National Strategy on Renewable Energy Development in Turkmenistan until 2030 is underway. A Roadmap was approved for the development of international cooperation on hydrogen energy for 2022-2023. In this context, a Center for Hydrogen Energy was launched at the Ya. Kakaev International Oil and Gaz University.

Capacity building. The OSCE Centre in Ashgabat held workshops on the use of renewables (April 25-26), implementation of advanced technologies and innovative solutions for the development of hydrogen energy and the implementation of energy-efficient approaches (April 28-29), green energy diplomacy (October 26-27), and an online roundtable to discuss the draft of the roadmap for development of green hydrogen energy in Turkmenistan (May 11).

Events. Turkmenistan hosted the following events: the international conference entitled "Development of construction, industry and energy sectors in Turkmenistan" (August 6-7, Ashgabat) on the sidelines of the international exhibition "Construction, industry, and energy of Turkmenistan 22"; conference "Green energy and EU strategies on the use of hydrogen and reduction of methane emissions" organized jointly with EU (November 22-23, Ashgabat).

Regional and international cooperation. Following the negotiations between Turkmenistan and Kazakhstan, a package of bilateral documents, including the Memorandum of Understanding between the energy ministries of the two countries, was signed (October 15, Astana, Kazakhstan). See "Bilateral Water Cooperation between the Countries of Central Asia".

[130] Law 54-IV of 15.08.2009

The Turkish company Çalik Enerji Sanayi ve Ticaret A.Ş started constructing the first 10-MW solar-wind plant in Serdar district of Balkan province. Thus, new settlements adjacent to Lake Altyn Asyr will be provided with clean energy.

Environment and Climate Change

Latest developments in legislation. As part of the Governance Support Program, USAID in partnership with national stakeholders and legal experts has drafted a law on environmental monitoring and organized a roundtable for the government agencies and organizations responsible for environmental monitoring (June 7, Ashgabat). The draft law reflects the requirements of international conventions and agreements as well as the Government of Turkmenistan's strategic priorities such as conservation of biological diversity, effective use of natural resources and the protection of ecosystems. In particular, the draft law supports national policies on environmental protection and safety.

National programs and strategies. Some provisions in the current National Strategy on Climate Change have been integrated into the national sectoral programs and socio-economic development plans.

The Government has approved the Nationally Determined Contributions[131] (NDC) for submission to the Secretariat of the UN Framework Convention on Climate Change. This document is a plan of actions for mitigation of climate change, including the long-term goal to keep the global average temperature well below 2°C of preindustrial level and make efforts to limit the temperature growth to 1.5°C in line with the Paris Agreement.

The following programs are implemented successfully: (1) the National Forestry Program of Turkmenistan for 2021-2025 (approved on 25.06.2021), as part of which tree planting campaigns are conducted to expand green spaces in cities and around settlements. The city of Ashgabat has got a UNECE certificate for the active green space expansion and for contribution to the Trees in Cities Challenge; (2) National Program for the Aral Sea for 2021-2025 (approved on 22.10.2021), which is the main document determining a set of measures for socio-economic and environmental improvement in the Dashoguz province in the context of Aral Sea disaster. The Program makes preparation for the construction of a big artificial lake between the Shasenem and Turkmen rivers that flow from the Dueboyun reservoir.

Projects. "Sustainable cities in Turkmenistan: Integrated Green Urban Development in Ashgabat and Awaza", (UNDP/GEF): a Plan for the contemporary environmental system in Ashgabat is developed with the support of UNEP. The following events were organized: (1) a webinar on the intermediate results of the preparation of the Fourth National Communication on Climate Change (NC4) and First Biennial Update Report of Turkmenistan under the UNFCCC and the briefing on the development of the updated draft NDC of Turkmenistan under the Paris Climate Agreement (March 4, online); (2) a seminar entitled "Introducing international experience in the development of regulatory and technical documents for the promotion of renewable energy sources in Turkmenistan" (May 30, online); (3) an educational session themed "Only One Earth" for children (June 7, Turkmenbashi).

A new project "Conservation and Sustainable Management of Land Resources and High Nature Value Ecosystems in the Aral Sea Basin for Multiple Benefits" funded by GEF and to be implemented by UNDP and the Ministry of Agriculture and Environmental Protection of Turkmenistan was signed. The project is aimed at the conservation and effective use of key ecosystems, land and water resources, and biodiversity in Lebap and Dashoguz provinces in the Turkmen part of the Aral Sea basin. Also, the project will support the implementation of the National Aral Sea Program for 2021-2025. A national workshop on water diplomacy was held as part of the project on December 15 in Dashoguz.

Capacity building: (1) a meeting with young eco-activists (February 25, Ashgabat); (2) a training for personnel of weather stations in Balkan province (April 4-8, Ashgabat); (3) a seminar on international experiences and best practices of the OSCE participating States in accession to and implementation of the UNECE Espoo Convention (May 30-31, online).

Events. The following events were organized in 2022: (1) 3rd and 4th coordination meetings of the Climate Group of Development Partners, where an update on the climate change agenda, Turkmenistan's priorities under the recently approved NDC, and the initiative of Turkmenistan to establish the Regional Center for Climate Change Technologies for Central Asian countries in Ashgabat were discussed (May 31, September 6, Ashgabat); (2) scientific and practical conference "State environmental policy – the basis for sustainable development and green economy" on occasion of the World Environment Day (June 5, Ashgabat); eco-festival "Let's save Earth together" (October 9, Ashgabat).

Delegations from Turkmenistan participated in a number of major regional and international events, including: (1) the regional conference "Central Asian Dialogue on Readiness for Climate Finance through Collaboration and Partnership" (April 12-13, Bishkek, Kyrgyzstan); (2) the 15th World Forestry Congress at the ministerial level (May 2-6, Seoul, Korea); (3) 33rd session of the CIS Interstate Council on Hydrometeorology (September 14, Nur-Sultan, Kazakhstan); (4) 4th Berlin Conference on Climate and Security (October 11-12, Berlin, Germany); (5) 27th Conference of the Parties to the UNFCCC /COP27, (November 7-18, Sharm El Sheikh, Egypt); (6) SPECA Economic Forum (November 16-17, Almaty, Kazakhstan).

[131] NDC is developed by the Government of Turkmenistan in partnership with UNDP. Turkmenistan ratified UNFCCC in 1995 and the Paris Agreement in 2016

Emergencies

The Government of Turkmenistan is making progress in building the country's disaster risk management capacity and in fulfilling its commitments under the Sendai Framework for Disaster Risk Reduction 2015-2030.

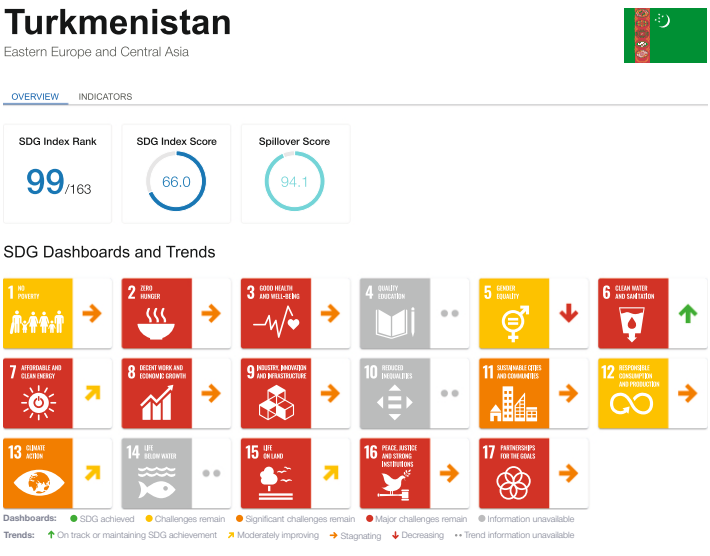
Projects. As part of the project "Strengthening disaster resilience and accelerating implementation of Sendai Framework for Disaster Risk Reduction in Central Asia" (EU/UNDRR), an inter-agency working group for disaster risk reduction (DRR) has been established to serve as a national platform on DRR. In 2022, meetings of the Group (February 16, February 23, Ashgabat) and a workshop on the disaster risk management capacity assessment and development process (May 16, Ashgabat) were held.

International cooperation. Turkmenistan ratified an agreement[132] with Kazakhstan on civil defense and emergency prevention and recovery (January 14).

Russian JSC "Vozrozhdenie" built and put into operation a 49-km long complex of mudflow drainage structures in Ashgabat. The complex was awarded 4 international certificates.

The Turkmenistan's delegation took part in the regional forum of emergency ministers of the Central Asia republics. The participants discussed how to coordinate actions for strengthening regional cooperation on DRR, combating climate change, and implementation of the Sendai Program and the Strategy for development of DRR cooperation in CA for 2022-2030 and the matters related to formation of early warning systems and emergency information sharing (October 4-6, Dushanbe, Tajikistan).

SDG in Turkmenistan



The Government of Turkmenistan and the UN are monitoring regularly the process of achievement of SDGs. The UN Sustainable Development Cooperation Framework for 2021-2025 signed by Turkmenistan is closely connected with the country national socio-economic development programs and reflects Turkmenistan's commitments to the sustainable development agenda. Turkmenistan ranked 99 among 163 countries in the annual sustainable development rating.

The national SDG Working Group of Turkmenistan and UN held an online meeting to review the progress in implementation of SDGs in Turkmenistan and to agree on the next steps towards presenting its Voluntary National Review (VNR) in June 2023 (June 23). UNDP in Turkmenistan and "Turkmenportal" (https://turkmenportal.com/) have signed a Memorandum of Understanding (MOU) to strengthen its partnership for accelerating the implementation of SDGs in Turkmenistan and beyond (September 7, Ashgabat). The delegation of Turkmenistan took part in high-level event "2022 SDG Moment" (September 19, New York, USA).

As part of: (1) the project "Partnering for SDG acceleration", UNDP provided server equipment for the National SDG Database; (2) "Young SDG Ambassadors", the third cohort of young ambassadors was selected (April 4-May 30, Ashgabat); they were introduced to the work of UN agencies, MFA and ministries of economy and finance of Turkmenistan (August 29-30, Ashgabat). The young ambassadors are expected to promote SDGs among youth.

Cooperation on the Caspian Sea

The **Sixth Caspian Summit** was held on 29 June in Ashgabat. Presidents of Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan discussed the matters of pentalateral cooperation on the Caspian Sea and adopted a Communique. Before the Summit, a meeting of foreign ministers of the Caspian states was held on 28 June.

In the course of the year, Turkmenistan hosted: (1) the regular meeting of the Inter-departmental Commission of Turkmenistan on the Caspian Sea (February 1, Ashgabat); (2) a workshop "The Caspian Sea – Sustainable Development and Stewardship" (March 4-15, Turkmenbashi); (3) the International Day of the Caspian Sea and the scientific-practical conference "The Caspian Sea – the sea of friendship and harmony" (August 12, Turkmenbashi).

Turkmenistan participated in the International Assembly "Caspian Dialogue-2022" (May 11, Moscow, hybrid format); Forum "Caspian 2022: Sustainable Development Paths" (May 22-24, Astrakhan, RF); meeting of working groups on science and aquaculture of the Commission on Conservation, Rational Use of Aquatic, Biological Resources of the Caspian Sea and Management of their Joint Stock (June, online); Caspian

[132] The agreement was signed in the course of the state visit of the President of Kazakhstan to Turkmenistan on October 24-25, 2021

Media Forum-2022 (September 8-11, Astrakhan, RF); and, 2nd Caspian Economic Forum (October 5-6, Moscow, RF).

Foreign policy and International Cooperation

In 2022, the President of Turkmenistan paid state, official and working visits to Korea (February), Saudi Arabia, Russia and Iran (June), Uzbekistan (July and September), Kyrgyzstan (July), Kazakhstan (October), and Qatar (December).

A number of high level officials visited Turkmenistan: presidents of India (April), Tatarstan (April), Kazakhstan (June), Iran (June), Russia (June), Uzbekistan (October), Azerbaijan (December); prime ministers of Georgia (July), Kazakhstan (February).

Key developments in the foreign policy of Turkmenistan

The President of Turkmenistan has approved the **Concept of Turkmenistan's foreign policy for 2022-2028** aimed at peace and security, permanent neutrality of the country, extended foreign economic ties, and sustainable development of international relations (July 8). The Concept also outlines the steps for the enhancement of regional environmental cooperation.

Development of alliances and strategic partnerships. Within the framework of regional cooperation, Turkmenistan: (1) hosted the Central Asian Expert Forum "Topical aspects of regional cooperation on climate change, water use, food security and information and communication technologies in the Central Asian region" (December 10, Ashgabat). See "2022 Calendar of Events. Major Events in Central Asia"; (2) participated in the 4th Consultative Meeting of the Heads of Central Asia States (July 20-21, Cholpon-Ata, Kyrgyzstan), International Conference "Afghanistan: Security and Economic Development" (July 26, Tashkent, Uzbekistan), and the Central Asia-Russia Summit (October 14, Astana, Kazakhstan).

Turkmenistan took part in the **CIS meetings** of: (1) the Council of the Heads of State (October 14, Astana, Kazakhstan); (2) the Council of CIS Heads of Government (May 20, online; October 28, Astana, Kazakhstan); (3) the Council of Ministers of Foreign Affairs (May 13, Dushanbe, Tajikistan; October 12, Astana, Kazakhstan); (4) the Economic Council (March 18, Moscow, RF; June 10, Nur-Sultan, Kazakhstan; September 23, Moscow, RF; December 2, online), and in an informal summit of Heads of State (December 26, St. Petersburg, RF).

Within the framework of SCO, President of Turkmenistan met with SCO Secretary General Zhang Ming (September 15, Samarkand, Uzbekistan), participated in the meeting of the SCO Council of Heads of State (September 16, Samarkand, Uzbekistan). Deputy Chairman of the Turkmenistan Cabinet of Ministers participated in the XXI meeting of the Council of SCO Member State Heads of Government (Prime Ministers) as an observer and as a guest of the presiding party (November 1, online). SCO conducted an Observation Mission during the elections of president in Turkmenistan (March 11-12, Ashgabat).

Promotion of the national interests and reinforcement of the country's image. Turkmenistan actively cooperates with the United Nations, EU, OSCE, OIC and ECO.

In 2022, Turkmenistan celebrated **30 years of membership in the United Nations**. A regular meeting of the Joint UN-Turkmenistan Steering Committee for the implementation of UN Sustainable Development Cooperation Framework for 2021-2025 was convened in a hybrid format (December 15). Turkmenistan initiated a number of resolutions: Integration of mainstream bicycling into public transportation systems for

sustainable development[133], Zone of peace, trust and cooperation of Central Asia.[134] Turkmenistan was elected a vice chair at the 77 UNGA (June 7). Speaking at 77th session general debates, the representative of Turkmenistan to the UN underlined that "…Turkmenistan is preparing for the establishment in Ashgabat a Regional Center for Climate Technologies for Central Asian Countries …", would "…strive to single out the Aral Sea issue as a separate area of the UN's activities. To this end, in May 2023, we intend to resume negotiations on the draft resolution of ESCAP on the establishment of the UN Special Program for the Aral Sea Basin …" (September 26, New York, USA). The 45th plenary meeting of UNGA 77 adopted the resolution "International Year of Dialogue as a Guarantee of Peace" initiated by Turkmenistan (December 6).

A joint **EU**-Turkmenistan Conference on Green Energy and EU Hydrogen and Methane Emissions Reduction Strategies was held in Ashgabat on November 22-23. The delegation of Turkmenistan participated in the first meeting of the leaders of "Central Asia-European Union" (October 27, Astana, Kazakhstan), 18th EU-CA Ministerial Meeting (November 17, Samarkand, Uzbekistan), EU-CA Connectivity Conference: Global Gateway for Sustainable Development (November 18, Samarkand, Uzbekistan).

Sources:

Official sites of:

MFA (https://www.mfa.gov.tm/ru);

State Committee of Water Management (http://turkmenwater.gov.tm/);

Ministry of Justice (https://minjust.gov.tm/ru);

Ministry of Agriculture and Environmental Protection (https://minagri.gov.tm/ru);

Ministry of Energy (https://www.minenergo.gov.tm/)

Information agencies and sites:

https://turkmenistan.gov.tm/ru/;

https://tdh.gov.tm/ru;

https://turkmenportal.com/;

https://orient.tm/ru;

https://arzuw.news/;

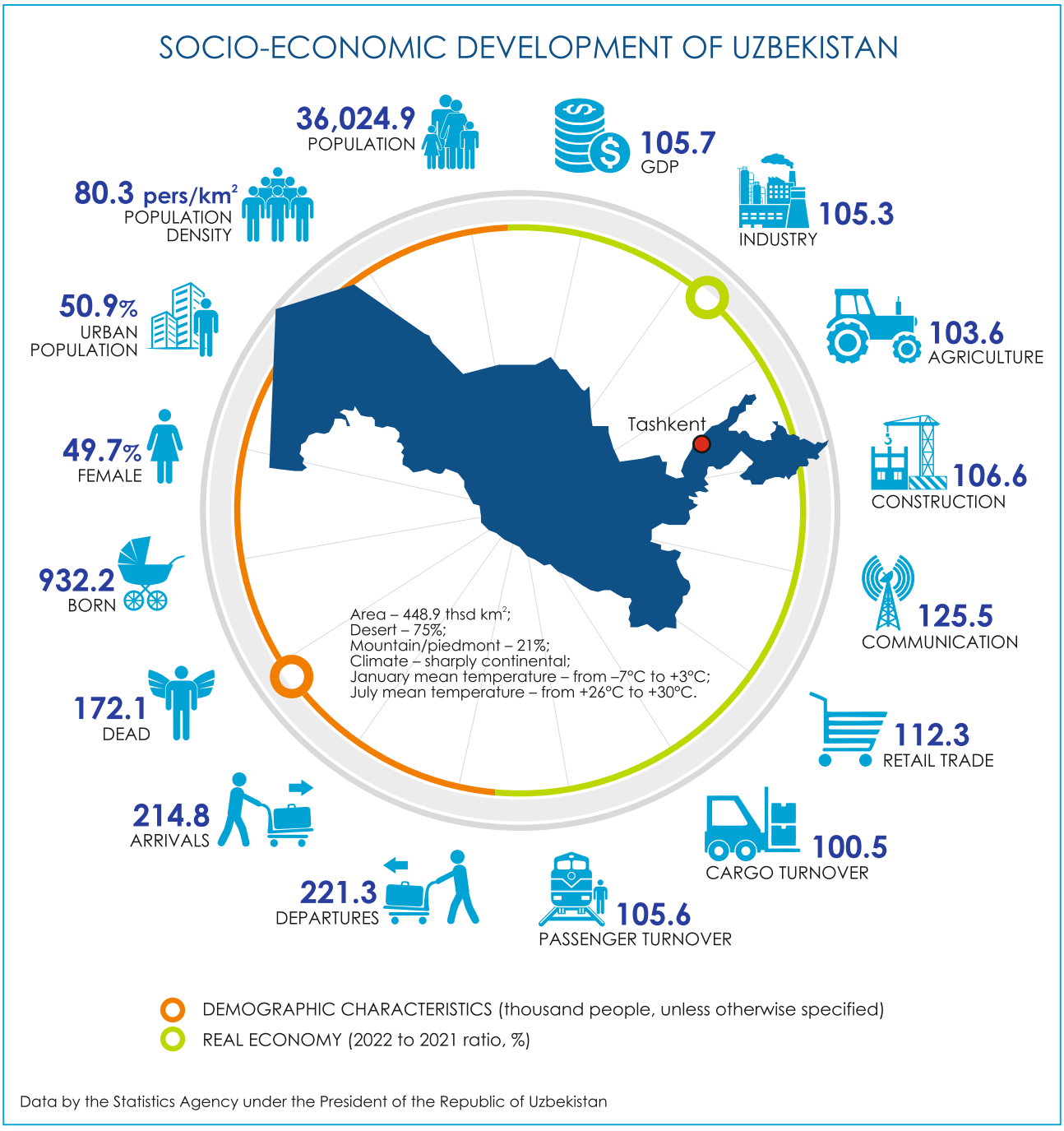
https://www.parahat.info/;

https://ashgabat.in/?lang=ru

[133] 76th UNGA session, 61st plenary meeting, 15 March 2022

[134] 76th UNGA session, 97th meeting, 28 July 2022

5.5. Uzbekistan



Data by the Statistics Agency under the President of the Republic of Uzbekistan

Water Sector

Water resources. The average quantity of water used in Uzbekistan is 51-53 billion m^3, of which 80% (approx. 41 km^3/year) is got from transboundary rivers.

The estimated natural fresh and brackish groundwater deposits potentially yield 27.6 km^3/year; however, they are unevenly distributed throughout the country.

The water demand is met through a combination of surface water (50.9 km^3/year), usable groundwater (0.5 km^3/year), and the reused collector and drainage water (1.6 km^3/year).

The average water use by sector is as follows: agriculture – 90-91%; municipal sector – 4.5%; industry – 1.4%; fisheries – 1.2%; thermal power – 0.5%; other sectors – 1%[135].

[135] "On approval of the Concept of Water Sector Development in the Republic of Uzbekistan for 2020-2030" (UP RUz No.6024 of 10.07.2020)

Latest developments in legislation. The Development Strategy of New Uzbekistan for 2022-2026[136] and the State Program for its implementation were approved. Target 31 "Implementation of the state program on fundamental changes in the water management and water saving system" of the Strategy sets the following subtargets: (1) save at least 7 billion m^3 of water through efficient water use; (2) reduce electricity consumption by waterworks facilities; (3) introduce a PPP-based water management system.

For the achievement of goals set in the **"Concept of Water Sector Development in the Republic of Uzbekistan for 2020-2030"**, the following resolutions were adopted:

- "On measures to further improve agricultural water saving" (PP RUz No.PP-144 of 01.03.2022), which (1) approved the proposal to increase water use efficiency through water saving technologies on an area of 478 thousand ha, including drip irrigation on 230 thousand ha, sprinkling – 28 thousand ha, discrete irrigation – 2 thousand ha, and laser leveling on 218 thousand ha; (2) established a procedure of government support in the form of subsidies to compensate the costs related to adoption of water saving technologies;

- "On measures to improve water management and regulate relations between end water users" (PP RUz No. PP-145 of 01.03.2022). The document defines a number of procedures in context of water management based on PPP principles;

- "On measures to develop social and production infrastructure of the Republic of Uzbekistan in 2022-2024" (PP RUz No.PP-98 of 22.01.2022), which instructed the Uzbek Ministry of Agriculture together with a number of ministries to (1) analyze efficiency and effectiveness of irrigation and land reclamation projects, taking into account water supply, land condition and other specifics of the provinces; (2) make proposals on automation of water and energy measurement and monitoring on irrigation networks and improvement of construction and reconstruction of these networks, including with the use of modern resource-efficient construction materials.

A draft **Water Code** of the Republic of Uzbekistan was posted on the state portal for discussion.

The Agreement[137] on joint water management of the Andizhan (Kempirabad) reservoir between the Government of the Republic of Uzbekistan and the Cabinet of Ministers of the Kyrgyz Republic was ratified (ZRU No. ZRU-805 of 30.11.2022).

Water management system. In the course of implementation of the "Strategy for water management and irrigation development in the Republic of Uzbekistan for 2021-2023"[138], water saving technologies were introduced on 940 thousand ha; digital technologies were implemented at 11,554 waterworks facilities, including 5,736 Smart Water devices, 4,452 groundwater monitoring tools, and 1,335 online monitoring tools for pumping stations; and, automation was implemented at 31 large hydroschemes; 1.116 trillion UZS were allocated for the construction and reconstruction of irrigation and land reclamation systems.

In Surkhandarya province[139], a pumping station on the Kapchagay canal was constructed, a 2.4-km water main was laid, construction of a 0.9-km canal near arable land was completed; hydraulic structures were cleaned and repaired, 17 new structures were constructed, and 2 Smart Water devices were installed on 22-km sections of Suenli and Keneges canals.

In Navoiy province, two canals were reconstructed, the Kuksaroy mudflow reservoir was repaired. In Fergana province, a two-stage pumping station was put into operation to lift water to 211 m through a 4-km pipeline network.

Projects. For development of the water sector, $114.88 million were spent as part of a number of international projects, including: $52.04 million – "Amu Bukhara irrigation system rehabilitation" (ADB), $17.2 million – "South Karakalpakstan water resource management improvement" (WB), $10.69 million – "Improved water resources management in Surkhandarya province" (IsDB), $26.1 million – "Fergana Valley water resource management – Phase II" (WB), $8.85 million – "Karshi pumping cascade rehabilitation-Phase-III" (SFD).

Ongoing projects: (1) "Ferghana Valley water resource management – Phase 2" (WB), 49 (62%) regulating structures on tertiary canals and 42 (55%) water-metering facilities were constructed; seminars were held on construction and operation of water metering and distribution unit on the Mukhtar canal (August 22) and on monitoring, assessment and repair of irrigation structures (September 12-15); meetings were held with the "GEDEPSA S.A." consulting company (September 19, Madrid) and the WB Mission, where the "Support to intensification and diversification of agriculture and improvement of water resource management"[140] project was launched ($2.7 million); (2) "National water resource management project in Uzbekistan" (SDC), the office and special-purpose equipment was handed over; training seminar for women in water (11 May; 9-12 June) and training on the use of modern water meters (October 17-21) were arranged; the water sector middle- and lower level professional development center was equip-

[136] UP RUz No.60 of 28.01.2022

[137] agreed on 03.11.2022

[138] PP RUz No.PP-5005 of 24.02.2021

[139] in pursuance of PP RUz No. PP-68 of 22.01.2022

[140] the project ($2.7 million) is implemented by a consortium of Annexure Financial Solutions Limited (Hong Kong)/SMEC International Pty Limited (Australia)

ped; (3) "Amu Bukhara irrigation system rehabilitation", Kiziltepa-1 pumping station was commissioned; (4) USAID "Regional water and vulnerable environment", the Syr Darya River Day was celebrated (September 9). For other projects, see http://www.uzaifsa.uz/en/content/ongoing-projects.

Under the "EU's Water Initiative National Policy Dialogues (NPDs) in Central Asia" project (EU, UNECE/OECD, September 2019-February 2023), the 1st Steering Committee meeting of NPDs[141] on IWRM, launching NPDs in Uzbekistan, took place; achievements, problems and priorities of Uzbekistan in the field of water policy were discussed; ways of NPDs implementation were agreed upon; intersectoral collaboration, safe and equitable water supply and sanitation, and transboundary cooperation aspects were discussed (September 27, Tashkent). The consortium of CARITAS and CAREC launched the project "Climate resilient integrated water resource management in the Zeravshan River Basin in Uzbekistan"[142] aimed at improving the living conditions of the population in basin by strengthening the capacity of water stakeholders, introducing market instruments and raising awareness of water users. A workshop was organized in Samarkand as part of the initial phase.

The EBRD Board of Directors approved a loan to finance the project[143] "Modernization of 118 pumping stations in Andizhan, Namangan and Fergana provinces" (2023-2027) worth of $199.96 million (PP RUz No.PP-438 of 07.12.2022).

Water Ways Technologies Inc.[144] signed an agreement for construction of 6 reservoirs and 6 complete head controls in Bukhara province (February 9).

Capacity building. The following events were held among many others: (1) seminars for water professionals on water-saving irrigation technologies (January 11; March 3-5; July 7; November 10); (2) practical seminars for land reclamation services (January 27; April 19); (3) webinar "Water security in Central Asia" (February 11); (4) seminar of the University for World Economy and Diplomacy entitled "Water allocation issues in Central Asia and prospects of their solution" (February 18); (5) training seminar on PPP projects (February 22); (6) workshop within the EU-IWMI program "Sustainable water resource management in rural areas of Uzbekistan", component I (July 29); (7) training seminar "Introduction of digital technologies and models in water management" (August 23, IWMI); (8) courses on cybersecurity in the water sector (September 5-20); (9) seminar "Efficient use of land and water resources in agriculture" within the framework of the EU-AGRIN project (November 25).

In 2022, the office of the Sectoral Council for Professional Skills and Knowledge Development and the Water Sector Professional Development Centre with the support of the EU and the UNESCO project "Development of employment skills in rural areas of Uzbekistan" were launched.

Events. The following events were organized: (1) roundtable "Topical issues of rational water resource use and glacier conservation in Central Asia" (January 19, online); (2) roundtable dedicated to the memory of Prof. Dukhovniy "Science and innovations for water security" as part of the International Central Asian Science-to-Practice Conference "30-years of water cooperation among the Central Asian states: facing the future" (April 26-27); (3) conference "Uzbek-Tajik cooperation on rational use of water resources" (April 29, online); (4) a regional seminar "Central Asia towards the 2023 UN Water Conference" (September 20, Tashkent); (5) workshop on supporting IWRM principles for development of the National Water Strategy of Uzbekistan for 2024-2026 (December 6-7, Tashkent).

Representatives of Uzbekistan[145] took part in the 24th ICID Congress and 73rd IEC meeting (October 3-6, Adelaide).

Regional cooperation. Agreements were signed with: (1) the Government of Turkmenistan on the management, protection and sound use of the Amu Darya River (July 14, Tashkent); (2) the Cabinet of Ministers of the Kyrgyz Republic on joint water management of the Andizhan (Kempirabad) reservoir (November 3, Bishkek); (3) Water Resource Service under the Ministry of Agriculture of the Kyrgyz Republic on water cooperation (November 3, Bishkek). See "Bilateral Water Cooperation between the Countries of Central Asia".

Deputy Prime Minister took part in the 22nd meeting of the IFAS Board (November 28, Dushanbe, Tajikistan).

The following events were held in Tashkent: (1) 3rd coordination meeting of the EC IFAS with international development partners (September 20); (2) 8th meeting of the Working Group on institutional and legal improvement of IFAS (September 21-22); (4) meeting of the Head of IFAS with the Director of SIC ICSD branch in the Republic of Uzbekistan (November 21).

ICWC member from Uzbekistan Sh.R. Khamrayev participated in 82nd (April 27) and 83rd (November 22) ICWC meetings. See "IFAS and other regional organizations in Central Asia".

[141] the project is aimed at improving IWRM and intersectoral coordination to ensure water security at the national level in CA countries. Implemented under the EU-funded "European Union – Central Asia Water, Environment and Climate Change Cooperation (WECOOP)" project

[142] with the support of SDC, Initial Phase – 01.08.2022-31.01.2023, Phase I – 01.02.2023-31.12.2026

[143] total cost – $247.51 million, including the contribution of the Republic of Uzbekistan – $47.55 million, of which $33.95 million in the form of reimbursement of value added tax

[144] a global provider of Israeli-based agriculture technology

[145] the delegation was headed by the Minister of Water Management, Sh.R. Khamraev, ICID Vice-President (2019-2022)

Drinking Water Supply

According to the Central Public Utility Organization (*AO Uzsuvta'minot*), the coverage by centralized drinking water supply to population expanded from 69.7% to 74.4%, while that of centralized sanitation services increased from 17.2% to 18.9%. The amount of drinking water supplies reached 1.19 billion m^3, while the number of customers equipped with water meters increased from 2.42 to 2.83 million (64.3%). The customer base enlarged from 4.15 to 4.4 million.

Assimilated government investments in fixed assets through the Fund for Water Supply and Sewerage Development amounted to 2.9 trillion UZS (92% compared to 2021).

3.3 trillion UZS from government funds and $185.5 million from international financing institutions were spent for laying 7,130.1 km of drinking water supply networks and 232.9 km of sewerage networks and for construction or reconstruction of 859 water supply and sewerage facilities.

Latest developments in legislation. The law "On drinking water supply and sewage disposal" (RUz No.ZRU-784 of 22.07.2022) sets the following: (1) guarantees drinking water supply of good quality to consumers; (2) the Ministry of Housing and Communal Services[146] is an authorized state body in the sphere of drinking water supply and sewage disposal; (3) organizations of any legal forms may perform as a drinking water supplier; (4) drinking water must be safe in epidemiological, radiation and chemical terms.

Resolutions: (1) "On measures for implementation of "Obod Kishlok"[147] and "Obod Makhalla"[148] programs in 2022-2026" (No.PP-172, 18.03.2022) adopted targets for the improvement of drinking water supply and sewerage systems; (2) "On additional measures to increase the coverage of population by drinking water supply and sewerage services" (No.PP-257, 24.05.2022) adopted the targets for the extension of the coverage by the services and the Program of drinking water supply to secondary schools, preschool educational organizations, medical institutions, and communities.

Programs. A number of programs are implemented, including the Program of social and industrial infrastructure development, investment programs, "Obod Kishlok" and "Obod Makhalla" state programs to reconstruct water supply and sanitation infrastructure and construct new ones in provinces throughout the Republic.

Projects. AO Uzsuvta'minot implemented 20 projects through $1.861-billion loans from the WB, ADB, EBRD, IsDB, Asian Infrastructure Investment Bank, Saudi Fund for Development and OPEC Fund for International Development.

Those included construction of: (1) Kadyria water treatment plant, with a capacity of 100 thousand m^3 per day in Tashkent province and a sewage treatment plant, with a capacity of 30 thousand m^3 per day in Djizak city (at the expense of ADB); (2) sewerage treatment plants for 100 thousand m^3 per day in Bukhara city (WB) and for 4 thousand m^3 per day in Shirin city (IsDB).

At the expense of the local water supply enterprises, 82.8 km of water mains were laid, 7 wells were drilled, 121 pumps were installed, 1.8 thousand drinking water supply networks and 1.8 thousand pumping units were overhauled and repaired. Replacement of 53 pumps with energy saving ones at Syrdarya and Surkhondarya water operators resulted in saving 77 thousand kW of electricity per month in each.

As part of the "Water" program, the non-governmental foundation "ONA"[149] installed 1,200 pumps and 6 treatment facilities in water-short areas.

Agreements were signed with: (1) the International Development Association and the State Secretariat for Economic Affairs of the Swiss Confederation (SECO) for the "Reconstruction of water supply and sewerage systems in Kattakurgan town in Samarkand province" project ($79.3 million, 2022-2026); (2) the ADB for the "Construction and reconstruction of drinking water supply and sewerage systems in cities and districts of Tashkent Province (Stage 3)" project ($185.8 million, 2022-2027); (3) the EBRD for the projects[150] "Improvement of drinking water supply in Chust, Pap, Namangan districts and construction of sewerage systems in Chust and Mingbulak district centers in Namangan province" and "Improvement of water supply in Muzrabad district of Surkhandarya province by constructing water mains from Oktosh and Poshkhurt groundwater deposits"; (4) the Alkataş İnşaat Ve Taahhüt LLC and Mesmer-East LLC for reconstruction of the sewerage treatment plant in Chirchik.

The French Development Agency (AFD) and the European Commission allocated funds for the projects[151]: (1) "Construction of sewerage systems in Karmana district of Navoiy province"; (2) "Reconstruction and construction of sewerage systems in Shakhrisabz city and Kitab district center of Kashkadarya province".

[146] by the Presidential Decree of RUz No.UP-269 "On measures to implement administrative reforms in new Uzbekistan" of 21.12.2022, the Ministry of Construction and Housing and Communal Services of RUz is formed on the basis of the Ministry of Housing and Communal Services and the Ministry of Construction of RUz

[147] improvement of villages

[148] improvement of communities

[149] Non-governmental foundation "ONA" began its work in August 2021

[150] implementation period – 2022-2026, total cost – $120 million

[151] implementation period – 2022-2027. AFD approved a €105 million loan and the European Commission – a €9 million grant

A governmental resolution was adopted (PP-428 of 18.11.2022) for implementation of the "Transformation of drinking water supply and sewerage systems in Tashkent city" project (€218.8 million)[152].

Capacity building. (1) training courses "Modern management of drinking water supply and sanitation" (March-April) and training seminars (March 1-3) for managers and employees of provincial water supply enterprises under AO Uzsuvta'minot; (2) international press conference "Human resources policy in the water sector: problems and solutions" (May 26). Totally, 1,400 employees upgraded their qualifications in operation, current and capital repairs, and construction quality control; 50 laboratory technicians underwent internal certification.

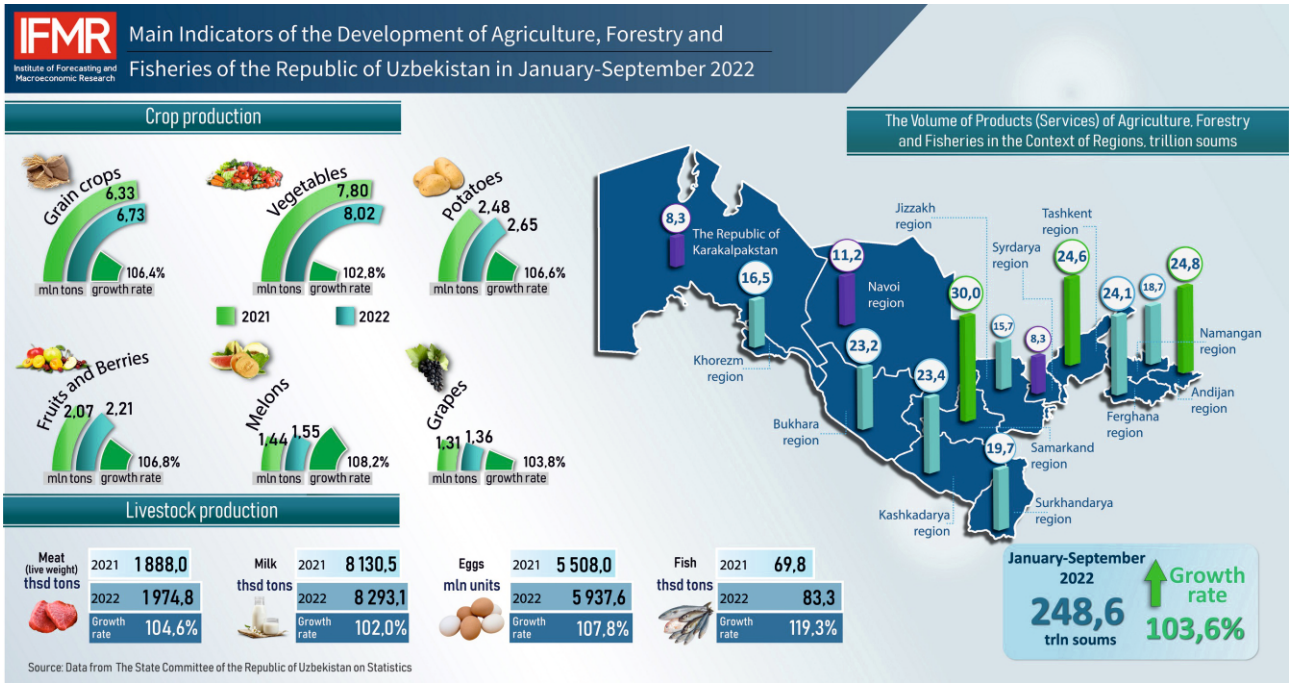
According to the draft resolution "On measures to develop the training system for drinking water supply sector", a unified scientific center "Water Academy" is to be established with the aim of introducing innovative technological solutions and modern approaches and of building capacities of drinking water supply services.

International cooperation. AO Uzsuvta'minot signed: (1) a MoU with South Korea's K-Water Corporation on capacity building in drinking water supply and sanitation in Uzbekistan (June 3); (2) a MoU with the Abu Dhabi Sewerage Services (ADSSC), UAE (November 2); (4) a MoU with the AFD on the improvement of access to drinking water in the regions of Uzbekistan (November 21-22, Paris).

Agriculture

By the end of the year, crop acreage was 3,260.7 thousand ha. Agricultural production amounted to 347,564.4 billion UZS, including crop production – 179,853.4 billion UZS and livestock production – 167,711.0 billion UZS. The production growth rate was estimated at 103.8% in crop growing and 103.4% in livestock production. Production of meat increased by 3.4%, milk – 3.2%, eggs – 4.4%, grain – 4.7%, potatoes – 4.7%, cucurbits – 5.9%, fruits and berries – 4.6%, grapes – 3.9%, and fish – 3.2%.

Uzbekistan was ranked 73rd in the Global Food Security Index 2022 (GFSI) (78th in 2021).



Source: Institute of Forecasting and Macroeconomic Research, https://ifmr.uz/infographics

Latest developments in legislation. To implement the Agricultural Development Strategy of the Republic of Uzbekistan for 2020-2030[153], the following Resolutions were adopted: (1) "On measures to establish the International Agricultural University" (No.PP-237 of 07.05.2022); (2) "On additional measures to effectively implement the tasks defined in the Agricultural Development Strategy of the Republic of Uzbekistan for 2020-2030" (No.PP-273 of 07.06.2022); (3) "On measures to introduce advanced technologies in agriculture in Uzbekistan at the expense of grant funds of the Republic of Korea" (No.PP-321 of 14.07.2022); (4) "On additional measures to further develop agriculture in Tashkent province" (No.PP-435 of 01.12.2022).

In 2022, a number of laws and resolutions were adopted in support of fisheries, poultry and livestock production (PP-83 of 13.01.2022, PP-100 of 24.01.2022, PP-

[152] implemented jointly with SUEZ International SAS (France)
[153] Decree of the Uzbek President No.UP-5853 of 23.10.2019

121 of 08.02.2022), for soil fertility and crop yields improvement (PP-179 of 25.03.2022), science and innovation-based cotton production (PP-308 of 07.07.2022), combating land degradation (PP-277 of 10.06.2022), etc.

New appointments. A.B. Voitov was appointed Minister of Agriculture.

Strategies and programs. As part of implementation of the "Agricultural Development Strategy of the Republic of Uzbekistan for 2020-2030", agricultural lands have been put up on the E-AUKSION platform since January 2022[154]. In one year, regional authorities reserved 102.6 thousand ha of land plots (103% compared to the plan), of which 95.5 thousand ha were allocated to 428.7 thousand citizens through open e-tenders.

A **unified information system "Agrosubsidy"** and a special telegram bot https://t.me/agrosubsidiya_support were launched[155] in a test mode; agricultural producers may now submit e-applications for subsidies for adoption water-saving technologies in their production processes.

Agroclusters. In 2018-2022, 506 clusters were established in Uzbekistan. In 2022, their production amounted to 28.7 trillion UZS; the share of their output reached 11.4% in the total exports of industrial products.

Two agro-industrial clusters in Namangan province and 14 modern service centers and 100 mobile brigades were formed and equipped in cooperation with CLAAS, John Deere, and Case companies in line with decrees on establishment of horticultural agro-industrial clusters in Namangan province (PKM 309 of 07.06.2022) and of agricultural engineering cluster in Chirchik city (PP RUz No.PP-335 of 28.07.2022). A modern agro-industrial cluster is to be established in Andizhan province[156].

The Deputy Business Ombudsman and JICA representatives discussed the cluster system development in Uzbekistan during a meeting on February 28.

Projects. The following projects were continued: (1) "Integrated natural resources management in drought-prone and salt-affected agricultural production landscapes in Central Asia and Turkey" (CACILM-2, FAO/GEF). High-tech laboratory equipment was handed over to the "Tuproqsifattahlil" SUE ($29 thousand); 3 motor tillers and 3 mini hay mowers were handed over to the karakul farm "Guzor" LLC in Guzar district, Kashkadarya province; households received 5 motor tillers and earth augers each in Bukhara district of Bukhara province and Kamashi district of Kashkadarya province; a training for trainers was conducted (July 18-21); (2) "Sustainable management of forests in mountain and valley areas in Uzbekistan" (FAO/GEF), under which a number of legal documents have been drafted to develop forestry in Uzbekistan and empower women working in the industry; conditions were created to improve the social status of 620 local households; (3) "Smart farming for the next generation" (FAO). In Andizhan, Namangan and Fergana provinces, 20 rural households were supported to modernize and optimize their greenhouses; (4) "Agriculture modernization project for Uzbekistan" (WB). A training of future consultants in AKIS was held (May 10-13), an initial agreement was reached to provide a total of $20 million for the development of a single integrated Digital Agriculture platform; (5) "Supporting an inclusive transition to a green economy in the Agri-food sector and development of a 'climate-smart' Uzbek Agriculture Knowledge and Innovation System (UAKIS)" (EU/UNDP). Annual work plan was presented (July 20), innovation groups were established; a training (August 19-20) and a seminar "Efficient use of land and water resources in agriculture" (29 November), and the "Zamin Yulduzlari" contest were held. For other projects, see www.agro.uz/ru/loyihalar/.

The new phase of the "Support for intensified and diversified agriculture and improved water resource management" project[157] started ($2.7 million). A memorandum of cooperation was signed between the project representatives and the Agricultural Knowledge and Innovation System (AKIS) Center, the Council of Farmers, Dekhkan Farms and Homestead Plot Owners of Uzbekistan, the Association "Women of Agrarian Sphere" and the "ShirinMeva" project (March 1); "Farmer's Day" was organized (June 16).

The Presidential Resolution was adopted[158] on the "Financing sustainable development of the livestock sector" project with participation of the AFD (2022-2026, €147.07 million).

Capacity building. The International Agriculture University was established in Tashkent in cooperation with the UK[159]. The **Uzbekistan Smart Farm**, an industrial technology platform is launched to boost economic growth by increasing the agricultural efficiency[160]. To improve capacities, a resolution was adopted to organize training and experimental farms in agricultural sector (No.527 of 27.09.2022).

[154] according to the Presidential Decree of 08.06.2021 No.UP-6243 "On measures to ensure equality and transparency in land relations, reliable protection of land rights and turning them into a market asset"

[155] according to PP RUz No. PP-144 "On measures to further accelerate introduction of water-saving technologies in agriculture" of 01.03.2022

[156] in line with the Memorandum of Cooperation between the Ministry of Investment, Industry and Trade of RUz and E20 Investment Limited (UAE) (24.03.2019)

[157] implemented by the consortium of companies Annexure Financial Solutions Limited (Hong Kong)/SMEC International Pty Limited (Australia) within the framework of the EU "Fergana Valley water resource management-Phase II" project

[158] within the framework of the Agreement with AFD (08.06.2021)

[159] Resolution No.PP-237 of 07.05.2022 "On measures to establish the International Agriculture University". For the 2022-2023 academic year, the total number of quotas is 250, of which 200 are state grants in 7 different areas

[160] developed in cooperation with the knowledge and innovation system in agriculture – AKIS Center, Korean organizations KIAT, KOMI, KITECH, CAMTIC and Agro Solution Korea

Series of workshops for representatives of dekhkan farms (January, Tashkent), practical training "Internal audit – model of opportunities"[161] (March 16), seminar "Seed production – future of agriculture" for farmers and agrarians (March 29, AKIS), workshop "Prospects for the development of artisanal fish farming and aquaculture in Uzbekistan within the framework of the International Year of Artisanal Fisheries and Aquaculture" (March 30)[162]; seminar-presentation of the program "Business game in farming" by German Sparkassenstiftung for international cooperation (April 1), training on "Development of horticulture value chain for extension agents" (May 16-20, USAID), regional training workshop on "Organization of strategic planning and policy development in food security" in cooperation with ADAFSA (May 24-25, Abu Dhabi), international training "Legislative framework of the EU and its impact on the organic production in Uzbekistan" (June 13-14, GIZ), and many other capacity building events were held in 2022.

International cooperation. In the course of bilateral negotiations, the agriculture ministers of Uzbekistan and Turkey signed: (1) a roadmap for enhancing strategic partnerships in agro-industry; (2) final minutes of the third meeting of the joint Uzbek-Turkish working group on agriculture; (3) a memo of intention between the agrarian ministries of the two countries on cooperation in agricultural research and development (February 8-9, Tashkent).

Cooperation on application of GIS in agriculture was discussed during the meeting of directors of the Agro-industry Digitization Center (Uzbekistan) and GEO TWO Co.Ltd (Korea) (March 24). At the meeting of the Russian-Uzbek IGC, the agricultural ministries of Russia and Uzbekistan exchanged roadmaps on the development of agriculture cooperation for 2022-2024 (October 23). The Embassy of Uzbekistan in Italy held a briefing on food security reforms in Uzbekistan at the FAO headquarters (June 7, Rome). The Minister of Agriculture addressed the 33rd Session of the FAO Regional Conference for Europe (ERC) (May 11, Poland).

A number of meetings were held with Germany, the Organization of Turkic States and ECO, IFAD and other organizations to further develop cooperation on agriculture.

Events. The Uzbek Ministry of Agriculture hosted workshops and conferences in cooperation with the: (1) Ask Facility EU Program[163] (February 25); (2) FAO (April 22, May 10-11, July 1); (3) IFAD (May 18); (4) AKIS/ISCAD[164] (June 1-2); (5) OTS (July 4); (6) International Agriculture University (December 2), etc.

Energy

The available generating capacities in Uzbekistan amount to 12,900 MW, of which 11,000 MW (84.7%) – TPP; 1,850 MW – HPP (14.3%); and more than 133 MW 75 (1%) – station units and isolated stations[165]. The energy system capacity is expected to reach 25.6 thousand MW (thermal – 18.8 thousand MW, hydro - 2.5 thousand MW, and solar and wind – 4.3 thousand MW) by 2025 and 29.2 thousand MW (share of RES, including hydro, solar, and wind – 40.4%) by 2030.

In 2022, 74.3 billion kWh of electricity (71.3 billion kWh in 2021) was generated, including 66.6 billion kWh (65.6 billion kWh in 2021) by AO TEC. The electricity export was 2.7 billion kWh (2.15 billion kWh in 2021), while the import was 5.6 billion kWh (6.2 billion kWh in 2021). As forecasted, by 2030, the republican consumption will reach 120.8 billion kWh.

At year-end, 66.5 billion kWh of electricity was transported through the main power grids (growth rate compared to 2021 – 102.8%).

According to the Program[166] for modernization and reconstruction of power grids, power transformers were replaced at 9 substations, and the installed capacity was additionally increased by 1,241 MVA.

Latest developments in legislation. In line with the decree on implementation of the "Energy sector transformation and resilient transmission" project with the involvement of the World Bank (No.PP-113 of 03.02.2022), a resolution was approved on automation of the energy sector (No.68 of 10.02.2022.

Another resolution was adopted on 18.10.2022 (No.609) "On approval of the operational regulations of electric stations and grids in the Republic of Uzbekistan".

New appointments. J.T. Mirzamakhmudov was appointed Minister of Energy (September 30).

International cooperation. The Government of Uzbekistan signed: (1) an intergovernmental MoU on energy cooperation with Azerbaijan (June 20); (2) a cooperation agreement with Saudi Arabia (August 18); (3) a MoU on further development of cooperation in the energy sector with Turkmenistan (October 24).

The following events were held: (1) 2nd meeting of Energy Ministers of the SCO member states (June 28); (2) 60th meeting of the CIS Electric Power Council (July 14); (3) meeting of the Ministers of Energy of Uzbekistan and Kazakhstan (February 26).

[161] in cooperation with the EU Agricultural Support and Knowledge Enhancement Program in the Ask Facility area

[162] organized by FAO under the "Capacity development for sustainable fisheries and aquaculture management in Central Asia, Azerbaijan and Turkey" project (FISHCAP), part of the FAO-Turkey Food and Agriculture Partnership Program

[163] Agricultural Support and Knowledge Enhancement Program - EU Assistance Program for the Implementation of the "Agricultural Development Strategy of the Republic of Uzbekistan for 2020-2030"

[164] with the support of EU, FAO, UNDP and ASK Facility EU Program

[165] Concept for Electricity Supply in the Republic of Uzbekistan for 2020-2030

[166] approved by the decision of the Sole Shareholder of "Regional Power Grids" JSC of 30.06.2021 No.5

Events. The following events were organized: (1) 16th international exhibition "UzEnergyExpo-2022" (October 26-28); (2) 15th international exhibition "Energy, energy saving, nuclear energy, alternative energy sources – Power Uzbekistan 2022" (May 18-20); (3) Uzbekistan Energy Forum/UEF 2022 (June 23-24); (4) roundtable on international experience in developing a competitive wholesale electricity market and future plans of Uzbekistan in this area (October 14); (5) exhibition "Use of renewable energy sources in Uzbekistan and new opportunities" (July 28-29).

Hydropower

76,550 million m^3 of water was used for hydropower generation[167].

In Uzbekistan, the hydropower sector has 49 HPPs, particularly 14 large HPPs with a total capacity of 1.76 GW (86% of total hydropower capacity), 23 medium HPPs with a total capacity of 0.262 GW (13%), 9 small HPPs with a total capacity of 0.0285 GW (0.014%) and 3 micro HPPs with a total capacity of 0.86 MW (0.004%). 30 HPPs (532 MW) are run-of-river. 10 HPPs (1.4 GW) operate at reservoirs.

Latest developments in legislation. The Cabinet of Ministers of RUz adopted[168] a resolution for implementation of investment projects entitled "Construction of HPP cascade on the Big Andizhan Canal in Namangan province" and "Construction of Zarchob-3 HPP on the Topalang River in Surkhandarya province" (No.534 of 28.09.2022).

Hydropower construction and modernization. In 2017-2022, AO Uzbekgidroenergo commissioned 12 new HPPs with a total capacity of 262.8 MW and modernized 16 operating power facilities. In accordance with the 2022-2026 Uzbekistan Development Strategy, 15 new HPPs with a total capacity of 868 MW will be built in the country and 5 operating HPPs will be modernized.

By the end of 2022: (1) construction of the 90-MW **Lower Chatkal HPP** was launched on the Chatkal River in Tashkent province; (2) construction of **Pskem HPP** is continued in Tashkent province; (3) **Farkhad HPP** was reconstructed in Syrdarya province. Modernization of 4 hydroelectric units resulted in the capacity of the HPP increased by 11.4% (from 114 to 127 MW); (4) **Topalang HPP** is modernized in Surkhandarya province. After installation of 2 units, the capacity of the HPP will be increased to 175 MW.

The Presidents of Uzbekistan and Tajikistan launched the construction of a 140-MW **Yavan HPP** on the Zeravshan River at an estimated cost of $282 million. The HPP will generate 700-800 million kWh (June 2).

Within the framework of the Investment Program, AO Uzbekgidroenergo implemented 13 projects at a total cost of $1.3 billion and a total capacity of 797 MW.

Small hydropower. It is planned to build 200 small HPPs at a total capacity of 56 MW in line with the Presidential Decree "On additional measures to introduce energy-saving technologies and develop renewable energy sources of small capacity" (No.UP-220 of 09.09.2022). 8 mini hydropower will be launched.

Regional and international cooperation. AO Uzbekgidroenergo signed: (1) a MoU with MACLEC technical project laboratory pvt. LTD (India) for manufacturing of generating units in Uzbekistan; (2) a MoU with K-Water Corporation for construction of Khojikent pumped storage (February 15); (3) an agreement with Hydro4U consortium to purchase equipment for a projected 2.2 MW small HPP in Fergana province (June 21).

Events. AO Uzbekgidroenergo had official meetings with ADB delegation, representatives of Toshiba and Itochu (Japan), WB, and AFD.

Thermal power

AO TEC includes 6 TPPs, 3 CHPPs and 3 service companies. The installed capacity of TPPs is 11,932 MW (available capacity – 11,060 MW); 55.5 billion kWh of electricity and 5.35 million Gcal of thermal energy were generated in 2022. By 2030, it is planned to increase the total capacity of TPPs to 14.7 thousand MW[169].

Fitch Ratings (USA) assessed the international indicative rating of AO TEC at BB- "Stable" and equated it to the sovereign rating of RUz.

Thermal power construction and modernization. In 2022, 6 TPPs with a total capacity of 1,374 MW were launched: (1) 174-MW TPP in Khorezm province; (2) 270-MW gas-piston TPP in Bukhara province; (3) 220-MW TPP in Syrdarya province; (4) 240-MW combined cycle gas turbine, 230-MW gas-fired TPP and 240-MW TPP in Tashkent province.

The President launched the construction of the Surkhandarya TPP – the largest in the country with a capacity of 1.56 GW at $1.2 billion.

Within the framework of the projects (1) "Construction of 2 new gas turbine units with a total capacity of 32 MW at Tashkent TPC JSC" (JICA), an annual production of 515.6 million kWh of electricity and 690.3 thousand Gcal of thermal energy was achieved; (2) "Expansion of Talimarjan TPP JSC with the construction of another combined cycle plant with a total capacity of at least 900 MW" (ADB/EBRD), it is planned to generate 7.2 billion kWh of electricity per year; (3) "Construction of the third combined cycle plant with a capacity of 650 MW at Navoiy TPP JSC" (JICA), an annual production of 4.9 billion kWh of electricity and 931.4 thousand Gcal of thermal energy was achieved.

[167] 11.8 m^3 of water is consumed to produce 1 kWh of electricity at HPPs

[168] within the framework of implementation of PP RUz No. PPP-44 "On additional measures to further develop hydropower" of 10.12.2021

[169] Concept of Electricity Supply in the Republic of Uzbekistan for 2020-2030

A resolution (No.PP-464 of 30.12.2022) was adopted for implementation of the "Construction of 1,573-MW combined cycle plant Bayaut district, Syrdarya province" investment project.

International cooperation. AO TEC cooperates with the General Electric (USA), Mitsubishi Corporation, Itochu (Japan), Hyundai (South Korea), Intecsa Ingeniera Industrial S.A. (Spain), AC Boilers S.p.A (Italy), Power Machines, Krasny Kotelshchik, Kaluga Turbine plant, Taganrog Boiler Building plant, Leningrad Metal plant (Russia), Çalik Enerji (Turkey), EBRD, Asia-Pacific Bank, JICA (Japan), China Development Bank (PRC).

Alternative energy sources

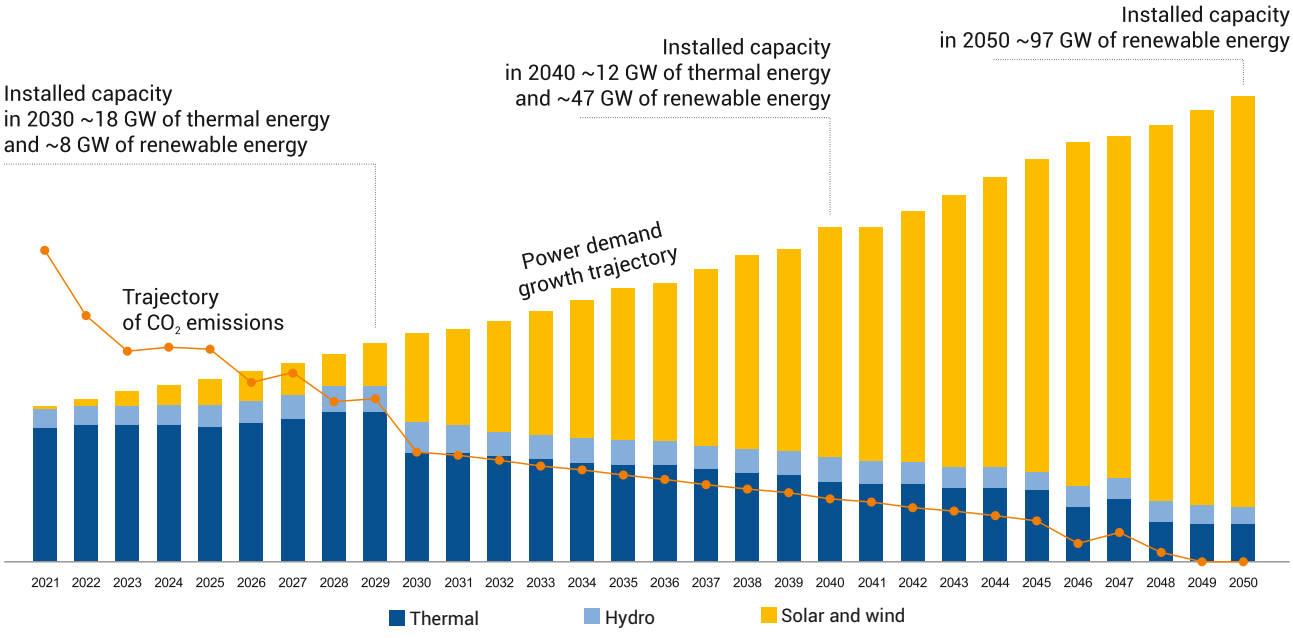
Latest developments in legislation. To promote energy-saving technologies and development of RES in Uzbekistan, a Presidential Decree (No.UP-220 of 09.09.2022) was adopted on "On additional measures to introduce energy-saving technologies and develop renewable energy sources of small capacity". In pursuance of the Decree, the Cabinet of Ministers approved resolutions for acceleration of production of RES-based facilities (No.518 of 21.09.2022) and for support of local producers of RES installations and their customers (No.568 of 05.10.2022).

The **National Research Institute for Renewable Energy Sources** under the ME[170] and the Research Center for Hydrogen Energy and the Laboratory for Testing and Certification of Renewable and Hydrogen Energy Technologies within its structure were established[171] (PKM RUz No.127 of 24.03.2022).

A number of documents were approved: (1) Green Economy Transition and Green Growth Program in Uzbekistan until 2030; (2) Concept for transition to green economy and energy saving in industries; (3) Green Economy Transition and Green Growth Action Plan in the Republic of Uzbekistan until 2030; (4) Targets for fuel and energy resource saving in economic sectors for 2022-2026 (PP RUz No.PP-436 of 02.12.2022): (1) reduce GHG emissions by 35% of the 2010 level; (2) increase RES up to 15 GW and bring their share in the total volume of electricity generation to 30% and more; (3) improve sectoral energy efficiency by at least 20%; (4) reduce energy intensity per unit of gross domestic product by 30%, including through increased use of RES; (5) improve water use efficiency in all sectors and introduce water-saving technologies on an area of up to 1 million ha; (6) expand urban green spaces to 30% or more by planting 200 million seedlings per year and bring their total number to 1 billion; (7) increase household waste recycling up to 65%, etc.

Carbon neutrality action plan for the energy sector of Uzbekistan. Uzbekistan aims to transit to carbon-neutral electricity generation by 2050.

Evolution of the combination of electricity generation and CO_2 emissions under a carbon-neutral scenario



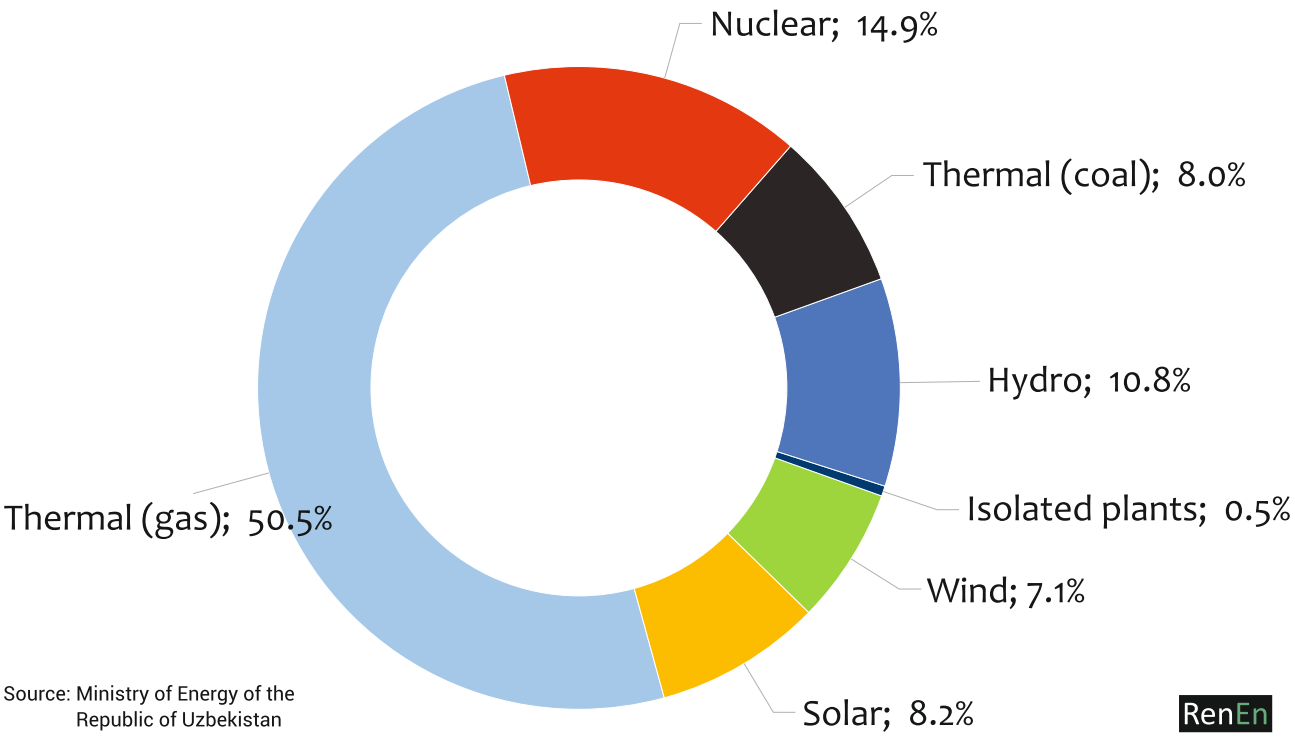
Note: capacities of TPPs include a nuclear power plant as presented in the 2020-2030 Concept of the Ministry of Energy

Source: Proceedings of the Conference "Achieving carbon neutrality and energy transition in Central Asia (Kazakhstan-2060 and Uzbekistan-2050)", November 14-16, Almaty, https://unece.org/sites/default/files/2022-11/EnergyTransition-CarbonNeutrality-Kz-Uzb-CA.pptx (in Russian)

[170] on the basis of "International Solar Energy Institute" LLC of the Academy of Sciences

[171] according to the PP RUz No.PP-5063 of 09.04.2021

Electricity generation structure in Uzbekistan in 2030



Source: Proceedings of the Conference "Achieving carbon neutrality and energy transition in Central Asia (Kazakhstan-2060 and Uzbekistan-2050)", November 14-16, Almaty, https://unece.org/sites/default/files/2022-11/EnergyTransition-CarbonNeutrality-Kz-Uzb-CA.pptx (in Russian)

Solar power. Commissioned projects: (1) 100-MW plant to generate 260 million kWh per year in Samarkand province, (May 24); (2) 131-MW solar farm "Tutli" (Total Eren, France) to generate 270 thousand kWh per year, 100 km west of Samarkand.

By the end of 2023, 4 solar plants will be built and commissioned in: (1) Surkhandarya province – 456.6 MW; (2) Djizak province – 220 MW; (3) Samarkand province – 220 MW; (4) Navoiy province – 200 MW.

Wind power. A resolution was adopted (PP-169 of 18.03.2022) for the construction and operation of 100-MW wind power plant in Karauzyak district, Republic of Karakalpakstan in the format of PPP[172].

The Masdar Company (UAE) signed agreements on financing construction of the first industrial 500-MW Zeravshan WPP[173] in Navoiy province (August 31).

Agreements were signed between the Government of Uzbekistan, the International Finance Corporation and EBRD on cooperation in the sphere of renewables (March).

Environment and climate change

Latest developments in legislation. A number of resolutions were adopted for the arrangement of protected natural territories (PP-131 of 16.02.2022, PKM 93 of 04.03.2022), enforcement of laws on nature protection in Djizak province (PP-226 of 27.04.2022), amendment and addition of the Regulations on state environmental monitoring (PKM 99 of 07.03.2022), improvement of performance of the Environmental and Nature Use Technology Research Institute (PKM 458 of 18.08.2022), etc.

Strategies and programs. Within the framework of the:

- Development Strategy of New Uzbekistan for 2022-2026, decrees and resolutions were adopted on priority measures for reformation of the waste management system (UP-189 of 11.08.2022), on organization of sanitation and cleaning service in settlements (PP-349 of 11.08.2022), on facilitation of transition to green economy (PP-436 of 02.12.2022), etc.

- Concept for Environmental Protection until 2030, provisions on Green Gardens and Green Parks were approved (PKM 529 of 27.09.2022).

The Aral Sea region. In 2022, the government adopted resolutions for afforestation of the dried bed of the Aral Sea and in the Aral Sea region and for formation of the Borsakelmas state reserve in the Republic of Karakalpakstan.

[172] project cost – $107.8 million

[173] construction project won the PFI Awards as the CA deal of the year

For implementation of the tasks defined in the Special Resolution[174] "On declaring the Aral Sea region a zone of ecological innovation and technologies", decisions were made to take additional measures to transform the Aral Sea region into a zone of ecological innovations and technologies (PKM 41 of 25.01.2022) and to implement the UNDP-GEF project "Conservation and sustainable management of lakes, wetlands, and riparian corridors as pillars of a resilient and land degradation neutral Aral basin landscape supporting sustainable livelihoods". An agreement was signed with ADB on financing the project "Climate adaptive water resources management in the Aral Sea Basin sector" (June 24).

MPHSTF for the Aral Sea Region. In 2022, Uzbekistan contributed $1.5 million and Germany – €700 thousand to the Aral Sea region.

The EU delegation visited the MPHSTF's project sites (April 30, Nukus, Karakalpakstan). The MPHSTF beneficiaries took part in a picture exhibition "Expanding the opportunities of youth: Uzbekistan's youth in European Union Cooperation" (May 19, Tashkent).

MPHSTF continued projects aimed at ensuring access to drinking water, supporting innovative youth initiatives in agriculture, etc. See "United Nations and its Specialized Agencies".

As part of the "Sustainable natural resource and forest management in key mountainous areas important for globally significant biodiversity" project, (1) SMART patrol system for snow leopards was tested in the Chatkal State Biosphere Reserve and Gissar State Reserve; (2) training workshops were held on business planning, tourism and gardening (May-June); (3) forest restoration activities were carried out on 2,436 ha of degraded highland forests; (4) final meeting of the Coordination Council of the joint project was held (November 30, Tashkent). The Upper Tupalang National Nature Park was established on 27,851 ha in Surkhandarya province.

As part of the "Green rehabilitation Investment Project for Karakalpakstan Republic to address impacts of the Aral Sea crisis" (KOICA/GGGI) project, the GGGI office in Uzbekistan organized technical consultations (April 12 and June 14, Nukus; June 22, Tashkent). The (1) "Green Recovery Investment Analysis: Climate-Resilient Agriculture in the Republic of Karakalpakstan"; (2) "Climate Resilient Green Growth Assessment: for the Republic of Karakalpakstan"; (3) "Agriculture Sector in Uzbekistan and Karakalpakstan: Legal & Political Framework Review"; (4) "2022 Karakalpakstan Agriculture Risk Profile for Climate Resilience Capacity Development" were developed.

International and regional cooperation. The Global Green Growth Institute (GGGI[175]) opened its office in Tashkent (February 22). GGGI signed: a MoU on cooperation in the area of green growth and climate change with the ICSD (February 24); a Joint Declaration of Intentions with the UN in the face of Resident Coordinator in Uzbekistan (March 30).

Agreements were signed: between the Uzbek State Committee for Ecology[176] and GIZ on the "Climate risk management in Central Asia"[177] project (August 11, Tashkent); between the Uzbek Government and EBRD on the "Rehabilitation of domestic waste landfills and construction of new landfills in the Republic of Karakalpakstan and Khorezm province" project[178] (March 25, Tashkent) and on a grant project in support of Uzbekistan's efforts in rehabilitating the Chorkesar and Yangiabad special landfills (September 1, London, UK).

The Uzbek State Committee for Ecology held meetings with the: (1) Committee on Environmental Protection of Tajikistan (May 25, Tashkent); (2) Committee for Environmental Regulation and Control of Kazakhstan (May 26, Tashkent); (3) Ministry of Environmental Protection of Israel (June 15, online). The 3rd meeting of the Uzbek-Russian working group on the Agreement between the environmental agencies of Uzbekistan and the Russian Federation on environmental cooperation was held online on December 13.

Events. In 2022, the "green cover" was formed of saxaul and other desert plants on 107 thousand ha of the dried bed of the Aral Sea. With the support of the local population, a stock of 590.3 t of desert plant seeds was made. Plant nurseries were arranged on 100 ha. The nationwide "Green land" project is under implementation.

The Embassy of Uzbekistan in the United States organized a charity reception in support of the Aral Sea region (December 15, Washington, D.C., USA).

The following events were held: (1) scientific and practical seminar "Protection of land resources" (April 22, Tashkent, Uzbekistan); (2) session "Solution of environmental problems" of the 3rd International Rating Forum (May 7, Tashkent); (3) Plenum of the Central Council of the Ecological Party of Uzbekistan (May 21, Tashkent); (4) 3rd meeting of the Environment Ministers of the SCO member states (May 27, Tashkent); (5) international conference "Enhancing environmental culture of youth for sustainable development: domestic and foreign experience" (August 19,

[174] Resolution A/75/L.83 adopted at the 66th plenary meeting of the 75th session of the UNGA on May 18, 2021, New York

[175] an international intergovernmental organization headquartered in Seoul, established on June 20, 2012 in Rio de Janeiro, Brazil, in the framework of the United Nations Conference on Sustainable Development

[176] Decree of the Uzbek President No.UP-269 "On measures to implement the administrative reforms of new Uzbekistan" of 21.12.2022, the Ministry of Natural Resources of the Republic of Uzbekistan is formed on the basis of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection

[177] the project (BMZ, €10 million, 2022-2026) developed under the "Green Central Asia" initiative

[178] the document was signed within the framework of the 1st Tashkent International Investment Forum (March 24-26)

Tashkent); (6) campaign on the World Cleanup Day[179] (September 17, Tashkent); (7) session[180] "Climate change and the need to transit to a green economy" (November 4, Samarkand).

The delegation of Uzbekistan participated in a number of big international events, including UNEA-5 (February 28-March 2, Nairobi, Kenya), "Stockholm+50: a healthy planet for the prosperity of all – our responsibility, our opportunity" (June 2-3, Stockholm, Sweden), Climate Change Conference (November 7-18, Sharm el Sheikh), 15th UN Biodiversity Conference (December 7-19, Montreal, Canada), etc.

SDG in Uzbekistan

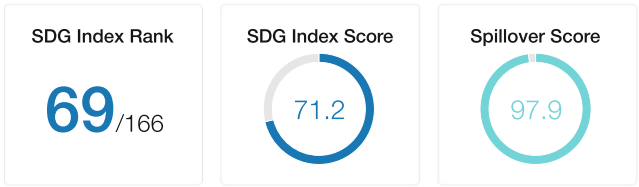
The country continued implementing the UN Sustainable Development Cooperation Framework 2021-2025[181].

The Resolution of the Uzbek Cabinet of Ministers No.83 "On additional measures to accelerate the implementation of national goals and objectives of sustainable development for the period up to 2030" of 21.02.2022 approved national goals and objectives for the period up to 2030 and the Plan of measures for 2022-2026.

Uzbekistan

Eastern Europe and Central Asia

OVERVIEW INDICATORS



SDG Dashboards and Trends

Source: https://dashboards.sdgindex.org/profiles/uzbekistan

Uzbekistan was ranked 69 of 166 countries in the annual ranking of sustainable development.

A Resolution was adopted (No.2816-IV of 29.12.2022) for strengthening the role of parliaments in accelerating the achievement of the Sustainable Development Goals. This document approved a Roadmap outlining 57 concrete measures in 13 areas.

The Government of Uzbekistan, with the support of the UNDP, developed and published the SDG Bond Allocation and Impact report, which provides information on how the proceeds from the bond issuance are helping to achieve the Government's development priorities and highlights Uzbekistan's commitment to achieve the SDGs.

[179] WorldCleanUpDayUzb2022

[180] within the framework of the 2nd Economic Forum of Uzbekistan (November 3-4, Samarkand)

[181] approved by the Government of RUz and UN in Uzbekistan on 24.10.2020

A joint meeting of the Chambers of Oliy Majlis on the implementation of the SDGs (October 26, Tashkent) and a roundtable "Human development and prospects for achieving the Sustainable Development Goals in Uzbekistan" (November 1, Tashkent) were held.

The delegation of Uzbekistan participated in the UNECE Regional Forum on Sustainable Development 2022 (April 7, online), High-level Political Forum on Sustainable Development (July 5-15, New York, USA), 6th North and Central Asia Multi-Stakeholder Forum on Implementation of the Sustainable Development Goals (October 6-7, Almaty, Kazakhstan).

Emergencies

Latest developments in legislation. (1) Law "On protection of population and territories from natural and anthropogenic emergencies" (ZRU-790 of 17.08.2022), under which (a) emergencies, depending on the source, may be of natural and man-made nature; (b) citizens are provided with free medical care, compensation and other benefits for work in emergency zones; (c) concealment, late submission or submission of false information as concerns emergency situations is not allowed; (2) resolution "On measures to protect the population and territories from emergencies related to hazardous hydrometeorological phenomena and geological processes" (PP-426 of 18.11.2022), which establishes the procedure for protecting the population and territories from floods and other emergencies.

Strategies and programs. Implementation[182] of the 2022-2030 Strategy for Development of Cooperation among the Central Asia Countries in DRR was started[183]. The Uzbekistani delegation participated in the meeting of the working group (experts) of the Regional forum-meeting of the Heads of Emergency Authorities of the CA countries[184], where trainings in monitoring of implementation of the Sendai Framework Program on DRR were held for representatives of public authorities in the CA countries (October 5, Dushanbe, Tajikistan).

Natural disasters. Due to heavy precipitation in spring, 15 floods and landslide events registered in several provinces of Uzbekistan damaged main and internal roads and bridges, houses, flooded homestead plots and crops, caused death of people and hundred heads of livestock.

Preventive measures. The Ministry of Emergency Situations (MES) organized: (1) 172 tactical and special exercises on cleaning riverbeds, mountain streams, and canals, strengthening their banks, and constructing embankments; (2) preventive and precautionary measures among the population living in hydrometeorologically and geologically hazardous areas; (3) emergency prevention and civil protection month (May). Provincial divisions of the MES were equipped with 15 sets of automated warning system.

Regional cooperation. The Agreement approved between the Governments of Uzbekistan and Kazakhstan on cooperation in prevention and elimination of emergencies[185] (PP-248 of 18.05.2022) provides for "...organization and monitoring of hazardous man-made and natural processes and phenomena; regular exchange of information on monitoring and forecasting of natural and man-made emergencies...", etc.

The Ministers of Emergency Situations of Uzbekistan and Belarus signed the 2023-2024 Action Plan for Cooperation (October 1, Samarkand).

Events. The MES took part in the: (1) 7th session of the Global Platform for Disaster Risk Reduction (Bali, Indonesia); (2) regional consultation workshop on climate change and security in CA (July 13-14, Almaty, Kazakhstan); (3) Regional Forum – Meetings of Heads of Emergency Authorities of Central Asian Countries (October 4-6, Dushanbe, Tajikistan); (4) summit of the Heads of Emergency Authorities of the Organization of Turkic States (21 December, Ankara, Turkey).

The following events were hosted: (1) training seminar for the heads of Expertise Departments at the Emergency Situations Directorate (May 26-27, Tashkent, Uzbekistan); (2) roundtable at the Research Institute of Fire Safety and Emergency Situations at the MES (August 30, Tashkent); (3) training seminar on emergencies in the water sector (October 17).

Foreign Policy and International Cooperation

In 2022, the President of Uzbekistan paid official and working visits to China (February), Pakistan (March), UAE (May), Kyrgyzstan (July), Hungary (October), Russian Federation (October, December), Kazakhstan (October 12, October 27), Turkmenistan (October), and France (November).

The country was visited by: the Presidents of Turkey (March), Tajikistan (June), Azerbaijan (June), Turkmenistan (July), Kazakhstan (December); the delegations from IRI (March, July), Russian Federation (March, April, October, November), Kingdom of Saudi Arabia (March, September, December), UAE (March, June), USA (June, August), PRC (July), Germany (November); the Prime Ministers from Kazakhstan (February), Belarus (April), Georgia (July); the Foreign Ministers from Japan (April), Poland

[182] according to the "Strategy for Achieving the Goals of the Sendai Framework for Disaster Risk Reduction in 2015-2030 in the Republic of Uzbekistan" (PKM RUz No.299 of 12.04.2019). The 3rd World Conference adopted the Sendai Framework on March 18, 2015, in Sendai, Japan

[183] approved by the regional forum – meeting of Heads of Emergency Authorities of the Central Asian countries by the Minutes of 05.11.2021

[184] under the UNDRR Initiative "Strengthening disaster resilience and accelerating implementation of Sendai Framework for Disaster Risk Reduction in Central Asia" funded by the EU

[185] signed during the state visit of the President of Uzbekistan to Kazakhstan on December 6, 2021 (Nur-Sultan). The Agreement was ratified by the Parliament of Kazakhstan (Law of RK No.169-VII ZRK of 28.12.2022)

(June); Head of the UN Counter-Terrorism Office (March), ADB President (March), SCO Secretary General (May), OSCE Chairperson-in-Office (June), first deputy UN Secretary General (June), WB delegation (September), EU President (October), EBRD President (November), OSCE Secretary General (November), and many others.

Key developments in the foreign policy of Uzbekistan in 2022. The aim of the republican foreign policy is to ensure dynamic and sustainable political, socio-economic, secular and democratic development of Uzbekistan. The most important objective is enhancing good neighborly relations and strategic partnerships, first, with the CA countries. The Development Strategy of New Uzbekistan for 2022-2026[186] sets the following goals: (1) Goal 93: Increase the role of the country as an equitable international entity; (2) Goal 94: Elevate to the highest level the close cooperation in Central Asia in security, trade and economic, water, energy, transport and cultural and humanitarian spheres; (3) Goal 95: To further develop relations with our traditional partners, strengthen economic diplomacy, and prioritize expanding the geography of our foreign relations; (4) Goal 96: Strengthen the activities of Uzbekistan in the framework of United Nations bodies and institutions, global and regional economic, financial and humanitarian organizations; (5) Goal 97: Achieve World Trade Organization membership and deepen integration processes with the Eurasian Economic Union; (6) Goal 99: Improve the regulatory framework of foreign policy and foreign economic activity, as well as the legal framework of international cooperation.

The Uzbek President delivered speeches at the: (1) 1st India-Central Asia Summit (January 27, online), where the Delhi Declaration was approved; (2) a high-level dialogue on global development in the "BRICS+" format (June 24, online); (3) 4th Consultative Meeting of the Heads of States of Central Asia (July 21, Cholpon-Ata, Kyrgyzstan); (4) 6th Summit of the Conference on Interaction and Confidence Building Measures in Asia (October 13, Astana, Kazakhstan); (5) meeting of heads of delegations in the "Central Asia-EU" format (October 27, Astana, Kazakhstan).

Development of alliances and strategic partnerships. In October, Sh. Mirziyoyev paid an official visit to Turkmenistan, where priority areas of cooperation in water management and environmental protection, prevention and elimination of emergency situations were identified and a number documents were signed at the level of governments, ministries and departments of the two countries. See "Bilateral Water Cooperation between the Countries of Central Asia".

As a member of **CIS**, Uzbekistan took part in meetings of the Council of Heads of CIS States (October 14, Astana), Council of Heads of Government (May 20, online; October 28, Astana), Council of Foreign Ministers (May 13, Dushanbe; October 12, Astana), Economic Council (December 2, September 23, June 10, March 18), 1st Dialogue of Women of Central Asian States and Russia (May 14, Ashkhabad), as well as in informal Summits of the Heads of CIS States (October 7, December 26, Saint Petersburg) and in the EAEU meeting in the status of an observer country (December 9, Bishkek).

Chairmanship in international organizations. In 2022, Uzbekistan held the chairmanship of the:

SCO. More than 80 events were organized, including the 21st meeting of the Council of Heads of the SCO member states. A package of documents was signed, incl.: (1) Samarkand Declaration; (2) Statement on Addressing Climate Change; (3) Statement on Ensuring Global Food Security; (4) Statement on Ensuring Global Energy Security (September 15-16, Samarkand).

The Samarkand Declaration noted that the member states: (a) "… emphasize the need to increase mutually beneficial cooperation in energy, … support the use of economically viable and environmentally friendly technologies that mitigate the negative impact on the environment and contribute to energy security and the transition to cleaner and environmentally friendly energy sources in an energy efficient economy…"; (b) "… stressed their commitment to building a sustainable economic system, also by promoting green and environmentally friendly technologies …"; (c) "… note the importance of cooperation in environmental protection, environmental safety, prevention of the negative consequences of climate change, conservation and use of biodiversity, as well as the exchange of experience and operational information on these matters…".

Uzbekistan participated in the: (1) 21st meeting of the Council of Heads of Government of the SCO member states (November 1, online); (2) roundtable "SCO 2022: steering for new development goals" (February 22, Dushanbe, Tajikistan); (3) meetings of the Council of National Coordinators (January 25-28, June 14-17, Tashkent; April 25-28, Fergana; October 17-20, New

[186] approved by the Decree of the Uzbek President No.UP-60 of 28.01.2022

Delhi, India); (4) 17th Meeting of the Security Council Secretaries (August 19, Tashkent); (5) meeting of the Council of Foreign Ministers (July 28-29, Tashkent).

ECO. A number of events were organized, including: 4th ECO Experts Group meeting on RES (April 27, online); 7th meeting of the Ministers of Agriculture of the ECO countries (July 5-6, Tashkent). On the initiative of the President of Uzbekistan, 2022[187] was declared the "Year of Strengthening Connectivity" in ECO.

OTS. The 9th OTS Summit was held under the leadership of the President of Uzbekistan. The Heads of State approved the Samarkand Declaration and signed a number of documents. The Chairmanship of the Organization was handed over to Uzbekistan (November 11, Samarkand).

Uzbekistan hosted: (1) 2nd meeting of the Working Group on Agricultural Cooperation of the Organization of Turkic States (July 3-6, Tashkent); (2) 1st meeting of the ministers of agriculture of the Turkic States (July 4, Tashkent); (3) 1st Turkic Agro-Forum (July 4, Tashkent).

Promotion of the national interests and reinforcement of the country's image

Uzbekistan celebrated 30 years of UN membership in 2022. Uzbekistan initiated the resolutions on "Strengthening connectivity between Central and South Asia"[188], "Youth and human rights"[189], "Enhancing the role of parliaments in accelerating the achievement of the Sustainable Development Goals"[190].

Documents prepared by the Uzbekistany side and recognized as official UNGA documents include the Bukhara Declaration[191], Tashkent Declaration[192], and Samarkand SCO Summit: Solidarity for Common Security and Prosperity.

The Uzbek Minister of Foreign Affairs speaking at the 77th session of the UNGA noted: "…We stand ready to actively participate in the multilateral efforts to promote the topical issues of the green agenda and curb climate change processes. Uzbekistan has taken on an additional obligation to reduce greenhouse gas emissions under the Paris Agreement and is implementing a comprehensive strategy for the transition to a green economy and the development of renewable energy… We will host the 14th Conference of the Parties to the UN Convention on the Conservation of Migratory Species of Wild Animals, as well as a meeting of the Committee to Review the Implementation of the UN Convention to Combat Desertification in Uzbekistan …" (September 24, New York).

Uzbekistan was elected a member of the Commission on Science and Technology for Development for 2023-2026 (April 13, ECOSOC meeting) and became the member of the UN Committee on the Peaceful Uses of Outer Space (COPUOS)[193].

Uzbekistan participated in the: (1) 49th session of the UN Human Rights Council (February 28, Geneva, Switzerland); (2) 66th session of the UN Commission on the Status of Women (March 14-25, New York, USA); (3) UN Ministerial conference on humanitarian commitments in Afghanistan (March 31, online); (4) 78th session of ESCAP (May 23-27, Bangkok, Thailand); (5) 7th annual session of the UNECE Steering Committee on Trade Capacity and Standards (June 27-28, Geneva, Switzerland); (6) UN Summit on Transforming Education (September 16-19, New York, USA); (7) Bazaar 2022 Festival under the UN auspices (November 22, Geneva, Switzerland).

Events. Uzbekistan hosted: (1) the international conference "Afghanistan: security and economic development" (July 26); (2) the 1st Tashkent international investment forum (March 24); (3) the international week of innovative ideas "InnoWeek.Uz-2022" (October 17-21); (4) "ICT Week Uzbekistan-2022" (October 24-27).

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Ministry of Water Management (http://www.water.gov.uz/ru)

Ministry of Energy (http://minenergy.uz/ru)

Ministry of Natural Resources (http://eco.gov.uz/ru)

Ministry of Agriculture (http://www.agro/uz/ru)

Ministry of Construction and Housing and Communal Services (https://kommunal.uz/ru)

Ministry of Emergency Situations (https://fvv.uz/)

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http://www/uzdaily/uz/; http://norma.uz; https://dunyo.info/ru; http://ru.sputniknews.ru; http://kun.uz; http://www.uzdaily.ru

[187] the year 2023 will be the Year of Green Transition and Interconnectivity under the presidency of Azerbaijan

[188] 93rd Plenary Meeting of the 76th session of the UNGA, July 11, 2022

[189] 51st session of the UN Human Rights Council (HRC, October 6, 2022. Uzbekistan elected as a member of the HRC for 2021-2023 at the 74th session of the UNGA on October 17, 2019)

[190] 53rd Plenary Meeting of the 77th session of the UNGA, December 14, 2022

[191] Declaration of the International Forum "Dialogue of Declarations", May 16-17, Tashkent

[192] Declaration of the international high-level conference "Regional cooperation among the Central Asian countries within the framework of the Joint Plan of Action (JPoA) for the Implementation of the United Nations Global Counter-Terrorism Strategy" (March 3-4, Tashkent)

[193] a special UN committee whose main task is to review and foster international cooperation in the peaceful uses of outer space, as well as to consider legal issues arising from the exploration of outer space

SECTION 6

United Nations and its Specialized Agencies

6.1. General Assembly

77th Session United Nations General Assembly

General Assembly (GA) occupies a central position as the chief deliberative organ of the United Nations. It is comprised of all Members of the United Nations, each having one vote. It is authorized to discuss full spectrum of issues covered by the Charter. The UNGA meets on September each year.

The 77th Session of the UN General Assembly themed "A watershed moment: transformative solution to interlocking challenges" was opened under the chairmanship of Csaba Kőrösi, Hungary in New-York on 13 September.

Climate change, combating the COVID-19 and other infections, sustainable development, developing countries' depts, contemporary conflicts and crises were in the focus.

The High-Level Week (20-26 September) formed the core events and brought together Heads of State and Government and foreign ministers all over the world. For the CA countries, the year of 2022 marked the 30th anniversary of membership in the UN.

Statements from Central Asia countries at the general debate of the UNGA 77th Session

Address by the President of the Republic of Kazakhstan

"Kazakhstan have pledged the total transformation of the oil-and coal-dependent energy sector into a net zero economy by 2060"

The world fell victim to a new round of conflicts. "The world appears to have entered a new, increasingly bitter period of geopolitical confrontation. The long-standing international system based on order and responsibility is giving way to a new, more chaotic and unpredictable one. The security architecture is eroding and mutual distrust between world powers is dangerously deepening. The world is falling prey to a new set of military conflicts. For the first time in two generations, we face the prospect of the use of nuclear weapons and not even as a last resort. New fault lines are creating artificial barriers and economic isolation."

Economic and political sanctions have become "a new norm" that erodes the supply chains that ensure food security, threatening millions, especially in vulnerable communities. The President Tokayev expressed concern about soaring inflation, job losses and fears of a worldwide recession. All these crises by his words severely hamper the urgent action to combat climate change.

The three most important UN principles are interdependent. The President stated about the need to promote the three most important UN principles: sovereign equality of states, territorial integrity of states, and peaceful coexistence between sates. "These three principles are interdependent. To respect one is to respect the other two." President of Kazakhstan called to rethink the linkages between three primordial principles, "staunchly defend these values, the UN as its core, and the spirit of cooperation." "In other words, we cannot simply shrug our shoulders and agree with polarization and division."

Disarmament. The President advocated for elaborating new mechanisms to ensure disarmament and nonproliferation, called for urgent measures to reduce biological risks and dangers. In this context, he reiterated his earlier proposal to establish an International Agency for Biological Safety.

Climate change. Kazakhstan has pledged the "total transformation of the oil-and coal-dependent energy sector into a net zero economy by 2060." To save the planet, investments are needed "at greater levels than we have ever seen"; "climate action cannot come at the expense of development or modernization."

Reliable supplier of grain. Kazakhstan will be a reliable supplier of grain and other food-staples" to world markets: "My country, as the world's seventh largest grain producer, is the breadbasket of Central Asia. We are committed to utilizing this agricultural potential to

fight global food insecurity. Kazakhstan will continue to act as a reliable supplier of grain and other socially important food products, especially to the poorest countries."

Caspian Sea. While advocating the development of a diversified global transit and transport infrastructure, in particular the land corridor from Asia to Europe, the President of Kazakhstan said that the Caspian Sea should become a "sea of new opportunities." "The Trans-Caspian International Transport Route or Middle Corridor has received a new impetus. We expect cargo volume through Kazakhstan to increase significantly in the years ahead."

Regional cooperation. […] "We intend to work together with all stakeholders to address a pressing regional agenda that includes climate change, the Aral Sea, rational use of water resources, border delimitation, combating extremism, and expanding intra-regional trade. That is why we consider it is important to establish the UN Regional Centre for SDGs for Central Asia and Afghanistan in Almaty. Kazakhstan sees the future Afghanistan as a truly independent, neutral, united, prosperous state, living in peace with its neighbors. Therefore, we support the difficult process of nation-building in that country including life-saving humanitarian assistance." […]

Access to energy. Kazakhstan will help mitigate the most immediate impacts of limited access to energy and critical raw materials caused by trade and supply chain disruptions.

Full version of the statement:
https://www.akorda.kz/en/speech-by-the-president-of-kazakhstan-kassym-jomart-tokayev-at-the-general-debate-of-the-77th-session-of-the-un-general-assembly-2082327

Record of video-address:
www.youtube.com/watch?v=0EdQRgY4_sA

Address by the President of the Kyrgyz Republic

The UN is a moral authority. "Perhaps the founding states of the UN, who signed the international agreement to establish the organization in San Francisco in 1945, naively believed that wars, destruction, hunger, and suffering would end forever? I don't think so. Success can always be achieved if there is a mutual understanding that disputes and disagreements must be resolved in a spirit of good faith and compromise." The UN has played an important unifying role as a moral authority in maintaining peace and security and providing for people's needs and wants. The country has consistently and strictly followed the UN Charter and have been fulfilling its commitments in good faith.

Kyrgyz-Tajik border. Speaking about the situation related to the recent aggravation on the Kyrgyz-Tajik border, President Zhaparov noted that two close neighboring peoples "have been living side by side for a long time, united by common values, culture, traditions and customs, a common religion." […] "It is all the more painful for me to report that on September 14, 15 and 16 of this year, military clashes took place in the south of Kyrgyzstan." About 140 thousand civilians have been evacuated from border settlements. Great material damage was caused to civilian and military facilities: houses, administrative buildings, schools, frontier posts. […] Taking into account that our trust has been weakened by the recent lawless actions of our neighbor, Kyrgyzstan is "ready to continue negotiations in any format with Tajik side in conformity with the principles of justice and international law."

"The Kyrgyz side does not claim foreign lands, nor does it intend to give a centimeter of its land to anyone. We are convinced that all border and internal issues should be resolved over the negotiation table, and there is such will and readiness on our part."

Sustainable development based on own capacity. The Kyrgyz Republic is committed to the SDGs and their gradual implementation, taking into account national capacity. The country's own potential should be the main source and engine of sustainable development.

"Kyrgyzstan fully supports the UN as the only universal structure authorized by all of us – the member states of the UN – to solve the challenges faced by humanity"

As it is known, Central Asia has no direct access to the sea, in this regard, the construction of the China-Kyrgyzstan-Uzbekistan railroad is an important regional project.

Its implementation will expand international trade and investment, transit and tourism opportunities for Central Asia, which is located on the route of the Great Silk Road.

Creative Economy. As part of the ongoing policy, priority is given to the development of a "green", "digital" and "creative" economy. The country is actively developing the locomotive of the "green economy":

hydropower industry; small and medium-sized hydropower plants are put into operation. Our esteemed neighbors – Kazakhstan and Uzbekistan – will participate in the construction of the largest hydroelectric power plant – Kambarata, because this will strengthen the energy security and optimize the use of water resources in the region.

Full version of the statement:
https://mfa.gov.kg/en/osnovnoe-menyu/press-sluzhba/novosti/vystuplenie-prezidenta-sadyra-zhaparova-na-obshchih-debatah-77-y-sessii-generalnoy-assamblei-oon

Record of video-address:
www.youtube.com/watch?v=3ZhJygcZgRw

Address of the Foreign Minister of Tajikistan

"The impact of climate change on water resources is another crucial topic that requires our concerted efforts"

Conference on Border Security. As the existing world order transforms, such threats as terrorism, extremism, drug and arms trafficking, cybercrime and other forms of cross-border organized crime have a tendency to increase exponentially. To further discuss the above-mentioned issues, the Government of Tajikistan, the United Nations Office of Counter-Terrorism and its partners will be holding a High-Level International Conference "International and Regional Border Security and Management Cooperation to Counter Terrorism and Prevent the Movement of Terrorists" in Dushanbe, Tajikistan on October 18-19.[194]

Sustainable Development Goals. "Tajikistan strongly reaffirms its commitments to the full implementation of the 2030 Agenda and its Sustainable Development Goals. As we are lagging behind on many SDGs, the Government of Tajikistan has taken bold steps toward integrating SDGs into national policies and development plans. Despite substantial progress made towards the achievement of SDGs, there are significant risks, such as climate-related hazards and disasters that could slow or reverse Tajikistan's path towards the realization of 2030 Agenda and threaten agricultural productivity and food security."

Water – climate issues. "This year the world has witnessed unprecedented water-related natural disasters. While we all have been struggling with the consequences of these water-related disasters, we are becoming increasingly aware that water is vital and a resource we must value, protect, and manage effectively. We need actions that can make a real difference. On June 6-9, 2022, we successfully held the Second Dushanbe Conference in Tajikistan, which became a key preparatory meeting for the midterm review of the Water Decade "Water for Sustainable Development", 2018-2028 in 2023.

As you are aware, on March 22-24 2023, the UN will convene its second water conference after 46 years. The UN 2023 Water Conference will be a good opportunity for all of us to review and evaluate the progress made and the gaps and obstacles we have encountered in realizing the goals of the Water Decade "Water for Sustainable Development", 2018-2028. Tajikistan and the Netherlands, leading the preparations for this global event, are diligently working and are determined to make the Conference a watershed moment for the whole world. To this end, we launched the Water Action Agenda as one of the outcomes of the UN 2023 Water Conference. We expect and encourage everyone to come to the Conference with new commitments to enrich the Water Action Agenda. This is important and necessary not only for us today, but for our children, our future generation!

The impact of climate change on water resources is another crucial topic that requires our concerted efforts. Alongside the increase in mudflows and floods, water scarcities and droughts, and changes in the hydrological cycle, today, the accelerated melting of glaciers, the primary sources of fresh water on the planet, is of great concern. To this end, Tajikistan is actively promoting an integrated approach to addressing water and climate issues, including within Water and Climate Coalition. During the Coalition's first meeting, H.E. Emomali Rahmon, President of the Republic of Tajikistan, proposed declaring 2025 as an international year of Glaciers' Preservation. We are currently working on the draft resolution to advance the said initiative through the second committee of the U.N. General Assembly. We seek your constructive engagement and support for this important resolution." […]

Afghanistan. "Tajikistan, a peace-loving country that went through a devastating imposed Civil War, is very aware of its cost and long-lasting consequences. Therefore, we can't stay indifferent to the fate of our im-

[194] a High-Level Conference "International and regional border security and management cooperation to counter terrorism and prevent the movement of terrorists" was held in Dushanbe on October 18-19

mediate neighbors…." To ease the suffering of the Afghan people during these difficult times, Tajikistan has offered its infrastructure, territory, and communication means to all stakeholders and donor countries to deliver humanitarian assistance directly to the people of Afghanistan. We have also never stopped providing the people of Afghanistan with much needed electricity since the Taliban came to power. In the current alarming situation, it is paramount for Tajikistan to strengthen its border with Afghanistan and create the necessary border infrastructure along its entire length, which share 1,400 km of border with this country. Tajikistan is convinced that the international community shall begin working to engage Afghanistan in multifaceted regional cooperation.

Tajik-Kyrgyz border. All hostilities on the border between the two States have ceased, the parties are negotiating settlement options and joint inspection was organized in the border area. […] "As a result of military aggression of Kyrgyzstan, more than forty civilians of Tajikistan were killed and about two hundred were injured […]. In addition to border facilities, schools, hospitals, religious buildings, residential buildings, infrastructure and utilities were destroyed."

Since 1950s, Kyrgyzstan has arbitrarily seized more than 2 thous. km^2 that rightfully belong to Tajikistan. Over the twenty-year history of negotiations with Kyrgyzstan, we have signed dozens of protocols. As of today, both countries managed to agree on and develop a draft description of about 600 km of joint border, which is approximately 61% of its total length. "Tajikistan, relying on the international practice of border delimitation, has repeatedly offered its neighbors to document the results of this many years of work, by signing an agreement on separate sections of the border. But our neighbors strictly decline this proposal. Border issues are not resolved by the populist statements and the creation of crisis situations. We need daily, thoughtful, joint work based on the political will of the parties. We stand ready to continue negotiations and firmly believe that the Tajik and Kyrgyz peoples have the right to live and build together an atmosphere of peace, friendship and harmony."

"The time has come for Tajikistan to seek for the first time, its non-permanent seat on the UN Security Council for 2028-2029. We are looking forward to closely working with all the U.N. member states to gain the trust and support for this vital campaign."

Full version of the statement:
https://mfa.tj/en/main/view/11140/statementbyhe-mr-sirojiddin-muhriddin-minister-of-foreign-affairs-of-the-republic-of-tajikistangeneral-debates-of-the-77th-session-of-theunited-nations-general-assembly

Address by the Permanent Representative of Turkmenistan to the UN

Cooperation for peace. Permanent Representative of Turkmenistan to the UN, A. Ataeva urged the countries to peacefully resolve conflicts and disagreements, referring to a dialogue as the only acceptable way of interstate cooperation. "Further promoting the philosophy of trust-based dialogue in international relations, Turkmenistan intends to propose to the UN General Assembly to consider the draft resolution "Dialogue is a guarantee of peace". […] Reinforcing our efforts in this direction, we propose that the international community declare 2025 the "Year of Peace and Trust", based on the provisions of the resolution of the United Nations General Assembly adopted earlier at the initiative of Turkmenistan. […] Turkmenistan will continue working actively with partners to expand the membership of the ***Group of Friends of Neutrality for peace, security and sustainable development***." […]

Global food security. "We are particularly concerned about the currently growing threats to global food security, which are rapidly spreading to an increasing number of countries and entire regions. […] In order to maintain the stability of the global food market, jointly search for solutions to complicated problems of providing food to the most vulnerable countries, as well as supporting the efforts of the UN Secretary-General in this direction, we propose to hold an International Forum on Food Security in Turkmenistan."

Climate change and water. "In Central Asia, for objective reasons, climate change and water issues are the most important, and in some cases, determining factors in the development of regional processes,

"We are particularly concerned about the currently growing threats to global food security, which are rapidly spreading to an increasing number of countries and entire regions"

having a significant impact on the overall situation, the implementation of socio-economic development programs, and the solution of serious environmental issues. Based on the positions of Turkmenistan on adaptation and mitigation of climate change, presented in November 2021 at the 26th session of the Conference of the Parties to the UN Framework Convention on Climate Change (COP26) in Glasgow, as well as practically considered during multilateral consultations within the framework of the Climate Conference in Bonn in June this year, Turkmenistan is preparing for the establishment in Ashgabat a Regio-

nal Center for Climate Technologies for Central Asian Countries. At the same time, noting the Nationally Determined Contribution (NDC) of Turkmenistan in May 2022 within the framework of the implementation of obligations under the Paris Agreement, Turkmenistan intends to intensify efforts to implement the goals outlined in this document, including reducing greenhouse gas emissions, promoting the Global Methane Pledge... We will persistently and purposefully strive to single out the Aral Sea issue as a separate area of the UN's activities. To this end, in May 2023, we intend to resume negotiations on the draft resolution of the UN Economic and Social Commission for Asia and the Pacific (ESCAP) on the establishment of the UN Special Program for the Aral Sea Basin, which will be based on the provisions of the UN General Assembly resolutions "On cooperation between the United Nations and the International Fund for Saving the Aral Sea (IFAS)" adopted in 2018 and 2019. "

Strengthening the health care system. The impact of the pandemic requires us to continue our coordinated efforts to address the identified vulnerabilities of global and national health systems. Turkmenistan will continue to support the joint activities of the world community to combat this new type of coronavirus infection, to establish tools for health diplomacy. Emphasizing the key role of WHO in developing consolidated responses to common challenges, we support the **global One Health concept** and will promote it within the framework of the **Roadmap for health and well-being in Central Asia until 2025**."

Full version of the statement:
https://www.mfa.gov.tm/en/news/3363

Address by the Foreign Minister of Republic of Uzbekistan

"We are ready to actively participate in multilateral efforts to promote topical issues of the green agenda and curb climate change processes."

Strengthening trust. "The world today is facing a deep crisis of trust at the global level, an intensification of numerous challenges to stability and security, growth of geopolitical confrontation and increase of risks of bloc mentality. No country can avoid global risks and challenges or cope with them alone. Under the current conditions, we strongly believe it is important to strengthen the central role of the UN in addressing global and regional challenges. The UN should evolve to respond effectively to transformation taking place. The establishment of inter-civilizational and inter-cultural relations and dialogue is also extremely important in finding the coherent approaches and solutions, relieving global tension, uncertainty and unpredictability. With this in mind, at the Shanghai Cooperation Organization Summit in Samarkand on September 16 the President of the Republic of Uzbekistan Shavkat Mirziyoyev put forward the Samarkand Solidarity Initiative for Common Security and Prosperity. Its goal is to contribute to the restoration of mutual trust and stability in international relations, as well as to strengthen solidarity through the establishment of a broad dialogue free from geopolitical rivalry, ideological contradictions, and disputes."

Reforms are for young people. Uzbekistan is on the eve of an important political event – a constitutional reform, the key goal of which is to make the process of transforming the system of state and public administration sustainable. [...] In many ways, this reform is focused on young people. They should play a key role in processes that have a direct bearing on the country's future. Uzbekistan plans to convene the first meeting of the Youth Council of the countries of Central and South Asia in 2023, which will become a platform for new ideas and specific initiatives. On November 14-16, 2022, jointly with the UNESCO we will host a World Conference on Early Childhood Care and Education in Tashkent.[195]

New political atmosphere in Central Asia. Thanks to the joint efforts of the Central Asian states, a fundamentally new political atmosphere has been created in the region. Launched at initiative of Uzbekistan, the mechanism of consultative meetings of the Heads of State of the region has become "a vivid symbol of a new era of regional cooperation". High-level international forums are organized regularly in the region, with the international conference on the implementation of the UN Global Counter-Terrorism Strategy in Central Asia becoming one of them in March 22 in Tashkent. "Taking into account the outcomes of the forum, we propose opening the UN Counter-Terrorism Regional Office in Central Asia to successfully implement the global strategy."

Assistance to Afghanistan. The prospects for the development of Central Asia are inextricably linked with ensuring peace in neighboring Afghanistan. Uzbekistan is concerned about the decline in international attention to this country, which is experiencing a

[195] https://www.unesco.org/ru/early-childhood-education/2022-world-conference

deep humanitarian crisis and considers it extremely important to prevent the isolation of Afghanistan. The International Conference on Afghanistan was held in July in Tashkent with the participation of the delegation of the interim government. "We are convinced that the general priority of the international community should be the restoration of the Afghan economy, its integration into interregional economic processes, the implementation of infrastructure and socially significant projects. To solve these problems, the support of the UN, international financial institutions, and donor countries is needed. Uzbekistan is making a feasible contribution to the international efforts to assist Afghanistan. Uzbekistan has established the International Transport and Logistics Hub in the border city of Termez, which is actively used by UN agencies to provide humanitarian assistance to this country.

Combating climate change. "Today, the negative consequences of climate change are acutely manifested in our region. We stand ready to actively participate in the multilateral efforts to promote the topical issues of the green agenda and curb climate change processes. Uzbekistan has taken on an additional obligation to reduce greenhouse emissions under the Paris Agreement and is implementing a comprehensive strategy for the transition to a green economy and the development of renewable energy. In 2021, President of Uzbekistan launched a massive initiative called "Yashil Makon" (Green Land) on planting 1 billion trees and shrubs across the country over the next five years. The Aral Sea is the biggest environmental crisis in our region. Over the past 5 years, 1.7 million hectares of forest plantations have been planted on the dried sea bed. I take this opportunity to thank the General Assembly for adopting the resolution on declaring the Aral Sea region a zone of ecological innovations and technologies. This year we plan to host the First Aral Sea International Forum under the UN auspices in Nukus. In 2023, for the first time, we will host the 14th Conference of the Parties to the UN Convention on the Conservation of Migratory Species of Wild Animals, as well as a meeting of the Committee to Review the Implementation of the UN Convention to Combat Desertification in Uzbekistan."

Full version of the statement:
https://gadebate.un.org/sites/default/files/gastatements/77/uz_en.pdf

Selected Resolutions on Water, Environment and Development Adopted by the UNGA 77th Session

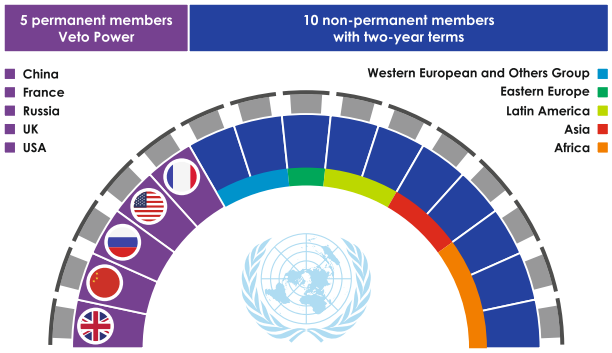
"Protection of the environment in relation to armed conflicts" (A/77/415); "The law of transboundary aquifers" (A/77/424); "Information and communications technologies for sustainable development" (A/77/440); "Towards the achievement of sustainable development: implementation of the 2030 Agenda for Sustainable Development, including through sustainable consumption and production, building on Agenda 21" (A/77/443/ADD.1); "Disaster risk reduction" (A/77/443/ADD.3); "Protection of global climate for present and future generations of humankind"(A/77/443/ADD.4); "Convention on Biological Diversity" (A/77/443/ADD.6); "Harmony with Nature" (A/77/443/ADD.8); "Ensuring access to affordable, reliable, sustainable and modern energy for all" (A/77/443/ADD.9); "Agriculture development, food security and nutrition" (A/77/449).

6.2. Security Council

The Security Council (SC) has primarily responsibility for the maintenance of international peace and security; all UN members are obliged to follow its decisions. It has 15 members, including 5 permanent members with veto power (Great Britain, China, Russia, USA, France) and 10 non-permanent, elected by the UNGA for two-year terms of five countries each year.

UNSC activity in 2022

"Arria-formula" meetings were organized: (1) at the ministerial-level on climate finance[196] as a means to build and sustain peace in conflict, post-conflict and crisis situations (March 9, UAE); (2) on "Climate, Peace and Security: Opportunities for the UN Peace and Security Architecture", which entailed exploring ways to strengthen national and local efforts to build resilience and reduce vulnerabilities to climate shocks



and touched on cooperation in natural resource management, early warning systems, enhanced climate finance and inclusive decision-making (November 29, New York).

[196] Climate finance can be broadly defined as local, national or transnational funding for initiatives that address climate change and its impacts

The Informal Expert Group (IEG)[197] convened a briefing on evidence and research from different regions on the linkages between climate change and security (February 4); IEG meetings were also held to discuss climate-related security challenges in Iraq (May 5) and Mali (June 2), respectively.

Source: www.securitycouncilreport.org/

6.3. Secretariat

> "In these turbulent times, the work of the United Nations is more necessary than ever to reduce suffering, prevent crises, manage risks and build a sustainable future for all."
>
> *António Guterres, Secretary-General*

The Secretariat is one of the main organs of UN. At the head of the United Nations Secretariat is the Secretary-General, appointed by GA upon recommendation of UNSC for a 5-year term. Since January 2022, Antonio Guterres (Portugal) has been serving as the Secretary-General.

Each year, the Secretary-General reports on the work of the Organization, including priority areas of the UN's activity and future plans. 2022 Report highlights the work in the following key area: (1) **sustainable development** (United Nations country teams led by resident coordinators work in 162 countries and territories to help to implement the 2030 Agenda); (2) **development in Africa** (helping 54 countries to leapfrog development challenges and catalyze a sustainable and equitable recovery from COVID-19); (3) **human rights** (facilitated assistance for 46,000 victims of torture and 13,000+ victims of contemporary forms of slavery); (4) **humanitarian assistance** (helped to mobilize a record $20.3B to assist 174M people across 60 countries and territories; (5) **justice and international law** (639 multilateral treaties addressing matters of worldwide interest are deposited with the Secretary-General; (6) **disarmament** (channeled funds to 104 arms-control-related projects benefiting 145 Member States. (7) **drugs, crime and terrorism** (drugs monitoring platform provided a multi-source system shares with more than 14,000 pieces of data on individual drug seizures from more than 125 countries).

Source: UN

6.4. The UN Development Program (UNDP)

The United Nations Development Program (UNDP) is the UN's global development network that promotes positive change and gives countries access to the knowledge, experience and resources that help improve people's lives.

It operates in 177 countries and territories.

UNDP activities in the Central Asian countries in 2022

UNDP in Kazakhstan

UNDP in Kazakhstan focuses its activities on SDGs implementation, water and land management, environmental protection, climate change, energy and other relevant development issues. In 2022, UNDP's project portfolio in Kazakhstan included 37 projects with a total cost of $20.51 million.

Nature, land resources and ecosystem management. Continued: (1) "Sustainable forest management" aimed to conserve and sustainably manage key globally important ecosystems for multiple benefits (2018-2024); (2) "Ecological education in Kazakhstan" (2020-2025), the output of which is to train more than 6 thousand teachers and develop teaching aids in the field of environmental protection, nature management, ecological and economic security. (3) "Integrated dryland and drought management in South Kazakhstan regions" (2017-2022), aimed to improve and maintain livelihood strategies and resilience of vulnerable farmers and pastoral communities in the selected pilot sites to cope with drought; (4) "Reintroducing of Turan tiger" (2021-2025).

[197] an entity established in 2020 to help Council members develop a more systematic approach to climate-related security risks. The IEG is currently co-chaired by Kenya and Norway

Energy and climate change. Continued: (1) "Low-carbon urban development" (2014-2023); (2) "Energy efficient standards and labelling" (2017-2024); (3) "De-risking renewable energy investment" (2017-2023); (4) development of Kazakhstan's National communication and biennial reports (2019-2023); (5) "Forest carbon offset mechanisms, Bitfury initiative" (2019-2024) to assist Kazakhstan in fulfilling international obligations to reduce greenhouse gas emissions by reducing the carbon footprint of electricity suppliers; (6) "National determined contributions program in Kazakhstan" (2020-2022); (7) "Improving chemicals management under environmental conventions" (2019-2022); (8) "Attracting investors in the field of energy efficiency" (2021-2026) to improve energy efficiency of buildings, infrastructure, and other facilities. The project "Leveraging nationally determined contributions" has been launched (2022-2023) to achieve net-zero emissions and climate-resilient development in response to the climate emergency.

UNDP designed a pocket manual for a wide audience to explain the causes of climate change and its impact on the livelihoods of the people in Kazakhstan.

A new project was launched as part of the "Climate Promise: from Pledge to Impact" initiative jointly with Japan to introduce climate-smart agri-technologies ($975 thousand). It is planned to support farmers in the regions of Kazakhstan, as well as pilot renewable energy solutions (wind and solar) with digital monitoring in agricultural production.

SDGs. (1) "Support of the Government with SDG financing strategy" (2020-2022) for adopting an integrated national financing framework; (2) "Regional SDG platform in Central Asia" (2021-2023) to establish a regional SDG platform that serves as a mechanism to accelerate countries' efforts in wider regional strategies for the attainment of the 2030 Agenda.

Kazakhstan presented its Second Voluntary National Review on the implementation of SDGs at the UN High-Level Political Forum (July 14, New York, USA).

Capacity building. The following regional projects are ongoing: "Supporting the economic empowerment of Afghan women" (2019-2025)[198] – the UNDP and EU discussed progress on the project (December 15, online); and, "Empowerment of Afghan women, Phase 2" (2021-2026).

Sources: www.kz.undp.org and open.undp.org/projects

UNDP in Kyrgyzstan

In 2022, UNDP's project portfolio in Kyrgyzstan included 28 projects with a total value of $26.65 million.

Water management. UNDP organized a training session on integrating climate risks into water policies and basin management plans in Kyrgyzstan as part of the regional project "Climate Change and Resilience in Central Asia". The training session was held for the key national and local authorities working in the field of water and climate risk management (July 12-13, Issyk-Kul province; October 17-18, Osh).

Environmental protection and climate change. Ongoing projects: (1) Conservation of globally important biodiversity and associated land and forest resources of Western Tian Shan mountain forest ecosystems to support sustainable livelihoods (2017-2023); (2) "Strengthening climate resilience of the Batken province through introduction of climate smart irrigation and mudflow protection measures" (2019-2023)[199] – a five-day training was held on how to work with software for predicting future hydro-climatic changes. (3) "Disaster risk reduction and climate change" (2016-2023) aimed at strengthening integrated risk governance capacities and regional cooperation in CA; (4) "Capacity building towards securing the resilience of communities and institutions to climate and disaster risks and sustainable and inclusive natural resource management" (2018-2022); (5) "UN support for strengthening disaster preparedness" (2012-2023) to support the coordination activities of the Disaster Response Coordination Unit Secretariat; – two national policy documents on gender mainstreamed and low-carbon development were drafted; (6) "HCFC phase-out management plan (HPMP)" – Stage 2 (2015-2023); (7) "PPG: Pamir-Alai project" (2021-2022) aimed at integrated community-based management of high value mountain ecosystems in southern Kyrgyzstan for multiple benefits.

Bishkek hosted the following events: (1) two meetings[200] of interdepartmental working group "Climate

[198] implemented with financial support from the EU
[199] implemented by UNDP with the financial support from the Russian Federation
[200] with the support of the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic and the UNDP Kyrgyzstan

Promise-2"[201] (NDC) and National Adaption Planning (NAP)[202] (April 12 and July 18); (2) the 1st Regional Conference of Youth on Climate Change; the conference program was based on keynote speeches, intergenerational "Green Talks" with senior experts in various sectors, educational science-based Climate Fresk[203] games, group work, and many more (December 1-3).

SDGs. Continued: (1) "National SDGs acceleration support program" (2018-2023) – a platform for advancing SDGs integrated approaches; (2) "UN joint SDG fund, reinforce SDG financing architecture" (2020-2023), aimed at creating a holistic, comprehensive and integrated financing strategy or Integrated National Financing Framework.

Sources: https://www.undp.org/ru/kyrgyzstan and open.undp.org/projects

UNDP in Tajikistan

In 2022, UNDP's project portfolio in Tajikistan included 48 projects with a total value of $30.66 million.

Land and water resources. Continued: (1) "Building climate resilience in agricultural and water sectors of rural Tajikistan" (2019-2022) – 3 subprojects on drip irrigation and 1 subproject on disaster risk reduction were completed; two concept notes for international/domestic funding were developed; (2) "Support to water initiatives of Tajikistan" (2021-2022) – the 2nd International conference within the framework of the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6-9, Dushanbe); (3) "Strengthening communities in Khatlon region and Rasht valley of Tajikistan" (2020-2022) – 4 mobile applications to facilitate access to information/ services were developed; the forum on rural development issues was held to make rural areas more attractive and 3 campaigns on raising awareness on improved service delivery were organized.

New projects: (1) "Improvement of water resources management in Khatlon" (2022-2024), aimed at improving livelihoods of rural communities in project area vulnerable to climate change; (2) "Technical support to Tajikistan water sector reform" (2022-2024) to achieve an efficiently planned, developed and managed water sector.

Energy. As part of the "Green energy SME development full-size project" (2018-2023), the Inter-Ministerial Working Group on RES was established and held two meetings; the draft Concept of energy sector development was developed and agreed with the Government of Tajikistan; the draft Concept of fuel and energy sectors development of the Republic of Tajikistan for the period up to 2040 was prepared.

Climate change, ecosystems. Continued: (1) "Conservation and sustainable use of Pamir Alay and Tien Shan ecosystems for snow leopard protection and sustainable community livelihoods" (2016-2022); (2) "Policy action for climate security in Central Asia" (2020-2022); (3) "An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan" (2019-2025) – 97 representatives from different local authorities and WUAs participated in a series of trainings on climate risk accounting for integrated watershed management (March); (4) "Strengthening Disaster Risk Reduction and Response Capacities (SDRRRS)" (2016-2022) – district risks maps were disseminated; 22,400 seedlings planted on 69 ha in 8 districts; more than 20 initiatives on disaster risk reduction were implemented jointly with partners; (5) "Enabling an effective national adaptation plan for Tajikistan" (2020-2023) – Interdepartmental working group was established and two meetings were held with the involvement of sectoral coordinators.

The project "Leveraging nationally determined contributions to achieve net-zero emissions and climate-resilient development in response to the climate emergency" has been launched (2022-2023).

It is aimed to support local communities and authorities in the East Khatlon province with eco-based solutions for the effective watershed management of the Tebalay River to reduce incidence and impact of the hydro-meteorological hazards.

SDGs. The ongoing project "Financing SDGs in Tajikistan" (2020-2022) is aimed to support the Government of Tajikistan in achieving its national SDG targets through an integrated resource mobilization framework.

Source: open.undp.org/projects

[201] UNDP's "Climate promise" project works with 119 countries to accelerate the fight against climate change, promote equity, fight poverty and enhance social and environmental sustainability

[202] the objectives of the NAP process are to strengthen institutions and enhance vertical and horizontal coordination of climate change adaptation planning, ensure that climate risks are addressed at the national, sectoral and provincial levels, and prioritize investments for climate change adaptation measures

[203] "Climate Fresk" is an international innovative tool for climate education, each participant can get a complete picture of climate change process by immersing themselves into participatory activity and building all the cause-and-effect relationships, see the humans' impact on climate change and think about climate solutions

UNDP in Turkmenistan

In 2022, UNDP project portfolio in Turkmenistan included 27 projects totaling $41.99 million.

Water and land management. Continued: (1) "Developing a national adaptation planning process in Turkmenistan" (2021-2024) – the workshop "Climate change: risks, assessment, panning" was held to discuss complex risks associated with climate change, including those relevant to Turkmenistan and its main sectors of the economy, as well as review the issues of climate change-driven migration and learn about risk assessment procedures for planning policies, strategies and programs for the short, medium and long terms (November 10-11); (2) "Conservation and sustainable management of land resources and high value ecosystems in the Aral sea basin for multiple benefits" (2021-2026) – two meetings were held with key project partners in Dashoguz and Lebap velayats. The project "Energy efficiency and renewable energy for sustainable water management in Turkmenistan" (2015-2022) was successfully completed.

Climate change and environmental protection. Continued: (1) "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan" (2016-2022) – the final reports on implementation of the gender-oriented local adaptation plans have been prepared and approved for six farmers associations and two livestock farms; the report on implementation of the small grant activities under the first and the second cycles (in total 19 grants) have been prepared and approved; a working meeting was held to discuss the curriculum on IWRM (February 15, online); (2) "Sustainable cities in Turkmenistan: Integrated green urban development in Ashgabat and Awaza" (2017-2024) – a working meeting was held to discuss preparation of the First Biennial Report and the Fourth National Communication of Turkmenistan on climate change, as well as the implementation of the "Nationally Determined Contribution" (NDC) in accordance with the Paris Climate Agreement (October 7); a training seminar "Introducing international experience in the development of regulatory and technical documents for the promotion of renewable energy sources in Turkmenistan" was held (May 30, online).

UNDP and the British Embassy in Turkmenistan convened the 3rd and 4th coordination meetings of the Development Partners Climate Group in Ashgabat aimed at continuing the established dialogue to accelerate the Government of Turkmenistan's efforts to meet its international commitments under the Paris Climate Agreement (May 31 and September 6).

SDGs. As a part of the 2nd phase of the "Partnering for SDG acceleration" project (2021-2023), a draft Periodic National Report on the progress of the SDG implementation was prepared.

Sources: www.tm.undp.org and open.undp.org/projects

UNDP in Uzbekistan

The directions of UNDP's work in Uzbekistan reflect the current UN Country Programme Document (CPD) and the United Nations Sustainable Development Cooperation Framework (UNSDCF) for 2021-2025. They also align with the national SDGs within the 2030 Agenda.

In 2022, the UNDP project portfolio included 50 projects totaling $31.58 million.

Land and ecosystem management. Continued: (1) "Sustainable natural resource use and forest management in key mountainous areas important for globally significant biodiversity" (2017-2022) – SMART patrolling system was tested in pilot areas in Chatkal State Biosphere Reserve and Gissar State Nature Reserve, guidelines for implementation of SMART patrolling system in all protected areas of the country were developed and published; pasture management plans for 8 forestries were tested and approved; snow leopard research and monitoring methodology was approved by the Academy of Sciences and the State Committee on Ecology; snow leopard research center was established at the Institute of Zoology; (2) "Sustainable rural housing and settlements in Uzbekistan" (2015-2023) aimed to transform this sector towards a more sustainable and low-carbon development pathway by designing, piloting and scaling-up a green mortgage market mechanism; (3) "Complete HCFC phase-out in Uzbekistan" (2018-2024) through promotion of zero ODS low GWP energy efficient technologies and equipment including recovery/recycling of HCFC.

Projects launched: (1) "Assisted afforestation of the vulnerable terrains of Uzbekistan"[204] (2022-2023) – 100 ha of land in Termez city and three districts of Surkhandarya province are planted with anti-erosion plantations and forest species; 625 people (91 of them women), including 448 Afghan citizens (56 of them women) living in Surkhandarya are involved in the project; (2) "Sustainable rural development" (2022-2025, $338 million), aimed to create favorable living conditions for rural residents and ensure their access to basic infrastructure, socio-economic services including access to health and education. The project provides for construction and renovation of social facilities in 20 districts: the Republic of Karakalpakstan, Navoi, Bukhara and

[204] in order to implement Uzbekistan's "Yashil Makon" initiative, launched by the President of Uzbekistan in November 2021, which planned the planting of 1 billion tree and shrub seedlings across the country over the next five years

Khorezm regions. By the end of 2022, 66 community development plans have been drafted.

Climate change. Continued: (1) "Promoting green urban development in Tashkent city through accelerating investments in low emission infrastructure" (2021-2027); (2) "Towards green recovery in Uzbekistan" (2021-2022); (3) "Supporting an inclusive transition to a green economy in the agri-food sector and development of a climate-smart Uzbek Agriculture Knowledge and Innovation System" (UAKIS) (2021-2025) – a seminar "Efficient use of land and water resources in agriculture" was held (November 28, Tashkent); (4) "Enhancing Multi-Hazard Early Warning System to increase resilience of Uzbekistan communities to climate change-induced hazards" (2021-2028) – introductory workshops were held to present the concept and objectives of the project (August-November); (5) "The sector-driven National Adaptation Plan (NAP)" (2020-2023) – the draft of National Climate Change Strategy of the Republic of Uzbekistan until 2030 was developed and submitted to the Government of Uzbekistan for consideration. A new project "Leveraging Nationally Determined Contributions (NDCs)" (2022-2023) was launched on net zero emissions and climate-resilient development in response to a climate emergency. 15 automated agrometeorological stations to expand the existing network of hydro and agrometeorological stations in the Ferghana Valley were purchased.

SDGs. The ongoing "Financing for Sustainable Development" project (2020-2023) is aimed at achieving SDGs in Uzbekistan through more efficient, transparent and result-oriented public financing. The draft Integrated National Financing Strategy was discussed with more than 60 representatives (40 men and 20 women) from government, private sector, research institutions, development partners in the financial dialogues (October 31-November 1). The Government of Uzbekistan has developed and issued the first SDG Bond Allocation and Impact report that provides information on how the proceeds from the bond issuance are helping to achieve the Government's development priorities and highlights Uzbekistan's commitment to attain the SDGs.

The Aral Sea. Continued: (1) "Building the resilience of local communities against health, environmental and economic insecurities in the Aral Sea region" (2020-2022); (2) "Unleashing young people's and vulnerable citizens' creativity and innovation by strengthening their adaptive capacity to address the economic and food insecurities in the exposed communities of the Aral Sea region" (2021-2023); (3) "Addressing the urgent human insecurities in the Aral Sea" (2019-2022) to address the environmental, social and economic insecurities in the most vulnerable communities of the Aral Sea.

Projects launched: (1) "Conservation and sustainable management of lakes, wetlands and riparian corridors" (2022-2026), aimed at improving a resilient Aral basin landscape supporting sustainable livelihoods – the project started the analysis of hydroclimatic scenarios and water management models to optimize water allocation among multiple users.(2) "Strengthening the capacity of rural communities in infrastructure management in the Aral Sea region" ($5 million). Work will be carried out to introduce water- and energy-efficient, new agricultural, ozone-friendly technologies in different sectors in a balanced manner.

Gender. New project "Achieving gender equality in the Republic of Uzbekistan" was launched (2022-2024). The Project aims to support the implementation of the Strategy for achieving gender equality in the republic – a policy brief on nationwide survey on gender stereotypes and patriarchal norms is to be finalized.

Sources: www.uz.undp.org and https://open.undp.org/projects

The UN Multi-Partner Human Security Trust Fund (MPHSTF) for the Aral Sea Region

On 27 November 2018, the UN Headquarters in New York hosted a High-Level Event on the launch of the UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan (MPHSTF).

A Joint Declaration of Intent on Cooperation in Meeting the 2030 Agenda for Sustainable Development in Uzbekistan was signed between the Global Green Growth Institute and the UN Resident Coordinator's Office in Uzbekistan (March 30) (in the context of the Sustainable Development Cooperation Framework) by actively seeking solutions to human security issues in the Aral Sea region through the MPHSTF. The Parties aim to make progress on recovery and resilience to climate change in the post-pandemic COVID-19 era in key sectoral areas of common interest.

The Government of Uzbekistan made its fourth contribution of $1.5 million to support the activities of MPHSTF.

Under the Third Call for Proposals, the MPHSTF Steering Committee approved $4.4 million in financing for two new projects addressing such priority areas as youth employment and innovation, health, and green growth (November 16).

Ongoing projects. The MPHSTF finances the UNDP/UNESCO Joint Program aimed to enhance the technical capacity of Forestry Department of the Takhtakupir district through the trainings on "Innovative methods of afforestation", etc., as well as to increase the scope of afforestation work in the dried bed of the Aral Sea.

Enhanced technical capacity helped to plant saxaul and other species on 3 thousand ha of land that was 6 times more than in previous project interventions. The afforestation resulted in more income for the staff of the Forestry Department.

The following projects were continued: (1) "Towards universal health coverage and security in Karakalpakstan" (2021-2023) to assess the health system. The local population has been consulted on its health needs and vision for health sector investment; a refined proposal for health sector investment in Muynak city and surrounding region was developed; (2) "Unleashing young people's and vulnerable citizens' creativity and innovation by strengthening their adaptive capacity to address the economic and food insecurities in the exposed communities of the Aral Sea region" (2021-2023). 30 vulnerable unemployed women and girls from target districts were trained in cooking, 30 young people were trained in plumber skills; 13 projects were selected to start an individual or family business. Trainings in livestock and water saving technologies were conducted with a total of 75 beneficiaries, including a workshop on "Benefits and the effectiveness of innovative technologies "Buried Diffuser" (subsoil irrigation) in the cultivation of crops" on the arranged demonstration site in the territory of the International Innovation Center of the Aral Sea Region under the President of the Republic of Uzbekistan (October). Access to clean drinking water was provided to the Kungrad central republican hospital, polyclinic and two schools with a total number of 7,208 beneficiaries. The Project's Coordinating Council discussed at the 3rd meeting progress, results for 2022 and prospects for future cooperation (December 15); (3) "Investing in a resilient future of Karkalpakstan by improving health, nutrition, water, sanitation, hygience and wellbeing of adolescents and by harnessing the talents of youth during and after COVID-19" (2021-2022, (Muynak, Kungrad, and Bozatau districts). 30 facilitators were trained to enhance the capacity of the public education specialists of the Ministry of Public Education in Karakalpakstan. UNICEF is in the process of developing a knowledge hub (https://bilim.tma.uz/) which will serve as a one-stop digital platform for communication, information sharing and repository of all training materials and resources on health topics for healthcare workers in the country.

Source: www.aral.mptf.uz

6.5. UN-Water

In 2003, the UN System Chief Executives Board for Coordination established the inter-agency coordination mechanism UN-Water. It coordinates the efforts of UN entities and international organizations working on water and sanitation issues. Over 30 UN organizations carry out water and sanitation programs.

Activities in 2022

The following events were organized: (1) the UN-Water integrated monitoring initiative for SDG 6 Steering Committee meeting to review the 2021 results and plan for the 2022 (March 2-3); (2) the 36th UN-Water meeting to discuss the preparation to the UN 2023 Water Conference, the Global Acceleration Framework for SDG 6 (April 7-8, Geneva, Switzerland); (3) the 37th UN-Water meeting to discuss preparation to the UN 2023 Water Conference, the SDG 6 capacity development initiative, SDG6 global monitoring (December 5-6, Paris, France); (4) UN-Water summit on groundwater (December 7-8, Paris, France).

The latest edition of the UN World Water Development Report "Groundwater: Making the Invisible Visible" draws attention to the issues related to groundwater, emphasizing their special role, challenges and opportunities associated with the development, management and governance of groundwater across the world.

Source: www.unwater.org

6.6. UN Economic Commission for Europe

The United Nations Economic Commission for Europe (UNECE) is one of five regional commissions of the United Nations set up in 1947. Its main scope of work includes environment, transport, statistics, sustainable energy, trade, wood products and forests, housing and land use, population and economic cooperation and integration.

UNECE and Water Convention, as well as the Protocol on Water and Health

UNECE is hosting the Secretariat of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and is providing the secretariat for the Protocol on Water and Health together with WHO/Europe. In 2022, the Water Convention was working on implementation of its Program of Work for the period 2022-2024 and the Protocol was preparing to its sixth session of the Meeting of the Parties (Geneva, 16-18 November

2022). In 2022 Kazakhstan was a Vice-Chair of the Bureau of the Water Convention.

Activities in 2022

Under the Water Convention and the Protocol on Water and Health, UNECE organized: (1) 27th and 28th meetings of the Bureau of the Protocol on Water and Health (February 2-3; May 17-18); (2) 6th meeting of the Global Network of Basins working on climate change adaptation (April 25); (3) 13th meeting of the Working Group on Water and Health (May 19-20); (4) Regional workshop on equitable access to water and sanitation (June 13-14); (5) 4th joint meeting of Working Group on IWRM and Working Group on Monitoring and Assessment, marking the 30th anniversary of the Water Convention (June 28-30); (6) 21st meeting of the Joint Expert Group on Water and Industrial Accidents (October 6); (7) Global workshop on water, agriculture and climate change (October 17-18); (8) 13th meeting of the Task Force on Water and Climate (October 19); (9) 33rd meeting of the Bureau to the Water Convention (October 20-21); (10) the 6th session of the Meeting of the Parties to the Protocol on Water and Health (November 16-18); (11) 7th meeting of the Task Force on the Water-Food Energy Ecosystems Nexus (December 12-13); (12) Global workshop on source-to-sea management (December 14-16).

Details: https://unece.org/info/events/unece-meetings-and-events/environmental-policy/water-convention

UNECE Activities in Central Asia

Transboundary cooperation. In 2022 UNECE continued to support the Secretariat of the Chu-Talas Commission and was in close contact with UNDP regarding the process of signing of the joint statement on the SAP. In particular, UNECE provided guidance and advice through several transboundary and national discussions. Consequently, the joint statement on SAP was endorsed by Kyrgyzstan in October 2022 and is in the process of endorsement by Kazakhstan.

Results of past projects are available on: https://unece.org/environment-policy/water/areas-work-convention/transboundary-cooperation-chu-and-talas-river-basin *and in the brochure on* https://unece.org/DAM/env/water/Chu-Talas/RUS_ClimateProofingChuTalas_web_10Dec2018.pdf

National Policy Dialogues on Water (NPDs). Since 2019 the NPD process in Central Asian countries has been supported through a regional NPD project, implemented by UNECE in cooperation with OECD, as part of the WECOOP program which supports the EU-Central Asia Working Group on Environment and Climate Change (WGECC).

NPD launch in Uzbekistan. The First Steering Committee meeting of the National Policy Dialogue (NPD) on Integrated Water Resources Management took place in hybrid format on 27 September. Key stakeholders, including national experts from Uzbekistan, representatives of the EU, international and regional organizations, and NGOs attended this event. The participants discussed Uzbekistan's achievements, challenges and priorities related to the water policy and agreed on a way forward for the NPD implementation. The meeting launched the National Water Policy Dialogue in Uzbekistan.

NPD in Kazakhstan. The 7th Meeting of the Interagency Coordination Council for the National Dialogue on Water Policy (NPD) in Kazakhstan took place on 14 December. The composition of the Interagency Coordination Council, the NPD governing body, has recently been updated and includes representatives of all stakeholders in the national authorities, business, research institutes, public and international organizations. At the meeting, the participants discussed the issues of protection and use of groundwaters, water and sanitation, pollution (including emergency pollution) in the Syr Darya River, transboundary cooperation, and the results of the work of international partners.

SPECA program. The 25th Session of the Working Group on Water, Energy and Environment of the United Nations Special Program for the Economies of Central Asia (SPECA WG on WEE) was held online on 15 November in the framework of the 2nd Almaty Energy Forum, co-organized by UNECE and ESCAP and hosted by the Government of Kazakhstan. The Working Group discussed ongoing initiatives supported by the EU, GIZ, USAID, UNDP, OECD, ADB, UNECE, and UNESCAP, to foster the integration of water, energy, food and environmental sectoral policies and actions in SPECA countries.

Project "Regional mechanisms for the low-carbon, climate-resilient transformation of the energy-water-land Nexus in Central Asia", funded by Germany's International Climate Initiative (IKI) from the German Federal Ministry for Environment. In partnership with OECD, SIC ICWC, EBRD and FAO, UNECE will implement a project funded by IKI to improve the management of water, energy, land, and environmental resources in Central Asia in the face of climate change, through analytical work and support to policy development and cooperation. The five years project, which is expected to start in 2023, will include activities at regional and national level in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The project has three main objectives: to mainstream the nexus principles into development planning process, to finance pilot projects to demonstrate benefits of investments in the "nexus", and to organize regional policy dialogues and facilitate capacity development. In particular, the UNECE will provide substantive input on nexus and transboundary cooperation, and brings political convening power to the consortium. The project will deliver a regional strategy and related national policy packages, the regional and country level dialogues, supported respectively by meetings of SPECA and National Policy Dialogues (NPDs) on Integrated Water resources Management.

Source: UNECE, www.unece.org/env/water.htm

International Water Assessment Center

The International Water Assessment Center (IWAC) is the center for international cooperation on integrated water resource management, which has been established as a subsidiary body of the Water Convention in Astana in 2017. The main purpose of IWAC is to support the implementation of the Water Convention and its relevant work programs.

Activities in 2022

IWAC in cooperation with the UNECE continued implementing the project "Development of joint measures to prevent and respond to pollution of the Syr Darya River in emergency situations". 2nd working meeting of experts was held online to present the collected information and identify further actions on the project (January 19).

IWAC organized the regional workshop "International experience related to transboundary water allocation and prospects for the development of cooperation on the joint use of water resources in Central Asia",[205] where general approaches to application of international experience in transboundary water allocation and development of cooperation on the joint use of water resources in Central Asia were discussed (November 2-3, Astana, Kazakhstan).

Also, IWAC organized a series of trainings on the safety of hydraulic structures in CA:[206] (1) 2nd International Training Workshop[207] to assist in studying the best practices in management of hydrotechnical structures, the exchange of knowledge and experience in ensuring safety, improving cooperation on water resources management in Central Asia (September 27-29, Bratislava, Slovakia); (2) a regional workshop[208] aimed at learning from the experience of Slovakia, India and other countries in ensuring HS safety, including risk management, safety monitoring and evaluation support, early warning, and ICT applications. Participants were also familiarized with the findings of the WB's Global Analysis of Dam Safety in 51 Countries (November 30, Almaty, Kazakhstan).

IWAC took part in a cooperation meeting on groundwater management in the frame of the Tashkent area transboundary aquifer[209]. S. Akhmetov, Director of IWAC, presented an overview of the existing framework of transboundary water management with a focus on groundwater resources at the session "Transboundary groundwater governance facilitation" (May 6, Almaty, hybrid format).

Source: www.iwac.kz

6.7. Economic and Social Commission for Asia and the Pacific

Established in 1947, the Economic and Social Commission for Asia and the Pacific (ESCAP) is one of the five regional missions of the UN. ESCAP works to overcome some of the region's greatest challenges by providing results-oriented projects, technical assistance and capacity building to member States in the following areas: macroeconomic policy and development; trade and investment; transport; social development; environment and sustainable development; information and communications technology and disaster risk reduction; statistics and sub-regional activities for development.

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

SPECA program

ESCAP in cooperation with UNECE manages SPECA. The 25th Session of the Working Group on Water, Energy and Environment was held online on November 15[210]. The following events were held in Almaty: (1) SPECA Economic Forum "Greener and Safer Future" on structural economic transformation, sustainable and balanced energy transition, digital transformation, while achieving gender equality and women's empowerment in the SPECA region (November 16-17). (2) 17th session of the SPECA Governing Council summarized the results of the SPECA Economic Forum; the "Almaty Declaration" was adopted; progress reports of the SPECA Thematic Working Groups were discussed; proposal of Azerbaijan to prepare a draft resolution "On the celebration of the 25th anniversary of SPECA" for approval at the 78th UNGA session in 2023 was supported. The Governing Council approved the next session of the SPECA Council and the SPECA Economic Forum 2023 in Azerbaijan (November 18).

Sources: www.unescap.org, www.unece.org

[205] in cooperation with the Finnish Environment Institute (SYKE) and with the support of SDC and UNECE
[206] as part of activities organized by WB and IWAC under the Central Asian Water and Energy Program (CAWEP)
[207] in cooperation with the Government of Slovakia
[208] in cooperation with the Slovak State Enterprise for Water Management (Vodohospodarska vystavba) and with the official support of the Slovak Ministry of Environment and the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan
[209] under the UNESCO-IHP project "Governance of groundwater resources in transboundary aquifers" (GGRETA) supported by SDC
[210] as part of the 2nd Almaty Energy Forum organized jointly by UNECE and ESCAP and hosted by the Government of Kazakhstan

6.8. The United Nations Regional Centre for Preventive Diplomacy for Central Asia

UNRCCA
The United Nations Regional Centre for Preventive Diplomacy for Central Asia

The United Nations Regional Centre for Preventive Diplomacy for Central Asia (UNRCCA) is a special UN political mission established on the initiative of the five Governments of Central Asian in Ashgabat, Turkmenistan in 2007 to support national authorities in identifying and addressing existing and potential threats to regional peace and security. In implementing its initiatives, UNRCCA interacts with regional and international organizations. The Centre began operations in 2008 and is led by a Special Representative of the Secretary General.

Key priorities for 2021-2025

The current UNRCCA Programme of Action for 2021-2025 focuses on five key priority areas, which correspond to the Centre's mandate: (1) promoting preventive diplomacy among the Governments of Central Asia; (2) monitoring and early warning in support of conflict prevention; (3) building partnerships for prevention, including with regional and sub-regional organizations; (4) strengthening the United Nations preventive diplomacy in Central Asia; (5) encouraging cooperation and interaction between Central Asia and Afghanistan in close cooperation with the UN Assistance Mission in Afghanistan.

The "Strategy in support of cooperation between the states of Central Asia in the field of water, energy, environment and climate for 2022-2025" (hereinafter referred to as the "Water Strategy") was adopted in 2021 with the active participation of all five CA states and focused on four main fields of activities, including: (1) preventive diplomacy and capacity building; (2) strengthening institutions and legal frameworks; (3) ensuring transparency, strengthening relationships and promoting partnerships; and (4) working on cross-cutting issues of the peace and security agenda.

Activities in 2022

As part of "Water Strategy", UNRCCA organized: (1) a roundtable on the linkages between climate change, peace and security[211]. The roundtable provided an opportunity to exchange views and was able to gauge interest for a follow-up dialogue series on climate security, which could be designed to support regional efforts in identifying advantageous and mutually beneficial forms of cooperation on water, energy, environment, and climate change in the region (April 26, Turkistan, Kazakhstan); (2) a conference forum on "Water and Mountains Towards Sustainable Development"[212], which provided a viable platform for exchanging experiences and best practice, familiarizing with specific case studies and projects from high mountain regions, including from Central Asia, as well as presenting the current water-related and climate policies of specific countries. As the outcome, the Conference Forum considered concrete recommendations on how to accelerate work in the field of climate, glaciers melt, as well as in the scientific, educational and advocacy fields contributing to the overall objectives of the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6, Dushanbe, Tajikistan); (3) a meeting of national experts from the Central Asian states to follow up on a joint work related to reviewing and taking stock in the existing legislative basis in the field of regional water-energy cooperation in Central Asia. The participants exchanged on the latest developments in the national regulatory frameworks on water management, climate change adaptation policies, green economy strategies and shared information on recent bi-and multilateral agreements between CA countries in these sectors, exchanged opinions on the role of Afghanistan in cooperation in the Aral Sea basin and discussed monitoring and early warning on transboundary rivers of Amu Darya and Syr Darya (November 29-30, Samarkand, Uzbekistan).

In cooperation with SIC ICWC, four Aral Sean Basin Transboundary Water Early Warning Bulletins were issued. The Centre also supports activities of the regional knowledge management platform "Water Unites", https://waterunites-ca.org.

Source: UNRCCA

6.9. World Meteorological Organization

WORLD METEOROLOGICAL ORGANIZATION

The World Meteorological Organization (WHO) is a specialized agency of the United Nations. It was established in 1950. It is the UN system's authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the oceans.

[211] within the framework of the Central Asian International Scientific and Practical Conference titled "30 years of Water Cooperation in Central Asia: facing the future"

[212] as part of the Second High-Level International Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028

Activities in 2022

WMO (1) organized the 75th Session of the WMO's Executive Council to discuss how to further develop the Global Framework for Climate Services, as well as the research and scientific vision for WMO. The Council also endorsed the establishment of a Consortium of WHO Education and Training Collaboration Partners (CONET) intended to broaden the engagement of education and training institutions in WMO activities (June 20-24); (2) launched a new web-portal to make key meteorological analyses and forecast products more readily accessible; (3) jointly with WHO, launched the first global knowledge platform dedicated to climate and health (ClimaHealth.info) in response to growing calls for actionable information to protect people from the health risks of climate change and other environmental hazards.

Projects in CA and Afghanistan. Continued: (1) "The Central Asian Flood Early Warning System"; (2) "Afghanistan Early Warning System project" ($2.4 million); (3) "Hydromet and Early Warning Services for Resilience" ($3.7 million); (4) "Uzbekistan Climate Data Restoration Project".

Publications. WMO Bulletin Vol. 71 – "Early Warning and Anticipatory Action"; 2022 WMO State of Climate Services: Energy report. Other publications can be found on https://library.wmo.int/.

Source: www.wmo.int

6.10. International Fund for Agricultural Development

The International Fund for Agricultural Development (IFAD) is a multilateral financial institution established in 1977. It mobilizes resources to eliminate malnutrition and improve agricultural productivity and incomes for rural poor in developing countries.

It provides direct financing in the form of loans and grants, attracts additional resources to implement projects and programs. Currently it has a number of ongoing projects in Central Asia.

Activities in 2022

Kyrgyzstan

Since 1996, IFAD has invested $124.9 million in rural development in Kyrgyzstan. IFAD activities in the Republic are based on the Kyrgyz Republic Country strategic opportunities programme 2018-2022. The goal is to support inclusive rural transformation that enables smallholders to reduce poverty and strengthen livelihood resilience. This goal will be achieved through two interrelated strategic objectives: (1) increase smallholders' equitable and sustainable returns through the improvement of services and development of livestock product value chains that enable rural producers to capitalize on market opportunities; and (2) enhance smallholders' resilience to climate change through the implementation of innovative approaches that strengthen resilience and ensure sustainable incomes from diversified livelihoods systems.

The implementation of the "Access to Markets" Project continued (2016-2024, IFAD input – $21.17 million). The Project aims to raise incomes and enhance economic growth in Kyrgyzstan's pastoralist communities.

The "Regional Resilient Pastoral Communities" Project (2021-2026) totals $31.28 million in funding from IFAD for farm development (it is expected to reach at least 398,000 rural households).

Tajikistan

The total amount of IFAD funding in Tajikistan is $115.16 million. The organization's activities are based on the program titled "Strategic Opportunities of the Country for 2019-2024". The Program is aimed at reducing rural poverty and strengthening national food security in rural areas of Tajikistan. This is to be addressed under two strategic goals: (1) promoting inclusive agriculture-based economic growth in poor rural communities; and (2) increasing the resilience of smallholder producers to climate change.

"Community-Based Agricultural Support" Project continued. "Community-based Agricultural Support Project 'plus'" was approved (2021-2027, IFAD's contribution – $37.85 million).

Uzbekistan

Uzbekistan joined to IFAD in 2011. Since 2014, IFAD has been financing three investment projects totaling more than $435.3 million (IFAD's contribution – $128.7 million) and directly targeting about 105,000 rural families. IFAD projects work to enable sustainable income growth for rural people through viable small-scale agricultural production and rural enterprise systems, with a specific focus on dekhan farmers, rural women and youth.

Implementation of Dairy Value Chains Development Program and Agriculture Diversification and Modernization Project continued. A new program titled "Strategic Opportunities of the Country for 2023-2027" developed by IFAD with direct involvement of the Uzbek Ministry of Agriculture was presented to the Government of Uzbekistan. IFAD will invest in climate smart agriculture and sustainable land management approaches that increase productivity.

Source: www.ifad.org

6.11. United Nations Educational, Scientific and Cultural Organization

UNESCO is the United Nations Educational, Scientific and Cultural Organization. It coordinates international cooperation in these areas. Established in 1945, it includes 193 member-states.

UNESCO's programs contribute to the achievement of the SDGs defined in the Agenda 2030. Key areas of activity include the following five program sectors: education, natural sciences, social and human sciences, culture, and communication and information.

Activities in 2022

Second International Conference on Water, Megacities and Global Change was held online on January 11-14. The goal was to address the main challenges faced by megacities in coping with the effects of global change on water issues.

UNESCO hosted the UN-Water first Summit on Groundwater on 7-8 December 2022 at its headquarters in Paris (December 7-8). One of important results of the Summit was the launch of the transboundary water cooperation coalition. This is a multistakeholder partnership of more than 30 governments and institutions making a commitment to promote and support transboundary water cooperation at all levels worldwide.

Publications:

(1) report "Groundwater, making the invisible visible" (prepared by UNESCO World Water Assessment Program (WWAP) on behalf of UN-Water). Groundwater already provides half of the volume of water withdrawn for domestic use by the global population, including the drinking water for the vast majority of the rural population. Globally, water use is expected to grow by roughly 1% per year over the next 30 years. Reliance on groundwater supplies is likely to increase as surface water resources become more limited due to climate change;

(2) report "World heritage glaciers: sentinels of climate change" (based on a study by UNESCO in partnership with IUCN). The report shows new data that highlight the accelerated melting of glaciers in World Heritage sites. Glaciers in Western Tien-Shan (Kazakhstan, Kyrgyzstan, Uzbekistan) have shrunk by 27% since 2000. Glaciers in a third of sites set to disappear by 2050. But it is still possible to save the glaciers in the remaining two thirds of sites if the rise in temperatures does not exceed 1.5°C compared to the pre-industrial period. This will be a major challenge for COP27.

UNESCO Projects launched in CA:

(1) "Promoting bio- and geodiversity for sustainable societies in Central Asia" (2022-2023);

(2) "Advancing water science for societies in Central Asia" (2022-2023);

(3) "Integrated water resources management in Uzbekistan" (2022-2023);

(4) "Strengthening the resilience of Central Asian countries by enabling regional cooperation to assess glacio-nival systems to develop integrated methods for sustainable development and adaptation to climate change" (2022-2026).

UNESCO Cluster Office in Almaty

Projects. As part of the "Glacier Lake Outburst Floods in Central Asia: Knowledge Management Platform" (GLOFCA), the following events were organized:

(1) a training on numerical modeling of rapid mass movements and glacier lake outburst floods (July);

(2) a four days joint field visit was conducted to the lakes close to the Adygene research station in the valley of Adygene, a western tributary to the Ala Archa river (August, Kyrgyzstan);

(3) a second regional workshop on "Assessment of downstream GLOF[213] hazard and community hazard mapping" (October 31-November 1, Almaty, Kazakhstan), summing up project's first year. Experts drafted the first chapter of the guidelines on best practices in reducing vulnerability to glacier lake outburst in CA. This document is to be presented on the international arena as a CA experience in this field.

The third meeting on collaboration was held as part of "The governance of groundwater resources in transboundary aquifers (GGRETA)" project and was aimed at strengthening the joint management of the Tashkent area Transboundary Aquifer (November 2, Almaty, Kazakhstan).

On 6 June 2022, in Dushanbe, Tajikistan, UNESCO Almaty Office together with UNRCCA and in partnership with the Committee for Environmental Protection and the Center for Glacier Studies at the Academy of Sciences of Tajikistan convened the

[213] GLOF – glacier lake outburst floods

Forum on "Water and Mountains Towards Sustainable Development" within the framework of the second High-Level International Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6, Dushanbe, Tajikistan). The Forum was focused on the challenges related to glacier melting in CA, as well as on water security in the context of climate change. The Forum provided a platform for exchanging experiences and best practice, familiarizing with specific case studies and projects from high mountain regions, including from Central Asia.

UNESCO Office in Tashkent

The work on the Water Security Outlook in Uzbekistan has been completed. This was the first quantitative and qualitative assessment of water management in administrative territories. The work was implemented by SIC ICWC upon UNESCO's request. The water security assessment was completed for Navoiy, Samarqand and Khorezm provinces.

Source: www.unesco.org, www.en.unesco.kz

6.12. Food and Agriculture Organization

Food and Agriculture Organization of the United Nations (FAO) was established in 1945. Nutrition, climate change, gender equality, social protection, and decent rural employment are cross-cutting issues of FAO activity in the Central Asian region.

Food and Agriculture Organization of the United Nations

FAO Activities in CA States in 2022

Kazakhstan

Ongoing projects:

(1) "Elaboration of the 2022-2026 State Program (including the Concept) of Agro-Industrial Development" (2020-2022, $370,000);

(2) "Supporting investments in smallholders inclusive agrifood value chain development in Kazakhstan" (2020-2022, $474,400);

(3) "Kazakhstan resilient agroforestry and rangeland management project" (2022-2026 $1.9 million);

(4) "Promoting the development of land market and supporting the development of small family farms" (2022-2023, $275,000);

(5) "Technical support to the development of an International Agrifood Hub" (2022, $95,000);

(6) "Preparation of GCF project CN on sustainable and CC resilient development" (2022, $60,000).

Kazakhstan has been selected as a pilot country for a FAO project to test, develop and improve RS-based tools and methodologies for monitoring agricultural land and crop yields.

The project "Contribution to development and further scaling up of healthy nutrition" is to be started next year (2023-2025, $465,000).

Capacity building. FAO:

(1) completed an inventory of obsolete pesticides in the pilot Karaganda, Akmola and Pavlodar provinces;

(2) organized trainings for national teams on FAO methodologies for pesticide inventory, data processing and storage. The trainings also focused on development of a roadmap and identification of ways of cooperation among agencies to provide administrative and technical support in the inventory process.

Five-day training was held for 14 representatives of credit associations, SMEs and Kazakh National Agrarian Research University on FAO "RuralInvest" toolkit to raise financial and investment awareness of farmers.

Kyrgyzstan

The FAO Country Programming Framework in Kyrgyzstan for 2023-2027 was signed, with key points related to improving food security and nutrition, stimulating agricultural development and promoting organic agriculture, improving, increasing household sustainability, improving environmental protection, enhancing the sustainable management of natural resource and adaptation to climate change, and boosting digitalization.

Ongoing projects:

(1) "Support for development of sustainable value chains for climate-smart agriculture" (2021-2023, $350,000);

(2) "Promoting accelerated green investment in agriculture through capacity building of national financial institutions" (2021-2023, $300,000);

(3) "Assessment and improvement of institutional capacities on food control, food safety management systems and international standards" (2021-2022, $75,000);

(4) "Enhancing capacity for food safety management in the Kyrgyz fruit and vegetable industry" (2020-2022, $570,000);

(5) "Supporting the implementation of organic agriculture policies and increasing the capacities of farmers in the Kyrgyz Republic – Component 1: Support to establish the legal and institutional framework for organic farming in the Kyrgyz Republic" (2019-2022, $500,000);

(6) "Strengthening capacities of public and private sector for regulation, certification and marketing of organic products" (2022-2024, $300,000);

(7) "Support to revision of the Land Code and to development of agricultural land markets" (2022-2023, $50,000);

(8) "Carbon sequestration through climate investment in forests and rangelands in the Kyrgyz Republic" (2022-2030, $30 million).

Planned projects: "Contributing to the sustainable development of the beef sector" (2023-2025, $200,000); "Introduction and promotion of innovative approaches for adopting best technologies for horticulture" (2023-2025, $120,000).

Capacity building. FAO and the Kyrgyz Ministry of Agriculture organized an event to raise awareness about fisheries and the benefits of fish consumption within the framework of the International Year of Artisanal Fisheries and Aquaculture.

To improve veterinary services' capacities in epidemiology, risk assessment and emergency response preparedness, FAO organized a two-day simulation exercise to respond to the outbreak of bovine lumpy skin disease in Bokonbaevo village in Issyk-Kul province.

Tajikistan

Ongoing projects:

(1)"Support of warm-water fishery sector" (2021-2023, $95,000);

(2) "Introduce innovative approaches for adopting best technologies for apricot production in Sughd" (2021-2023, $92,000);

(3) "Provision of Technical Assistance on E-agriculture to the Ministry of Agriculture" (2021-2023, $90,000) – a multilateral workshop was held, with the Korean experts sharing knowledge and experiences in digital agriculture policies, programs and methods; technical assistance was provided to the Ministry in the development of the National Roadmap for boosting digitalization;

(4) "Agrobiodiversity conservation for food security and livelihood improvement" (2021-2023, $91,000);

(5) "Enabling market access for Tajik agricultural products through improved food safety systems" (2018-2022, $197,000);

(6) "Support to export increase of agrifood products through green development and enhanced market access" (2022-2024, $88,000);

(7) "Strengthening capacity on promotion of conservation agriculture among farms at Romit Reserve" (2022-2023, $39,000);

(8) "Support to agricultural sector reform and improvement of the investment climate" (2022-2023, $95,000); (2022-2023, $95,000);

(9) "Cooperative development and strengthening of rural institutions under the Agrarian Reform Programme" (2022-2023, $96,000);

(10) "Strengthening resilience of the agriculture sector (2022-2026, $2.4 million);

(11) "Facilitating agrobiodiversity conservation and sustainable use to promote food and nutritional resilience in Tajikistan " (2022-2025 , $1.7 million);

(12) "Strengthening the capacity of the Republic of Tajikistan to comply with the Enhanced Transparency Framework under the Paris Agreement" (2022-2023, $50,000).

Capacity building. FAO is setting up agrometeorological stations throughout the country to help farmers predict the weather more accurately. This includes a pilot agrometeorological network covering three crops – vineyards in Tursunzade district, apricots in Kanibadam district and cotton in Jaloliddin Balkhi district.

FAO provided 40 removable solar dryers for fruits and vegetables to eight farmer groups in four districts of Khatlon province; allocated $20,000 to the most vulnerable 40 female-headed households in Yavan district; established eight farmer field schools and distributed 340 kg of high quality legume seeds; organized a series of capacity building activities for 268 farmers, 61% of whom were women; and assisted cooperatives and informal production groups in seed multiplication in six districts of the country.

FAO introduced simulation exercises for veterinary services responding to lumpy skin disease and distributed reference literature. 5 water tankers, 2 jet sprayers, 12 showers and 343 camping items were delivered to combat a possible locust infestation; support was provided for the development of a regional monthly bulletin on locust control and 2 transboundary locust surveys in Uzbekistan and Tajikistan.

FAO Tajikistan organized three side events within the framework of COP27 on regional cooperation on climate change and the role of agrobiodiversity and climate finance in climate change mitigation.

Turkmenistan

Among the highlights of FAO's work in Turkmenistan in 2022 were improvements to the cotton value chain, increased capacity of lumpy skin disease resistance, and increased sustainability in agrifood.

Ongoing projects. Under the project "Integrated natural resources management in drought-prone and salt-affected agricultural production landsca-

pes in Central Asia and Turkey" (CACILM-2), experts are drafting a law related to soils, have prepared a report on early warning systems, disaster risk management and agrometeorological services. The project built 2 plant nurseries and a demonstration plot for reclamation measures to reduce soil salinization and procured 25,000 fruit tree seedlings to expand horticultural areas in various soil-climate conditions.

Capacity building. FAO assisted in improving cotton value chain efficiency and sector sustainability. Two reciprocal field visits of cotton experts from Turkey and Turkmenistan were organized; workshops were held on improving cotton production and mechanized harvesting. Under an agreement with the Turkish Nazilli Cotton Research Institute, work on a gender-sensitive strategy for accelerating the mechanization of the cotton industry is ongoing.

FAO organized a monthly online course for 400 veterinarians at the FAO Virtual Training Centre designed to help veterinarians better detect, prevent and control lumpy skin disease.

In March, FAO and the Ministry of Agriculture and Environmental Protection of Turkmenistan held the 5th Meeting of the Ministers of Agriculture of Central Asia. Participants discussed how integrated natural resources management contributes to agricultural sustainability and learned about FAO tools, initiatives and projects that support its implementation.

Uzbekistan

FAO's activities in Uzbekistan are supported by FAO-Uzbekistan Country Programming Framework (CPF) for 2021-2025.

The total funding budget for the implementation of the CPF is expected to be approx. $ 17 million.

Ongoing projects. In agriculture and natural resource management:

(1) "Recovery and development of the potato sector in response to COVID-19" (2021-2023, $195,000);

(2) "Strengthening sustainable food systems through geographical indications" (2021-2022, $250,000) – support was provided to the Intellectual Property Agency under the Uzbek Ministry of Justice in drafting a new law on geographical indications, which was adopted on March 3, 2022;

(3) "Rice crop production and management support" (2020-2022, $100,000);

(4) Support in implementation of inclusive agricultural policies (2020-2022, $100,000) – draft strategy was developed on gender equality for the Ministry of Agriculture; assistance was provided for improving three legal instruments related to agriculture;

(5) "Preparing the grounds for digital transformation of agriculture" (2022-2023, $315,000);

(6) "Support to country program development on sustainable agriculture" (2022-2023 $50,000);

(7) Food Systems, Land Use and Restoration (FOLUR) Impact Program (2022-2026, $6 million);

(8) "Capacity building to establish an integrated and enhanced transparency framework in Uzbekistan to track the national climate actions and support measures received" (2022-2025, $1.3 million);

(9) "Multi-faceted response to the food and energy emergency in Uzbekistan" (2022, $80,000).

Forest management projects:

(1) "Sustainable management of forests in mountain and valley areas of Uzbekistan" (2018-2023, $3.2 million) to sequestrate carbon and improve the quality of forests and tree resources;

(2) "Sustainable forest and rangelands management in the dryland ecosystems of Uzbekistan" (2022-2026, $3.8 million).

Continued projects on the Aral Sea: "Unleashing young people's and vulnerable citizens' creativity and innovation of the Aral Sea region" (2020-2023, $180,000) and "Empowering youth towards a brighter future through green and innovative development of the Aral Sea region" (2022-2023, $23,000).

Capacity building. FAO is providing technical assistance to the Ministry of Agriculture for the development of a program to identify key priority areas and activities to accelerate the digitalization of the sector and strengthen agricultural knowledge and information systems.

FAO is helping smallholder farmers in three communities produce more food with less pesticides, fertilizers, water and labor, using low-cost digital and non-digital technologies. During the first crop cycle, farmers achieved a 90% increase in tomato production and a 140% increase in sweet pepper production.[214]

FAO built three fruit tree nurseries in three households in the Muynak, Kungrad and Bozatau regions of Karakalpakstan and planted more than 3000 seedlings. An aquaculture pond was established in Bozatau region, and two more ponds are being established in the Muynak and Kungrad regions.

FAO at the regional level

Completed projects:

(1) "Developing capacity for strengthening food security and nutrition in selected countries of the

[214] as part of the project "Smart farming for the future generation" funded by the Republic of Korea

Caucasus and Central Asia" – final project report is available in English;

(2) Central Asian Desert Initiative/CADI – over 6 years a wide package of measures was implemented to conserve and use sustainably cold winter deserts in Kazakhstan, Uzbekistan and Turkmenistan. Among the multiple project outputs are the following: establishment of new protected areas; nomination of the Cold Winter Deserts of Turan as UNESCO World Heritage Site; organization of Farmer Field Schools to strengthen the capacities of farmers for a sustainable use of deserts, support young scientists within the CADI Fellowship program, and generate many new baseline data and knowledge about the vulnerable and endangered ecosystem of cold winter deserts.

Ongoing projects:

(1) "Improving national and regional locust control in the Caucasus and Central Asia" aimed at safeguarding rural population food security and livelihoods: annual regional workshop on locust data collection, analysis, forecasting and reporting was held (February 16-18, online); cross-border survey between Tajikistan and Uzbekistan was conducted (March 28-April 2); regional training of trainers on locust control took place (October 17-28, Samarkand); 3rd meeting of the Steering Committee, which approved the workplan for the third year including the 2023 national anti-locust campaign (December 14, online). The report of the annual Technical Workshop on locusts in CA was published (November 21-24, Dushanbe);

(2) "Integrated natural resources management in drought-phone and salt-affected agricultural production landscapes in Central Asia and Turkey", Phase II of the "Land Governance Initiatives of CA countries": 2nd regional workshop titled "The Road Ahead after COP26: Enhancing Targets and Compliance with Enhanced Transparency Framework (ETF) for Agriculture and LULUCF" was organized;

(3) "Lifecycle management of pesticides and disposal of POPs pesticides in Central Asian countries and Turkey" supported by GEF;

(4) "Strengthening regional collaboration and national capacities for management of wheat rust diseases and resistance breeding in Central Asia and the Caucasus".

Source: www.fao.org

6.13. International Law Commission

The International Law Committee (ILC) is a subsidiary body of UNGA, consisting of thirty-four members of recognized competence in international law who sit in their individual capacity and not as representatives of their governments.

The task of ILC is encouraging the progressive development of international law and its codification. It was established in 1947.

The Commission has no representatives of the Central Asian states in its composition.

During the 73rd session of ILC in 2022, reports were presented on the following topics: "Immunity of State officials from foreign criminal jurisdiction", "Peremptory norms of general international law (jus cogens)", "Protection of the environment in relation to armed conflicts", "Succession of States in respect of State responsibility", "General principles of law", etc.

The Commission considered the third report of Special Rapporteur on "Protection of the environment in relation to armed conflicts" (A/CN.4/750 + Corr.1 + Add.1) as well as comments and observations received from Governments and international organizations and other parties (A/CN.4/749).

The Commission adopted, on second reading, the entire set of draft principles on protection of the environment in relation to armed conflicts including a draft preamble and complete set of 27 draft principles together with commentaries to this set.

On the topic "Sea-level rise from the perspective of international law", the Commission reconstituted the Study Group on Sea-level rise in relation to international law, which had before it a second issue paper (A/CN.4/752 and Add.1) on issues relating to statehood and the protection of persons affected by sea-level rise. The Group exchanged views on the paper and on other issues related to the sub-themes under consideration, as well as considered a number of indicative questions prepared by the co-chairs and held discussions on the future program of work on the topic.

Source: ILC Report at the 73rd session, 2022

6.14. International Court of Justice

The International Court of Justice (ICJ) is one of the six principal organs of the United Nations. It was established in 1945. It delivers judicial and advisory functions. No judges from Central Asia sit in the International Court. Cases submitted to the Court involve a wide variety of subject matters: territorial and maritime disputes; consular rights; human rights; environmental damage and conservation of living resources; international responsibility and compensation for harm; the immunities of States, their

representatives and assets; interpretation and application of international treaties and conventions.

In 2022, the Court's list of cases included only two cases directly related to water disputes – the Gabcikovo-Nagymaros project (Hungary/Slovakia) and dispute over the status and use of the waters of the Silala (Chile v. Bolivia). For the nature of the case and proceedings on Gabcikovo-Nagymaros project (Hungary/Slovakia), see the ICJ report.

Dispute between Chile and Bolivia over the status and use of the waters of the Silala (Chile/Bolivia): On June 6, 2016, Chile instituted proceedings against Bolivia before the International Court of Justice over the status and use of the waters of the Silala. On December 1, 2022, the Court delivered its Judgement.

In its Judgment, which is final, without appeal and binding on the Parties, the Court found that the claims made by the Republic of Chile in its final submission regarding (a) the Silala River system as an international watercourse governed by customary international law, (b) Chile's entitlement to the equitable and reasonable utilization of the waters of the Silala River system, (c) Chile's entitlement to its current use of the waters of the Silala River system (d) Bolivia's obligation to prevent and control harm resulting from its activities in the vicinity of the Silala River system no longer have any object and that, therefore, the Court is not called upon to give a decision thereon.

The Court reached the same conclusion on the counter-claim made by the Plurinational State of Bolivia in its final submission concerning (a) Bolivia's alleged sovereignty over the artificial channels and drainage mechanisms installed in its territory; and (b) Bolivia's alleged sovereignty over the "artificial" flow of Silala waters engineered, enhanced or produced in its territory.

In each of these claims, the Court declined to issue a decision because the positions of the Parties have converged in the course of the proceedings, the Court acknowledged the agreement between them on these matters and ruled that it was devoid of any object.

The Court found that Bolivia has not breached the obligation to notify and consult incumbent on it under customary international law, and rejected the claim made by the Republic of Chile in its final submission (e). Similarly, the Court rejected the counter-claim made by the Plurinational State of Bolivia in its final submission (c) regarding the alleged need to conclude an agreement for any future delivery to Chile of the "enhanced flow" of the Silala.

Judges Tomka and Charlesworth append declarations to the Judgment of the Court; Judge ad hoc Simma appends a separate opinion to the Judgment of the Court.

Some preliminary observations on the Silala case by legal scholars can be found on EJIL Talk at https://www.ejiltalk.org/preliminary-reflections-on-the-icj-decision-in-the-dispute-between-chile-and-bolivia-over-the-status-and-use-of-the-waters-of-the-silala/

Source: Judgment 1 December 2022, Dispute over the status and use of the waters of the Silala (Chile v. Bolivia)

SECTION 7

International Water Organizations and Initiatives

7.1. Asia Water Council

The Asia Water Council (AWC) is a global network focused in providing tangible solutions on Asian water challenges and facilitating multilateral discussions among stakeholders. It was established at the initiative of South Korea during the 7th World Water Forum in March 2015. AWC is composed of 147 organizations from 27 countries. The AWC action tools include the application of high-tech tools in all areas of water management and nature conservation through IWRM, the reduction of risks through better water security, especially as concerns prevention of floods and droughts. AWC is the main organizer and sponsor of the Asia International Water Week (AIWW).

Activities in 2022

Asia International Water Week. The 2nd Asia International Water Week/2-AIWW under the theme "Sufficient and Sustainable Water for All" was held in Indonesia on March 14-16, 2022. The AIWW program included the Water Project Business Forum, Ministerial Conference, an exhibition and thematic sessions (four sessions on 6 themes each): (1) Security and sustainable growth; (2) IWRM planning/pilot projects to introduce smart technologies and build capacity; (3) Water management policy and technology in the context of climate change; (4) Water-Energy-Food-Ecosystem Nexus; (5) Water Security: responses to local, regional and global challenges; (6) Asian Dynamic Water Center – power of knowledge and information. A new Asia to World Statement was launched on behalf of AWC.

Events. The following events took place in the course of 2022: (1) 15th AWC Board of Council meeting, which approved appointment of Dr. Young-deok Cho as new Secretary General and made a decision to hold the 3rd AIWW in 2023 in China (March 13, Indonesia, hybrid); (2) Climate Change High-level Round-table 'Innovative Climate Solutions in Water Sector' (March 22, Senegal); (3) Special Session on Global Water Welfare Report, where AWC introduced the Global Water Welfare Report being developed by itself and formed a consensus in the international community on the implementation of water-related projects (Singapore, April 17-21); (4) COP27 Side Event "Strengthening Climate Resilience through Expansion of Investment in the Water Sector and Activation of Water Projects" at the Korean Pavilion (Egypt, November 8); (5) 16th AWC Board of Council meeting, which appointed new representatives of AWC to enhance cooperation between AWC and other organizations implementing mid- and long-term water development plans in Asia and globally, determined venue and time for the 4th AWC General Assembly – 23-28 September 2024 in China (November 22, Korea, hybrid).

Source: Agency of IFAS, http://www.asiawatercouncil.org

7.2. Geneva Water Hub

The Geneva Water Hub is a Centre of the University of Geneva, co-financed by joint project of the Swiss Confederation (Swiss Agency for Development and Cooperation, SDC, Global Program Water Division) and the University of Geneva. The Geneva Water Hub was established in 2014 to help prevent water conflicts at an early stage and to promote water as an instrument of peace and cooperation.

The Platform for International Water Law (PIWL) was established by some members of the Department of Public International Law and International Organization of the Faculty of Law of the University of Geneva in 2009. Later, it became a part of the Geneva Water Hub. The Geneva Water Hub serves as the Secretariat of the Global High-Level Panel on Water and Peace.

Activities in 2022

In June 2022 in Dushanbe, Tajikistan, the Geneva Water Hub participated to the **Dushanbe Second International High-Level Conference on the International Decade for Action "Water for Sustainable Development"**, where the Director General of the GWH moderated a thematic panel on "Transboundary water cooperation for economic growth and sustainability". It also participated to a side event on "digital tools and e-learning in transboundary water management" organized by the OSCE. At this occasion, the GWH launched **the OSCE E-learning Course** on "Water Diplomacy and Integration of Water Norms in Peacebuilding", an open and free course exploring the intersection between water and peace and aiming to provide theoretical and practical tools for integrated sustainable water governance in dialogue and processes linked to conflict prevention and peacebuilding. The course is available on the OSCE e-learning platform (https://elearning.osce.org/courses/course-v1:OSCE+EEA-WD01+2021_10/about).

The Course is particularly useful for water practitioners, professional negotiators, and university students interested in water management and its interlinkages with peacebuilding processes.

On the margin of the Dushanbe Conference, the Geneva Water Hub participated physically in the Syr Darya River Basin Youth Dialogue, co-organized by the Central Asian Youth for Water (CAY4Water), the International Secretariat for Water (ISW) and the Swiss Development and Cooperation Agency (SDC). This workshop reunited young water professionals from Tajikistan, Uzbekistan, Kyrgyzstan, and Kazakhstan, with the objective of better understanding the importance of dialogue and interactions at basin level. At this occasion, the Geneva Water Hub provided a training on water diplomacy and on the legal aspects of transboundary water cooperation. With this activity, the GWH supported the organization of **self-managed spaces of dialogue for the youth and contributing to the reinforcement of their capacities and skills**. https://www.sie-see.org/en/article/syr-darya-river-basin-youth-dialogue/

In 2020, at the request of SDC, the Geneva Water Hub was involved in the development and implementation of a Course on Water Diplomacy at the Kazakh-German University (DKU).

As part of the Blue Peace Central Asia initiative, SDC supported the development of 3 elective courses at DKU, which took place in November 2020 and November 2021.

The Training of Trainers (ToT) Course on Water Diplomacy took place online on 23-27 May 2022, online (via Zoom), with the facilitation of the Regional Environmental Centre of Central Asia (CAREC), which mapped and identified the universities and participants for the ToT.

Source: Geneva Water Hub

7.3. Global Water Partnership

The Global Water Partnership (GWP) is a global network of action including over 3,000 partners in 179 countries.

GWP is comprised of 13 Regional Water Partnerships (RWPs) and 69 National Water Partnerships (NWPs), with the mission to advance governance and management of water resources for sustainable and equitable development.

Activities in 2022

The completion of 2022 marks the mid-point of the GWP 2020-2025 Strategy. The first half of the strategy period has been dominated by the COVID-19 global pandemic. The network has nevertheless maintained a high level of delivery and the implementation of the Strategy remains on track.

Climate resilience through water. In 2022 GWP supported the mobilisation of $1.5 million under the GCF Project Preparation Facility for the preparation of the $117 million project Climate Resilient Systems for SADC Water Sector: SADC Hydrological Cycle Observation System.

IWRM solutions for the SDGs. GWP supported the development of government-led investment programmes in Zanzibar and Zambia. The government of Zanzibar has expressed its commitment to include $100 million in its 2023 national budget and the Zambian government has pledged $1 billion. GWP piloted the measurement of IWRM at municipal level both in Honduras and Nicaragua, in coordination with mandated authorities from municipal to national level.

Water-Energy-Food-Environment Nexus. GWP supported the organization of the 10th SADC Multistakeholder Dialogue bolstering regional productive capacities for water, energy, food security and ecosystem resilience to achieve inclusive and sustainable industrial transformation. National dialogues were also facilitated in 14 SADC Member States that allowed identifying potential in-country Nexus investment projects and developing a follow-up action plan.

Transboundary cooperation. The International Commission for the Protection of the Danube River endorsed the Danube River Basin Management Plan as well as the Danube Flood Risk Management Plan. GWP provided technical inputs for the preparation of both plans.

GWP supported the adhesion of Cameroon to the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

Several advancements took place in the Buzi, Pungwe and Save Basins Tri-basin, on the border between Mozambique and Zimbabwe, including the approval by the Joint Water Commission of the draft Save Water Agreement and Establishment and Hosting Agreement previously supported by GWP. Further, GWP facilitated stakeholder consultations for the development of a Flood Forecast and Early Warning System.

4 regional organizations and more than 9 transboundary water management institutions have been supported in 2022. Examples include the Amazonian Cooperation Treaty Organization (ACTO) and Lake Chad Basin Commission (LCBC).

IWRM Toolbox. The redeveloped GWP Toolbox IWRM Action Hub was launched in 2022 at the World Water Forum in Dakar, Senegal. The ToolBox is a global knowledge platform which supports actors to imple-

ment IWRM, share knowledge and expertise about their implementation experiences, and bring relevant stakeholders together to improve the way water is managed around the world.

Learning Labs were organised in Zanzibar, Uzbekistan, Nicaragua, Armenia, Sao Tome, Indonesia and Senegal, which content was adapted to the needs of participants to strengthen their contribution to better water management.

Central Asia and the Caucasus. Tangible achievements from the region in 2022 were the finalized Roadmap for the restoration and conservation of the aquatic ecosystem of Lake Balkash and the new network Youth for Water & Peace was established, gathering youth from Armenia, Azerbaijan and Georgia. Besides, a learning lab 'Towards an Integrated Drought Management Strategy for Armenia' (September 30-October 1) was organized with key national stakeholders. The aim was to support Armenia in the next steps towards integrated drought management, as well as integrating IWRM into the River Basin Management Plans. An overview report on the current state of drought management and draft concept for revision of the national action program to combat drought and land degradation were prepared, in support of the current processes led by the Ministry of Water Resources and the State Forestry Committee in Uzbekistan.

Capacity building. In partnership with Cap-Net and the Gender and Water Alliance, GWP launched the Gender and Integrated Water Resources Management course. The second edition trained 211 participants, with a completion rate of 39% (the global average rate being below 15%). A Community of Practice was initiated on the GWP Toolbox to allow continuous and long-term exchanges amongst participants.

GWP organized the Global Integrated Flood and Drought Management Competition for youth-led projects in partnership with WMO. Twenty young professionals were also trained through the 8-month "Youth for Water and Climate Program", which offered in-person workshops, mentorship opportunities, support in finding an internship, a community of practice.

At global level, knowledge and learning efforts continued in 2022 with new sessions of the 'transboundary freshwater security governance train', launched in 2021 in collaboration with the Wuhan International Water Law Academy (IWLA). This initiative is part of the Massive Open Online Course (MOOC) on transboundary freshwater security developed by GWP, in collaboration with GEF IW:LEARN.

Source: GWP, www.gwp.org

7.4. International Commission on Irrigation and Drainage

The International Commission on Irrigation and Drainage (ICID) was established in 1950 as a scientific and technical organization with a view to develop scientific technologies in engineering, agriculture, irrigation and drainage, economy, ecology, and social sciences to increase food production, protect environment, improve water quality, improve land productivity, and manage floods and disasters. Kazakhstan, Tajikistan, and Uzbekistan are the members of ICID.

Activities in 2022

ICID continued holding its activities physically and online.

24th ICID International Congress and 73rd International Executive Council[215] Meeting took place in Adelaide, Australia from 3 to 10 October 2022.

The Congress centered around the theme "Innovation and research in agriculture water management to achieve sustainable development goals", which was dealt with under two relevant questions – Question 62: What Role Can Information and Communication Technology Play in Travelling the Last Mile? and Question 63: What Role is Played by Multi-Disciplinary Dialogue to Achieve Sustainable Development Goals? The Congress included several thematic sessions and workshops of ICID working groups, as well as the special session "Developing the future tools for managing uncertainty in irrigation water supply" and the Symposium "Integrated Approaches to Irrigation Management in Future". The plenary session was attended by about 400 delegates from 44 countries.

The 73rd IEC meeting was organized in three sessions. The Opening Plenary presented ICID annual awards and recognitions. Nineteen heritage structures from 7 countries have been recognized in the year 2022 as the World Heritage Irrigation Structures (WHIS). The Best Paper Award was presented to Chinese resear-

[215] the International Executive Council (IEC) is the highest decision-making body of ICID. It is vested with the management of the affairs of the International Commission on Irrigation and Drainage

chers for their paper entitled 'Bacillus amyloliquefaciens application to prevent biofilms in reclaimed water micro-irrigation systems' published in Volume 70 Issue 1 (2021) of Irrigation and Drainage – the Journal of ICID. The 5th Best Performing Workbody Award (BPWA) was presented to the African Regional Working Group (AFRWG).

The main session of IEC was conducted in two sessions. President Prof. Dr. Ragab Ragab emphasized the opportunity to spotlight where ICID – and various stakeholders of the irrigation and drainage sector as a whole – needs to come together to promote sustainable management of water for agriculture worldwide, as Agenda 2030 provides an opportunity to ICID to revisit its vision and mission to align with UN SDGs.

Mr. Carl Walters from the Australian National Committee (IACID) presented the important aspects regarding agriculture water management in the country, resulting in increased agriculture activity in Australia and underlined both positive and adverse impacts of such development.

Dr. Bahrom Gaforzoda from the Tajikistan National Commission on Irrigation and Drainage (TajNCID) brought attention to the initiatives by Tajikistan at the UNGA which resulted in the declaration of International Freshwater Year (2003), International Decade for Action "Water for Life" (2005-2015), International Year of Water Cooperation (2013) and International Decade for Action "Water for Sustainable Development, 2018-2028".

Ms. Karlene Maywald, South Australian Water Ambassador and Chair of the Australian Nation Water Commission delivered the 11th N.D. Gulhati Memorial lecture on the theme "Putting People at the Heart of What We Do".

Finally, the participants made the following recommendations: use lessons from technical, social, and institutional innovations tested in the field by water managers across different sectors and irrigators, government, researchers, and donors to build climate resilience through water management.

They acknowledged that water conservation & management, innovative agriculture practices, renewable energy, food systems and nutrition are interlinked and that the rising trend of losses caused by natural and human-induced disasters must be addressed, with particular attention paid to people in vulnerable situations, including least developed countries.

IEC-ICID endorsed the decision that an expert group on the Aral Sea may be established under Task Team on Transboundary Water (October 10). The key objectives of the expert group is to use the ICID platform (competencies, knowledge, experience and potential) to support efforts of the Aral Sea basin countries to search for solutions for better use of water and irrigated land and stabilization of aquatic ecosystems (from glaciers to the Aral Sea) and further sustainable development in the region.

During the 73rd IEC the Working Group on irrigation and drainage in the states under socio-economic transformation (WG-IDSST) held its 4th meeting (October 8).

WG-IDSST[216] was established in 2018 with the aim to facilitate a single platform of National Committees of ICID that belong to States characterized by transition economy, in overcoming certain mutual problems in Irrigation and Drainage.

Earlier, the WG had an online meeting (May 26), with the two presentations made: "The Role of Agricultural Drainage and the Challenges it faces in Africa" by Dr. Mohamed Wahba, VHP, Egypt, and "Integrated Water Resources Management in Central Asia: Challenges, Experiences, and Achievements" by Dr. Shukhrat Mukhamedjanov, Vice Chair of the Group, Uzbekistan.

In the course of the year, ICID organized **13 webinars**, in particular on: (1) INSPIRE: Mapping & Monitoring Irrigation Performance, WB Group (January 27); (2) Updates and Advances to the FAO56 Crop Water Requirements Methods (February 15); (3) Integrated Water Resources Management in Large River Basins Based on Simulation Modeling and Optimization Methods (February 16); (4) Sustainable Irrigation Development: a Water-Energy-Food (WEF) Nexus Perspective Towards Achieving More Crop per Drop per Hectare under Climate Change (March 15); (5) Precise Land Reclamation as a Tool of Precision Agriculture (March 16); (6) Combining Farmer and Science-Based Knowledge Through the Virtual Irrigation Academy (June 2 and 29); (7) Impacts of Climate Change on Surface and Groundwater Resources (June 23); (8) 73rd ICID Foundation Day Seminar on the Role of Modern Irrigation in Global Food Security (June 24) (9) Innovative Coastal Protection on Mangrove Coast (July 14); (10) Capacity Building in Agricultural Water Management is in 'Intensive Care Unit' – Can It Be Rejuvenated? (July 20); (11) Advanced Micro irrigation Technology with Precision Water and Salt Management (August 25); (12) Low Land Development in Indonesia (December 22).

Publications. Irrigation and Drainage Journal (Volume 71); Water-Saving in Agriculture – A Roadmap to ICID Vision 2030.

Source: Mrs. Irena G. Bondarik, ICID Honorable Vice-President; https://icid-ciid.org/home

[216] it is composed of representatives of Ukraine, Uzbekistan, Tajikistan, Russia, Nigeria, Sudan, Egypt, India, Pakistan, Australia, Sri-Lanka, and Japan

7.5. International Network of Basin Organizations

The International Network of Basin Organizations (INBO) was established in 1994 in Aix-les-Bains (France) to promote integrated water resources management at the level of national and transboundary basins of rivers, lakes and groundwater aquifers to link economic growth, social equity, water and environmental protection, and civil society participation. Basin organizations, governmental administrations in charge of water, and bi and multilateral cooperation organizations are the members of INBO from 90 countries.

INBO member organizations belonging to the same geographic region created 7 regional networks of INBO.

Activities in 2022

Events. Main international events:

(1) statutory session of General Assembly, which decided to extend the Presidency of the Kingdom of Morocco until the General Assembly of 2024 and approve the French presidency as from 2024 (Dakar, Senegal, March 22);

(2) 9th World Water Forum, where INBO jointly organized around 30 sessions promoting the interest for the management of water resources at basin level and supported the "Basin segment";

(3) 20th International Conference Europe-INBO for the Implementation of the European Water Directives (Annecy, France, September 26-29);

(4) COP27 Climate Change Conference, where INBO co-organized seven events on water and adaptation to climate change, including the official high level event of the Marrakesh Partnership for Global Climate Action: Water Action Event (Sharm El-Sheikh, Egypt, November 6-18).

In particular, at the 9th WWF, INBO called for an acceleration of the actions implemented in three priority areas for achieving the Sustainable Development Goals (SDGs):

(1) Integrated Water Resources Management (IWRM), with the launch (with OMVS, OMVG, UNECE & Swiss Confederation) of the **Dakar Action Plan for river, lake and aquifer basins** (**91** signatory organizations from **50** countries) at the high-level segment dedicated to basins. This initiative reaffirms that accelerating the achievement of the SDGs depends greatly on the action of basin organizations and the support they receive. Good management of river basins guarantees the water, food and energy security of our societies. It is a call to action to strengthen cooperation, planning, legal and institutional frameworks of basin organisations and their financing;

(2) Biodiversity preservation, with the promotion of the **Water and Nature Declaration**, alongside the World Water Council and the Nature Conservancy (more than **100** signatories from **27** countries); and,

(3) Adaptation to climate change, with the "Dakar 2022" labeling of the **"100 Water and Climate Projects for Africa"** project incubation initiative.

INBO also actively participated in its partners' activities, including: High Level International Conference on the International Decade of Action "Water for Sustainable Development", 2018-2028 (Dushanbe, June 6-9); Joint meeting of the Working Groups on Integrated Water Resources Management (IWRM) and on Monitoring and Assessment, marking the 30th anniversary of the Water Convention (Tallinn, Estonia, June 28-30); IWA World Congress under the theme "Water for smart and liveable cities" (Copenhagen, September 13-14); OECD Water Governance Initiative (the Hague, September 19-20); Groundwater Summit 2022, where INBO contributed to the Data and Information Session (Paris, December 7-8), etc.

Publications. INBO Activity report 2019-2021 (March); new issue of the INBO Newsletter covering the themes of governance, financing, knowledge, and planning (No. 29, January 2022); and, the IWA-INBO Handbook on Basin-connected Cities, which is designed to inform, influence and encourage urban stakeholders to take an active role in protecting and investing in water, together with basin and catchment organizations (March).

Source: INBO, www.inbo-news.org/en, INBO Newsletter No. 30

The Eastern Europe, Caucasus, and Central Asia Network of Water Management Organizations (EECCA NWO)

EECCA NWO is one of the seven regional networks of INBO. It was established in 2008 to exchange views, experiences, and information on various aspects of water management activity.

The Network is administered by SIC ICWC, and Network's activities are coordinated with those of INBO.

In 2022, two roundtables were held under umbrella of EECCA NWO: (1) "Science and innovation technologies for water security" (April 26, online); (2) "Following the path of Professor V.A. Dukhovniy" (August 16, online). The both roundtables were devoted to the memory of Prof. Viktor Dukhovniy.

Among big events organized by members of the Network were the following: International Conference "Dnestr transboundary basin management and European integration – step by step" (Chisinau, Moldova, October 27-28); XI All-Russian Science-to-Practice Conference "Siberian and Far Eastern rivers: Preservation of riverine ecosystems in the era of global transformations" (Khabarovsk, RF, November 17-18).

The information on the activities of the Network and its members is disseminated via the special website (http://www.eecca-water.net/index.php?lang=english), as well as the social media (https://www.facebook.com/eecca.nwo and https://www.linkedin.com/groups/9023073/).

The Central Asia Expert Platform on Water Security, Sustainable Development, and Future Studies developed in early 2021, continued to be maintained in 2022 and many assessments and research efforts were conducted as part of the Platform.

Source: EECCA NWO Secretariat

7.6. International Water Management Institute

International Water Management Institute (IWMI) is a research-for-development (R4D) organization, with headquarters in Colombo, Sri-Lanka, offices in 13 countries and a global network of scientists operating in more than 30 countries. IWMI is a Research Center of CGIAR, the global research partnership for a food-secure future. IWMI's Vision reflected in its Strategy 2019-2023 is "a water-secure world". IWMI leads the CGIAR Research Program on Water, Land and Ecosystems.

IWMI
International Water Management Institute

Activities in 2022

IWMI continued to engage in the transition to One CGIAR. The formulation of One CGIAR'S portfolio of new research initiatives has strengthened collaboration and coordination among CGIAR centers. IWMI is closely involved in 32 initiative design teams across five impact areas that will support CGIAR to transform food, land and water systems.

New big projects. Built Water Storage in South Asia (2022-2025, Bangladesh, Bhutan, India, Sri Lanka, Nepal, Pakistan/US Department of State); Securing the food systems of Asian Mega-Deltas for climate and livelihood resilience, AMD (2022-2024, Bangladesh, Cambodia, VietNam/CGIAR); Resilient Aquatic Food Systems for Healthy People and Planet (2022-2024, Bangladesh, Ghana, India, Kenya, Cambodia, Myanmar, Malawi, Nigeria, Solomon Islands, Timor-Leste, Zambia/CGIAR).

Research projects involving Central Asian countries: H2020: Hydropower For You (2021-2026, Central Asia/EU), From Fragility to Resilience in Central and West Asia and North Africa (2022-2025, Egypt, Sri Lanka, Uzbekistan/CGIAR Trust Fund), NEXUS Gains: Realizing Multiple Benefits Across Water, Energy, Food and Ecosystems (Forests, Biodiversity) (2022-2024, Ethiopia, India, Nepal, Pakistan, Uzbekistan, South Africa/CGIAR), Improving and Strengthening Water Security and Watershed Management in Central Asia – Water Governance Specialists Component (2022-2023, Central Asia/United States Forest Services).

A number of projects were completed in 2022: Assessment of Transboundary Water and Land Resources in the Amu Darya Basin (2019-2022, Uzbekistan and Tajikistan/ EU-ISTC), Increasing water use efficiency in the Aral Sea region (2021-2022, Kazakhstan, Uzbekistan/GIZ), Implementation and conducting of Trainings on water efficiency technologies by cotton production in Uzbekistan (2021-2022, Uzbekistan/ BMZ).

Work with partners. To strengthen the response to pressing challenges, IWMI launched a year-long Transformative Futures for Water Security (TFWS) initiative – A Multi-Stakeholder Dialogue on Science-Based Action for Water Security – Beyond Business as Usual. The TFWS initiative is building partnerships and coalitions among the policy, business, development, practitioner, and science communities, balancing voices from the Global South and Global North in order to focus and strengthen the science base for action on water security. The centerpiece of the TFWS initiative was a series of regional multi-stakeholder dialogues that culminated in the final conference in January 2023.

Awards. Two researchers Sidra Khalid and Najeeb Ullah won the special prize at the 2022 Transformative Research Challenge (TRC), hosted by the World Food Forum, for their research pitch on 'Transforming nutritional practices and livelihoods through improved fish farming in Pakistan' under the TRC category, Better Life.

IWMI's Dr Lisa-Maria Rebelo at the International Water Management Institute in Sri Lanka is the recipient of the 2022 Derek Tribe Award. She received the award in recognition of her work across the African continent, and in South and Southeast Asia, in water productivity, remote sensing, natural resource management, wetland monitoring and assessment, basin water accounting and water productivity.

Publications. IWMI Research Reports 181-183, Water reuse in the Middle East and North Africa: a sourcebook, Water-energy-food nexus narratives and resource securities: a global south perspective, Groundwater for Sustainable Livelihoods and Equitable Growth, Change in global freshwater storage.

Source: https://www.iwmi.cgiar.org/

7.7. Stockholm International Water Institute and World Water Week

The Stockholm International Water Institute (SIWI) is a Swedish not-for-profit Foundation. The SIWI's vision is a Water Wise World – a world that recognizes the value of water and ensures that it is inclusively shared and used sustainably, equitably, and efficiently for all.

At SIWI, they believe that the best way to tackle water crises and help bring about lasting change – is to strengthen water governance among public and private actors alike. SIWI focuses on priority areas including transboundary water cooperation, international policy, WASH, and water governance and streamlines three cross cutting issues – gender equality, youth empowerment, and human rights-based approaches – throughout all programming. SIWI hosts the world's premier annual water meeting and water dialogue platform, the World Water Week and awards the prestigious Stockholm Water Prize and the Stockholm Junior Water Prize. As a trusted convener, SIWI is the host and driver of important initiatives such as the UNESCO Category II's International Centre for Water Cooperation and the Shared Waters Partnership (SWP), hosted by SIWI's Transboundary Water Cooperation Department.

World Water Week

World Water Week 2022, held onsite and virtually from August 23-September 1, was a truly global event that brought the international community together to work towards a more water-wise world. Many of the world's greatest challenges are inextricably linked to water, its use and management. Water-related solutions are thus key to delivering the sustainable development goals by 2030.

World Water Week is the leading annual conference on water, a meeting place for our ever growing and inclusive community of changemakers, working together to accelerate the change needed to develop water-related solutions that can simultaneously tackle the water, climate, food, biodiversity and energy crises.

Thanks to the generosity of the 490 session organizers, almost all the 248 sessions and other content were made available online for free. A record 5404 participants from 160 countries participated, demonstrating not only the great concern for the world's water, but also a determination to change things for the better. Read the detailed report on outcomes and important actions here.

Activities in Central Asia and Afghanistan in 2022

Programs. SIWI's Shared Water Partnership program engaged in several key activities in Central Asia and Afghanistan supporting targeted capacity development and experience exchanges, and networking opportunities to elevate regional water cooperation.

SIWI, in partnership with the Office of the Co-ordinator of OSCE Economic and Environmental Activities (OCEEA) and the CAREC, continued the "Women in Water Management Central Asia and Afghanistan" network launched in September 2021 as a part of the OSCE project Women, Water Management and Conflict Prevention – Phase II. Through the Network, women water experts from Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan engage in joint capacity development, experience and knowledge exchange, and skills building activities. Through their work, participants of the Network highlight the value of inclusivity and the need for women water experts to achieve sustainable regional water cooperation.

Events. The following events were held: (1) Closed webinars on Water Security and project management (February), Central Asia and the Global Climate Change Agenda (March), "Water Diplomacy, regional and transboundary cooperation and Negotiation skills" for the Women in Water Management Central Asia and Afghanistan Network (April); (2) The Women in Water Management Network in Central Asia and Afghanistan Workshop on the sidelines of the Dushanbe Water Process. This was the first in-person meeting of the Women in Water Management Network in Central Asia and Afghanistan (June); (3) The Women Water Management Network in Central Asia and Afghanistan participated in the "Women in Water Diplomacy Network Forum" at the 2022 World Water Week (August).

Source: SIWI, https://www.siwi.org

7.8. World Water Council

The World Water Council (WWC) is an international multi-stakeholder platform. It was established in 1996 on the initiative of renowned water specialists and international organizations, in response to an increasing concern about world water issues from the global community.

The World Water Council catalyzes collective action during and in between each World Water Forum – the world's largest event on water. Organized every three years with a host country, the Forum provides a unique platform where the water community and key decision makers can collaborate and make long-term progress on global water challenges.

9th World Water Forum "Water Security for Peace and Development"

The 9th WWF, held in Dakar, Senegal, 21-27 March 2022, was the first of its kind hosted in sub-Saharan Africa. It gathered representatives from 94 countries and 8000 participants who travelled to Africa. This event focused on four priorities, namely: 1-Water security and sanitation, 2-Water for rural development, 3-Cooperation and 4-Means and Tools, including the crucial issues of financing, governance, knowledge management and innovation; four axes that constitute priorities for Africa and also for the world as a whole.

216 sessions and high-level panels were held during five days. During the Forum week, a total of 90 Ordinary Thematic Sessions (OTS), 33 High-level Panels (HLP), 62 Special Sessions (SS) and 46 Side Events (SE) were presented. More than 80 meetings were led or organized by WWC members and Task forces.

There was also an Exhibition Hall, a Village of Solutions, a Village of Sanitation, and a special place for youth conferences. The Head of States meeting under the auspices of President Macky Sall took place as part of the political segment. For the first time in the history of the WWF, a high-level political segment was entirely dedicated to basins. This segment on basins received all the political attention, with the presence of several key personalities. Finally, the Dakar Action Plan for basins (see also International Network of Basin Organizations above) was adopted.

The 9th World Water Forum ended with a declaration called "Blue Deal" for water security and sanitation for peace and development or the Dakar Declaration. The aim is to accelerate the implementation of the right to drinking water and sanitation for all. The declaration also emphasizes the need to mobilize all stakeholders through integrated and inclusive strategies. The declaration also stresses the importance of strengthening the protection of wetlands and encourage the conservation of traditional water systems as well as recycling and reuse of treated wastewater.

Activities in 2022

Events. The World Water Council took an active part in a number of important events in the course of the year. Among them were: the second edition of Eaumega, UNESCO's international conference on "Water, Megacities and Global Change" (January 11-14, virtual); the 3rd edition of the Brazil Water Week (May 23-27, virtual); 27th World Congress on Large Dams – ICOLD (May 27-June 3, Marseille, France); 2nd High-Level International Conference on the International Decade for Action "Water for Sustainable Development" 2018-2028 (June 6-9, Dushanbe, Tajikistan); Cairo Water Week (October 16 -19, Egypt); UN Summit on Groundwater (December 6-8, Paris).

In 2022, the World Water Council held its 9th General Assembly (December 10-11). A new Board of Governors was elected for 2023-2025 with a mandate to strengthen the political dimension of the three-year strategy and to prepare, together with Indonesia, the 10th World Water Forum (to be held in 2024 in Bali), focused on concrete innovations.

In December, on the margins of the General Assembly and the UNESCO Summit on Groundwater, WWC had several bilateral talks with: Mrs Audrey Azoulay, Director General of UNESCO; the Chinese delegation; Mr. Mohamed Abdel Vetah, High Commissioner of the Organisation pour la Mise en Valeur du Fleuve Sénégal; the Japanese delegation; and, the Korean delegation.

Publications. Blended Finance in the Water Sector (April); Nature Contributing to Water Security? An Investor Guide (June); Water Security for World Health, Annual report 2021 of the World Water Council (edited in July); Quadrennial Report 2022 (December).

Source: Quadrennial Report 2022, https://www.worldwatercouncil.org/en

SECTION 8

Activities of International Partners in Central Asia

8.1. Asian Development Bank

The Asian Development Bank (ADB) has provided technical assistance support and made investments in the water sector in the Central Asia region since its first lending (to Kazakhstan) in 1998. Investments to date, totaling $ 4.4 billion, have included support for flood management, irrigation and drainage, clean water supply, sanitation, hydropower, institutional reforms, and knowledge and capacity building.

ADB has assisted the Central Asia Regional Economic (CAREC) Program for regional cooperation and integration. This partnership of 11[217] countries supported by six multilateral institutions promotes development through cooperation, leading to accelerated growth and poverty reduction. In 2017, CAREC introduced agriculture and water as a key pillar of the CAREC 2030 strategy. In 2020, ADB approved technical assistance (TA) to support the development of the CAREC water pillar, emphasizing economic aspects and sustainable financing of water resources management. The TA project prepared a scoping study in 2020, focusing on five Central Asian republics that largely share the water resources in the Amu Darya and Syr Darya river basins. The report presented the framework of the water pillar, comprising three blocks: (i) climate-resilient and productive systems, (ii) sustainable water resources and water services, and (iii) nexus solutions and cross-sector learning. The TA included preparation of a longlist of potential Water Pillar projects discussed with government agencies, intergovernmental organizations, and other stakeholders at the regional workshop in November 2022.

Projects in Central Asia in 2022

Investment approvals in 2022 included a $150 million loan and $3 million grant for **Uzbekistan**, for climate adaptive water resources management in the Aral Sea Basin. This project is following a long-term, strategic, and knowledge-based approach. It will deliver climate adaptive solutions to water resources management by modernizing irrigation and drainage in selected subprojects within the Amu Darya and (selective reaches of the) Zarafshan River Basins in Uzbekistan.

In addition, ADB is supporting an upstream climate change assessment. This will identify investment projects focused on increasing resilience to climate change impacts to support basin-wide stakeholders in coping with climate stress and dwindling water supply. A combination of top-down and bottom-up approaches is being used through climate risk modeling and stakeholder engagement to better understand the underlying vulnerabilities and barriers to scaling adaptation.

In water supply and sanitation, ADB has provided financing totaling $522 million since 2016 to support infrastructure in Tashkent Province and western Uzbekistan. The latest project in Tashkent Province, a sewerage improvement project ($161 million loan), was declared effective in September 2022. In 2022, ADB approved the Integrated Urban Development Project which will support inclusive, resilient, and sustainable urban infrastructure and services (mainly water supply and sanitation) in four secondary cities (Djizzak, Havast, Khiva, and Yangiyer). It will (i) enhance livability for residents and visitors, including persons with disabilities; (ii) support green and resilient economic recovery targeting women; (iii) accelerate digital transformtion, particularly in the tourism and water sectors; and (iv) increase the quality, coverage, efficiency, and reliability of urban services. All projects include water, sanitation, and hygiene (WASH) components to address the spread of COVID-19.

In **Tajikistan**, the Climate- and Disaster-Resilient Irrigation and Drainage Modernization in the Vakhsh River Basin Project ($30 million grant) became effective in May 2022. The project aims to increase climate and disaster resilience, water productivity, and income for farmers in selected areas of the Yovon irrigation and drainage system. It has a significant focus on gender inclusiveness, recognizing the significant role women play in agriculture and water resources management. It is ADB's first gender equity project in irrigation in the Central Asia region, so Tajikistan will be a leading gender champion in this sector. About 6,700 farmers, of whom 12% are female, and 4,200 homestead (kitchen) gardens, which are mostly managed by women, will benefit from improved water service delivery.

In Dushanbe, the capital city of Tajikistan, ADB has been supporting the government with several investments in water supply and sanitation through the ongoing Dushanbe Water Supply and Sanitation (WSS) Project. Additional financing of $88.43 million for this project was approved in 2022 (consisting of a $79.2 million grant from ADB and $9.2 million from the government). This will improve WSS infrastructure and services for 352,000 people in Shomansur District.

For the **Kyrgyz Republic**, the Landslide Risk Management Sector Project became effective in April 2022. ADB contributed a $23.5 million loan and a $11.5 million grant. This is the bank's first integrated preemptive landslide risk reduction investment to safeguard rural communities in the country. Climate change is expected to increase landslide frequency because of earlier snowmelt, melting permafrost, and more intense precipitation events. This innovative project will embed international best practices and advanced technologies for improved risk reduction and monitoring. It will combine engineering and nature-based solutions with community-based planning and capacity building for sustainable long-term landslide safety.

Source: Asian Development Bank, https://www.adb.org/

[217] Afghanistan, Azerbaijan, Georgia, Kazakhstan, People's Republic of China, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan

8.2. Asian Infrastructure Investment Bank

The Asian Infrastructure Investment Bank (AIIB) is a multilateral development bank with a mission to improve social and economic outcomes in Asia.

Headquartered in Beijing, AIIB began operations in January 2016 with 57 founding Members and by the end of 2020 have grown to 100 approved members worldwide.

AIIB's 2022 Annual Meeting themed "Sustainable Infrastructure Toward a Connected World" was focused on connectivity and regional cooperation, both of which were among AIIB's core thematic priorities (October 26-27).

The Bank has committed to making climate finance 50% of its approved projects by 2025. At COP27, AIIB announced that it has joined the Coalition for Climate Resilient Investment (CCRI), fostering a strategic partnership to apply climate-resilient solutions (November 14). Also, the AIIB Board of Directors has approved an update to the Bank's Energy Sector Strategy (November 22).

Under the updated Strategy, AIIB will focus its energy investments on supporting its Members to achieve their long-term climate goals and net-zero/carbon neutrality commitments and to accelerate the just transition towards secure, affordable, and sustainable energy access for all.

Projects in Central Asia in 2022

AIIB is considering providing funding in the amount of $40 million to 100-MW Shokpar Wind Power Station (total cost: $135 million). The Project will be located in an adjacent plot to the Zhanatas Wind Power Plant (PD000225-PSI-KAZ) in the Sarysu district of Zhambyl Region, Kazakhstan.

The 897MW Solar PV Portfolio (Samarkand, Jizzakh and Sherabad solar PV plants) was proposed for financing ($145 million) in 2022, approved in March 2023.

AIIB approved a $248.4-million loan for the "Bukhara Region Water Supply and Sewerage Project" Phase II (BRWSSP II). The Project Objective is to provide access to safely managed water and sanitation services in the Bukhara Region, Uzbekistan and strengthen the operational performance of the water utility of the region. The $437.6-million first phase was approved in April 2020 and is implemented currently.

Source: www.aiib.org/en/index.html

8.3. European Bank for Reconstruction and Development

The European Bank for Reconstruction and Development (EBRD) was established in 1991. It invests in projects facilitating the transition to open market, as well as the development of business activity. The EBRD work in Central Asian countries on water issues is very broad, including water supply, wastewater treatment, RES, and increased climate resilience.

Projects in Central Asia in 2022

Kazakhstan was among the top three countries, where EBRD operates, in terms of most effective project performance. To date, the cumulative EBRD investments in 306 projects in Kazakhstan amount to €9,755 million. Current portfolio of projects is €2,842 million.

In 2022, EBRD adopted the latest Kazakhstan strategy for 2022-2027 and set the following priorities: fostering private sector competitiveness, connectivity and strengthening economic governance; support Kazakhstan's green pathway to carbon neutrality and climate resilience; promote economic inclusion and gender equality through private sector engagement.

A loan of up to €252 million in KZT equivalent was approved for comprehensive modernization of the existing Almaty Combined Heat and Power Plant 2 ("CHP-2"), with full replacement of coal by natural gas as a primary fuel in order to reduce CO_2 emissions and improve air quality in the Almaty city. Up to KZT 3.3 billion (€6.9 million) were allocated under GrCF2 W2 – Shymkent WWTP Capacity Extension Project to a privately owned utility in the city of Shymkent. The money will be used for the wastewater treatment plant capacity extension and the wastewater network rehabilitation.

In the **Kyrgyz Republic**, EBRD focuses on fostering sustainable growth; enabling SMEs to scale up; promoting the sustainability of public utilities; strengthening the financial sector; and supporting critical infrastructure. To date, the cumulative EBRD investments in 221 projects in the Kyrgyz Republic amount to €879 million. Current portfolio of projects is €173 million.

A number of projects was approved in 2022 for modernization of water supply services in Kyrgyz municipalities, including the Bazar-Korgon Water Sub-Project, Aidarken Water, Kadamzhai Water Sub-Project, Kok-Dzhangak water, and Tash-Komur water.

In **Tajikistan**, EBRD focuses on all sectors, including energy, agribusiness, municipal services, etc.

To date, the cumulative EBRD investments in 157 projects in Tajikistan amount to €899 million. Current portfolio of projects is €513 million.

Thousands of small and microbusinesses across Tajikistan were able to continue their activity and take on board green technologies thanks to a financial package of up to $ 6 million mobilized by EBRD for the country's leading microlending institution, Imon International (Imon). Two other banks – Humo and Arvand Bank – also received financing under the GCF-Green Economy Financing Facility (GEFF) Tajikistan.

In **Turkmenistan**, EBRD focuses on expanding private sector operations in the corporate and financial institutions sectors, targeted policy dialogue and fostering coordination among IFIs and donor organizations.

To date, the cumulative EBRD investments in 87 projects in Turkmenistan amount to €329 million. Current portfolio of projects is €32 million.

EBRD continued its Advice for Small Businesses programme in 2022 in Turkmenistan, e.g., by supporting growth of Turkmen dairy producer.

In **Uzbekistan**, the EBRD's investment areas range from renewable energy to banking. The EBRD has expanded its presence and now operates through a principal office in Tashkent and satellite offices in Andijan and Urgench. To date, the cumulative EBRD investments in 129 projects in Uzbekistan amount to €4,015 million. Current portfolio of projects is €2,335 million.

EBRD continued to invest in renewable energy power generation and low-carbon technologies in Uzbekistan by arranging two syndicated loans worth $520 million to help construct and put into operation two wind power plants with a total installed capacity of 1GW in the Bukhara region. Also, EBRD organized $74 million financing package for Zarafshan wind power plant. The Bank provided $10 million to one of the country's largest private lenders, Ipak Yuli Bank, to improve access to green technologies for local households and SMEs.

Source: www.ebrd.com

8.4. European Union

The European Union's engagement with the region has significantly expanded since the early 1990s. In 2019, the Council adopted a new EU Strategy on Central Asia. The new-generation bilateral Enhanced Partnership and Cooperation Agreements (EPCAs) form a cornerstone of EU engagement.

The 18th EU-Central Asia Ministerial meeting took place in Samarkand (Uzbekistan) on 17 November. During the Ministerial meeting participants confirmed their commitment to strengthen EU-Central Asia cooperation to support a green and sustainable post-COVID-19 recovery. At the first EU-Central Asia Connectivity Conference: Global Gateway held in Samarkand on 18 November the high-level participants affirmed the central contribution that enhanced and sustainable connectivity can make to addressing the challenges presented by climate change, water scarcity, and a growing demand for green energy and recalled their commitment to the full and effective implementation of the Paris Agreement.

EU Regional Environment Programs in Central Asia

EU is currently supporting two regional cooperation programs in Central Asia on environment-related issues: (1) Central Asian Water and Energy Program (**CAWEP**) implemented jointly by EU, WB, Switzerland and UK to promote water and energy security at the regional and national levels (see World Bank); (2) Regional coordination and support to improve the EUCA Platform for Environment and Water Cooperation (see further).

"European Union – Central Asia Water, Environment and Climate Change Cooperation (WECOOP)"

The WECOOP project (third phase from October 2019 to October 2022) aims to enhance environment, climate change and water policies at national levels in Central Asia through approximation to EU standards and to promote investments in relevant sectors with the aim of contributing to measurable reductions in man-made pollution, including CO_2 emission. The project activities include support to the EU-CA Platform for Environment and Water Cooperation and its Working Group on Environment and Climate Change (WGECC), as well as implementation of the EU Green Deal's international dimension in Central Asia to advance climate action.

Activities in 2022

NPD. The National Policy Dialogue (NPD) on IWRM is a platform for discussing the most pressing issues of the integrated use of water resources and for search of agreed solutions. It is implemented within the EU-funded project "European Union Water Initiative National Policy Dialogues (NPDs) in Central Asia" by UNECE in cooperation with OECD as part of the WECOOP. The NPD in Uzbekistan was launched with the First Steering Committee meeting in 2022 (hybrid format, September 27). The participants discussed Uzbekistan's achievements, challenges and priorities related to the water policy and agreed on a way forward for the NPD implementation. In Kazakhstan, the NPD has been operating since 2013. At the 7th NPD meeting, the participants discussed the issues of pro-

tection and use of groundwaters, water and sanitation, pollution (including emergency pollution) in the Syr Darya River, transboundary cooperation, and the results of the work of international partners (Astana, December 14). In Kyrgyzstan and Tajikistan, NPD meetings took place in early 2023: (1) 18th Steering Committee Meeting of the NPD on IWRM, to discuss the national Water Strategy and Water Code developments, economic and financial instruments related to water sector enhancement, cooperation between national stakeholders as well as international partners (Bishkek, February 3); (2) 16th Steering Committee Meeting of the NPD on IWRM, to address progress in implementation of the water sector reform in the Republic and discuss national commitments on the Water Action Agenda (Dushanbe, February 15).

Study-tours. (1) "Integrated environmental permitting and introduction of Best Available Techniques (BAT)" for national experts from the CA countries (Czech Republic, September 19-23); "Sustainable business practices: the Latvian experience" for young entrepreneurs from CA – finalists and winners of the International Green Business School competition (Latvia, September 26-30).

Contests. 6 winners out of 52 participating journalists in the EU contest "Switching to renewable energy sources – our contribution to carbon neutrality" were announced and given the opportunity to participate in the study tour to the Netherlands. The contest was organized with a purpose to increase public awareness on the urgent need to switch to renewable energy sources in order to meet the rapidly growing energy demand and tackle the energy security challenges.

Source: https://ec.europa.eu, https://wecoop.eu

8.5. German Society for International Cooperation

As a globally active federal enterprise for international development cooperation, the German Society for International Cooperation/Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH/ supports the German Federal Government in implementation of its development policy goals. Since the beginning of the 1990s, GIZ has been implementing programs and projects in Central Asia.

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Regional Programs and Projects on Water, Environment, and Development

The project 'Green Central Asia: Transboundary dialogue on climate, environment and security in Central Asia and Afghanistan' (2020-2024) commissioned by Federal Foreign Office supports science-based regional political dialogue on questions of environmental and climate-related security risks. The project operates based on the Regional Action Plan which was approved by all five Central Asian countries; in there, four priority areas for joint action were identified: climate sensitive water and land management, cooperation on international environment instruments and waste management with a focus on e-waste. In 2022, 'Green Central Asia' supported the work of three operational inter-governmental working groups on the elaboration of a regional climate change adaptation strategy, mutually beneficial water-energy mechanism and glacier methodology and monitoring with representatives from Ministries of Foreign Affairs, Water Resources, Environment, Energy, Hydrometeorological Services and others.

The Potsdam Institute for Climate Impact Research (PIK), the Helmholtz Centre Potsdam – German Research Centre for Geosciences (GFZ), the Martin Luther University Halle Wittenberg (MLU) and the German-Kazakhstan University (DKU) provided scientific support and capacity building measures, namely the production of high-resolution climate projection for the entire Central Asia, hydrological modelling, analysis of annual, seasonal flow and extremes (floods and droughts) under climate change (PIK), reservoir, lake, GLOF and natural hazard monitoring (GFZ), drought map tool for drought monitoring and forecasting in the Aral Sea Basin (MLU), elaboration of Policy Briefs for Decision Makers as a "Bridge between Science and Policy" (DKU).

Under the Green Central Asia Initiative, two BMZ-funded Regional Projects operated in all five Central Asian countries. 'Integrative and Climate-sensitive Land Use in Central Asia' (2021-2025) aims at strengthening integrative land use management approaches on national and regional levels with a focus on forestry and pastures and is supporting cross-border cooperation on protected areas and watershed management.

"Climate risk management in Central Asia" (2022-2026) aims at improving transboundary climate and disaster risk management in Central Asia with a focus on developing capacity for transboundary water-related climate risk reduction. Beneficiaries are watershed associations, the regional disaster management center and stakeholders from selected watershed councils.

Under 'Green Central Asia', the new BMZ project **'Climate-sensitive water management in Central Asia'** was developed in 2022, which starts in March 2023.

Other Regional Programs and Projects. The regional project 'Ecologically oriented development in the Aral Sea Region' (ECO ARAL) (2020-2024/BMZ) supports the governments of Kazakhstan and Uzbekistan to ensure ecologically sustainable and climate-resilient economic development in the Aral Sea region across borders. The project supports the public and private sector in identifying and piloting sustainable business activities to showcase and inform about environmen-

tally friendly production and income generation. Local and national administrations and academic institutions are supported in applying GIS as well as in territorial development and investment planning. All activities of the project use sustainable economic growth potentials in the Aral Sea Region to support the population in securing livelihoods and protecting ecosystems.

The global Programme 'Sustainability and Value Added in Agricultural Supply Chains' (Cotton) (2019-2024/BMZ) worked to increase the sustainability in the cotton supply chain by promoting sustainable farming methods, strengthening sustainable capacities for local value addition in the textile sector and fostering global knowledge exchange. The programme worked closely with IWMI to promote water-saving technologies in cotton production in Uzbekistan, as well as to support cotton producers in effective water use.

'Capacity Development for climate policy in the countries of South-East, Eastern Europe, the South Caucasus and Central Asia, Phase III' (2017-2022/ BMWK IKI) focused on benefits of regional cooperation on the energy-water-land nexus transformation in Central Asia and aimed to accelerate dialogue on the barriers and opportunities of cooperation around energy, water and land use in Central Asia. As a direct outcome of the project, the OECD produced a discussion paper containing background analysis on the energy-water-land use nexus in each country of Central Asia and experience of and opportunities for cooperation around the nexus across countries. The discussion paper informed on the preparations for a regional policy dialogue led by the OECD on the benefits of cooperation on the energy-water-land nexus.

Global Programme 'Policy Advice for Climate-Resilient Economic Development' (CRED) (2019-2022/BMU IKI) supported the ministries of economy in Kazakhstan, Georgia and Vietnam in integration of climate risks into their long-term economic and adaptation planning using macro-economic modelling as a tool for assessing the economic impact of climate change and adaptation measures. In Kazakhstan, CRED elaborated the 3.kz macro-economic model which helped to assess GDP and employment effects of improved irrigations systems under different climate change scenarios.

'Technology Based Adaptation to Climate Change in Rural Areas of Tajikistan and Kyrgyzstan' (TCCA-RA) (2019-2023/BMZ and DKTI (German Climate Technology Initiative)) aims at improving the access to digital geospatial data where water is part of it. National spatial data infrastructures are jointly being developed in Tajikistan and Kyrgyzstan. This allows geographical information to be gathered, exchanged, evaluated and applied. In Kyrgyzstan and Tajikistan, the project supported the development of NSDI (National Spatial Data Infrastructure) as a tool for sharing the geospatial data (data with geographic location) between the stakeholders. Data from National Water Information Systems is integrated with Cadastral, DRR and other sectoral information systems. In Tajikistan the project launched an Earth Observation Laboratory to provide a service on monitoring of glaciers, creating the risk profiles, land cover and land use mapping and other remote sensing based studies. Climate related Local Adaptation Plans were developed.

National Projects on Water, Environment, and Development

A number of projects continued its activity in 2021: (1) 'Integrated Rural Development Project' (TRIGGER) (2019-2024/EU, BMZ), supports the Ministry of Energy and Water Resources and the Ministry of Agriculture of the Republic of Tajikistan in implementing a "river to market" approach in selected river basins that are particularly vulnerable to climate change impacts. It provides technical assistance to River Basin Organizations in the field of Integrated Water Resources Management and the Water-Energy-Food-Environment Nexus, improves water access and water use efficiency for small-scale farmers and assists producer groups and village advisors with value chain development support, all with a holistic approach to improve water security and resilience of small-scale farmers' livelihoods and agri-food systems in Tajikistan; (2) "Rural development in Southern Kyrgyzstan" under the Integrated Rural Development Programme (2018-2023/BMZ); (3) "Biodiversity conservation and poverty reduction through community-based management of walnut forests and pastures" (2018-2023/BMZ); (4) Green Economy and Sustainable Private Sector Development in Kyrgyzstan (2020-2023/BMZ).

Source: GIZ Green Central Asia Program, https://www.giz.de

8.6. Organization for Economic Co-operation and Development

The Organization for Economic Co-operation and Development (OECD) is a multidisciplinary intergovernmental organization comprising 38 member countries and provides a unique forum and the analytical capacity to assist governments to compare and exchange policy experiences, and to identify and promote good practices through policy decisions and recommendations.

The OECD is working to help developed and developing countries meet the water challenge. The OECD contributes analyses to improve the information base, identifies good practices, and provides a forum for exchanging country experiences. OECD work on water focusses on the economic and financial dimensions of water management and improving governance.

In addition to analytical work, the OECD works with selected regions and countries to facilitate the reform of water policies. The OECD has enhanced its convening power and capacity to structure discussion among stakeholders on water issues, by setting up international initiatives including the Roundtable on Financing Water, the Water Governance Initiative, and the Network of Economic Regulators. The OECD facilitates the Global Commission on the Economics of Water (GCEW) which was convened by the Government of the Netherlands and launched in May 2022 with the aim of redefining the way water is valued and governed for the common good.

The OECD Council Recommendation on Water captures policy guidance developed by the OECD and can inspire water policy reforms in countries around the globe. Non-member countries are welcome to adhere to the Recommendation with a view to create a momentum for water policy reforms that contribute to water security and sustainable growth. The Recommendation on Water includes high-level policy guidance on topics relevant for water resources management and the delivery of water services including managing water quantity, improving water quality, managing water risks and disasters, ensuring good water governance and ensuring sustainable finance, investment and pricing for the water and water services.

Activities in Eastern Europe, the Caucasus and Central Asia in 2022

In Central Asia, the OECD works with partner countries through its GREEN Action Task Force. The GREEN Action Task Force annual meeting in 2022 was held on June 30-July 1 in Tbilisi, Georgia, with an agenda that reviewed progress with implementation of the programme of work for 2021-22 and a substantive focus on the environmental effects of COVID-19 related recovery measures in the EECCA region, the effects of the Russian invasion of Ukraine on climate and energy policies in the European Union's Eastern Partnership and Central Asian countries and an update on work on the energy-water-land use nexus in Central Asia.

The OECD assists the countries in EECCA in adopting a more integrated approach to water management, applying robust economic and financial analyses and improving multi stakeholder participation. It also helps in identifying and removing some of the key obstacles to effective and efficient water management, while reflecting countries' level of socio-economic development. This work is part of the programme of the European Union Water Initiative (EUWI), for which the OECD is a strategic partner, together with UNECE, and is aimed at improving river basin management and water governance frameworks. National Policy Dialogues are jointly facilitated by the OECD and UNECE and fed by robust analytical work, often lead to practical implementation of policy advice. The OECD focuses on the economic aspects of water resources management (policy coherence, managing water for growth and making the best use of economic instruments for water management), and on the financial sustainability of water supply and sanitation services (strategic and mid-term financial planning and financial support mechanisms to the sector). Work in Eastern Europe and the Caucasus is carried out within the frame of the EU4Environment Water Resources and Environmental Data Programme which the OECD implements in partnership with the Environment Agency Austria (UBA), Austrian Development Agency (ADA), International Office for Water (OiEau) (France) and United Nations Economic Commission for Europe (UNECE).

In Central Asia, recent work has focussed on the analysis of energy, water and food security as part of a new programme of work on "nexus". This work led to the publication of a study on the Benefits of regional cooperation on the energy-water-land use nexus transformation in Central Asia and also included a high-level policy dialogue in Almaty, Kazakhstan on June 16 2022 where Central Asian officials met to discuss the benefits of cooperation towards resource security and to comment on proposals for a new IKI funded programme of work on the energy, water, land-use nexus transformation. This work will be launched in 2023 and the OECD will partner with SIC-ICWC, EBRD, FAO and UNECE on a five-year regional programme.

Source: OECD

8.7. Organization for Security and Co-operation in Europe

The Organization for Security and Co-operation in Europe (OSCE) has a long history in supporting its Central Asian participating States in the area of regional water management, focusing on water governance and support for transboundary water management, training and capacity development, research and development of standards and legislation.

Activities in 2022

The OSCE Program Office in Bishkek (POiB) continued its support to the water resources management in Kyrgyzstan by supporting the activities of the Chu-Talas Water Commission. Technical and expert support was provided to the Commission in collection of surface water sampling and further analysis of water quality in the transboundary Chu-Talas river basin.

OSCE Organization for Security and Co-operation in Europe

The POiB contracted an expert to support the Commission in analysis of sampling data and preparation of a report on the state of water quality in the Chu-Talas river basin. The analytical report with recommendations on improvement of the environmental situation on the river basin was presented in the annual concluding meeting of the Commission held in Bishkek in November. The POiB supported also the representatives from the Government of Kyrgyzstan in participation in the round table on the safety of the Kirov water reservoir (Almaty, March).

The OSCE Program Office in Dushanbe (POiD) in 2022, supported the Second High-level International Conference on the International Decade for Action "Water for Sustainable Development, 2018-2028". It facilitated an exchange visit for the Agency for Land Reclamation and Irrigation (ALRI) and the Tajik National Commission for Irrigation and Drainage (TajNCID) to Uzbekistan for learning from better practices of rehabilitation of pump stations. Furthermore, the POiD organized the Science for Diplomacy workshop targeting young professionals from Tajikistan to facilitate long-term water-related science networks. The POiD, in cooperation with the ALRI, developed three by-laws to the Water Code on Land Reclamation and Irrigation and two by-laws developed in 2022 were approved. The Office, in co-operation with the ALRI facilitated a TajNCID meeting to update members on new and ongoing projects in the irrigation sector, as well as facilitated Women and Water session to learn from experiences and challenges. Further building on 2021 achievements , the POiD facilitated the Ministry of Health and Social protection to conduct a survey on the quality of drinking water supply. The POiD also supported implementation of the National Water Strategy 2030 through an intervention on decentralized energy security in remote areas.

The OSCE Programme Office in Astana (POiA) facilitated the activities of the Chu-Talas Water Commission, with support of national experts, conducted a technical examination of the reservoirs and determined necessary maintenance and repair work for Kirov and Orto-Tokoy water reservoirs in the Kyrgyz Republic. The POiA in co-operation with the OSCE Program Office in Bishkek also supported a working group meeting on environmental protection under the Secretariat of the Intergovernmental Chu-Talas Water Commission, where participants from Kazakhstan and the Kyrgyz Republic discussed the results of laboratory water quality assessments and also reviewed a joint annual report on water quality and the hydrometeorological situation in the Chu and Talas river basins. As part of the POiA's efforts to enhance national legislation in line with good practices in the efficient and sustainable management of water resources, the POiA provided expert assistance in developing a new edition of the national Water Code.

In 2022, the OSCE Centre in Ashgabat (CiA) placed particular focus on strengthening the capacities of state officials from the State Committee of Water Management of Turkmenistan, the Hydrometeorology Service under the Ministry of Agriculture and Environmental Protection, as well as non-governmental organizations on the use of innovative solutions and digital systems for sustainable water management. The participants of a two-day online seminar increased their knowledge about the use of open-source data to improve hydrological water balance modeling and develop a monitoring system to protect freshwater resources in CA from pollution, as well as on satellite remote sensing and its application for the analysis of irrigation efficiency and crop mapping in the Central Asian region (June). The seminar was one of a series of events in the framework of the Centre`s support to the implementation of the Concept of Water Sector Development in Turkmenistan up to 2030 and the promotion of the regional dialogue on sustainable water management.

The Office of the Co-ordinator of OSCE Economic and Environmental Activities (OCEEA) continued to support the participating States to implement their commitment and strengthen dialogue and co-operation in the area of water management. As part of the project "Women, Water Management and Conflict Prevention – Phase II", the OCEEA, in partnership with CAREC and SIWI continued the organization of monthly capacity-building sessions for the Women in Water Management Network in Central Asia and Afghanistan. In June, OSCE Secretary-General Helga Schmid and the Network's members participated in the Second High-level International Conference on the International Decade for Action, 'Water for Sustainable Development,' leading to the UN Water Conference, co-organizing the Women Water Forum and **directly contributing to the Dushanbe Declaration**, 'From Dushanbe 2022 to New York 2023', where women's voices were strongly reflected. The Network also took part in the Women in Water Diplomacy Global Network Forum, on the margins of 2022 Stockholm World Water Week: the first event of its kind brought together women water experts and supporters from the Nile and Central Asia-Afghanistan Networks across Africa, Asia, Europe and North America. During the Session "A Rising Tide: Shared Vision for Women in Water Diplomacy", participants from around the world shared experiences and presented the new Global Strategy 'A Path Forward for Women, Water, Peace and Security' (August 30).

Among other activities, the OCEEA also developed a series of podcasts dedicated to female role models sharing their experience in the water sector in partnership with the **Central Asia Youth for Water Network** (CAY4W).

Source: OSCE

8.8. Swiss Confederation (SDC and SECO)

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

State Secretariat for Economic Affairs SECO

The **Swiss Cooperation Programme for Central Asia** (2022-25) features a special focus on water, infrastructure and climate change, aiming at the Central Asian states that collaborate, use evidence and take concrete steps to manage their water resources with a basin approach in a climate-resilient, sustainable and inclusive way.

The Cooperation Programme is implemented by the two operational arms of Switzerland's International Cooperation, the Swiss Agency for Development and Cooperation (SDC) under the Federal Department of Foreign Affairs and the Swiss State Secretariat for Economic Cooperation (SECO) under the Federal Department of Economic Affairs, Education and Research.

In the Kyrgyz Republic, Tajikistan and Uzbekistan, the Swiss programs focus on supporting the national water sector reforms, water supply and sanitation and disaster risk reduction/climate change adaptation.

In the **Kyrgyz Republic**, Switzerland supports the promotion of IWRM through the National Water Resources Management Project in cooperation with WB. The project assists the Government of the Kyrgyz Republic to implement the Water Code adopted in 2005. In addition to the above mentioned key activity, the project includes a capacity building program that will increase the capacities to manage irrigation more efficiently.

As part of the IWRM approach, Switzerland has also been supporting the urban water supply program funded by SECO. To date, the program has been implemented in 6 major cities of the Kyrgyz Republic, benefitting nearly half of population of the country residing in urban area.

In **Tajikistan**, Switzerland continued its support to the water sector reform in the Tajik Syr Darya Basin and continued its multiple activities in the water supply and sanitation sector. In addition, Switzerland supported the city of Khorog to put in place the institutions, knowledge base and systems required as a precursor to the resilient implementation of infrastructure investments in Khorog as a basis for sustainable economic development.

In **Uzbekistan**, Switzerland supported the Ministry of Water Resources in the development of the Water Sector Development Concept 2020-2030 (Water Concept) and the Road Map to implement its main elements in 2021-2023, which is to serve as a basis for the strategic and regulatory IWRM framework.

In addition to the works in these three focus countries, Switzerland is also active at the transboundary and regional level, including through its program on water and peace, the Blue Peace Central Asia initiative (BPCA), which aims at supporting the countries in reaching a mutual understanding and agreement in terms of regional water resources management. In addition, BPCA has continued the support to the Central Asia Youth for Water network (CAY4W), with the aim of encouraging the emergence of a strong and capacitated young voice for water in Central Asia. BPCA has supported the development of academic modules on water education in the sectors of water policy/diplomacy, WASH and water modeling.

Switzerland further contributes to the Central Asia Water Energy Development Program (CAWEP), a multi-donor trust fund managed by the World Bank (see "World Bank").

New emerging topics are taken into account such as the efficient and sustainable use of transboundary groundwater resources, where Switzerland joins forces with UNESCO on a programme on Governance of Transboundary Aquifers in Central Asia.

Source: Swiss Agency for Development and Cooperation

8.9. United States Agency for International Development

The United States Agency for International Development (USAID) works across the whole Central Asia region to transform water-sharing problems into cooperation that would lead to better and equitable water management.

USAID also supports projects that promote stability, economic prosperity and healthy ecosystems in Central Asia.

Activities in 2022

The USAID Regional Water and Vulnerable Environment activity, with a total budget of $21.5 million, aimed at strengthening regional capacity to manage shared water resources and mitigate environmental risks in the Syr Darya and Amu Darya River basins, has continued.

The following results were achieved: (1) a delivered lecture series on the water-energy-food-environment nexus (WEFE nexus) to enhance an understanding of the WEFE nexus approach and increase its implementation in the region; (2) launched a Community of Practice e-platform for knowledge exchange and network building among water professionals in the region; (3) provided trainings on capacity building to Small Basin Councils (SBCs) of Isfara, Murghab and Padshaata rivers ; (4) established National Intersectoral Committees (NIC) in Kazakhstan, Tajikistan and Uzbekistan uniting all the sectoral ministries within the WEFE nexus project and the Regional Coordinating Committee (RCC) of the NIC. The RCC meets twice a year. Particular attention is paid to the reflection of national interests in the regional agenda of the countries for effective and sustainable transboundary water management; (5) organized an expedition for water professionals, officials and journalists from all countries of Central Asia along the Syr Darya River basin (May 18-30).

Within the framework of the project, about $1.6 million was allocated for the implementation of the second phase of the Environmental Restoration of the Aral Sea activity (ERAS II). ERAS II will focus on planting new forests in the Aral Sea region of Uzbekistan, building on the ongoing first phase, which focuses on the northern part of the Aral Sea in Kazakhstan. Additionally, USAID will promote bilateral cooperation between Kazakhstan and Uzbekistan to advance the restoration of the Aral Sea ecosystem and improve livelihoods in the region.

The USAID Power Central Asia activity was continued with a total budget of $40 million to assist the five Central Asian countries to achieve their national and regional priorities in energy security, regional connectivity and transition to clean technologies. The first Central Asian Energy Forum on "Energy Transition and Innovation" was organized within the project on September 13-15.

Source: www.usaid.gov

8.10. World Bank

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

Activities in 2022

Central Asian Water and Energy Program

The Central Asia Water and Energy Program (CAWEP) continued implementation of its phase III in 2022. CAWEP is a multi-donor trust fund with a total budget of $ 12.9 million financed by the European Union, Switzerland and the United Kingdom. The program development objective is to strengthen the enabling environment to promote water and energy security at regional level and in the beneficiary countries (five Central Asian countries and Afghanistan), aligning with the World Bank's regional engagement framework that aims at strengthening connectivity and increasing the economic value of water and energy resources in the region. The long-term vision of the program is to promote sustainable development and livelihood security within the region.

The activities fall into three thematic pillars: (1) Water Security; (2) Energy Security; and (3) Water-Energy Linkages. CAWEP-funded activities have strong links with the ongoing and pipeline World Bank investment operations and have contributed to the design of more than $720 million worth of World Bank investments through analytical work and technical studies. Ongoing water activities focus on the following key issues: (1) facilitating regional dialogue on water and energy and supporting a process of reforming the IFAS; (2) national water management; (3) improving management of sub-basins with transboundary significance; (4) modernizing irrigated agriculture to improve water productivity with a focus on increased awareness.

Regional dialogue

In cooperation with the Executive Committee of the IFAS, CAWEP hosted a "Central Asia Regional Water Cooperation" Forum (June 6), as an integral part of the Second Dushanbe UN Water Action Decade Conference in Dushanbe. The Forum explored regional and national priority development issues and opportunities relating to water and highlighted the importance of strengthening regional institutions and progressing institutional reforms. Later, CAWEP and EC-IFAS hosted a Regional Preparatory Workshop "Central Asia towards the UN 2023 Water Conference" where country representatives agreed to finalize a draft Joint Statement for the UN Water Conference in New York, summarizing their respective commitments to regional cooperation (Tashkent, September 20).

CAWEP is actively continuing its support to the structured reform process for the IFAS institutions by facilitating Regional Working Group (RWG) meetings. The RWG discussions have five stages: (i) updating IFAS objectives; (ii) identification of gaps; (iii) recommendations for organizational structure; (iv) financing; and (v) required legal framework.

CAWEP's Central Asia Knowledge Network (CAKN) continues to enhance regional knowledge and professional capacity in the areas of water resource management, energy and climate change in the Central Asia region.

The CAKN, in partnership with the Central Asia Regional Environmental Center (CAREC), delivered an online training on Gender and Social Inclusion (GESI) in Transboundary Waters (March 2-3). The training aimed to raise awareness of, promote, and mainstream gender aspects of efficient water resource management in Central Asian countries. At a regional conference on strengthening networking and cooperation among scientific institutes in Central Asia the CAKN presented the CAKN online academy platform (Dushanbe, June 10). The objective of the online academy platform is to convene a broad group of water sector actors including academia, young professionals, development partners, sector practitioners, and think-tanks, from across Central Asia. It allows actors to share international and regional practice as well as experience in teaching water engineering disciplines with a focus on linking education, research, and practice. Along with the courses developed by Central Asian academics in 2021 under the CAKN, the platform offers micro-online courses developed by the Solutions for Water Living Lab project, based on the results of the pilot projects.

National water management

CAWEP, in partnership with the International Water Assessment Centre (IWAC), arranged two international workshops on safer management of water infrastructure in Central Asia for water experts from the Central Asian region. The first workshop shared international best practices in the management of hydraulic structures and their safety, including European methods of water management based on the Slovak practical experience (Bratislava, Slovakia, September 27-29). The second workshop brought together more than 60 technical experts and policy makers to showcase the best global practices of hydraulic structures management, including risk assessment and management, support for the monitoring systems, early warning systems, and the use of information and communication technologies (Almaty, Kazakhstan, November 30).

In water supply and sanitation, stakeholder consultations were conducted in the Kyrgyz Republic to discuss existing construction norms and standards (SNiP) for water supply and wastewater systems (January and March). CAWEP supported participation of international experts to share global best practices. The revised SNiPs propose new water consumption norms, recommend new technologies (including for small-scale wastewater treatment), and revise requirements for water supply and wastewater systems.

In cooperation with the Regional Environmental Center for Central Asia (CAREC) and the EU under 'Central Asian Dialogue on Promoting Intersectoral Financing based on the Water-Energy-Food Relationship' project (Phase II), CAWEP also financed the demonstration project "Treatment of siltation at the Ruslovoe Reservoir of the Tuyamuyun Hydrocomplex' to promote regional water-energy cooperation at facility level. Rapid sedimentation of the Ruslovoye Reservoir is impacting effective operation of the Tuyamuyun Hydroelectric Complex. At the 5th meeting of a Technical Working Group meeting, cost-effective sedimentation removal and technical mitigation measures were discussed, and technical solutions were presented, including for reservoir sludge reuse (Urgench, Uzbekistan, May 11-12). Turkmen and Uzbek specialists discussed these solutions, which could significantly improve hydrocomplex operations. The pilot project is undertaking a cost-benefit analysis and developing a business plan for investors to support implementation of the proposed measures.

In 2022, CAWEP supported several trainings for national hydrometeorological agencies of the five Central Asian countries. The online training course for practitioners and policymakers in energy and hydrometeorology sectors in Central Asia demonstrated how climate data can be used to inform smart, clean energy transitions, and to foster dialogue and partnerships between hydrometeorological agencies and energy service providers (February 21-March 4). CAWEP in collaboration with the German Weather Service (DWD), the World Bank and World Meteorological Organization (WMO) piloted ICON-In-the-Cloud (ICONIC) Numerical Weather Prediction (NWP) on Commercial Cloud Services for Central Asia. High resolution NWP is critical for improved forecasting of meteorological conditions, especially of extreme events. A training for IT and NWP experts from the Central Asian hydrometeorological agencies provided basic insights into the structure and functional scope of the ICON model and its operation (October 12-14). In addition to trainings, CAWEP assessed the needs and capacities of Kazhydromet and Uzhydromet and developed roadmaps to strengthen national hydromet and multi-hazard early warning systems and services to better meet the needs of government, communities, and the business sector.

Sub-basin Water Management

CAWEP is financing a feasibility study and environmental and social impact assessment for the proposed North Aral Sea Development and Revitalization Project. The project will help to restore wetlands and reduce the impacts of windblown salt and dust from the seabed. It would also create conditions for enhancing local livelihoods and provide services and opportunities for the local communities in the Aral Sea and Syr Darya basin in Kazakhstan. The feasibility study and environmental and social impact assessments are at final stages and will be completed by end June 2023.

Irrigation Modernization

In irrigation, CAWEP is supporting a remote sensor-based irrigation assessment of the performance of irrigation and drainage sectors in Central Asia. The activity is also surveying irrigation and drainage service providers (including water user associations) in four Central Asian countries to assess and benchmark their performance. The brief based on the performance assessment will be provided to the governments of Central Asian countries in 2023. For Uzbekistan, CAWEP developed a policy note on how to improve irrigation sector and presented it during the consultations meetings (Tashkent, May).

Source: World Bank, «CAWEP»

SECTION 9

Water Education

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

9.1.1. Kazakhstan

Kazakh National Agrarian Research University

The Kazakh National Agrarian Research University (KazNARU) was founded in 1929. The University includes in its structure the Research Institutes of Water Problems and Land Reclamation and of Agricultural Innovation and Ecology, the Forestry Research Institute, the Institute for Professional Development, the Water, Land and Forest Resources and Agrobiology faculties, the International Research Center (IRC) "Water Hub"[218], the Agrotechnological Hub, and the "Farmers High School". The Dissertation Council on 8D086 – "Water resources and water use" (specialization 6D080500 – "Water resources and water use"; Educational program 8D08603 – "IT-technology based water management") functions at the University as well.

Major Events and Activities in 2022

Research. Ongoing projects: (1) "Selection of non-traditional crops for intensive use of irrigated land and creation of a green conveyor depending on bioclimatic potential of cultivation zones" (2021-2023); (2) "Development of technology for rehabilitation of anthropogenically degraded drift sand of desert pastures in the Southern Balkhash region"(2021-2023); (3) "Evaluating the effectiveness of various land cover/use systems to mitigate climate change by reducing greenhouse gas emissions and increasing albedo" (2021-2023); (4) "The effects of excessive water use and agricultural intensification on the Aral Sea shrinkage: SES dynamics within the Syr Darya River basin"[219] (2021-2023, PEER, USAID); (5) "Interdependent dynamics of food, energy and water in Kazakhstan and Mongolia (FEWKZMG): connecting LULCC to the transitional socioecological systems"[220].

The "Water Hub" carries out research[221] on: "Development of principles and methods of balanced water distribution in irrigation systems based on hydrological information and water formation in river basins"; "Development and optimization of energy-efficient reclamation technologies for soil management in irrigated agro-landscapes in Kazakhstan". Research is also conducted jointly with: (1) Ahmedsafin Institute of Hydrogeology and Environmental Geoscience on groundwater, which is a strategic resource for water security; (2) RSE "Kazhydromet" on climate change and its impact on water resources; (3) Institute of Geography and Water Security on the reduction of water scarcity in the country; (4) KazSRIWE within the framework of the KMA's[222] research and development program "Irrigation technologies and techniques for development of new irrigation and reconstruction and modernization of existing irrigation systems": a demonstration polygon was opened with modern seepage prevention technologies and water meters on canals (Saymasay village, Almaty province).

Capacity building. The following events were organized: (1) training and presentation of the Model UN Program and the UN Academic Impact Program (February 23); (2) 14th Republican Olympiad for students specializing in "Water resources and water use" under "Hydraulics" and "Hydrology" disciplines (April 28-29).

Events. The 2nd international interdisciplinary scientific conference "Digitalization and sustainability for development management: economic, social and environmental aspects" (September 15) and a roundtable for discussion of the draft Concept of the Water Code of the Republic of Kazakhstan (December 2).

KazNARU took part in: (1) the international workshop "Modernization of curriculum towards the UN SDGs for Central Asian universities" on topics "Climate action" and "Sustainable cities and communities" (June 13-18, Bishkek); (2) International scientific conference "Construction Mechanics, Hydraulics and Water Resources Engineering" (CONMECHYDRO 2022) (August 23-24, NRU TIIAME).

Achievements and awards. According to the international rating "QS World University Rankings" (QS WUR 2023), KazNARU took 443rd place among 1,500 universities.

Publications. Scientific journal "Research. Findings", Almaty 2022, on https://journal.kaznaru.edu.kz/index.php/research/index.

Source: www.kaznaru.edu.kz/?lang=ru, "Water Hub"

[218] established in 2017. The mission is to search for and transfer the best innovative technologies, new knowledge, adapt them to local conditions, and consolidate efforts of all water researchers in Kazakhstan and Central Asia for effective water management. The IRC "Water Hub" includes the "Water resources and land reclamation" Department, 14 research laboratories, Kazakh-American Center "Smart Water", Research Institute for Water Problems and International Water Cooperation, and the Institute for Advanced Training of Hydraulic Engineers

[219] jointly with the University of Michigan and the University of South Dakota

[220] jointly with the University of Michigan, the Humanities University of Mongolia and the Mongolian Academy of Sciences

[221] within the framework of program-targeted financing "Irrigation technologies and techniques for development of new irrigation and reconstruction and modernization of existing irrigation systems"

[222] Kazakh Ministry of Agriculture

German-Kazakh University

The German-Kazakh University (GKU) was founded in 1999 with the aim of training students in line with the German standards. GKU has been the only German university in Kazakhstan and Central Asia up to present time. The World Politics Faculty of GKU has developed and carries out the training program "Integrated Water Resources Management"[223]; the Economics and Business Faculty holds the "Strategic Management of Renewable Energy and Energy Efficiency" Program. Within GKU, the Center for Natural Resources and Sustainability (CNRS) was established and received the status of the UNESCO Chair for Water Resources Management in Central Asia; GKU offers the Central Asia Youth for Water Network (CAY4W) and the Central Asian Journal of Water Research/CAJWR[224]. Since 2022, the Central Asian Journal of Sustainability and Climate Research/CAJSCR has being published.

Major Events and Activities in 2022

Research. CNRS jointly with (1) UNESCO published "Sustainable Water Governance in Asia and the Pacific: UNESCO sites for water security towards the 2030 Agenda"; (2) WB contributed to the country report "Climate and development in Kazakhstan", including analysis of political, socio-economic and environmental conditions, current and projected status of climate change, as well as its impact on water resources, cropland and pastures in regional and sectoral dimensions.

The colloquium was organized for graduate students working in examining water resources, climate, energy, resource-efficient production logistics, and agriculture.

Within the framework of the OSCE project "Empowering young Central Asian women in the energy transition", the first version of the policy brief "Barriers and opportunities for Central Asian women in the energy sector" was prepared based on the results of surveys of students and energy professionals, who participated in roundtables in Kyrgyzstan (April 5, Bishkek), Uzbekistan (April 28, Tashkent), and Kazakhstan (July 14, Astana).

Capacity building. The following events were organized: (1) Central Asia training course "Weather and climate services for energy sector" for experts involved in the development of relevant policies and measures, energy companies, meteorological organizations, NGOs and scientists in CA (February 21-March 4); (2) student's contest on "Sustainable Development Goals in Central Asia" (February-June) and its final stage (October 3); (3) national training "Water-energy-food-ecosystems nexus assessment"[225] for civil servants of the Republic of Kazakhstan (April 28-29, Almaty), Kyrgyz Republic (June 2-3, Bishkek), Tajikistan (May 26-27, Dushanbe), and Uzbekistan (June 16-17, Tashkent) and a regional seminar (October 27, online); (4) roundtable and educational trip "Renewable Energy Trip 2022" to study best practices on RES use (June 20-26); (5) roundtable and study trip to the RES polygon[226] (July 14, Nur-Sultan); (6) seminars "City of Active Citizens" (March 18) and Water Day (November 11), first presentation of the "Ecologization of educational institutions (schools and universities)" Manual and training "First steps towards ecological living" (November 14)[227].

Additionally, the following trainings were held: (1) online course "Modern thermal power engineering - international trends and challenges for Kazakhstan" including 14 webinars (May 17-June 15); (2) CAWa Summer School "Integrating scientific knowledge of water and land management into decision making support in Central Asia" (July 11-20) and a roundtable "Global food security on a global scale" (July 19), "Central Asia Sustainable Development Program" (August 15-20, GKU), Aral Sea Summer School (August 22-September 1). The International School of Green Business #EcoTalk2022 was active in 2022. The Kazakhstan ClimAccelerator is implemented in partnership with EIT Climate-KIC since the beginning of 2022. It aims to mentor young entrepreneurs of Central Asia, providing an opportunity to 'accelerate' their working eco start-ups and open it up for investors.

With the support of the "Green education and science for Central Asia" project, CNRS staff had research internship at the Potsdam Institute for Climate Impact Research (PIK).

Events. The online conference "Silk Road of Knowledge: science meets green policy" held on February 23-25 included 7 thematic sessions and 2 pre-sessions. These resulted in seven policy briefs.

The following events were organized: (1) public lectures as part of the "Environmental human rights and culture" project (September 15; October 31; and December 2); (2) a series "Tomorrow was too late" (June 4; September 9; and October 13); (3) "Green school" eco-festival dedicated to solving environmental problems in Kazakhstan (November 6); (4) children's art exhibition "Tomorrow was too late. Almaty glaciers: clean water and mountains" (December 10).

Achievements and awards. GKU programs have been ranked at the top of the Atameken-Rankings for 2022: Logistics – 1st place out of 13; Marketing – 1st place out of 14; International Relations – 1st place out of 21; Finance – 4th place out of 65.

[223] in 2022, the leading German accreditation, certification and quality assurance institute AQOUIN in Bayreuth awarded the program a quality certificate

[224] indexed in DOAJ, EBSCO, IndexCopernicus, RSCI, Cite Factor and Google Scholar and included in the list of recommended publications by the Ministry of Education and Science of RK (Order No. 623 of July 29, 2021)

[225] under the project "Training for Government Officials from Central Asia on Water-Energy-Food-Ecosystems Nexus" supported by the USAID Regional Water and Vulnerable Environment Activity

[226] within the framework of the "Empowering young Central Asian women in the energy transition" project

[227] under the "Involvement of youth in solving environmental problems in Almaty" project implemented by GKU with the support of the Eurasia Foundation in RK

Publications. For CAJWR publications, visit https://water-ca.org/issues; for CAJSCR publications, visit https://cajscr.com/. For collections and selected publications, visit https://dku.kz/ru/content/view/?slug=nauchnyye-publikatsii-dku&tab=2.

Source: GKU, https://dku.kz/en, www.crs.dku.kz/ru/

Nazarbayev University

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

Major Events and Activities in 2022

Research. The NU Office of Sustainable Development in cooperation with the "National Conservation Initiative" Corporate Fund and with the support of Chevron company continues the Sustainability Living Lab Program to support students' green research and innovation projects in water conservation, energy, etc.

Events. NU hosted: (1) NU GSPP Conference "Public policy and good governance in a changing world", including 6 panels, with panel 4 on "Environmental Sustainability" (June 7); (2) seminar "UN's role in supporting Kazakhstan's development priorities (September 20); (3) international workshop "Resource studies and sustainable development in Central Asia" jointly with Akita University (Japan) (September 22); (4) "Water resources policy and management" program for students of "AUA-NU Overseas Program 2022" (October 5-December 7, online); (5) international educational conference "Climate Talks", organized by UNDP jointly with the NU Office of Sustainable Development, MEGNR and "National Conservation Initiative" Corporate Fund (December 7-8, NU); (6) Seminar "Innovations. Youth. Clean and Green Energy" (December 22).

NU took part in the: (1) 2022 IRENA Youth Forum[228] "Youth-led solutions to accelerate the energy transition" (January 13, online); (2) session "Water resources and water security in Central Asia" (February 24, Almaty) on the sidelines of the "Silk Road of knowledge: science meets green policy" Conference (February 22-25, online); (3) 14th International Conference on geostatistics for environmental applications (geoENV2022)[229] (June 22-24, Parma, Italy). The SDSN Kazakhstan Secretariat took part in the 2nd research conference of the CAREC Institute "Resilience and economic growth in times of high uncertainty in CAREC region" (April 11-12, online) and a seminar on clean energy policy and innovation (November 30, Almaty).

Cooperation. NU has become a partner with the Columbia University Earth Engineering Center's Global Waste-to-Energy Research and Technology Council. GSPP officially launched: (1) Sustainable Development Solutions Network[230] – SDSN Kazakhstan (June 8); (2) SDSN Youth Kazakhstan was inaugurated, where students were involved in discussion of projects in the field of sustainable development, youth capacity building in innovations related to water and land resource management, etc. (October 7). SDSN Kazakhstan, NU, FAO Kazakhstan and JLU Giessen University discussed potential collaboration steps on joint research on sustainable development in Kazakhstan (September 15).

Achievements and awards. NU is the only HEI included in the prestigious Center for World University Rankings (CWUR 2022-2023): 1765th place in the TOP 2,000 among 19,800 universities in the world. NU also received the Scopus Award in Research Excellence nomination, while eight NU scholars received awards for scientific achievements.

NU achievements and future endeavors are available on https://nu.edu.kz/news/nazarbaev-universitet-itogi-za-12-let-i-zadachi-na-budushchee

Source: Nazarbayev University, https://nu.edu.kz/ru/, https://nu.edu.kz/media/RUS-Brochure-14.04.22-RUS.YAZ.pdf

Non-profit joint-stock company "Al-Farabi Kazakh National University"

The non-profit joint-stock company "Al-Farabi Kazakh National University" (Al-Farabi KazNU) is the leading multidisciplinary institution of higher education[231] in the country. The multilevel system of education includes higher basic education, master's and doctoral studies program. The University has 16 faculties, 29 research institutes and Centers of natural-scientific and technical, social-humanitarian profiles. University branches have been opened in Bishkek and Istanbul.

Training in water is offered by the Geography and Nature Management Faculty, Meteorology and Hydrology Department. The Faculty opened "Geoinformation Cartography" discipline, first in the country. The Faculty also includes: (1) UNESCO Chair for Sustainable Development; (2) Center for Geographical Research and Additional Professional Education; (3) Center for Digital Cartography and Applied Geodesy; (4) COMSATS Centre for Climate and Sustainability. The University has a Center for Remote Sensing, which has capacities to conduct ground-space monitoring of water resources. The Al-Farabi KazNU was granted the status of a research university by the Resolution of the Government of the Republic of Kazakhstan No.516 of July 25, 2022.

[228] IRENA is an intergovernmental organization that supports countries in their transition to the sustainable energy future and serves as the main platform for international cooperation, https://www.irena.org/

[229] leading interdisciplinary conference where scientists from around the world share their experience in applying geostatistics to environmental problems

[230] Global network of knowledge-generating institutions advancing the SDGs, https://www.unsdsn.org/join-the-sdsn?gclid=CjwKCAjwybyJBhBwEiwAvz4G7wwjjv56_JPwUFzZDHyEObEzkndRfFdWze6n35YMe_KKKL3rbUF7MhoCf3AQAvD_BwE

[231] Resolution of the Government of the Republic of Kazakhstan No516 of July 25, 2022

Major Events and Activities in 2022

Research. Al-Farabi KazNU continues to lead the Global Hub of the UN Academic Impact (UNAI) Program on sustainable development, which plays an important role in achieving the goals of the national project "Zhasyl Kazakhstan"[232]. The Green Technology Center functions at the University and demonstrates innovative projects in the field of green energy. The French-Kazakh Center "Geo-Energy" of the University conducts research on climate change. The UNESCO Chair for Sustainable Development is focused on education and science projects aimed at implementing green initiatives for energy and resource saving, incl. rational use of water resources, RES and environmental protection.

Capacity building. In 2022, the 14th Republican student Olympiad on discipline 5B060800 "Ecology" (April 20-21) and the 9th international student forum "Green bridge through generations" dedicated to the 30th anniversary of Kazakhstan's accession to the UN (April 21-22) took place.

Events. The workshop "Impactful research towards the 2030 Agenda" featured a presentation on ongoing research and development on SDG implementation (June 8, New York, USA). Al-Farabi KazNU took part in the international conference dedicated to the 30th anniversary of the UNESCO UNITWIN/Chairs Program on "Transforming knowledge for fair and sustainable future" (November 3, Paris, France).

The following events were held: roundtable "Implementation of Sustainable Development Goals: challenges and opportunities" (April 7) on the sidelines of the 1st International Al-Farabi Forum (April 4-15), international scientific and practical conferences "Integration for life" (September 22) and "Environmental Code of the Republic of Kazakhstan and challenges of its enforcement" (October 31).

Achievements and awards. Al-Farabi KazNU (1) was recognized as the first and best university among universities in Kazakhstan, Russia, Kyrgyzstan, Belarus, Ukraine, Azerbaijan and Moldova by the IAAR Eurasian University Ranking (IAAR EUR 2022)[233]; (2) took the 150th place in the QS World University Rankings (QS WUR 2023); (3) was ranked 1,001-1,200 among 1,799 universities in the Times Higher Education (THE) WUR-2023; (4) took the 44th place among 760 universities in the QS Asia University Rankings 2023 and 1st place among CA universities.

By the Decree of the President of Kazakhstan, Rector of Al-Farabi KazNU, Zhanseit Tuymebayev was awarded the Barys II Order. The awards of the students of the Meteorology and Hydrology Department are available on https://www.kaznu.kz/ru/7451/page/; UNESCO, visit https://www.kaznu.kz/ru/20210/news/.

Publications. The list of publications for 2022 is available on https://bulletin-geography.kaznu.kz/index.php/1-geo/issue/archive, https://pps.kaznu.kz/kz/Main/ChairPublications/101/3/0/2022, https://pps.kaznu.kz/ru/Main/ChairPublications/131/1/0/2022, https://pps.kaznu.kz/kz/Main/ChairPublications/131/3/0/2022, https://www.kaznu.kz/ru/22319/page/

Source: https://www.kaznu.kz/ru/

Taraz Regional University named after M.Kh. Dulati

The Taraz Regional University named after M.Kh. Dulati (TarRU)[234] was established by the Order of the Kazakh President No.752 of October 11, 2019 and on the basis of the order of the Ministry of Finance of the Republic of Kazakhstan No.346 of June 3, 2020. Specialists for water sector are prepared at the Institute of Water Management and Environmental Engineering[235]. The Institute has 11 departments, including for Land Reclamation and Agronomy; Water Resources; Ecology; Life Safety. There is the Dissertation Council for the award of the Degree of Doctor of Philosophy (PhD) in the following disciplines: (1) 8D074 – Water management (6D074400 – "Hydrotechnical construction and structure"); (2) 8D086 – Water Resources and water use (6D081000 – "Land reclamation, re-cultivation and protection").

Major Events and Activities in 2022

Events. The following events were held: (1) extended meeting of the Training and Methodological Association on "Water Management" (May 4); (2) job fair "Young Professionals-2022" (May 12); (3) meeting of the Advisor to the Minister of Ecology, Geology and Natural Resources (Kazakhstan) and the Rector of TarRU, where they discussed water sector professional development, allocation of grants for training, involvement of water experts in the educational process, joint participation in research projects of experts from the University, KazSRIWE research institute and RSE Kazvodkhoz enterprise (June 15).

Source: https://dulaty.kz/ru/

South Kazakhstan State University named after M. Auezov

The South Kazakhstan State University named after M. Auezov (SKSU) is a state multidisciplinary higher education institution. The University is comprised of 9

[232] Al-Farabi KazNU's green initiatives focused on goals of the national project "Zhasyl Kazakhstan" are reflected in the international rating "UI Green Metric": KazNU took the 212th place among 956 universities in the world in 2021

[233] Independent Agency for Accreditation and Rating (IAAR)

[234] Zhambyl Hydromelioration and Construction Institute celebrated its 60th anniversary in 2022

[235] The Institute of Water Management and Environmental Engineering was created as a result of combining both Institute of Water Management, Ecology and Construction and the Oil and Gas Engineering faculty in the 2021-2022 academic year

faculties, Distance Learning Institute, five higher schools and a college. The Agrarian faculty has 9 departments, including "Water resources and water use" and "Water supply, sewage and water protection". At SKSU, the New Climate Economy Center named after Rae Kwon Chung[236] was opened. It will focus on the introduction of new model of economic development and green technologies, as well as mitigation of climate change impacts on agriculture (October 31).

Capacity building. The International Winter School, Auezov University-2022 "Innovative solutions in modern energy" was held online from February 21 to March 4.

Achievements and awards. The University ratings are as follows: (1) ranked 481 among 1,500 universities in the QS World University Rankings (QS WUR 2023); (2) 177th place among 757 universities in the QS Asia Ranking 2023; (3) 260th place among 1,050 universities in the UI GreenMetric.

Source: https://auezov.edu.kz/kaz/

Source: https://green.auezov.edu.kz/ru/component/sppagebuilder/?view=page&id=443

9.1.2. Kyrgyz Republic

American University of Central Asia

The American University of Central Asia (AUCA) founded in 1993 is the first university in Central Asia to offer US accredited degrees in liberal arts programs through a partnership with the Bard College in the US. AUCA cooperates with many universities and organizations all around the world. Its curriculum includes the Preparatory Program (New Generation Academy), 15 undergraduate majors and 10 graduate degree programs. AUCA also includes the Technical School of Innovation, which offers seven disciplines, in particular, Ecology and Energy Efficiency, the Tian Shan Policy Center (TSPC) and the Center for Environment and Development (CED).

Major Events and Activities in 2022

Research. The International Science and Technology Center is implementing the regional project "Assessment of water and land resources in small transboundary tributaries of Amu Darya River basin using Earth Observation", which studies climate change impact on water resources in the Amu Darya River basin – Surkhandarya (Uzbekistan) and Karatag (Tajikistan).

Teachers and students of the: (1) Environmental Sustainability and Climate Science Department monitored desert biodiversity in cooperation with the Dubai Desert Conservation Reserve (February); (2) Applied Geology Department monitored degradation of high-altitude pastures in Alay district in cooperation with the Michigan State University under the NASA L project "Atmospheric teleconnections and anthropogenic telecouplings drive land change in Central Asian highlands: how environmental changes, migration, and remittances threaten montane agropastoralist livelihoods and community viability".

Events. The workshop "Modernization of curriculum towards the goals of UN SDGs for Central Asian universities – climate action and sustainability development" was organized in partnership with Pace University, Central Asia University Partnerships Program (UniCEN) and the U.S. State Department (June 12-19, Bishkek).

Jointly with the Critical Ecosystem Partnership Fund (CEPF), TSPC organized a summer environmental camp for students on "Sustainable natural resource management and GIS in Chychkan" (August 26-30, Chychkan Gorge, Kyrgyzstan).

AUCA held the international workshop "Interdisciplinary research in the field of transboundary water security as part of the transboundary water security project in Central Asia and the Middle East" (Accelnet PEER2PEER)[237] (September 3-4).

Source: AUCA

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

The Kyrgyz-Russian Slavic University named after B.N. Yeltsin (KRSU) was established in 1993. Education at the University is offered in 24 disciplines. Professionals for the water sector are trained at the Architecture, Design and Construction Faculty and the Physical Engineering Faculty. KRSU has the Dissertation Councils of the Higher Attestation Commission of KR,

[236] Prof. Rae Kwong Chung – Advisor to the UN Secretary General on Climate Change, Nobel Prize Laureate

[237] the NSF-funded project extends the network of water experts from the USA, Central Asia and the Middle East

postgraduate program (on disciplines 05.23.07 – "Hydraulic engineering" and 25.00.30 – "Meteorology, climatology, and agrometeorology"), doctoral school (05.23.07 – "Hydraulic engineering"), and the Inter-branch Scientific Research Center for High-Altitude Dam Monitoring. The Center in particular studies the effects of earthquakes and microseisms on hydraulic structures and makes forecasts of their status in order to prevent failures.

Major Events and Activities in 2022

Events. (1) international scientific and practical conference "Innovations in science and technology" dedicated to the memory of Prof. V. Yurikov (April 20). The plenary session addressed energy security, hydropower and other issues; (2) students' scientific and practical conference "Public-private partnership in the context of faltering economy" (April 27); (3) international scientific-practical conference on green economy (May 12); (4) expedition to Lake Issyk-Kul (September).

Cooperation. The teaching staff participated in the seminar "Modernization of curriculum towards the goals of UN SDGs for Central Asian universities – climate action and sustainability development" (June 12-19, AUCA), and the "Save our Earth" festival (September 21-23, Tyumen, online).

Achievements and awards. The best University students were awarded a presidential scholarship (December 16).

Publications. 12 issues of the "Vestnik KRSU" journal were published.

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

Kyrgyz National Agrarian University named after K.I. Skryabin

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

Major Activities and Events in 2022

Events. KNAU organized: (1) seminar "Water diplomacy and international water law"[238] (September 22-23); (2) seminar by Aerocosmos-Agro company (October 4); (3) excursion for students to HPP-3 – one of the stations at JSC Chakan HPP (October 7); (4) exhibition of scientific and technical developments and achievements dedicated to the Science Day (November 3); (5) scientific and practical conference "Land reclamation and water management challenges" dedicated to DAgrSc Professor B. Saipov (November 18); (6) roundtable "Green expertise/skills" as concerns the quality of higher vocational education and new green jobs (November 22); (7) training workshop on development of a national agrarian-soil data center of the Kyrgyz Republic in cooperation with scientists from the Lomonosov Moscow State University (November 23-25); (8) international conferences "Green economy and sustainable development in the Kyrgyz Republic" (November 17), "Scientific and technological development of agro-industrial complex for sustainable development" (November 21, online). The ecological club "Young environmentalist" organized an online marathon Ecoadam 2.0 (January 20-27) and eco-marathon "Ecology starts with me" (February 21-March 7).

The teaching staff took part in: (1) summer school (September 26-30, Brunel University, London, UK) and closing conference (November 3-4)[239]; (2) 6th Central Asian international online forum "Transnational cooperation in the global educational space" (October 7, Almaty, Kazakhstan); (3) 1st Regional conference "Regional aspects of sustainable development of vocational education: challenges and prospects" (October 27-28, Tashkent, Uzbekistan); (4) 5th Novosibirsk agrifood forum "Integration of production, science and education – basis for agro-industrial development" (November 9-10, Novosibirsk, Russia).

Cooperation. Delegations of the (1) Hungarian University of Agriculture and Life Sciences (November 21); (2) Incheon National University of the Republic of Korea (November 9); (3) Moscow State University of Geodesy and Cartography (December 15-16).

KNAU delegation visited: (1) Weihenstephan-Triesdorf University of Applied Science and discussed the possibility to get more quotas for master's students in the International Master Course "Agricultural Management", the double degree education and possible establishment of the Farmer Field School for students and farmers (September 19-20, Germany); (2) KazNARU to strengthen cooperation and share experiences (October 6-7, Almaty, Kazakhstan); (3) Novosibirsk State Agrarian University and discussed educational programs within the framework of network programs (November 9-10, Novosibirsk, Russia).

Achievements and awards. The best students of the University were awarded a presidential scholarship (December 16). International Master's program "Agrarian Management" received international accreditation in the "ACQUIN" agency (September 21).

Publications. Four issues of the Newsletter were published.

Source: https://knau.kg/

[238] as part of the USAID Regional Water and Environment project

[239] under the EU Erasmus+ "Development of Doctoral Education and Research Capacities of Kyrgyzstani Academia (DERECKA)" project

9.1.3. Tajikistan

Tajik Agrarian University named after Shirinsho Shotemur

The Tajik Agrarian University named after Shirinsho Shotemur (TAU) was established in 1931. The University has 9 faculties, including the Hydromelioration Faculty, which offers education in the field of land reclamation and water management, hydraulic engineering, and rational use and protection of water resources.

Major Events and Activities in 2022

Events. TAU organized: (1) a tree planting campaign (February 4); (2) Student Olympiad "Sustainable Development Goals in Tajikistan" jointly with ESCAP, GWP, Central Asian Youth Association "CAY4W", SDC, and GKU (May 5); (3) national scientific and practical seminar "Development of intensive orchards and modern farming methods for double-season crops" (June 23, Hissar); (4) Student Olympiad on water resources management (June 6); (5) roundtable "Industrial value for GIS application in developing new farming and land use interventions in the Republic of Tajikistan" (December 8); (6) national scientific and practical conference "Topical issues of effective use of arable land under biologization and ecologization of agricultural production" (December 15).

The teaching staff took part in the 5th international scientific and practical conference "Education. Business. Science. Culture" (February 15, online); exhibition "Tajikistan – land of golden rivers" (April 7); Forum of Rectors of the Central Asian countries (May 12-13, Almaty, Kazakhstan).

Cooperation. A meeting with the delegation of the Caritas Country Office took place at TAU to discuss the project "Utilization of weather, water and climate services for sustainable livelihoods and well-being of rural communities" (April 2).

A cooperation agreement was signed between TAU and the Kangwon National University of the Republic of Korea (November 8, Chungcheon, South Korea).

Within the framework of the academic mobility program: (1) TAU's Rector U.M. Makhmadyorzoda visited KazNARU and was awarded the title "Honorary Professor" of KazNARU by the decision of Academic Council (May 14); (2) students of the Kuzbass State Agricultural Academy of the Russian Federation were trained under the exchange program at TAU (September).

Delegations of the Irkutsk State Agrarian University named after A.A. Ezhevsky (March 25) and Kuban State Agrarian University named after I.T. Trubilin (April 19) visited the University.

Publications. In 2022, 3 issues of the TAU journal "Kishovarz" were published. FAO Representative Office in Tajikistan published papers of the University teaching staff.

Source: http://www.tajagroun.tj/, https://www.instagram.com/_tau_official___/, www.facebook.com/groups/683492831824366/

Tajik Technical University named after Acad. M. Osimi

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

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

Major Events and Activities in 2022

Events. The "Construction and Architecture" Faculty launched a Tajik-Chinese Luban Workshop, where students would be able to study in the Center for Practical Training of Geodesy and Intelligent Cartography and the Center for Practical Training of Green Energy (November 3).

TTU hosted: (1) roundtable "Industry – the basis of the country's economic development" (April 6); (2) scientific and theoretical conference "Scientific growth and prospects in higher education of the Republic of Tajikistan" (April 21); (3) 7th scientific and practical republican conference "Science – the basis of innovative development" (April 27); (4) roundtable "Water unites us" for women and female students dedicated to the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 8); (5) international scientific and practical conference "Energy: status and prospects for development" dedicated to the World Energy Day (December 20).

The TTU's teaching staff and students took part in the: (1) regional conference "Prospects for the development of renewable energy in the Central Asian countries" (June 3); (2) events dedicated to the World Environment Day (June 3); (3) global water marathon "Run Blue" (June 4); (4) regular meeting of the Coordinating Council of the CIS Network University (June 16); (5) educational trip to study best practices of using RES "Renewable Energy Trip" (June 20-26); (7) Student Olympiad on water resources management (July 6).

Publications. TTU publishes the academic journal "Polytechnic Bulletin" (series: Engineering studies, "Intelligence. Innovation. Investments" and "Technology and society").

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

9.1.4. Turkmenistan

Turkmen Agricultural University named after S.A. Niyazov

The Turkmen Agricultural University of S.A. Niyazov (TAU) was founded in 1930. The University consists of 8 faculties, including the Hydromelioration Faculty, which offers education in "Hydromelioration" and "Land construction and cadastre".

Major Events and Activities in 2022

Capacity building. TAU's teaching staff and students participated in the: (1) training on land mapping[240] (April 26-28, online); (2) international exhibition and scientific conference "Healthcare, education and sports in the revival of a new era of a powerful state" (October 10-11).

A two-day exhibition-competition of young University scientists' projects was dedicated to the World Science Day (June 8).

Events. TAU organized: (1) as part of weekly days of science, scientific and practical conferences covering a wide range of topics, including "Methods of field leveling for agricultural crops" (October 8); "Drip irrigation in orchards" (October 22), etc.; (2) a thematic session "The importance of education and science for environmental security in Turkmenistan" dedicated to the World Environment Day. In particular, the following topics were addressed during the event: environmental value of wetlands in Turkmenistan, importance of the Bereketli Garagum State Nature Reserve in protection and research of desert ecosystems in Turkmenistan, methodology for delivering ecological knowledge and education in universities of Turkmenistan, significance of Turkmen lake "Altyn asyr" for biodiversity of the country, etc. (June 5).

Achievements and awards. According to the results of the regional stage of the annual international student Olympiad on SDGs, a TAU student took the first place with the eco-project "Secondary benefits of water". The winners' projects will be presented at the International Business Forum to be held in Bangkok in January 2023.

Source: TAU

Turkmen Agricultural Institute

The Turkmen Agricultural Institute (TAI) was established in 2010 at the Ministry of Agriculture and Environmental Protection of Turkmenistan. The Institute offers water education at the Hydromelioration and Agricultural Mechanization Faculty in the following disciplines: operation of irrigation and drainage systems, hydromelioration and, since 2022, hydraulic facilities. The Institute includes in its structure the Production and Training Farm and the Scientific and Production Center (SPC).

Major Events and Activities in 2022

Capacity building. The TAI teaching staff and students participated in training on land mapping (April 26-28). A set of field equipment for quick analysis was bought for the Institute and the NTC[241].

The teachers participated in the kick-off meeting on the project "Conservation and sustainable management of land resources and high nature value ecosystems in the Aral Sea Basin for multiple benefits" (UNDP/GEF) (November 10). The TAI students had field trips to best-performing farms in Dashoguz province.

Events. TAI hosted: (1) a thematic session "Environmental improvement in the Aral Sea region" dedicated to the World Environment Day (June 5). The topics discussed included: IFAS activities; efforts made by CA republics for environmental improvement and integrated water use in the Aral Sea basin in the face of climate change; further strengthening of partnerships to address water management, environmental, and socio-economic challenges, cooperation with international organizations; (2) Olympiads on geodesy (March) and meteorology and climatology (April).

Source: TAI

[240] as part of the FAO/GEF project "Integrated natural resources management in drought-phone and salt-affected agricultural production landscapes in Central Asia and Turkey" (CACILM-2)

[241] as part of the FAO/GEF project Integrated natural resources management in drought-phone and salt-affected agricultural production landscapes in Central Asia and Turkey" (CACILM-2)

9.1.5. Uzbekistan

National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

The National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" (NRU TIIAME)[242] is a regional academic and research university known for its leading programs in engineering (irrigation, water resources, environment, electrification and automation, agricultural mechanization), land management and agricultural economics/management and marketing. NRU TIIAME consists of: a parent university with 7 faculties, Research institute for fundamental studies, Bukhara Institute of Natural Resources Management, Karshi Institute of Irrigation and Agritechnology, academic lyceum "International House", Beshkent Agricultural Vocational School, and Pakhtaabad Agricultural Vocational School and Training and Research Center (Urtachirchik district, Tashkent province).

Since its foundation in 1923, the University trained more than 56 thousand graduates for water management and agro-industrial complex. In 2022, the University started offering education in the following disciplines: jurisprudence (transboundary water relations), AI, innovative technologies in remote sensing, information systems and technologies, etc.

Major Events and Activities in 2022

Research. Joint international (educational, scientific, and capacity building) projects are implemented on a wide range of topics of sustainable development: SDGnexus Network[243], Hydro4U, Tashkent water security lectures[244].

Events. In 2022, NRU TIIAME hosted 6 international scientific conferences, 14 scientific seminars and roundtables, including: (1) 21st scientific and practical conference for young scientists, Masters and talented students "Current problems of agriculture and water pollution" (May 12-13); (2) international scientific conferences – "Agroecosystems, land reclamation and water resources in the context of climate change" (AgEC 2022) (March 10-11) and "Geophysical ecosystem design"[245] and a symposium "Priorities of land reformation strategy: challenges and solutions" (May 23-24); "Construction mechanics, hydraulics and water resource engineering" (CONMECHYDRO 2022) dedicated to the memory of DEc. Prof. U.P. Umurzakov (August 23-24); "Environmental technologies and engineering for sustainable development" (ETESD-2022) (October 13-15); 3rd international conference "Energy, civil and agricultural engineering" (ICECAE-2022) (October 14-16).

Cooperation. In 2022, the number of international agreements and memorandums was increased by 14 and reached 116. As part of international projects, scholars from NRU TIIAME and Colorado State University (USA) jointly teach disciplines included in the curriculum for students of both universities based on international standards.

Achievements and awards. NRU TIIAME ranked 1st among Uzbek HEIs and received high ratings on UN SDGs (15 out of 17). According to international ratings, (1) ranked 301st in the "QS Asia University Rankings 2023" among the universities of the Asia-Pacific ocean region, (2) ranked 603rd in the "World Green University Rankings".

Source: https://tiiame.uz/en

National University of Uzbekistan named after Mirzo Ulugbek

The National University of Uzbekistan named after Mirzo Ulugbek (NUUz) was officially established on May 12, 1918. The University has in its structure 16 faculties, including Geography and Natural Resources, Ecology, Geology and Geoinformation System, and Hydrometeorology[246] Faculties. Water disciplines are taught at the "Land Hydrology" Department of the Hydrometeorology Faculty. There are also PhD and DSc programs on "Land Hydrology. Water Resources. Hydrochemistry".

Major Events and Activities in 2022

Research. The teaching staff of the Hydrometeorology Faculty is implementing the following projects: (1) "Development of a monitoring system over changes in the mass balance of mountain glaciers and the scenarios describing the future state of glaciers in the face of global climate change", jointly with the UzHydromet's Research Institute of Hydrometeorology and the Abdullaev Institute of Geology and Geophysics of the Uzbek Academy of Sciences[247]; (2) "Glacier lake outburst floods in Central Asia: knowledge management platform" (GLOFCA).

Within the framework of SDGs, the University is implementing the following projects: (1) "Evaluation of ef-

[242] TIIAME was renamed into the National Research University "TIIAME" by Resolution 42 of December 10, 2021. The proposal to establish the Bukhara Institute of Natural Resource Management and the Karshi Institute of Irrigation and Agricultural Technologies, respectively, on the basis of branches in Bukhara and Karshi and organize the Institute for Basic and Applied Research under NRU was approved. The NRU will be transferred to the self-financing system from January 1, 2022

[243] SDGnexus Network is a part of the DAAD "Higher Education Excellence in Development Cooperation – exceed" program and, as such, it aims to strengthen higher education for enabling effective and innovative contributions to the UN SDGs

[244] under the Green Central Asia Program as a platform for discussion of climate change issues among different actors

[245] on the sidelines of traditional international scientific conferences GAT-GISCA-2022 in CA and GI-2022 on geoinformatics "Priorities for land reformation strategy: challenges and solutions"

[246] The Hydrometeorology Department was established at NUUz in the academic year 2021/2022 by Resolution No.4896 of November 17, 2020

[247] Appendix No.7 to Resolution No.PP-4896 of 17.11.2020

fect of dams and climate change on water scarcity and drought in arid and semi-arid river basins of India and Uzbekistan" (2021-2023) – hydrological and meteorological data of observations in the Chirchik river basin were summarized, drought indices (SPI, SSI, Run theory) were determined and correlated. Changes in annual and seasonal variability of flow in the Chirchik River were estimated. A workshop on resource management was organized jointly with the Indian Institute of Technology Kharagpur (November 13-20, Kharagpur, India); (2) "Dynamics of glacier degradation due to climate change and its impacts on river flow in the mountain systems of Uzbekistan" (2021-2023) – the long-term changes in areal and linear characteristics of glaciers in Uzbekistan, as well as their mass balance, meteorological parameters of the high-mountain zone of Uzbekistan, and runoff from glaciers were derived from remote sensing and field observations; (3) "Combined use of ground-based observations and solar radiation data from geostationary weather satellites for the sustainable development of agriculture, water resources and energy sources" (2022-2024) – it is planned to develop a database of historical data on main meteorological variables (temperature and humidity, precipitation, and wind speed and direction) for the last 10 years for all meteorological stations in Uzbekistan.

Capacity building. The following events were organized: (1) a field trip on hydrometry for the Hydrometeorology Faculty; (2) a field trip on geodesy for the Geography and Natural Resources Faculty; (3) a field trip to the training and research polygon (Muynak district, Republic of Karakalpakstan) and expedition to the dried Aral Sea bed for the Ecology and Biology Faculties (November 3-8). As part of the academic exchange program, the NUUz teaching staff and Leibniz University Hannover (Germany) delivered lectures and practical classes for the University students at the "Charvak" field training polygon (August 10-15). Scholars from foreign universities and research institutes delivered lectures and practical classes, seminars and trainings for the University students during the year.

The Hydrometeorology Faculty organized: (1) the online contest "Water and climate change" (contest of posters, articles and videos) dedicated to the World Water Day on March 22; (2) the contest of articles "Climate change – youth perspective" dedicated to the World Meteorological Day.

The NUUz students took part in the: (1) 8th Green Summer School "Linking scientific evidence of water and land management with the decision making support in Central Asia" (July 11-20, Almaty, Kazakhstan); (2) 3rd international student Olympiad on "Hydrology" (April 26-27, online) and the national round of the regional Olympiad "Sustainable Development Goals" on discipline "IWRM and landscape management" (May 10-11, NUUZ) and won prizes.

In 2022, the teaching staff of the Hydrometeorology Faculty defended their dissertations on discipline 11.00.03 – "Land hydrology. Water resources. Hydrochemistry".

Events. NUUz organized: (1) the international conference "Sustainable management of earth resources and biodiversity"/SERBEMA-2022 (April 12-13); (2) scientific and practical conference "Integrated land use and land reclamation for food security: new approaches and innovative solutions"[248] (April 21); (3) international scientific and practical conference "Hydrometeorological research in the context of climate change: current challenges and their solutions" dedicated to the 70th anniversary of Prof. F. Hikmatov (June 3); (4) republican scientific and practical conference "Formation of ecological culture: institutional framework and organizational aspects"[249] (September 15).

Cooperation. NUUz and the Russian State University of Hydrometeorology launched a joint online course "Meteorology and Climatology" (3+2) since the 2021-2022 academic year.

The Hydrometeorology Faculty cooperates with the Lomonosov Moscow State University (Moscow, Russia), Potsdam Institute for Climate Impact Research (Potsdam, Germany), Leibniz Institute for Tropospheric Research (Leipzig, Germany), Russian State Hydrometeorological University (St. Petersburg, Russia), Space Research Institute of the Russian Academy of Sciences (Moscow, Russia), University of Fribourg (Fribourg, Switzerland), Indian Institute of Technology Kharagpur (Kharagpur, India), University of Reading (Reading, Berkshire, UK), Kyoto University (Kyoto, Japan), Institute of Geographic Sciences and Natural Resources Research of Chinese Academy of Sciences (Beijing, China), CAREC (Almaty, Kazakhstan), SIC ICWC (Tashkent, Uzbekistan) and many others.

Publications. Since 1997, the University has been issuing its Newsletter highlighting results of research efforts and articles of teaching staff and students.

The teaching staff of the "Land Hydrology" Department prepared 1 textbook, 1 manual, 4 monographs, more than 80 scientific articles, of which 10 were published in international journals and 18 – in national journals.

Source: NUUz named after Mirzo Ulugbek

Samarkand State University named after Sharaf Rashidov

The Samarkand State University (SamSU) was founded in 1927. The University consists of 14 faculties. The Geography and Ecology Faculty offers education in ecology, hydrometeorology (Bachelor's degree), soil science, hydrology (Master's degree).

[248] jointly with the Senate's Committee on Agriculture and Water Management

[249] jointly with the Committee on Ecology and Environmental Protection of the Legislative Chamber of the Oliy Majlis of the Republic of Uzbekistan and the fraction of the Ecological Party of Uzbekistan

Major Events and Activities in 2022

Research. SamSU carries out research on: (1) sampling and analysis of the Zarafshan River and Siyob Canal; (2) monitoring and mapping of landscapes in Aydar-Arnasay lake system using remote sensing[250]; (3) development of chemical and phytometric methods to detect ions in soils.

The SamSU teaching staff and students jointly with scientists of the: (1) Aligarh Muslim University arranged an expedition to the Malik Desert (Bukhara province) to study its geomorphology, climate, soils, flora and geo-ecological conditions (June); (2) University of Trier (Germany) studied plant resistance to anthropogenic and abiotic factors in the Nurata, Turkestan mountain ranges and southwestern part of the Kyzylkum desert (June).

Events. SamSU organized: (1) international scientific and practical conference "Transboundary regions of Central Asia and neighboring regions: opportunities and challenges for cooperation", including sessions on "Rational use of transboundary water and hydropower", "Scientific and practical basis for solving transboundary environmental problems" (May 5-6); (2) scientific and practical seminar "Topical issues of environmental protection" (June); (3) Aggie's Summer Camp (July); (4) international conference "Pastures of Central Asia: global challenges and opportunities", with a field trip to the pastures of Nurabad district, in Samarkand province (November 15-16).

The teaching staff and students participated in the: (1) International week of innovative ideas, InnoWeek-2022, where 14 University's innovation projects were presented. SamSU won in the nomination "The most active HEI" (October 17-21, Tashkent); (2) 5th International educational forum "Altay-Asia 2022: Eurasian educational space – new challenges and best practices" (September 15-17, Barnaul-Belokurikha, Russia). The 5th Congress of the Association of Asian Universities was held within the framework of the Forum, where SamSU's Rector was elected the president of the Association (September 15).

Cooperation. SamSU had meetings with representatives of: (1) the Hungarian University of Agriculture and Life Sciences (MATE) (November 12); (2) Pomeranian Academy of Poland and discussed the matters related to development of joint educational programs, including in geography and environmental protection, and academic exchanges (December 15, online).

Publications. SamSU publishes the following journals: "Scientific Newsletter of the Samarkand State University", "Journal of Human Capital and Social Development", and "Food Security: National and Global Challenges".

Source: https://www.samdu.uz/en

9.2. Regional HEIs and Professional Development Centers

9.2.1. Regional Training Center at SIC ICWC

Water sector professional development courses in Central Asia were established at SIC by the ICWC decision (ICWC Protocol No.24 of 23.10.1999).

The courses were founded by the ministries of agriculture and water resources of five CA states, SIC ICWC, BWO Amu Darya and BWO Syr Darya. Later, these vocational training courses were transformed into the Regional Training Center (RTC) at SIC ICWC.

Major Events and Activities in 2022

SIC ICWC experts delivered: (1) lectures and practical classes at NRU TIIAME for the 1st and 2nd year master's students on the disciplines "Hydraulics and hydrology engineering" and "GIS in hydraulics and hydrology engineering research" at the Hydraulics and Hydro-informatics Department and for students on "Integrated water resource management", "Rural

[250] Decree of the Cabinet of Ministers #136 "On additional measures for management of Aydar-Arnasay lake system" as of 26.03.2022

water supply" and "Water quality management" at the Ecology and Water Management Department; (2) a training workshop on accurate water accounting for hydrometry experts of the District Irrigation Divisions and specialized Water Services of Khorezm province, jointly with the Left-bank Amu Darya BISA, SIC ICWC, and the Research Center for Water Problems at the Cabinet of Ministers of Uzbekistan (June 22); (3) roundtables on "Science and innovations for water security" (April 26, Turkistan, Kazakhstan) and "Following the path of Prof. V.A. Dukhovny"[251] (August 16, online).

Two master's students of NRU TIIAME on 70530804 "Hydraulics and hydrology engineering" (Hydraulics and Hydrology Engineering Department) and 70812307 "Integrated water resource use and management" (Ecology and Water Management Department) completed their internship at SIC ICWC (June 13-July 13).

D.R. Ziganshina delivered reports/lectures: (1) on "Transboundary water use: diplomacy, law and science" at the meeting of the UWED Scientific and Methodological Council. UWED is planning to launch a new training program on water diplomacy/economics and has invited SIC ICWC to participate in developing curriculum and preparing lectures (February 18); on "Legal framework of transboundary water cooperation in the Aral Sea basin" for GKU master's students (April 6, online); (3) at the workshop entitled "Emotions in international water law" as part of planned joint research by scientists of the IHE Delft Institute for Water Education (UNESCO-IHE), University of Amsterdam, SIC ICWC and GKU (October 1-3, UNESCO-IHE, Delft).

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

The University of Central Asia (UCA) was founded in 2000 to promote socio-economic development in Central Asia, particularly its mountain communities, by offering an internationally recognized standard of higher education. UCA is comprised of the: (1) School of Arts and Sciences (SAS), offering a five-year undergraduate program in six majors, including Earth and Environmental Sciences; (2) Graduate School of Development (GSD), which includes the Mountain Societies Research Institute (MSRI); (3) School of Professional and Continuing Education (SPCE).

Major Events and Activities in 2022

Research. In cooperation with colleagues from the University of Potsdam, SAS experts developed the Terra Antiqua software to make paleogeographic maps for visualization in all areas of Earth science and to generate boundary conditions for climate models to predict climate change in the near and distant future. The software was presented to the General Assembly of the European and American Geoscience Unions. Training sessions were held for students from universities in Europe and UCA (November, Khorog campus, Tajikistan https://www.youtube.com/@terraantiqua8840/videos)

Experts of MSRI and the Meteorological Research Institute (Tsukuba, Japan) will be conducting research on dynamical downscaling for Central Asia using MRI regional climate model known as non-hydrostatic regional climate model. They will run a satellite high-resolution (5 km) climate model over Central Asia.

Capacity building. UCA organized: (1) in cooperation with partners, Summer Schools in Kyrgyzstan: on "Knowledge transfer and data exchange" for meteorologists, hydrologists, glaciologists and ecologists of Central Asia (August 5-11) and in Issyk-Kul for civil servants in CA to discuss the integration of environmental factors in infrastructure development[252] (September 21-23); (2) a seminar on "New research on history, environment, society and development in the Pamirs" (October 1-2); (3) a training on remote sensing and GIS (November, Khorog, Tajikistan); a seminar[253] and field trip in Kulob (Khatlon district, Tajikistan).

Dr. Erkin Isaev, MSRI's research fellow, measures water level at the glacier's foot

Summer School at 3400 Meters above Sea Level
Source: UCA News, ISSUE # 22-09
https://ucentralasia.org/media/e3clwhvb/2022-09-uca-news-eng.pdf

Open lectures were delivered on: "Modern agriculture, food and rural development policy: environment, food security and nutrition, agri-food business, agri-food trade and social cohesion" (November), "Energy transition – away from fossil fuels to renew-

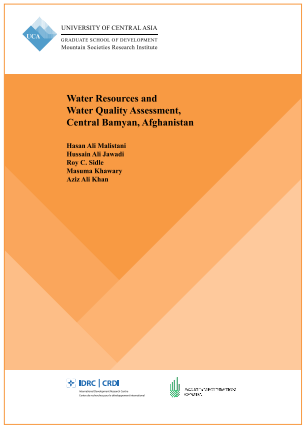
[251] see the event report on http://cawater-info.net/expert-platform/pdf/16-08-2022/report-en.pdf
[252] see the summary report on https://sipa-centralasia.org/wp-content/uploads/2022/12/SIPA-SS-2022-report_eng.pdf
[253] results were presented for the Kulob Botanical Garden (KBG) sub-project implemented under the THRIVE GDA Tajikistan project, https://ucentralasia.org/media/zs1j1hc2/2022-12-uca-news-eng.pdf

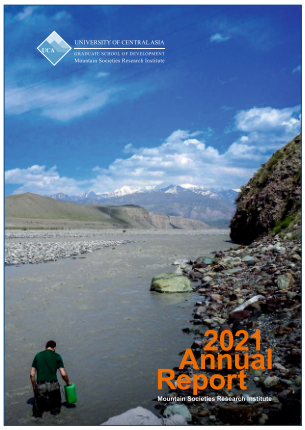
able energy sources" (November), and "Climate change as problem-solving" (December 12). Movie series entitled "Voices from the Roof of the World!"[254] was created.

UCA participated in a number of international conferences, including those titled "Can agroecological farming feed the world? Farmers' and academia's views" (September, Prague, Czech Republic) and "Cryosphere and related hazards in high mountain Asia in a changing climate" organized by UNESCO (November 1-4, Almaty, Kazakhstan); 6th North and Central Asia multi-stakeholder forum on implementation of Sustainable Development Goals organized by ESCAP (November, Almaty, Kazakhstan).

Publications. A. Azarov, M. Kulikov, R.S. Sidle / Classification of Mountain Silvopastoral Farming Systems in Walnut Forests of Kyrgyzstan: Determining Opportunities for Sustainable Livelihoods / Agriculture 2022, 12(12), 2004 https://www.mdpi.com/2077-0472/12/12/2004; H.A. Malistani, H.A. Jawadi, R.C. Sidle, M. Khawary, A.A. Khan / Water Resources and Water Quality Assessment, Central Bamyan, Afghanistan / Water 2022, 14(19), 3060. https://doi.org/10.3390/w14193060, https://ucentralasia.org/media/qegb4jpk/uca-msri-water-resources-eng.pdf; A. Caiserman, R.C. Sidle, D.R. Gurung / Snow Avalanche Frequency Estimation (SAFE): 32 years of monitoring remote avalanche depositional zones in high mountains of Afghanistan / The Cryosphere, 16, 3295-3312, https://doi.org/10.5194/tc-16-3295-2022; K. Tilekeyev, D. Kirbasheva / Rehabilitating the Irrigation Canals in Southern Kyrgyzstan: An Impact Evaluation Study / WORKING PAPER #69, 2022 https://ucentralasia.org/media/4a1klhoz/uca-ippa-wp69-irrigation-project engfinal.pdf.

MSRI's Annual Report available on https://ucentralasia.org/media/sc0nazhc/uca-msri-annualreport-2021-eng-2.pdf





Source: https://ucentralasia.org/ru/glavnaya, https://www.facebook.com/ucentralasia/

9.3. Professional Development Courses and Trainings

9.3.1. Professional Development Courses and Trainings in 2022

February 14-18; **March 14-18** and **May 23-27** – trainings in GIS and remote sensing[255]

February 21-March 4 – Central Asia training course: weather and climate services for energy sector

February 21, 22, 24; **March 1-3**; **May 16-18**; **August 17**, **22**, **25** and **31** – series of training courses[256] on modeling tools for Water Evaluation and Planning (WEAP) and Low Emissions Analysis Platform (LEAP)

March 14 – capacity development workshop on science and policy interfaces for climate and disaster resilience by ESCAP

March 24; **November 24** – webinars "Operationalizing the water-food-energy nexus in the context of climate-smart agriculture"

March 28 – "FutureDAMS Central Asia" stakeholder workshop on applying the Python Water Resources ("Pywr") model in Central Asia

March 31; **May 31**; **July 5**, **26**; **September 30**; **October 27** and **November 23** – media trainings and a series of lectures[257] on building capacity and promoting the water-energy-food-environment nexus (WEFE Nexus)

April 8 – Central Asia Regional Information Network (CARIN) Research Webinar /GOFC-GOLD CARIN # 5

May 18-30 – Summer school for water professionals in CA – expedition from the zone of the Syr Darya River flow formation to the Aral Sea

June 6-17 – online course on "Water security for policy makers and practitioners"

October 10-December 11 – course on "International Water Law and the Law of Transboundary Aquifers" (University of Geneva, EUG)

December 6-7 – workshop on the use of IWRM tools for officials involved in the development of the National Water Strategy of Uzbekistan for 2024-2026

[254] as part of the joint initiative of the Aga Khan University, Aga Khan Agency for Habitat, Aga Khan Foundation, and UCA in preparation for COP26

[255] within the regional project "Ecologically Oriented Regional Development in the Aral Sea Region" (ECO-ARAL)

[256] within the framework of the USAID Regional Water and Vulnerable Environment Project

[257] within the framework of the USAID Regional Water and Vulnerable Environment Project

NASA Applied Remote Sensing Program Trainings (ARSET):

Trainings: (1) Monitoring and modeling floods using Earth observations (September 14-21); (2) Selecting climate change projection sets for mitigation, adaptation, and risk management applications (September 19-20); (3) Climate change monitoring and impacts assessment using NASA Earth observations (October 24), etc. (visit https://appliedsciences.nasa.gov/join-mission/training).

GOFC-GOLD CARIN webinar series, visit https://lcluc.umd.edu/content/gofc-gold-carin-webinar-series

9.3.2. Professional Development Courses and Trainings in 2023

Programs (UNESCO-IHE):

February-June – course on water policy and strategic planning in the context of climate change organized by IFAS and UNESCO-IHE:

– on campus

May 1-19 – course "Groundwater resources and treatment"

May 1-12 – course "Water infrastructure asset management"

May 15-26 – course "Citizen science water management and sustainable development"

July 3-14 – course "Water resource planning under changing climate and environment"

– online

February 27-June 16 – course "Public and environmental health in emergencies"

March 1-April 30 – course "Water policy analysis: a systems approach"

March 6-June 30 – course "Water and sanitation in urban humanitarian context"

September 4-October 13 – course "Irrigation management and development"

Course "Water productivity and accounting using WaPOR"

Course "Understanding climate change basics"

Course "Introduction to Modflow and Model Muse"

Programs at the University of Geneva (EUG):

February 23-March 31 – course "Water resources management and policy"

July 3-14 – summer school "Water governance: frameworks and negotiations"

https://lcluc.umd.edu/content/gofc-gold-carin-webinar-series

Within the framework of the USAID Regional Water and Vulnerable Environment Project:

February 23 and throughout the year – media trainings and a series of lectures[258] on building capacity and promoting the water-energy-food-environment nexus (WEFE Nexus)

March 9-12 – training on the RDS process (Almaty, Kazakhstan)

March 13 – regional seminar on the RDS process (Burabay village, Kazakhstan)

NASA Applied Remote Sensing Program Trainings (ARSET), visit https://appliedsciences.nasa.gov/join-mission/training?program_area=All&languages=All&source=All&page=0

GOFC-GOLD CARIN webinar series, visit https://lcluc.umd.edu/content/gofc-gold-carin-webinar-series

IWMI webinar series, visit https://www.iwmi.cgiar.org/events/early-career-researchers-webinar-series-by-iwmi-in-india/

The International Water Training Institute (https://hydroschool.org/) provides trainings on surface water hydrology, surface water hydraulics, water quality, and groundwater

The Institute has also a webinar series for 2023 https://hydroschool.org/webinars/

September 10-19 – summer field school (hybrid) on mountain ecosystems and resource management (Igman, Bosnia and Herzegovina)

https://www.grassrootsglobal.net/mer2023/?fbclid=IwAR1mZwWtyNEI6GetNsij-87NcPd7j5wa04vSyirK75Vff651qAOOczqd7ok

[258] within the framework of the USAID Regional Water and Vulnerable Environment Project

SECTION 10

Science and Innovations

10.1. Innovations in 2022

Water Saving Technologies

Idrica developed a new digital solution for **end-to-end management of agricultural irrigation infrastructures** and networks. The multinational company, with an extensive track record in the digital transformation of drinking water and sanitation infrastructures, is now transferring its know-how to the agricultural sector with the GoAigua Agro Twin module, which centralizes the main elements of agricultural irrigation management. The use of data-integrated algorithm facilitates real-time control and monitoring of assets, improves decision-making, optimizes irrigation schedules, and provides early detection of leaks, fraud, and consumption that exceeds the established allocations. Along with comprehensive work order management, GoAigua Agro Twin boosts operational results and records interactions with irrigation associations through an online office and mobile application. This technology can also program irrigation, pumping and fertilizer systems from the control center. It can also analyze soil water status and optimize crop water consumption; manage the network of meters, devices, communications, asset energy consumption and set up customized alarms that can be configured by the user. It also facilitates real-time data visualization, including the creation of dashboards and management indicators, and provides advanced water efficiency management, both in the distribution network and at the supply points.

By recirculating and treating shower water in real time, the innovative LOOP shower system proposed by the Danish Flow Loop reduces water consumption by up to 80% and energy usage by 70%. This is done by recycling, cleaning and disinfecting the personal shower water in a closed loop while showering. The system also has a backwash cycle that is activated after each use. It can be integrated into most existing bathroom systems.

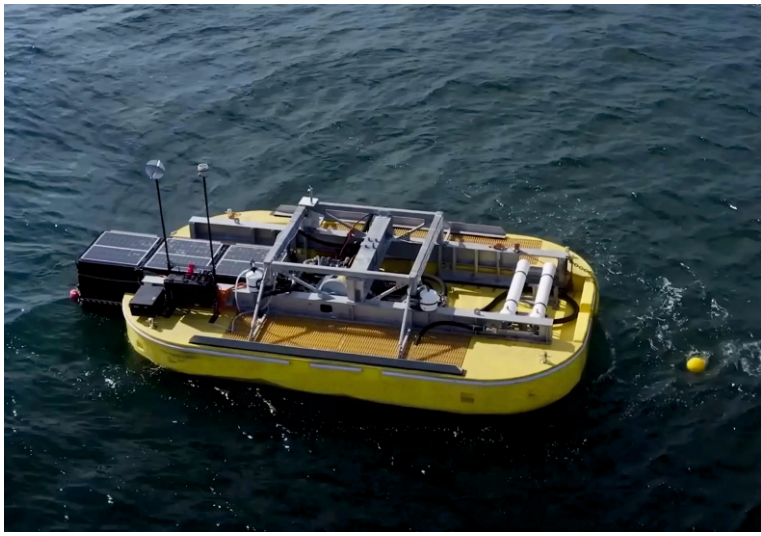
Water Treatment and Desalination

Researchers led by the MIT and Shanghai Jiao Tong University demonstrated **solar-powered multi-stage membrane distillation**. In test devices, the team says that this technique can achieve over 80% efficiency in converting solar energy to water vapor, even when the starting water had salt concentrations up to 20% by weight. No salt crystals were detected in the device after a week of operation. Importantly, the system is made of everyday materials, so it should be scalable and inexpensive. The team calculates that a system with a collecting area of just 1 m^2 could provide enough drinking water for a family's daily needs.

MIT researchers have developed a **portable desalination unit** weighing less than 10 kilograms. The technology is packaged into a user-friendly device that runs with the push of one button. This device utilizes electrical power to remove particles from drinking water. The unit can be deployed in remote and severely resource-limited areas, such as communities on small islands or aboard seafaring cargo ships.

NanoseenX nanomembranes for water desalination and filtration are produced by a team of engineers and researchers from the startup Nanoseen (Poland) from mixed matrices created by combining many types of nanomaterials in different weight ranges (Mix Matrix Solution). Depending on the salinity of the water and/or the level of its contamination, from 2 to 20 nanomembranes are used, which are arranged in cascades. Each membrane has been designed to remove different sizes of contaminants, from larger physical objects, to pesticides, heavy metals and eventually viruses and nanoplastics. The technology is environmentally friendly with zero CO_2 emissions. The nanomembranes are biodegradable.

The Canadian Oneka developed **wave-powered floating desalination buoys**. This desalination device is made from recycled plastic bottles and creates up to 53,000 liters of fresh water a day. Buoys are anchored to the sea floor anywhere with an average wave height of more than 1 m; they absorb energy from passing waves, and convert it into mechanical pumping forces that draw in seawater and push around a quarter of it through a reverse-osmosis desalination system. The remaining three quarters is mixed back in with the briny discharge from the desalination process and released back into the sea. It's only 30% saltier than the water around it. Within about 3 m of each device, there's already no measurable increase in water salinity over the baseline. Iceberg-class units are designed to generate between 30-50 m^3 of water per day – enough for the daily needs of between 100-1,500 people. Onboard sensors, powered by small solar panels, continuously test the water that's produced, ensuring it meets relevant standards.



Water from Air

The team at the University of Texas at Austin (USA) developed a particularly **"salt-friendly" hydrogel**. This gel gains the ability to absorb and retain water when

combined with a hygroscopic salt. Using hydrogel, almost six liters of pure water per kilo of material can be extracted from air in 24 hours with only 30% relative humidity. The basis for the new hydrogel was a polymer constructed from zwitterionic molecules. Polyzwitterions carry both positive and negative charged functional groups, which helped the polymer to become more responsive to the salt in this case. Initially, the molecular strands in the polymer were tightly intermingled – but, when the researchers added the lithium chloride salt, the strands relaxed and a porous, spongy hydrogel was formed. Polyzwitterionic hydrogels could play a fundamental role in the future for recovering atmospheric water in arid, drought-stricken regions.

Mini atmospheric water generator Mobile Box developed by the Watergen (Israel) provides up to 25 liters of fresh drinking water generated from the air. Once the Mobile Box is plug into a 12- or 220-V vehicle outlet, the unit sucks in air through a fan, runs it through a filtration system on the way to the patented heat exchanger that extracts water out through condensation, processes it through a multi-level filtration system that includes UV light, and stores it in a reservoir. Users can pour the water through the tap or remove the entire reservoir. Another "On Board" version makes up to 50 liters of drinking water per day.

Innovations in Agriculture

The FAO developed a **portal, known as WaPOR** – Water productivity through open access of remotely sensed derived data. WaPOR processes satellite data to provide information that can help farmers optimize irrigation systems and achieve higher, more reliable agricultural yields. WaPOR provides near real-time data that can be used for a range of applications in agriculture and water resource management. The portal presently offers data that covers Africa and the Middle East.

Finnish manufacturer Tracegrow developed a new fertilizer made from spent batteries. The product, known as **ZM-Grow**, is a sulphate-based concentrate, containing 60g/liter of zinc, 67g/liter of manganese and 75g/liter of sulphur. The fertilizer is made by crushing, treating and leaching batteries into a mass that is then filtered, purified and finally neutralized to measure around four on the pH scale. ZM-Grow was tested in a variety of climates, is listed as being suitable for most plants, and is also certified for organic farming.

Efficient production technique for a novel "green" fertilizer was proposed by the Deutsches Elektronen-Synchrotron DESY (Germany), Ruđer Bošković Institute (IRB, Croatia) and Lehigh University (USA). An international team used PETRA III to optimize the production method that is an adaptation of an ancient technique: by milling two common ingredients, urea and gypsum, the scientists produce a new solid compound that slowly releases two chemical elements critical to soil fertilization, nitrogen, and calcium. The team used the P02.1 setup to gain insight into parameters governing the milling process, to optimize reaction conditions for preparing the target fertilizer. They found a procedure that enabled 100% conversion of the starting materials into the target fertilizer. The milling method is rapid, efficient, and clean – as is the fertilizer product, which has the potential to reduce the nitrogen pollution that fouls water systems and contributes to climate change.

Ag Leader (USA) offers **nozzle-by-nozzle sprayer control** (USA) – RightSpot – for consistent and effective coverage plus added flexibility for a wider speed range, greater productivity and increased accuracy. RightSpot is very precise at applying the right rate and pressure desired across varying speeds and field terrain. It means maximizing the effectiveness of their inputs with the right droplet size and coverage to give the crop what it needs while minimizing wasted product and time. With RightSpot, flow rate and pressure are controlled independently.

AgNext Technologies (India) introduced **E-Spray**, an electrostatic-based pesticide sprayer for 360° crop coverage, zero pesticide wastage, or excessive pesticide dripping. The e-spray contains an IoT device that allows users to track spraying activity in real-time, allowing a farmer to monitor the entire activity such as the movement of the spraying person with GPS location on the map, sprayed area, chemical consumption, start & end time of spraying, etc., and prevent malpractices.

The new **plant-inspecting Solix robot** was designed by the Canadian Solinftec. It will use onboard cameras and other sensors (along with AI-based software) to check the health of plants and assess their nutritional content, plus it will look for weeds and evidence of insect damage. When a problem is spotted, its location within the field will be noted and reported to the farmer, along with suggestions on how it should be rectified. The robot runs on lithium-ion batteries, is recharged by solar panels and does not produce additional CO_2 emissions.

Scientists from Russia and Belarus developed a **"Locust extermination machine"** excluding application of chemicals. The device gets rid of locust larvae through high-voltage electric pulses with minimal energy consumption. This machine is cost-efficient, environmentally friendly and highly demanded in agriculture.

Aeroscript (Russia) developed a digital platform **"Horizon"** for aerial farm robots. The aerial robots monitor water, crops, soil and weeds. Images in the infrared and visual spectral range help to judge on conditions of crops. The digital platform not only coordinates flights, but also provides a number of specialized user-friendly tools. In particular, KML/KMZ files to upload flight task parameters in the system and display GIS layers of user fields. The map showing the airspace structure has a number of elements that enable more accurate and convenient coordination. All this much eases the farming.

The Altay State Agricultural University and the Moscow Timiryazev Agricultural Academy (RSAU-MTAA) (Russia) developed an **automated system to monitor I&D networks**. The system ensures safe operation of hydraulic facilities – reservoirs and irrigation canals. Monitoring of water level in the source or in the network of irrigation canals enables quick decision making on water distribution and safe operation of facilities. The system helping to track dynamics of water level and head stores the data on a memory card and/or transmit it through GSM-channels via GSM interface. The system operates on a solar battery and is fully autonomous.

A **total fleet of 100 units of drone sprayers** has been recently fulfilled by XAG (Ukraine). Totally, 59 mobile crews are formed. It is estimated that XAG's drone fleet will cultivate more than 500 thousand ha of crops. The use of drone sprayers will help farmers to save 30% of pesticides, 95% of water and 90% of fuel.

The Russian "Agronout" implements the **True Fields platform** for digitalization of agro-industrial enterprizes. True Fields AI-based software platform combining IT-technologies and traditional soil and agronomic expertise helps agrarians to increase crop yields by getting reliable data on soil fertility potential and subsequent accurate application of stuff to the selected zones of sustainable fertility.

Researchers of the Uzbek Institute for Polymer Chemistry and Physics developed a production technology for the **"Kuprumkhit" protector**. "Kuprumkhit" is applied as 0.5% solution for pre-treatment of cotton and wheat seeds to prevent diseases. It forms a polymer film that protects seeds from hazardous environmental conditions. The product is environmentally safe, biologically active and biodegradable; it is effective against pathogenic microorganisms and accelerates plant growth and enhances plant immunity.

The Institute of Microbiology of the Academy of Sciences of the Republic of Uzbekistan developed the **bio-product "Azos-Uz"** representing an association of active nitrogen-fixing and phytohormone-producing effective strains of bacteria of the genus Azospirillum. The bio-product is designed to increase crop yields and enhance crop resistance to diseases under conditions of saline soil; it also dissolves mineral phosphates, produces a number of B vitamins and growth-stimulating substances. "Azos-Uz" is offered for crop seed treatment. As a result, the yield increases by 5-10 kg/ha, the need for chemical nitrogen fertilizers decreases by 50%.

Combatting Desertification

The Norwegian startup Desert Control claims that it can fight desertification efficiently by spraying sand with **Liquid NanoClay (LNC)** and turning it into soil in 7 hours. When sprayed onto sand, this amazing invention trickles down and percolates the sand, turning it into water-retaining soil where plants can germinate and thrive. The effects of Liquid NanoClay last for about five years, after which the artificially created soil needs a top-up.

A new technology for **calling precipitation** from clouds is developed by the North Caucasus Federal University together with other Russian researchers and colleagues from the UAE. In the future, the technique will effectively redistribute atmospheric moisture, mo-

ving clouds 50-100 kilometers horizontally. It is based on the use of reagents that increase the lifetime of clouds and their saturation with moisture. To control the behavior of the atmospheric front, meteortrons – installations that create powerful vertical jets of warm, moist air – are used. The developed reagent, due to the condensation of water particles on it, releases heat as it rises, which increases the energy and speed of the ascending airflow. The chemical composition of the reagent includes sodium and calcium chlorides, urea. Addition of a reagent to the meteotron increases the vertical extent of the atmospheric front. This leads not only to an increase in the intensity and amount of precipitation, but also to an increase in the lifetime of clouds.

Alternative Energy

A giant "water battery" Nant de Drance capable of storing as much energy as 400,000 electric car batteries was switched on in Switzerland. The €2 billion project is located nearly 600 m beneath the Swiss Alps. The hydro battery works by using the excess energy to pump water between two separate reservoirs at different altitudes. Six pump turbines send water from the lower reservoir of Emosson to the upper reservoir of Emosson Vieux during times of overproduction. With a capacity of 25 million m^3, the water battery has a power output large enough to power as many as 900,000 homes.

The Finnish Vatajankoski built a **commercial sand battery** for the Polar Night. This is a thermal energy storage system, effectively built around a big, insulated steel tank – around 4 m wide and 7 m high – full of plain old sand. When this sand is heated up, using a simple heat exchanger buried in the middle of it, this device is capable of storing an impressive 8 MWh of energy, at a nominal power rating of 100 kW with the sand heated to somewhere around 500-600°C. The company claims an efficiency factor up to 99%, a capability to store heat with minimal loss for months on end, and a lifespan in the decades.

Scientists from Helmholtz-Zentrum Berlin (HZB) broke the efficiency world record of tandem solar cells consisting of a **silicon bottom cell and a perovskite top cell**. The team used an improved perovskite compound with a modified surface – it developed an interface modification in which charge recombination losses are largely suppressed. Furthermore, they applied special measurement methods to better understand the fundamental processes. These developments were then successfully transferred to tandem solar cells. The certifying institute European Solar Test Installation (Italy) officially confirmed the 32.5% efficiency record.

10.2. Theory of Climate Change Intensity Assessment

The analytical review of existing methods to assess climate change on various accessible research platforms of international organizations and institutions (see below) carried out by a group of researchers[259] from Uzbekistan found that no proper approaches are available to assess the intensity of climate change.

To fill this gap, the researchers suggested the following formula to assess the intensity of climate change in a particular region (Ji):

$$J = \sum_{t=10} (T \cdot V) \cdot R \cdot G \cdot K\kappa \cdot Kc \cdot Knr,$$

where:

T – annual measurement of surface air temperature (or surface temperature) – seasonal average (at least for ten years t=10 years);

V – atmospheric air humidity;

R – prevailing wind direction (wind mode). Since the inflow from the west and north (North-West) occurs most of the year, it is suggested to take Rnw = 0.7 (cold season), and southwest index Rsw = 0.3 (warm season);

G – Geographic location of the region (tropical, equatorial, temperate, polar). Based on the CMIP forecast[260], which says that the highest intensity will be in the temperate belt and the polar belt – the following

Existing assessment methods

1. Climate change adaptation planning, research and practice platform (weADAPT).
URL: https://www.weadapt.org/;

2. Climate Change Knowledge Portal (CCKP) of the World Bank Group.
URL: https://climateknowledgeportal.worldbank.org/;

3. United Nations Framework Convention on Climate Change (UNFCCC), official country data portal on greenhouse gas emissions.
URL: https://di.unfccc.int/detailed_data_by_party;

4. World Meteorological Organization. Catalogue for Climate Data.
URL: https://climatedata-catalogue.wmo.int/;

5. Roshydromet Climate Centre.
URL: http://cc.voeikovmgo.ru/ru;

6. The Central Asia Climate Information Platform (CACIP).
URL: https://centralasiaclimateportal.org/;

7. Portal of Knowledge for Water and Environmental Issues in Central Asia (CAWater-info).
URL: http://www.cawater-info.net/news/index_e.htm

[259] B. Alikhanov (Senate of Oliy Majlis), S. Samoylov (Ecological Movement of Uzbekistan) and V. Sokolov (GEF Agency of IFAS)
[260] World Climate Research Program. URL: https://www.wcrp-climate.org

coefficients are proposed for these regions: G temperate belt = 2, G polar belt = 1.5. For the tropical and equatorial belt, the index is 1.25. This approach to estimating the geographical coefficient is related to the response of radiation reflected from clouds. Total radiation is the total influx of solar radiation to the horizontal surface of the Earth. Annual amounts of radiation influx vary from 40 kcal near the polar circle to 100 kcal in the Mediterranean region and Central Asia;

Kк – is a correlation index that takes into account the specificity of the territory (urbanized K = 2, rural area K = 1.7, forests K = 1.0, desert K = 1.5, etc.);

Kc – cyclist index, which characterizes the number of recurrences of: floods; droughts; fires; abnormal natural phenomena (downpours, tornadoes, volcanic eruptions, dust storms, etc.);

Knr – index of reduction (loss) of natural resources, characterizes the number of lost types of resources (flora and fauna, water resources and other types of natural resources).

The authors' ownership to this method is confirmed by the copyright No.005172 issued on 28.10.2022 by the "Center for Intellectual Property" under the Ministry of Justice of the Republic of Uzbekistan.

For the Theory published on the WMO and GWP Integrated Drought Management Program portal, see https://www.droughtmanagement.info/portal/wp-content/uploads/2022/11/Theory-of-Climate-change-Intensity-Determination_Eng.pdf.

Source: GEF Agency of IFAS

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[261]. It is a back-up organization of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (since 1994) 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 offering 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.

Activities in 2022

Research. The Institute developed: (1) a software for rating **regional environmental development** in Belarus (http://ecorating.by/). The information system gives a comprehensive environmental assessment of administrative territories and large cities by group of indicators for the purposes of the public policy on sustainable development and environmental improvement, as well as for the improvement of individual environmental management instruments of international cooperation; (2) **information system of the state water cadaster** – an integrated web-based information system for water management; the system contains regularly updated spatial (cartographic) and attributive (thematic) data on water bodies (rivers, streams, canals, lakes, reservoirs, ponds, springs) broken down by administrative territories and basins.

RUE CRICUWR using the unmanned aerial vehicle PHANTOM 4 RTK featuring high-precision mapping: measures areas of water and other objects; determines the degree of macrophyte invasion of water bodies and calculates the invasion area; detects the degree of eutrophication of water bodies and spots of increased blooming; monitors floods; monitors HPPs (visual inspection of dams, main units and mechanisms), etc.

Events. RUE CRICUWR took part in: (1) Scientific conference "Sustainable use of natural resources and environmental protection in the context of climate change" (January 26, Minsk); (2) 28th International information and communication technology forum "TIBO-2022" (June 6-10, Minsk); (3) International exhibition of housing and communal services "Our House" and roundtable "Improving reliability of water sewerage systems. Reconstruction of wastewater treatment plants under restrictive measures" (September 21-23, Minsk); (4) 9th Regional Forum of Belarus and Russia entitled "The role of interregional cooperation in deepening integration processes within the Union State" (June 30-July 1, Grodno). As part of the Forum, a session was held under the section "Cooperation between Belarus and Russia in the context of new international climate agenda" (June 30); an exhibition, where the RUE CRICUWR demonstrated the information system and the results of regional environmental rating in Belarus, was organized; cooperation agreements were signed between the RUE CRICUWR and the Russian State Hydrometeorological University (June 30, Grodno).

[261] established according to the Decree of the Council of Ministers of the USSR No.425 of 22.04.1960 "On measures to streamline the use of and enhance the protection of water resources in the USSR" and the order of the Presidium of the Academy of Sciences of the BSSR No.10 of 14.02.1961

The Institute's Council of Young Scientists participated in the national youth festival "ECO style life" including the following events: international research conference "Ecology: a step into science", discussion platform "The future of planet is in the hands of the youth", exhibition-presentation of research projects of students and environmental capmpaign "Hero's Tree" (April 21-22, Minsk).

Mass media. Head of the Surface Water Division, E. Gromadskaya participated in the two press conferences: (1) "Latest developments in water use and protection legislation: environmental norms and regulations, National Water Resource Management Strategy, ecological status and improvement of surface water bodies" (August 12, Press Center, "House of Press" RUE); (2) "Water resources of Belarus: use and conservation" (August 30, Sputnik Belarus multimedia press center).

For media publications, see http://www.cricuwr.by/rprinfo/.

Publications. For Institute publications in 2022, see http://www.cricuwr.by/.

Source: www.cricuwr.by

Kazakhstan. Kazakh Scientific Research Institute of Water Economy (KazSRIWE)

The KazSRIWE was established in 1950 in Taraz. This is one of the leading research organizations in the area of water management, land reclamation and irrigation, watering technology and technique, agricultural water supply and pasture watering, and water economics.

The Institute's mission is to deliver research, design, and educational activity to ensure effective and sustainable development of the water sector in the context of integrated water use and water security of the country.

Activities in 2022

Research. The scientific and technical program "Technologies and technique of watering in new irrigated land and of reconstruction and modernization of existing irrigation systems" is ongoing[262]. The program has the following tasks to solve: justify optimization of water use when applying water-saving technologies; develop a system of RS- and ground-based monitoring of water-rich territories suitable for development of irrigated agriculture in the southern region of Kazakhstan; develop principles and methods for balanced irrigation water distribution based on hydrological information and taking into account water formation in river basins; develop and optimize energy-efficient technologies for soil potential management in irrigated agro-landscapes of the Republic.

Events. The KazSRIWE hosted international conferences entitled: (1) "Climate and water resources: land reclamation and ecology" dedicated to the 70th anniversary of DAgrSc B.M. Koybakov, member of the Academy of Agricultural Sciences of Kazakhstan. The conference work was organized in 4 sections: "Impact of climate change on Eurasian water resources", "Transboundary waters and threats to their conservation", "Prospects of irrigated agriculture under conditions of water shortage", and "Environmental challenges in light of growing water consumption and climate change" (February 4); (2) "Innovative and practical solutions for accelerated restoration of degraded irrigated land productivity"[263], sessions "The status and prospects for reclaimed land use", "Innovative technologies of land reclamation", "Water-saving irrigation and water supply", and "Ecology and economics of water management" (May 20).

Publications. Proceedings of the International Scientific and Practical Conference, May 20, 2022, Taraz, 2022. – 273 pp.; Collection of scientific papers/ KazSRIWE, – Taraz, 2022. – 282 pp., Vol.1, Vol.2.

Source: KazSRIWE

Kyrgyzstan. Institute of Water Problems and Hydropower at the National Academy of Sciences of the Kyrgyz Republic (IVP&GE NAN KR)

The IVP&GE NAN KR was established in 1992. The Institute's activity is focused on fundamental research and applied technology development in the area of hydrology and hydropower. The Tien Shan Highland Research Center (TSHHRC) and the Ala-Archa Polygon for studies of hazardous hydrological processes operate at the Institute. In 2022, the IVP&GE NAN KR celebrated its 30th anniversary.

Activities in 2022

Research. Based on the "Analysis of opportunities for forecasting and management of water and energy resources in the Kyrgyz Republic in the context of climate change and under anthropogenic load" program, research efforts are carried out on the following themes: (1) Assessment of river runoff in Kyrgyzstan in

[262] jointly with "National Center for Space Research and Technologies" JSC, NAO "KazNARU", "S. Seyfullin Kazakh Agro Technical Research University" NCJSC, LLP "A.I. Barayev Research and Production Centre for Grain Farming"

[263] on the results of the joint project of KazSRIWE and the WB Central Asia Water and Energy Program (CAWEP)

the context of climate change; (2) Study of hydropower potential in the basins of Issyk-kul Lake and the Chu River under conditions of climate change; (3) Development and justification of groundwater management plans for the eastern part of the Chu Valley on the base of non-stationary geofiltration models; (4) Study of hazardous exogenic hydrogeological processes in Tien Shan; (5) Environmental and geographic characteristics of sustainable river basin development in Kyrgyzstan in the context of climate change and anthropogenic load; (6) Creation of RS-based GIS for monitoring water and land in Kyrgyzstan.

Researchers of the Institute continuously monitor: (1) the status of breakthrough lakes in the Ala-Archa River valley through regular stationary measurements of the key hydrometeorological parameters. **Surveys** were also made near Adygene lakes and **glacier**, and sites for future surveys were identified (July); (2) Kara-Batkak glacier feeding the Chon-Kyzyl-Suu River in southeastern Issyk-Kul region. Along with RS-measurements, complex expeditions are organized annually to the altitudes above 3,500 m from April to October.

Source: http://iwp.kg/?m=202207

As part of the RSF grant No.20-77-10057 "Diagnostics of permafrost degradation based on isotope tracers (234U/238U, δ18O+δ2H, δ13C+14C)", researchers of the Institute and the FECIAR UrB RAS's[264] Environmental Radiology Laboratory organized: (1) an expedition to the Ala-Archa River valley. Isotope-geochemical analysis methods of water samples help to gain insight into river flow formation and assess the components of the water balance; (2) a roundtable on "Evolution of glaciation of the Inner Tien Shan under the impact of climate change and human activity", where the IVP&GE NAN KR and FECIAR UrB RAS signed an agreement on scientific and technical cooperation (July 26).

Capacity building. The annual summer school "Knowledge transfer and data exchange" on the program "Satellite and instrumental monitoring of water resources in Central Asia" was organized for meteorologists, hydrologists, glaciologists and ecologists of Central Asia at the TSHHRC (August 5-11, Kyzyl-Suu vilage).

Young researchers and experts of the Institute took part[265] in: (1) the expedition from the Syr Darya River flow formation zone to the Aral Sea organized by EC IFAS (May 18-30, KR, RK, RT, Ruz); (2) workshops on WEAP and LEAP models in the Syr Darya River basin (September 29-30).

Events. The IVP&GE NAN KR organized: (1) roundtable "Water and energy resources of Kyrgyzstan under climate change and anthropogenic load" (March 22); (2) International scientific and practical conference **"Problems of monitoring and forecasting of water and energy resources in Central Asia in the context of climate change"** dedicated to the Science Day, the 30th anniversary of the IVP&GE NAN KR and the memory of D.M. Mamatkanov, Academician of NAN KR and NAN RT (November 9-11). The monograph "Water and Hydropower Resources of Kyrgyzstan in the context of Climate Change" was published.

The IVP&GE NAN KR took part in the 2nd International High-level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6-9); 4th Forum of scientists of the CIS member states (June 16-18, Bishkek); International scientific and practical conference on "Scientific achievements for human development" as part of the "Uzbekistan-Kyrgyzstan" academic readings (September 17-20, Navoiy, Uzbekistan).

Awards. As part of the Science Day celebrations at NAS KR, staff members of IVP&GE NAN KR were awarded the "Excellent Scientist" and the "Honored Worker of NAS KR" badges (November 10).

Media. Experts of the Institute gave interviews on: (1) water level lowering in Issyk-Kul Lake since 2011 (January 24, KR); (2) water challenges (February 19, TV KABAR; April 14, EITR "Ilim Bilim"); (3) water-energy balance in Central Asia at the meeting at the National Institute for Strategic Research of the Kyrgyz Republic (June 24, MARAL FM); (4) status of mountain lakes in the Chu valley (July 13, BBC News Kyrgyzstan); (5) causes of glacier collapse in Zhuuku Gorge (July 14, SPUTNIK Kyrgyzstan).

Source: http://iwp.kg/,
https://www.facebook.com/iwp.istc.kg/

[264] N. Laverov Federal Center for Integrated Arctic Research of the Ural Branch of the Russian Academy of Sciences
[265] with the support of the USAID Regional Water and Environment activity

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

RosNIIVKh was founded in 1969. It consists of the lead institute (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 included in the List of organizations forming expert centers and offering expertise on specific issues, the dissertation committee on geoecology, the Water Sector Professional Development Center (WSPDC), and the Water Museum.

The Institute's mission is to reach a balance between the water sector development and the nature protection by combining academic research and its practical value, with ultimate achievement of environmentally friendly development of water resources in Russia.

Activities in 2022

Capacity building. 317 specialists were trained at Water Sector Professional Development Center and received certificates on "Hydraulic facilities safety", "Regulation of water use", "Information systems and complexes of Rosvodresursy", and "Water management and governance". The Center maintains the Water Museum to promote knowledge on sound water use and protection among water professionals, students, schoolchildren, and the general public.

Events. The Institute took part in the: (1) 25th anniversary meeting of the Basin Council (BC) of the Don Basin District (BD) (June 16, Rostov-on-Don); (2) international scientific and practical conference "Institutional and legal support to sustainable water use in the Russian Federation" (March 31, Moscow); (3) 25th and 26th joint meetings of the BCs of the Oka and Dnepropetrovsk BDs, of the Baltic and Barents-White Sea BDs, of the Dvina-Pechora BD (March 31-April 1, Tula, September 7-10, Velikiy Novgorod).

Publications. In 2022, 6 issues of the Journal "Water economy of Russia: challenges, technologies, governance" were published and included research articles by the staff of the Institute and its branches.

Source: RosNIIVKh

Tajikistan. Institute of Water Problems, Hydropower and Ecology of the National Academy of Sciences of Tajikistan

The Institute of Water Problems, Hydropower and Ecology of the National Academy of Sciences of Tajikistan was founded in 2002[266]. It carries out diverse research, including comparative analysis of energy efficiency of large rivers in Tajikistan, development of a unified economic criterion of hydropower development; development of methods for regulation and forecasting of flow for hydropower and irrigation purposes, assessment of economic value of water under joint use for hydropower and irrigation; optimization of hydropower operation and planning of hydraulic facilities in river basins of Tajikistan; studies of climate impact on water and energy resources and development of methods for hydropower adaptation; analysis of international and national legislation on transboundary water and energy sharing, causes of hydropower and irrigation conflicts between the Aral Sea Basin countries and development of proposals for their solution.

The Institute offers: (1) master's programs on "Hydraulic engineering", "Ecology", "Natural water and wastewater treatment", "Environmental monitoring", "Rational use and protection of water resources", "Energy efficient technologies and energy management" since 2014; (2) PhD programs on "Ecology", "Hydrology", "Meteorology", "Hydraulic engineering and facilities", "Water resources and water use", "Construction" since 2017.

Research. In 2022, research efforts were continued on: (1) "Optimization of water-food-energy-environment nexus in the Zeravshan River basin in the context of climate change" (2018-2022); (2) "Problems of formation and regulation of solid runoff in waters of Tajikistan and their solution" (2020-2024); (3) "Energy development and optimization strategy. Hydro-coal scenario of energy sector development in Tajikistan" (2020-2024).

Project proposals were developed on "Study of water quality and ecology of the Varzob and Kafirnigan Rivers and their tributaries", "Study of physical and chemical composition of ash and slag waste and development of recommendations for its ecological utilization", "Study of climate change impact on the Vakhsh River water regime using ground observations and RS data", and "Study of spatial and temporal dynamics of glaciers and lakes of Tajikistan depending on impact factors".

Events. The Institute hosted[267]: (1) scientific and practical conference "Water sector: problems and solutions", jointly with the Agency for Hydrometeorology

[266] PP RT No.279 of 03.07.2002 "On establishment of the Institute of Water Problems, Hydropower and Ecology of the National Academy of Sciences of Tajikistan"

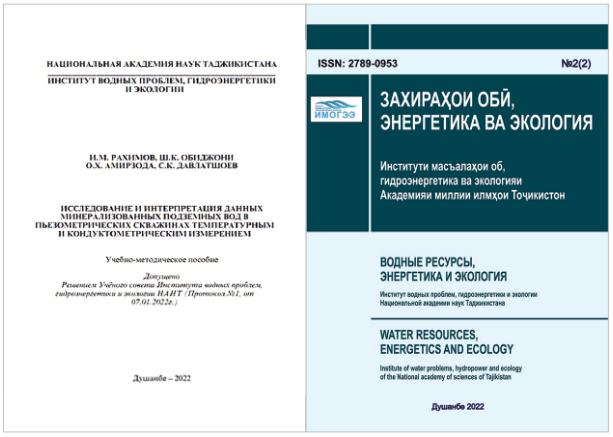
[267] as part of activities of the International Decade for Action "Water for Sustainable Development", 2018-2028

and the Aga Khan Agency for Habitat (May 6-7); (2) International scientific and practical conference "Water security as a basis for sustainable development" dedicated to the 20th anniversary of the Institute (October 5-6).

The Institute took part in the: (1) International Central Asian scientific and practical conference "30-years of water cooperation among the Central Asian states: facing the future" (April 25-27, Turkistan, Kazakhstan); (2) international exhibition "Water for sustainable development" coincided with the 2nd International High-level Conference on the International Decade for Action "Water for Sustainable Development", 2018-2028 (June 6-9).

Publications. Since 2021, the Institute has been publishing the Journal "Water Resources, Power Engineering, and Ecology" registered at the Tajik Ministry of Culture (No.191-MJ-97). In 2022, 4 issues were published.

Other publications: O. Amirzoda, N. Kurbon. Tajikistan initiatives on water and SDGs. – Dushanbe: Donish, 2022. – 79 pp.; O. Amirzoda, N. Kurbon, Kh. Asoev. Leader of the Nation: water, climate and environment. – Dushanbe: Donish, 2022. – 134 pp.; I.M. Rakhimov, Sh.K. Obidzhoni, O.Kh. Amirzoda, S.K. Davlatshoev. Training manual "Study and interpretation of data on saline groundwater in piezometric wells using temperature and conductometer measurements". – Dushanbe, 2022.



For publications of the Institute in national and independent information agencies of Tajikistan, see https://www.imoge.tj/ru/publikatsii/stati.

Source: https://www.imoge.tj/ru/

Uzbekistan. Research Institute of Irrigation and Water Problems (RIIWP)

RIIWP is a major research institution in the area of water management and land reclamation in Uzbekistan.

The Institute includes 15 research laboratories, 5 regional centers (Karakalpakstan, Bukhara, Namangan, Samarkand and Surkhandarya), Water Engineering Center, and Research Consulting Center for Water Saving Technologies.

The Institute employs 14 doctors of science, 42 doctors of philosophy and candidates of science; 86 doctoral students and 20 independent researchers are engaged in the Institute's research work as well.

Activities in 2022

Research. According to the results of 2022, the Institute took the 8th place among 105 national research organizations in the national rating of the Ministry of Innovations of the Republic of Uzbekistan.

RIIWP works on 12 topics through grant projects of the Ministry of Innovations of RUz: (1) "Development of 'field-irrigation-irrigation system' technology – a smart technology for irrigated areas in Syrdarya province suffered from disaster" (innovative research); (2) "Scientific basis, principles and new methodology for

land reclamation in Uzbekistan", "Flow regulation and streamflow process patterns in river basins under anthropogenic impact" (fundamental research); (3) "Development of technology serving to reduce CDW in Khorezm province", "Development of hydro-adaptation technology for hydraulic structures with direct intake", "Development of water-saving technology for rice production under soil-climatic conditions of the Republic of Karakalpakstan and Khorezm province", "Development of resource-saving technology for optimal cotton irrigation", "Development of water-saving technology for irrigation and leaching and creation of a polygon providing favorable regime of irrigated land in the Republic of Karakalpakstan", "Development of technology increasing energy efficiency of pump stations", "Development of GIS-based model for reservoir operation and siltation management", "Development of a long-term streamflow forecast model for the Surkhandarya and Kashkadarya basins in the context of climate change", "Development of water regime of lakes and reservoirs in Muynak district to improve their hydrological and hydrobiological status" (applied research).

RIIWP implemented the Project "Conducting a comprehensive biochemical analysis of silt composition in the in-stream reservoir at the Tyuyamuyun hydroscheme", including the bathymetric (hydrographic) survey and calculation of reservoir siltation.

Capacity building. RIIWP held training: (1) for the staff of the specialized water service; (2) in all provinces of Uzbekistan and the Republic of Karakalpakstan[268] in line with the PP RUz No.PP-145 of 01.03.2022; (3) on laser leveling and application of "Biosolvent" product for soil leaching and "Hydrogel" product to preserve moisture in the soil in case of water shortage in the Republic of Karakalpakstan.

24 young researchers upgraded their skills in prestigious world research institutions. 7 demonstration sites were established to introduce scientific achievements and know-how in the water sector.

Events. RIIWP representatives participated and made presentations at more than 15 international conferences.

Cooperation. 9 Memorandums of Understanding were signed with research and leading universities of China, Great Britain, Belarus, Russia, Hungary, South Korea, Japan and CA countries on personnel training, transfer of scientific achievements and know-how.

Publications. 14 monographs, 36 recommendations and manuals were published and more than 350 articles were included in Web of Science and Scopus databases. Nine patents were registered.

Other publications: (1) I. Makhmudov, D. Paluanov, U. Sadiev. Technical solutions to ensure the safety of operating hydraulic engineering constructions. ASEAN Journal on Science & Technology for Development. Vol. 39, No.4, 2022, 189-191 189 DOI 10.5281/zenodo.6583860; (2) I. Makhmudov, U. Sadiev. Mathematical model of mass transfer of reinforced concrete structures of hydraulic structures with corrosion protection in aggressive environment. Journal of Positive School Psychology http://journalppw.com 2022, Scopus, EBSCO/ Vol. 6, No.6, 5889-5892 // https://journalppw.com/index.php/jpsp/article/view/8494; (3) I. Makhmudov, U. Sadiev, U. Jovliev. Transporting irrigation systems and problems of their tightness. Journal of Positive School Psychology http://journalppw.com 2022, Scopus, EBSCO/ Vol. 6, No.6, 5879-5883 // https://journalppw.com/index.php; (4) Yu. Shirokova, G. Paluashova, F. Sadiev, J. Amers and D. Kodirov. Desalinization of degraded soils by atmospheric precipitation and Biosolvent for saving water resources. // IOP Conference Series: Earth and Environmental Science DOI 10.1088/1755-1315/1112/1/012130.

Source: RIIWP

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

The IWPLR of NAAS was founded in 1929. The Institute carries out fundamental and applied research in the area of hydraulic engineering, irrigation and drainage, water management, agricultural water supply, land reclamation and environmental monitoring. It deals also with the design of water facilities and water supply and sanitation systems. The Institute offers postgraduate and doctoral programs on: 06.01.02 – "Agricultural land reclamation" (technical, agricultural sciences); 201 – "Agronomy" and 192 – "Construction and civil engineering". In 2022, the Academic Council[269] was established at the Institute for awarding degree of Doctor of Science.

Activities in 2022

Research. Scientists of the Institute are working on[270]: *(1) "Study of formation of water and nutritive regimes under combination of different irrigation and tillage methods on reclaimed land in a changing climate"*

[268] PP RUz No.PP-145 of 01.03.2022 "On measures to improve water resource management in the lower reaches and regulate relations between water users", https://lex.uz/ru/docs/5884127

[269] based on the Decree of the Ministry of Education and Science of Ukraine No.894 of 10.10.2022

[270] within the framework of *fundamental research on scientific excellence program of NAAS 04 "Sustainable water use, enhancement of water security, development of land reclamation and effective use of reclaimed land under climate change"*

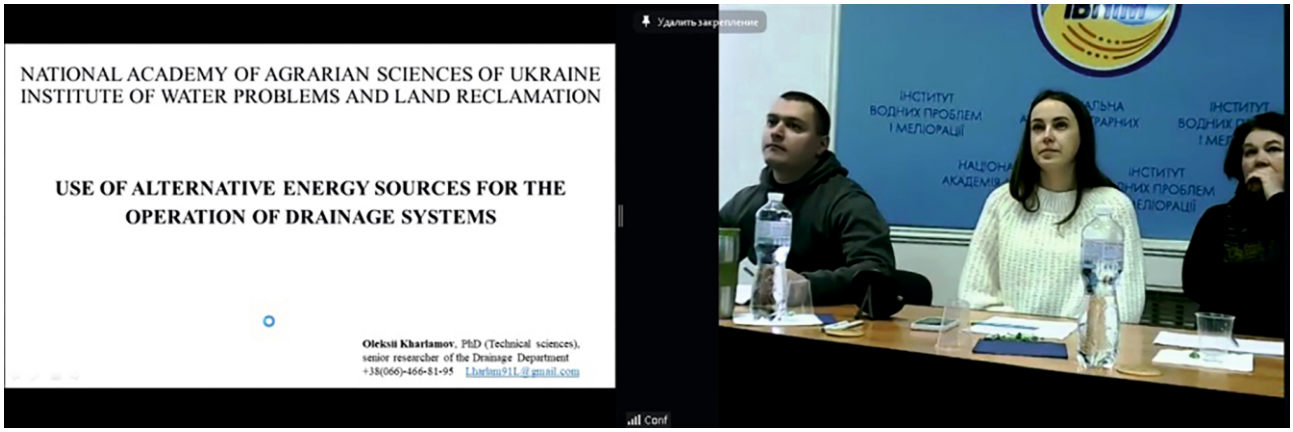
(2021-2025, 04.02.00.11F); (2) "Study of formation processes and development of scientific and methodological bases of soil water regime management on reclaimed land in current farming practices and climate change" (2022-2025, 04.02.00.25F).

The IWPLR and the State Agency of Water Resources of Ukraine signed a Memorandum of Cooperation defining the procedure of cooperation between institutions on scientific support in the field of management, use and reproduction of surface water resources.

Capacity building. The Institute conducted advanced training courses for research and academic-pedagogical staff on "Modern technologies and techniques in irrigation" (June 8-9, online).

IWPLR took part in: (1) online webinars "New approaches for climate change assessment" (January 21) and "International experience of integrated land and water resource consolidation: organization, procedures, implementation – opportunities for Ukraine" (May 18-June 1); (2) training (November 21-25, Schwarzenburg, Switzerland).

Events. The Institute organized the 5th International scientific and practical conference of young scientists "Role of land reclamation and water management in sustainable agriculture development" (December 8).



Scientists of the Institute delivered speeches at the: (1) meeting of the Working Group on Irrigation and Drainage in States with Transition Economy (26 May, online); (2) International scientific and practical conference "Integrated quality assurance of technological processes and systems" (May 26-27, online); (3) Scientific Assembly of the International Association of Hydrological Sciences (May 28-June 3, Montpellier, France); (4) 4th International AGBIOL Conference 2022 (August 29, online); (5) Balkan Congress (August 21-September 3, Edirne, Turkey); (6) International conference "Growing crops using sewage sludge on marginal lands" (September 22, online); (7) conference "Efficient land use in the Polesie Zone in a changing climate" (September 22, online); (8) meeting "Land reform in Ukraine: prospects and challenges for sustainable development of agrarian sector and rural areas" (December 1).

Publications. Publications in 2022: Multiyear changes in water regime of Ukrainian rivers/ V.I. Vishnevskiy, A.V. Kutsiy. – Kiev: Nakova dumka, 2022. – 252 pp.

Water regime management while growing fodder crops on drained land/ G.V. Topolnik, S.M. Kika, I.M. Vodka, M.G. Sgetsyuk, M.D. Zosymchuk, A.A. Zosymchuk, A.A. Danilitsky, under the editorship of Candidate of technical sciences G.V. Voropay. – Kiev: Agriscience, 2022. 244 pp. ISO 978-966-540-561-0

Modernization of irrigation systems using self-regulated water supply/ V.M. Popov, T.V. Matyash, M.M. Targoniy, M.V. Yatsyuk, A.P. Muzyka, N.V. Soroka, V.V. Shlikhta. Kiev: Agriscience, 2022. 128 pp. ISBN 978-966-540-544-3

Source: https://igim.org.ua/

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

International Institute for Central Asia

The International Institute for Central Asia (IICA), established on the initiative of the President of Uzbekistan in 2020, is the only public research institution in the region engaged in interdisciplinary research on civilizational diversity and modern processes of broad development in Central Asia.

IICA is to promote the establishment and strengthening of close research and expert cooperation in the areas of common interest of the countries in the region.

IICA closely cooperates with representatives of the public and private sectors, civil society, distinguished

scientists and experts of Uzbekistan to ensure open-mindedness and impartiality.

The Institute aims to establish broad links with advanced think tanks of the CA countries and other states, as well as experts of international organizations dealing with Central Asian issues.

The Institute employs experts with experience in analytical work in the following areas relevant for the Central Asian region: economics, energy, ecology, and cultural and humanitarian studies.

Main fields of activities

- comprehensive and in-depth studies of main trends in modern foreign policy, domestic political and socio-economic processes in the countries of the Central Asian region;
- analysis of political, legal, trade, economic, humanitarian and other aspects of cooperation between the countries in Central Asia, as well as the status of and prospects for joint solution of common challenges facing the states, incl. in the areas of trade and investment, industrial cooperation, transport and transit, agriculture, tourism, science and culture, water and energy, environmental protection, as well as security;
- contribution to policy documents to deepen the multifaceted cooperation of the Republic of Uzbekistan with other countries in the region;
- elaboration of proposals and recommendations on new growth areas of regional development;
- exploration of prospects for extension of investment and innovation cooperation, adoption of green technologies, and development of digital economy;
- study of the historical and cultural heritage of Central Asia and the ways for its preservation.

Activities in 2022

IICA organized and participated in 27 international conferences, 49 roundtables, forums and online seminars held jointly with international partners (India, Kazakhstan, China, Pakistan, Russia, Turkey, Tajikistan, Turkmenistan, France, etc.). 27 meetings and negotiations were held with the heads of diplomatic missions of foreign countries (Israel, Kazakhstan, Korea, Kyrgyzstan, Latvia, Russia, Tajikistan, Turkey, France) and representative offices of international organizations (UN, UNRCCA, TIKA, SETA, JETRO, JIIA, Ebert Foundation, Japan Peace Foundation, etc.).

12 events were focused on water and environment: (1) roundtables "Topical issues of rational water use and glacier conservation in Central Asia" (January 19, Tashkent, IICA jointly with NAS RT) and "On prospects for effective use of water diplomacy mechanisms in the Central Asian region"[271] (November 11, Tashkent); (2) International Central Asian scientific and practical conference "30-years of water cooperation among the Central Asian states: facing the future" (April 25-27, Turkestan, Kazakhstan); (3) Conference "Uzbek-Tajik water cooperation" (April 29, online, IICA in cooperation with the Center for Strategic Studies under the President of Tajikistan); (4) under the "USAID regional water and environment activity"– 2nd and 3rd meetings of the Regional Coordination Committee (May 11-14, Bukhara, Uzbekistan; September 26-29, Kyzylorda, Kazakhstan), 3rd meeting of the National Intersectoral Committee (September 7-9, Namangan, Uzbekistan) and a workshop on the use of WEAP (Water Evaluation and Planning) and LEAP (Long-range Energy Alternatives Planning) (December 5, Tashkent); (5) within the Dushanbe Water Process (June 6-10, Dushanbe, Tajikistan); (6) meeting with Prof. T. Dadabaev of the University of Tsukuba (Japan) (August 18, Tashkent, IICA); (7) regional seminar "Central Asia towards the UN 2023 Water Conference" (September 20, Tashkent); (8) International conference "Global climate change" with the Ebert Foundation and ISRS (November 17, online).

Source: IICA

[271] organized by the Legislative Chamber of the Oliy Majlis

SECTION 1

Key Water Developments in the World

11.1. Africa

The Grand Ethiopian Renaissance Dam on the Nile River. On August 12, Ethiopian Prime Minister Abiy Ahmed announced that his country has now completed the third filling of the reservoir behind the dam. This contributes to further tensions with downstream neighbours Egypt and Sudan. Egyptian authorities have filed a complaint with the UN's Security Council. The authorities in Cairo claim that Ethiopia refuses to share Dam plans, something which they view as essential in a project of great dimensions such as this one which will have an impact on the Nile's water flow. Egypt accuses Ethiopia of filling the dam's reservoir without articulation with Egypt os Sudan, which would violate international law. It also urged the Council to intervene in order to bring Ethiopia to the negotiations table. The enormous $4.2bn dam has been at the centre of a regional dispute ever since Ethiopia broke ground on the mega project in 2011. Ethiopia announced in mid-June that it had completed 88% of the construction work on the GERD, and is looking forward to the actual completion of its construction by the end of 2023.

This general view shows the site of the Grand Ethiopian Renaissance Dam in Guba, Ethiopia, Feb. 19, 2022. – Amanuel Sileshi/AFP via Getty Images

The **Horn of Africa**, a region in East Africa encompassing parts of Kenya, Somalia and Ethiopia, was enduring "the worst in 40 years" drought, which affected 36 million people in the region, caused crop failures and the death of more than 3 million livestock. The crisis in the region results from a combination of causes, including armed conflict, political instability and weather shocks. On the contrary, in West Africa heavy rainfall and floods caused the displacement of 1.3 million people and killed more than 600. In Nigeria, the floods affected 33 of the country's 36 states. Nearly 110,000 ha of farmland were destroyed by the floods. According to UNICEF, the floods left more than 2.5 million people in need of humanitarian assistance, more than 60% of them children.

Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

Senegal has kicked off work to build the country's first water desalination plant in Dakar's Mamelles district aimed at easing the capital's chronic water shortage. The coastal facility will desalinate water from the Atlantic, with a peak capacity of 100,000 m^3 per day. The project also entails renovation of more than 300 km of water pipes. However, the scheme is contested by critics as costly and an environmental peril.

The **Lesotho** Highlands Development Authority (LHDA) announced in November 2022 that the Polihali Dam and Polihali Transfer Tunnel construction contracts have been awarded and the work will start. These structures are a part of the Lesotho Highlands Water Project (LHWP), a multi-billion bi-national project which was established by the treaty of 1986 signed between the governments of the Kingdom of Lesotho and the Republic of South Africa. The LHWP is a multi-phased project to provide water to the Gauteng region of South Africa and to generate hydro-electricity for Lesotho. It is the largest water transfer scheme in Africa. The above contracts are a key

milestone in Phase II of the Project, which will increase the current water transfer rate of 780 Mm^3 per annum incrementally to more than 1,270 Mm^3 per annum.

Tanzanian authorities began rationing water in the commercial capital Dar es Salaam following a drought-induced drop in water levels from its main source, the Ruvu River. The 5.5 million inhabitants of the Indian Ocean city went without piped water for 24 hours on alternating days. Water supply from the Ruvu has dropped from 466 to about 300 million litres a day, whereas the city consumes an estimated 500 million litres a day.

The Africa's biggest Sudd wetland is under threat of being turned to desert by the revival of a half-completed engineering megaproject that would divert the Nile River away from the wetland and shorten its route north to the Mediterranean Sea. Africa's largest freshwater wetland permanently occupies roughly 3,500 square miles in an otherwise dry region of South Sudan and floods up to 10 times more in the wet season. Egypt is set to fund the scheme, which would reduce evaporation from the swamp, and so deliver water downstream to its reservoirs. The **South Sudan** government hopes the canal will also reduce flooding around the swamp. However, there are increasing concerns that even a partial loss of the Sudd would be an ecological disaster, desiccating the world's second largest swamp and ending seasonal flooding of the surrounding grasslands. Hydrologically, cutting evaporation will reduce rainfall for farms and rainforests across South Sudan and neighboring countries.

View of the Sudd swamp in South Sudan.
Photo by Inna67895/Wikimedia Commons (CC BY-SA 4.0)

Construction of the Angololo multipurpose dam, a joint project between **Kenya and Uganda** is set to commence. The 430 square kilometer project is expected to offer water for irrigation and domestic use as well as generate 1.75 megawatts of electricity. The dam will supply 20 million people with water for domestic use and put 3,300 ha of land under irrigation.

Higher than usual rainfall was filling up Lake Chad as a result of significant flows into the Chari-Logone and the Komadougou Yobe tributaries of the Lake. The Lake Chad Basin Commission 2022 hydrological report disclosed that the rainfall helped farming in several localities. However, the resulting overflow of major rivers caused flooding and significant material losses and internally displaced persons in the region. "The Lake is filling up rapidly, following higher than the average rainfalls of 1981-2010 recorded in the Lake Chad Basin in 2022," the report said. Its volume is comparable to that of an average lake with a surface area of about 24,000 km^2.

A new regional transboundary aquifer map for the African region has been released[272]. Across Africa, there are now 106 transboundary aquifers, an increase from 72 in the 2015 inventory. They range in size from 10 km^2 to 2,500,000 km^2. Despite the progress

[272] it is based on the Transboundary Aquifers of the World Map (TBA Map) that was updated in 2021

made, there are still data and knowledge gaps for Africa's transboundary aquifers. Several aquifer boundaries are also unconfirmed by all riparian states. This could lead to a lack of ownership over their assessment, monitoring and management by riparian's.

Nigerian[273] President has, for the third time, pushed for the approval of a water bill which has been highly criticized by coastal states of the Niger Delta. After two failed attempts the government is now sponsoring the same bill albeit under a different name. Critics say that this bill is an attempt at a power grab from the federal government as it tries to take control of all waterways which are currently under the control of the states.

According to the newly-released National Infrastructure Plan 2050, all of **South Africa's** major metropolitan areas will face water restrictions within the next five years. Irrigated water use may have to increase by a further 6% (up from the existing 60%), to maintain current crop yields. This, despite an overall water deficit. The plan also sets some priorities and implementation goals including establishment of a Water Resources Infrastructure Agency and single national water regulator; completion of a raw water pricing strategy; a plan for ensuring the viability of municipal wastewater plants; and, a policy for water use in agriculture.

The Democratic Republic of the **Congo** signed a new law on the Promotion and Protection of the Rights of the Indigenous Pygmy Peoples that legally recognizes Congo's traditional forest communities as a distinct people with rights, including the right to free, prior and informed consent before the government and companies can exploit their land.

11.2. Asia

Afghanistan

Socioeconomic and humanitarian crisis and climate change. In the aftermath of the Taliban takeover, Afghanistan faced acute socioeconomic and humanitarian crisis on an unprecedented scale. According to UN, in 2022, 24.4 million people (59% of country's population) were in need of humanitarian assistance and more than 9 in 10 lived in poverty. More frequent and devastating natural disasters caused by climate change compounded the crisis. On 22 June, an earthquake in south-eastern Afghanistan resulted in an estimated 1,036 deaths and about 3,000 injuries and damage to at least 4,500 homes. Atypical floods during the summer season (June-August) affected 130,000 people, caused damage to some 3,400 houses and destroyed irrigation systems in at least nine provinces in the country.

Hydraulic structures. The construction of the Qosh-Tepa canal began in Kaldar district of Balkh province near the border with Tajikistan and Uzbekistan. The irrigation canal is to divert water from the left bank of the Amu Darya River (see 12.5 "Construction of the Qosh-Tepa canal in northern Afghanistan").

The construction of the Tori Dam, which will cost 97 million Afghanis to build, began in the southern province of Zabul in October. The dam will be constructed with a storage capacity of 2.9 million cubic meters, which will be used to irrigate 600 hectares of land and generate 100 kilowatts of electricity.

The Kajaki power dam was inaugurated on 27 July in Helmand province in the south of Afghanistan. The power dam will provide 100 MW of electricity to the provinces of Helmand and Kandahar. The Kajaki dam was originally built by the US in 1953. In 1975, a 33-MW powerhouse was commissioned. In 2016, a Turkish company modernized the power dam to increased its capacity to 51 MW.

Humanitarian aid. The UN team in Afghanistan has launched its One-UN Transitional Engagement Framework (TEF) to assist Afghans in 2022. The TEF is the overarching strategic planning document, ensuring the coordination of the UN team's work in saving lives, sustaining essential services and preserving essential community systems in Afghanistan. The $8 billion required to implement this UN-wide framework include the $4.44 billion previously requested through the Humanitarian Response Plan, launched on 11 January. The UN requires an additional $3.6 billion in immediate funding. The European Union announced $302 million to meet the basic human needs of the Afghans. ADB has approved $405 million in grants to support food security and sustain delivery of essential health and education services. WB and the Afghanistan Reconstruction Trust Fund (ARTF) approved first transfer of $280 million in support of delivery of essential services as part of the provision of over $1 billion in the form of recipient-executed grants. The U.S. support for Afghanistan amounted to more than $1.1 billion in humanitarian assistance since August 2021. Humanitarian aid was also provided by other governments, including China, which donated $37 million.

China

In January, China released the **first-ever 14FYP for Water Security**[274]. With an overall aim of significantly strengthening China's national water security capability by 2025, this comprehensive water plan res-

[273] Nigeria is a federation of states, each with their own ethnic make-up and many with different perspectives on water management depending on whether they are part of the Niger Delta

[274] Five-Year Plan for the period 2021-2025

ponds to China's significant national water challenges. During the current five-year period, China will promote reforms in key areas of water conservation, improve the innovative development of water conservation, and modernize the water management system by implementing a national water-saving initiative and smart water network, as well as undertaking the construction of major water projects. As part of this, there will be a strong emphasis on digitalizing and monitoring water resources. These include the full monitoring of its watersheds from mountains-to-oceans using new technologies from 5G, remote sensing to unmanned ships and underwater robots. China's aim is to accelerate the construction of 'digital watersheds' for all its major river basins/water sources. In the context of climate change, the plan sets key tasks that address core adaptation issues around water – from ensuring water supply to building resilience to water shocks, particularly by fortifying flood measures. Moreover, China's new **National Climate Adaptation Strategy** aims to develop the country as a 'climate resilient society' by 2035. The new policy document was jointly released on the 13th of June by 17 ministries, led by the Ministry of Ecology and Environment. Building on the already existing 2013 National Strategy for Climate Change Adaptation, the new strategy emphasizes the monitoring and assessment of climate risks as well as the protection of food security and climate sensitive economic sectors such as supply chains, financial sectors and energy supply.

State Councilor and Foreign Minister Wang Yi attended the third "China+Central Asia" Foreign Ministers' Meeting. Finally, the parties adopted the Joint Statement, which particularly focused on initiatives for cooperation in the field of environmental conservation, water and energy, and green growth (June 8, Nur-Sultan). China will also explore the possibility of participating in environmental and socio-economic projects in the Aral Sea region within the framework of the UN Multi-Partner Human Security Trust Fund.

China Belt and Road Initiative (BRI) investments in 2022: BRI finance and investments were steady in 2022 at $67.8 billion. Total engagement in the energy sector reached $24.1 billion – which is the lowest level of energy engagement since the launch of the BRI in 2013. Green energy engagement (solar, wind, hydro) in 2022 increased 50%. Coal saw renewed engagement through coal mining in Indonesia; engagements with Sub-Saharan Africa and West Asia dropped to lowest levels. Major beneficiary countries of Chinese investments were Hungary ($7.6 billion), Saudi Arabia, and Singapore; the focus of China's overseas BRI engagement continued to be in infrastructure, particularly in energy (36%) and transport (18%). Metals and mining constitute the second largest investment sector for Chinese engagement in the countries of the BRI.

China announced its first national drought emergency on the 19th of August amid the hottest, driest summer since Chinese records began 61 years ago. Water in the drainage area of the Yangtze River had dropped to 60% below average levels for August. In Sichuan province, which is highly dependent (80%) on hydropower for its electricity supplies, factories were ordered to shut down for six days in order to save power. The drought has also affected an estimated 2.2 Mha of agricultural land. China's State Council announced a $1.45 billion package of subsidies for rice farmers to compensate for agricultural losses.

At the same time, during China's rainy season, many parts of the country experienced intense floods leading to large economic and human losses. In June, floods in the southern province of Guangdong affected almost half a million people, impacting the industrial city of Shaoguan, where factories had to halt production. In August, destructive rains were reported across the country, including the northwest province of Qinghai, the northern province of Shanxi, the southwest province of Sichuan and the northeast province of Heilongjiang. As the planet warms, a greater proportion of China's rain will fall as more concentrated downpours.

Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

Three major water projects commenced as part of the Chinese government's plan to invest an estimated $120 billion in water infrastructure in 2022. One three-year project tackles floodgate reconstruction in the Yellow River. The project will ensure stable water supply in areas of the country with large-scale grain production. The largest of the projects, worth $750 million, will impact the Hunan water reservoir and is expected to be able to guarantee a flow of 285.000 t of clean water a day into the Southeastern city of Jishou. Hunan is the second largest consumer of water in the Yangtze River Economic Belt (YREB) due to its agricultural activity. The third project is aimed to improve river management in Anhui province providing water security to 1.5 million people and nearly 200,000 hectares of farmland.

Other Asian Countries

In the midst of heavy monsoon rainfall and as **South Korea** deals with floods, **North Korea** (DPRK) has, for the second time this year, opened the floodgates of dam on the Imjin River without notice, causing an increased water flow downstream and a risk of flooding. In an agreement signed by both countries in October 2009 the DPRK committed to provided warning ahead of opening floodgates, however, and despite South Korea's appeals back in June, this has not been done. In 2009, opening of floodgates by the DPRK without notice caused the death of six people in South Korea's Yeoncheon County. According to North Korea official there is no reason for prior notification since South Korea is more modern and knows whether or not they've opened the gates.

India and **Pakistan** experienced extremely high temperatures in March and April. March was the hottest in India since records began 122 years ago. And in Pakistan, temperatures reached 47°C in some parts of the country. However, from mid-June to the end of August, **Pakistan** experienced very intense

rainfall, coincident with the monsoon season (see Brahmaputra and Indus River Basins below). Parts of **Malaysia** also suffered from floods in early 2022. The government has estimated that the total losses from the floods amount to $1.46 billion, with most of the economic damage located in Selangor, the country's richest state.

Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

Destruction due to stagnant rainwater causing of poor sewerage system creating problem for commuters and residents after flood flowed in area on July 26 2022 in Hyderabad.
Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

The 38th meeting of the **India-Bangladesh Joint Rivers Commission (JRC)** took place in New Delhi in August. This was the first meeting of the JRC after 12 years, the 37th edition having been held in 2010. JRC was established as an outcome of the 1972 Indo-Bangla Treaty of Friendship, Cooperation and Peace by the two countries. The issues under discussion included also water sharing of Teesta river which Bangladesh was quite keen to have. It is a major river after Ganga and Brahmaputra. A deal on sharing of Teesta water was about to be signed in 2011 during the visit of then Bangladesh Prime Minister Manmohan Singh. But this could not happen as West Bengal Chief Minister dropped out at the last minute from the visiting delegation. Presence of the latter would have helped in signing the deal as water is a state subject under the Indian constitution. Moreover, water from Teesta River helps irrigate farmlands in northern Bengal. Thus any deal on Teesta is going to materially affect the state of West Bengal. India and Bangladesh share 54 rivers between them. Now both countries are trying to reach an understanding over sharing of water of these rivers.

Cambodia shared its plan to secure UNESCO world heritage recognition for all the rich biodiversity to be found along the long stretch of the Mekong from the Lao border to the province of Kratie over 200 km downstream. Securing UNESCO recognition will also help protect 40 endangered species on ICUN's red-list. Cambodia is already home to three heritage sites, including the legendary Angkor Wat and one natural heritage site, the successful U.N.-backed biosphere reserve and the bird sanctuary site on Tonle Sap, the biggest inland lake in the region.

Deforestation intensifies in northern **Malaysia's** most important water catchment. Between 2002 and 2021, the greater Ulu Muda landscape lost 82.8 square kilometers of humid primary forest and forest loss continued to intensify in 2022. The Ulu Muda rainforest is one of the last large, continuous tracts of forest in the Malay Peninsula, providing vital habitat for countless species as well as water for millions of people in northern Malaysia. Much of the recent clearing of Ulu Muda rainforest is occurring inside Ulu Muda Forest Reserve (UMRF). Conservationists worry that the loss of Ulu Muda rainforest will have detrimental impacts on the region's biodiversity and water security, as well as contribute to global climate change.

The **Indonesian government** has launched a program that will pay thousands of traditional fishers to collect plastic trash from the sea. The four-week initiative is part of wider efforts to cut marine plastic waste by 70% by 2025. Indonesia is one of the largest contributors to marine plastic pollution in the world. The country produces about 6.8 million metric tons of plastic waste annually, according to a 2017 survey by the Indonesia National Plastic Action Partnership. Only 10% of that waste is processed, while nearly the same amount, about 620,000 metric tons, winds up in the ocean. Each of the 1,721 participating fishers will receive the equivalent of $10 a week for collecting up to 4 kg of plastic waste from the sea daily.

Indonesia and Norway inked a deal that will see the Nordic country pay Indonesia to keep its forests standing. Under the agreement, measurable progress by Indonesia on reducing emissions from deforestation and forest degradation will be eligible for payment. The deal falls in line with Indonesia's ambitious bid to transform its forests into a major carbon sink by 2030, absorbing 140 million metric tons more CO2 than they emit into the atmosphere. While Indonesia has in the past been a major carbon emitter due to land-use change, deforestation, forest fires and peatland destruction, the recent decline in deforestation is seen as a positive sign. The previous deal, signed in 2010, was terminated by Indonesia in 2021, citing lack of progress on promised payments. This time around, the deal will be based on "mutual respect and mutual understanding," including a mutually agreed-upon measurement, reporting and verification protocol.

Large River Basins in South Asia

Mekong River Basin

In October, the governing board of the Mekong River Commission (MRC) approved a milestone document that clarifies guidelines for how to design hydropower projects, to minimize impact on ecosystems and communities along Southeast Asia's largest waterway. Beyond this revised **Preliminary Design Guidance** (PDG), the MRC Joint Committee also agreed on a Guideline on **Transboundary Environmental Impact Assessment** (TbEIA). Given the transboundary nature of a river flowing through the four MRC Member Countries – Cambodia, Lao PDR, Thailand and Viet Nam – a TbEIA would measure how a project affects a neighbor. The agreement allows the TbEIA to be tested and applied by countries and developers, with MRC's technical support. Discussions of the TbEIA actually began 18 years ago, in 2004, when the term "Transboundary" was added to acknowledge that no river-related issue is limited to one country's borders. The PDG 2022 is the culmination of four years of discussion, which incorporates the MRC's lessons learned over the past decade, as well as international best practices in how to strike the right balance.

The Mekong delta's transboundary water problems. The past few years have seen Mekong water flows recurringly decline and processes of saltwater intrusion accelerating in the Vietnamese Mekong delta. These transformations are attributed to climate change and large-scale hydropower dams operated in the upper stretches of the river. Some argue that China holds back a significant amount of water for the sake of its own development; downstream countries, notably Laos, also contribute to the problem by pursuing the construction of a wide array of dams, both in tributaries and the mainstream. Many express their doubts about the role that the Mekong River Commission plays in monitoring the hydrological regimes across the geographical span of the Mekong River, aside from the well-functioning knowledge hub it provides for the Mekong countries. There is much uncertainty about the longer-term changes to the Mekong's hydrological regime. But a significant out-migration from the delta is already occurring, with the rural poor abandoning the delta in search of employment in urban areas. Transboundary hydrological transformations present unprecedented risks to the delta. At the local scale, a mix of control and adaptive measures have been undertaken to deal with externalities. But these local efforts are insufficient; meaningful cooperation towards improving Mekong hydrological conditions must also be facilitated, and benefits shared between upstream and downstream countries.

An underwater expedition has confirmed the presence of some of the world's largest and most threatened freshwater fish in a remote and barely studied stretch of the Mekong River in northeastern **Cambodia**. The findings included a 180-kilogram (400-pound) giant freshwater stingray. In addition to the endangered giant stingrays (Urogymnus polylepis), the area is thought to be home to Mekong giant catfish (Pangasianodon gigas) and giant barbs (Catlocarpio siamensis), both of which are listed as critically endangered on the IUCN Red List.

The 4-meter-long giant freshwater stingray (Urogymnus polylepis) captured accidentally and subsequently released by fishermen in the deep-water pools in Cambodia's stretch of the Mekong River in May 2022.
Image courtesy of Wonders of the Mekong

But just as researchers reveal the value of its biodiversity, food security and fisheries livelihoods, the area faces a new threat: earlier this year, feasibility surveys began for a 1,400-megawatt hydropower dam planned for directly upstream of the deep-pool habitats. Cambodia's 2020-2030 energy master plan doesn't include any hydropower dams on the mainstream Mekong. However, local media reports indicate that the dam has government approval "in principle." The dam would be the second major hydropower scheme in Stung Treng province, with the Lower Sesan 2 dam already operating on a tributary of the Mekong. According to the expedition team, construction of the dam would have "devastating ecological effects and could seriously threaten local food security in an

area of the world already impacted by changing climate."

The **Seventh Lancang-Mekong Cooperation (LMC)**[275] **Foreign Ministers' Meeting** was held in Myanmar on 4th July 2022. The meeting set future directions for the LMC cooperation, namely, enhancing strategic guidance, deepening economic integration, expanding agricultural cooperation, upholding green development, promoting digital cooperation, and maintaining closer people-to-people and cultural exchanges. Next, the meeting announced six plans to be implemented in the next stage for the LMC cooperation, which include an action plan on Lancang-Mekong agricultural cooperation, a beneficial plan on Lancang-Mekong water resources, a cooperation plan on Lancang-Mekong digital economy, a Lancang-Mekong space cooperation plan, a Lancang-Mekong talent plan, and a Lancang-Mekong public health cooperation plan. Finally, the meeting endorsed the Five-Year Plan of Action on the Lancang-Mekong Cooperation (2023-2027) to be submitted to the upcoming 4th LMC Leader's Meeting for adoption.

Myanmar has launched the Lancang-Mekong Project's Data Center in the capital city of Nay Pyi Taw. The center will help improve the practices and understanding on analyzing, compiling and collecting of data on food production in Myanmar and will also help to promote cooperation among the countries.

Brahmaputra and Indus River Basins

India plans to construct the country's second-largest dam to counter China's ambitious water diversion scheme of the river that feeds downstream into the Brahmaputra. The proposed dam in the upper reaches of Arunachal is part of the proposed Upper Siang multi-purpose storage project that will also generate hydropower. Water in the lean season in the Brahmaputra comes from melting snow in the mountains on the Tibetan plateau. India's plan involves releasing water from the dam to maintain water security in case China builds structures to divert water. Also, in the case of China releasing water from its upper reaches, such a dam will also help in storing water to prevent floods.

The 117th meeting of the Permanent Indus Commission (PIC) took place in Islamabad from 1-3 March. The commissioners of India and Pakistan discussed issues related to infrastructure development, the sharing of data and the release of (un)treated wastewater. India is constructing three infrastructure projects (a dam and two hydroelectric projects) located in Jammu and Kashmir. The government of Pakistan had raised objections to the projects. These issues were reviewed, but India maintained that its project designs were fully compliant with the terms of the Indus Waters Treaty and indicated to Pakistan that it was open to any technical suggestions. Differences of opinion also existed in regard to the Fazilka drain, which Pakistan had blocked to prevent untreated wastewater from some 18 urban areas in Punjab from flowing into its territory. However, this led to the accumulation of wastewater on the Indian side of the border and contaminated water in some 200 nearby villages. Pakistan has since acknowledged this issue and has promised to reopen the drain.

There was an **unprecedented flooding in the Indus River Basin** this June. Pakistan was a victim of compounding events: intense heat accelerated glacial melt in the northern mountainous regions which increased water flow into the basin. These resulted in floods that inundated more than a third of the country's districts. Around 33 million people were displaced and more than 1,500 were killed. The estimated economic impact was $30-35 billion – or over 10% of Pakistan's GDP. The road to recovery will be long for Pakistan but perhaps this could be a trigger point for Pakistan to build back stronger – future-proofing villages/towns/cities along the river to climate threats ahead. This is especially important as the Indus River Basin is key to Pakistan – it houses 88% of Pakistan's population and 92% of its GDP.

11.3. America

The United States and Mexico have reached an agreement on emergency delivery of Colorado River waters. The US-Mexico International Boundary and Water Commission has signed Minute No.327 on emergency deliveries of Colorado River waters for use in the city of Tijuana, Baja California that renewed cooperation in light of a potential emergency that could affect the region's water supply. The Minute provides for emergency deliveries of Colorado River waters, for five years, to the city of Tijuana, through the Otay Mesa International Connection, of a portion of water allotted to Mexico under the 1944 Water Treaty. The requested water quantities cannot exceed the capacity of the connection at 1.5 million m^3 and should not affect the deliveries or releases of water of the Colorado River system to US users.

Water cuts for Colorado River States. In June, the Federal Bureau of Reclamation had issued an ultimatum to the seven states sharing the waters of the drought-plagued Colorado River basin to either jointly agree on a reduction in water demand or face externally imposed cutbacks by the Federal Government. Federal officials said more cuts were needed, both under terms already negotiated in the 100-year-old Colorado River compact and the 21st century reality of human-influenced climate change resulting in hotter temperatures and drier soils. Arizona, Nevada

[275] founded in 2016, the LMC consists of six member countries: China, Thailand, Cambodia, Laos, Myanmar, and Vietnam

and Mexico will have supplies reduced for a second straight year: 21% for Arizona, 8% for Nevada and 7% for Mexico. They are the first to be subject to cutbacks under the Colorado River compact. Negotiations over further reductions are creating tension among the states, especially as California, the largest user, has so far avoided cuts triggered by low reservoir levels. Thus, the 23-year megadrought, the worst on record in at least 1,200 years, is testing the strength of the compact.

The Parana[276] crossing Brazil, Paraguay and Argentina **is at its lowest level since 1944**. The impact is being felt in all three countries as Brazil continues to experience its worst drought in 91 years. The historic low water level has hindered grain transportation which used the waterway, has triggered a rise in wildfires, and has damaged entire ecosystems. There are fears that this is a trend that will only intensify as a result of climate change and global warming. There is also direct human intervention that is having a negative impact on the river's ability to self-regulate. This has a significant economic impact in the region's economy. The region is one of the world's largest producers of soybean and maize, but the ongoing drought has been having an impact on yields and also on the ability to transport the grains.

The **Honduran capital** of Tegucigalpa is facing a "humanitarian crisis" due to water scarcity. A damaged sewage system, closure of businesses and schools have also been cited as among the possibilities if water scarcity persists. Water is being rationed in Tegucigalpa, with people lining up to get water from trucks as tap water only runs once every 7 days. If the situation does not improve, residents may see water rationing further increased to only having tap water twice a month.

As a record-breaking drought enters its 13th year, **Chile** has announced an unprecedented plan to ration water for the capital of Santiago, a city of nearly 6 million. The plan features a four-tier alert system that goes from green to red and starts with public service announcements, moves on to restricting water pressure and ends with rotating water cuts of up to 24 hours for about 1.7 million customers. The government estimates that the country's water availability has dropped 10% to 37% over the last 30 years and could drop another 50% in northern and central Chile by 2060.

One of the most important developments for tropical rainforests in 2022 was **Brazil's** presidential election of Luiz Inácio Lula da Silva. Lula, who presided over a sharp drop in Amazon forest deforestation during his terms in office between 2003 and 2010, made saving the Amazon a central part of his bid for the presidency, pledging to rehabilitate Brazil's international standing on climate and environmental issues. Brazil's National Space Research Institute released preliminary figures showing that deforestation in the Brazilian Amazon amounted to 11,568 square kilometers for the year ended July 31, 2022, a 11% drop from last year, when Amazon forest loss breached 13,000 square kilometers, the highest level in 15 years. Despite the apparent drop in deforestation, an analysis by the Monitoring of the Andean Amazon Project concluded that the eastern third of the Amazon may have already passed a critical threshold for forest loss. That region is especially important because of its role in driving moisture from the Atlantic to the central Amazon.

The Amazon rainforest. Photo: Rhett A. Butler

[276] second in size only to the Amazon River

Lack of rain and high temperatures have caused large agricultural losses in Brazil in 2022. Brazil is one of the world's breadbaskets. It is a top-5 producer of 34 commodities and the world's largest net agricultural exporter. This is the third consecutive dry year in the country. Dry conditions in Brazil are linked to La Niña and partly to human-induced causes, particularly, deforestation in the Amazon forest.

Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

Congress in the last two years opened the public purse for **U.S.** water systems, providing federal funding at levels not witnessed in a half century. Cities, tribes, and states had the option of spending a portion of their $350 billion in pandemic relief funds on water and sewer upgrades. The U.S. Environmental Protection Agency began distributing the $50 billion for water systems that was a part of the Infrastructure Investment and Jobs Act. Newark, New Jersey, finished removing more than 23,000 lead service lines in the city, a process that took under three years. Another majority-Black city with high-profile lead contamination – Benton Harbor, Michigan – nearly completed its lead pipe removal. However, notable problems persisted. The water system in Jackson, Mississippi, failed during heavy rains in August. Some 160,000 people were without running water for a week. As per official, Jackson's water system is troubled by short staffing and "decades of deferred maintenance."

Mexico's historic summer 2022 drought. Dry conditions are not rare in northern Mexico. Much of the land consists of desert or is semiarid, typically receiving less than 30 inches of rain per year. Rainfall this year has been lower than normal, however. Water levels in the three dams that supply water to the city were very extremely dwindling. Groundwater is also near record lows. Mexican President Andrés Manuel López Obrador acknowledged that growing industrial demand has strained water supplies and called on companies and farmers to give some of their water to the public during the drought.

50 years of protecting and restoring the Great Lakes. The Great Lakes cover nearly 250,000 square kilometers and hold over 20% of Earth's surface fresh water. More than 30 million people in the U.S. and Canada rely on them for drinking water. Despite their enormous importance, the lakes were degraded for well over a century as industry and development expanded around them. In 1972, the U.S. and Canada signed the Great Lakes Water Quality Agreement. Now, 50 years later, they have made progress, but there are new challenges and much unfinished business. The agreement set common targets for controlling a variety of pollutants in Lake Erie, Lake Ontario and the upper St. Lawrence River, which were the most polluted section of the Great Lakes system. Despite encouraging results in reduction of nutrient pollution, especially phosphates from detergents and sewage, toxic pollution in the Great Lakes remains a colossal problem that is largely unappreciated by the public. Numerous fish advisories are still in effect across the region because of chemical contamination. Industries constantly bring new chemicals to market, and regulations lag far behind. Another major challenge is the discharges that come from many diffuse sources, such as runoff from farm fields. Nitrogen levels in the lakes have risen significantly. As a result, algal blooms have returned to Lake Erie. To address this problem, measures, known as Total Maximum Daily Loads, have been applied. But this strategy relies on states, along with voluntary steps by farmers, to curb pollution releases. Climate change is now complicating Great Lakes cleanup efforts due to warming water that affects oxygen concentrations, nutrient cycling and food webs in the lakes, potentially intensifying problems and converting nuisances into major challenges.

11.4. Australia and Oceania

South-eastern Australia witnessed heavy rain and flooding during November 2022, following heavy rains during the month of October, which were the heaviest on record in the Murray Darling Basin. Heavy rainfall and flooding had already taken place in Queensland and Coastal New South Wales from February to April. On November 17th, for the first time, emergency services in New South Wales have requested international assistance to cope with flooding. The Australian flood insured losses over 2022 have reached AU$ 6 billion. Despite the damage to property from the floods, the rainfall has restored water flows in the lower reaches of the Murray River and the Coorong lagoon system, which had been deprived of sufficient water for decades following the millennium drought which lasted from 1996 to 2010.

Australian mining and energy firm Mayur Resources announced that it would scrap plans to build a planned coal-fired power plant in **Papua New Guinea**, instead focusing on projects in the country to offset its own emission. But PNG authorities issued later a public notice canceling Mayur's carbon credit project that involved approximately 800,000 hectares in PNG's Western province because of breaches of the country's forestry laws. It's unclear if the breach is particular to Mayur Resources or due to a blanket moratorium on carbon credit schemes announced by the environment minister on March 2. The moratorium was imposed with immediate effect on voluntary carbon standards (VCS) after multiple accounts of unaccredited and inexperienced companies sweeping into the nation to take advantage of the new market created by the U.N.'s Kyoto Protocol. Mayur is now threatening to sue the PNG government for canceling the carbon scheme.

Water Services Entities Bill passed in December. The Water Services Entities Act is the first of three pieces of legislation as part of a public infrastructure restructu-

ring programme launched to centralize the management of water supply and sanitation in New Zealand. The Act establishes four new Water Services Entities to manage, develop and deliver drinking water, wastewater and stormwater services across New Zealand from July 2024. The Act provides for community ownership and oversight of the new water services entities through local government's role as shareholders. Two further pieces of legislation which have been introduced to Parliament for consideration include the **Water Services Legislation Bill** that will make sure the new Water Services Entities have the necessary legal functions, responsibilities, and powers to get on with their work and the **Water Services Economic Efficiency and Consumer Protection Bill** that provides a detailed longer-term framework for ensuring the Entities provide affordable and well managed services.

The eruption of the **Hunga-Tonga-Hunga-Ha'apai**, a submarine volcano in the **Tongan archipelago in the southern Pacific Ocean**, on 15 January 2022 was the largest recorded since the eruption of Krakatoa in 1883. The eruption caused tsunamis in Tonga, Fiji, American Samoa, Vanuatu and along the Pacific rim. A lack of clean water was a priority because supplies in **Tonga** have been disrupted by layers of volcanic ash and salt water.

11.5. Europe

11.5.1. Western and Southern Europe

High temperatures and drought conditions affected large parts of Europe during the 2022 summer that was hottest on record in Europe.

Temperature records were set in weather stations across Europe, including Portugal (47.0°C), Spain (42.3°C) and Scotland (35.1°C). In the UK, temperatures passed the 40°C mark for the first time ever. Low water levels in European rivers, including Germany's Rhine, France's Loire and Italy's Po, reduced agricultural production, affected the activity of energy plants and caused disruption in shipping. In parts of Spain, water reservoirs were at 30% of their 10-year mean levels.

Source: Counting the cost 2022: A year of climate breakdown, Christian Aid, December 2022

Transport vessels cruise past the partially dried riverbed of the Rhine river in Bingen, Germany, 9 August. Photo: Wolfgang Rattay/Reuters

Mar Menor – the Europe's largest saltwater lagoon is effectively a person, says Spanish law. The lagoon now has legal guardians, including a scientific committee, and a legal right to exist, evolve naturally, and be restored. This way the authorities try to address pollution in the lagoon. In recent years, the Mar Menor has suffered greatly from fertilizers washed off farm fields. Millions of dead fish were found on the shores. In this context, activists launched a petition to adopt a new and radical legal strategy: granting the

lagoon the rights of personhood[277]. Nearly 640,000 Spanish citizens signed it, and on 21 September, Spain's Senate approved a bill enshrining the lagoon's new rights.

The 17-metre high dam "La Roche qui boit" on the Sélune has been demolished. The hydroelectric dams of La Roche-qui-boit and Vezins were built on the Sélune River in **France** in early 20th century. Since the demolition of the 37 m high Vezins dam two years ago, the ecological continuity of the historic salmon river Sélune is now restored. In the main river alone, more than 60 km are free and allow access to former spawning sites. The campaign for a free Sélune led by associations including ERN, the French Fishing Federation, FNE and others have lasted 20 years.

The Po River under threat. The longest river in Italy starting from the Cottian Alps had the flow which was 6x lower than the seasonal levels in June. Rome declared a state of emergency in Northern Italy; this was its worst drought in 70 years. The drought not only forced more than a hundred northern towns in Italy to ration its water, but also impacted food security as 40% of the nation's agricultural production relies on irrigation from the Po River. As low levels of river flow caused seawater intrusion, some farmlands have become highly saline as drying out aquifers in the river basin are now filled with seawater. Once seawater has seeped into aquifers, it can only be flushed out with lots of freshwater. Rain is the only hope as the other components of river flow, glacial & snowpack melt are likely not forthcoming as temperatures rise in the Alps and across Europe.

The **first Watch List** under the new Drinking Water Directive was published in January. Three representative endocrine-disrupting compounds: beta-estradiol, nonylphenol and bisphenol were included in the list. Water operators support the idea of the watch list in the DWD as a way to investigate contaminants of emerging concern in water resources/raw water and inform the Risk-Based Approach where they are likely to be present in water intended for human consumption and could pose a potential risk to human health.

The **European Commission** published guidelines to help Member States and stakeholders apply the rules on the safe reuse of treated urban waste water for agricultural irrigation. With several Member States increasingly suffering from droughts, reusing water from urban waste water treatment plants can become an essential tool to ensure a safe and predictable source of water, whilst lowering the pressure on water bodies and enhancing the EU's ability to adapt to climate change. The Water Reuse Regulation, applicable from June 2023, sets out minimum water quality, risk management and monitoring requirements to ensure safe water reuse.

Urban wastewater is one of the main sources of water pollution. The EU's **Urban Wastewater Treatment Directive** currently in force is more than 30 years old. Since its adoption, the quality of European surface water has dramatically improved. Yet there is still pollution that needs to be addressed and is not covered by the current rules. To address this, the Commission has proposed an update to the Directive. Several improvements include obligations to recover nutrients from wastewater, new standards for micropollutants and new monitoring requirements for microplastics. Obligations to treat water will be extended to smaller municipalities with 1,000 inhabitants. As 92% toxic micro-pollutants found in EU wastewaters come from pharmaceuticals and cosmetics, a new Extended Producer Responsibility scheme will require producers to pay for the cost of removing them.

The 2022 summer was worst on record for **glaciers in the Alps**. Switzerland's glaciers have lost an average of 6.2% of their ice. Austrian glaciers have lost more glacial ice in 2022 than they have in 70 years of observations. Across the Alps, the preceding winter had very limited snowfall and therefore glaciers were not well insulated against the forthcoming summer melt season.

Spain and **Portugal** have agreed to strengthen the measures to be adopted to prevent and tackle water shortages in the river basins shared by the two countries in the framework of the Albufeira Convention. The decision was taken at the 24th plenary session of the Commission for the Implementation and Development of the Albufeira Convention (CADC) and following a year marked by the drought that has affected both countries (December). At the meeting, the operating conditions of the Permanent Technical Secretariat of the CADC were also established to facilitate ongoing cooperation between the two countries, especially in relation to the management of bodies of water and the hydrological planning of shared basins. However, earlier, in September in the context of acute drought Spain announced that it would no longer fully honor the Albufeira Convention by reducing the water flow of the Douro and Tagus rivers to Portugal.

Rhine River Basin

The states in the Rhine catchment have been cooperating in the International Commission for the Protection of the Rhine (ICPR) for 70 years. For the third time since 2009, the International Commission for the Protection of the Rhine (ICPR) has published a river basin management plan. The report provides an overview of the state of the Rhine and its largest tributaries and the associated groundwater and summarizes which measures the states will take in the period 2022-2027 in order to achieve the good status of the water bodies[278]. For this purpose, the Rhine and its tributaries are divided into sections, the so-called surface water bodies and for these an assessment is made. The latest results show that in the International River Basin District Rhine, 10 % of the larger water bodies are currently in good ecological status. This is an improve-

[277] success stories exist in indigenous communities, e.g. in Canada and New Zeland

[278] according to the European WFD, the good status should be achieved for all water bodies by 2027 at the latest

ment of 7 percentage points compared to 2016. For 2027, it is predicted that one third of the surface water bodies shall achieve the good ecological status. 97% of groundwater bodies are already in good quantitative status. 75% are classified as good in terms of their quality; this is an increase of 8 percentage points compared to 2016. By 2027, the proportion of groundwater bodies in a good qualitative chemical status is expected to increase to just under 80%.

Danube River Basin

The International Commission for the Protection of the Danube River (ICPDR[279]) is an International Organization consisting of 14 cooperating states[280] and the EU. Ehe ICPDR deals with the whole Danube River Basin, which includes its tributaries and the groundwater resources.

The ICPDR held its 4th Ministerial Meeting on February 8, where the two Management Plans Updates and the Danube Declaration were endorsed. The Danube River Basin Management Plan (DRBMP) includes concrete measures relating to the five Significant Water Management Issues identified by the ICPDR. The measures are to be taken within the next management cycle until 2027, including restoration of habitats and ecological corridors for migratory fish species – in particular sturgeons, implementing adequate wastewater treatment technologies and best management practices with a view to further tackling the issue of nutrient loads transported into the Black Sea via the Danube. The updated Danube Flood Risk Management Plan (DFRMP), besides the strategic basin-wide level measures to prevent and reduce damage caused by floods, gives special attention to measures employing areas which have the potential to retain flood water, such as natural floodplains as well as the other areas enabling controlled flooding. The Danube Declaration, which is updated and signed every six years, serves as a coordinating mechanism for transboundary water management within the basin.

11.5.2. Eastern Europe and Caucasus

Armenia

Water resources. The 70-Mm^3 Azat reservoir[281] – largest in the Ararat Valley – on the Azat River[282] is to undergo renovation since 2 of 3 gates are out of operation and other units are malfunctioning.

The Armenian government plans to restore[283] the former course of the Araks River in order to avoid further collapses in the corresponding section of the border with Turkey, approximately 6.5 km long, and eliminate one of the tributaries. It is also proposed to build a dam at the corresponding boundary marker on the current course of the Araks in order to route water to the former course and restore the earthen embankment 130 m long and 8 m deep (June 30, Cabinet of Ministers).

At year-end 2022, irrigation water discharge from Lake Sevan was lower than the established limit: 165 Mm^3 against planned 170 Mm^3. This is explained by a decrease in the lake water level, with the lowest mark reaching 1900.29 m in December. The lake lacked 300 Mm^3 of water in May relative to the previous year. Short water was also observed in a number of other lakes. In particular, the Azat reservoir lacked 6-7 Mm^3 of water. Similar situation was observed in Lake Arpi. In contrast, the positive trend was observed in the Akhuryan reservoir, which showed 100 Mm^3 more water as compared to 2021. Water lowering was recorded in Yerevan Lake as well.

Agriculture. The government of Armenia made changes to a number of agricultural programs to encourage adoption of modern irrigation systems (January 27). In particular the cost compensation for the installation of modern irrigation systems is to be increased to 50% instead of the earlier 22% and 25%. Businesses and communities are also given the opportunity to expand existing reservoirs. The mandatory requirement to publish a list of bodies conducting laboratory studies of the agrochemical soil composition has been removed from the program, which allows enterprises to independently choose the appropriate service provider. At the same time, the acquisition of land for horticulture is permitted, as long as the maximum cost limits set by the program are not exceeded.

Energy. ADB and the Armenian government signed a memorandum "On technical assistance to assess the viability of wind energy projects" (November 28). The economically feasible wind energy potential of Armenia is estimated at 450 MW of total installed capacity, capable of generating 1.26 billion kWh of electricity. The main promising territories are the Zod Pass, Bazum Mountains, Pushkin and Jajur passes, and Aparan and Meghri regions.

Environment. Draft amendments to the Law on environmental impact assessment and expertise have been disclosed for public consultation. According to the amendments, all hydropower projects at the construction stage shall be subject to environmental

[279] established in 1998

[280] Austria, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Montenegro, Moldova, Romania, Serbia, Slovakia, Slovenia, and Ukraine

[281] operated since 1976. The reservoir lessens the load on Lake Sevan during the irrigation season

[282] takes its origin from Gegham mountains and drains into the Arax River

[283] as part of the "Irrigation system improvement" program

expertise and environmental impact assessment irrespective of project capacity. Earlier, only over 1-MW hydropower projects have been subjected to environmental expertise.

Large-scale bloom of blue-green algae was recorded this summer in Lake Sevan. The main causes are an increase in mean water temperature and in biogenic substances and a decrease in self-purification capability. Climate change and pollution by phosphorus and nitrogen through discharge of domestic and agricultural wastewater contributed to this negative phenomenon. The self-purification capability was deteriorated also due to the reduction of lake inhabitants. Thus, experts believe it necessary to increase endemic fish species to restore the ecosystem, to improve hydro-biological and -chemical indicators of the lake, to regulate industrial fishing in the lake, to build modern treatment stations in catchment areas, and to clean coastal territories.


Algae blooming in Lake Sevan

Green growth. The Government of Armenia together with WB, EU and UNDP launched the platform "Growth and Recovery: for a stronger, modernized and prosperous Armenia" in support of Armenia's forward-looking sustainable development, green recovery and growth. The goal of the Green Armenia platform is to integrate and optimize policy and investment initiatives for transition to a green economy.

Azerbaijan

Water resources. The Ministry of Ecology and Natural Resources of Azerbaijan started working on the Zeyemchay reservoir. A feasibility study is developed now. A number of other reservoirs, such as Alijanchay, Gudiyalchay, Velvelechay, Garachay, Gusarchay, Agsuchay, Turyanchay, Yengijay and Vilashchay, are also at the study stage.

The Cabinet of Ministers has approved the Rules for charging water use (March 17). According to the Rules, legal and physical persons shall pay for the amount of water used if they divert water directly from sources, i.e. surface water and groundwater sources using technical facilities. Also, water use is charged for water-management organizations. The charges will be based on tariffs that are differentiated depending on water quality, purpose, state of hydraulic structures, methods of water diversion and transportation and other factors. Physical persons may use ponds free of charge (beaches, boating, sport fishery, livestock watering, water diversion without application of technical facilities, etc.).

In 2022, like in previous years, farmers and peasants faced the irrigation water shortage problems in spring and summer. The lower farms had to spend additional money for the re-use of drainage water.

Agriculture. A rural business information system was developed within the framework of agricultural digitalization in the country[284]. This system would help farmers to connect to the electronic database and other digital services, as well as to improve transparency in interactions between business and public agencies.

Energy. ADB and Masdar Azerbaijan Energy Limited Liability Company (MAE) signed a $21.4 million loan agreement to finance a 230-MW solar power plant

[284] as part of a joint project with the EU aimed at the creation of electronic systems and a database for the agriculture market

near Alat settlement in Azerbaijan. It is the first significant private sector renewables investment in Azerbaijan. The new solar power plant will generate up to 558 gigawatt-hours of clean energy annually from the first year of operation, avoiding up to 265,000 tons of annual carbon emissions.

Environment. The Ministry of Ecology and Natural Resources of Azerbaijan organized environmental campaigns for the population to change some of their domestic wastes, such as plastics, glass, paper, batteries, for tree seedlings (November).

The Azerbaijani authorities started forming a bio-reservation on the base of the Zagatals state reserve. Upon completion, this bio-reservation can become the ecotourism destination, with the well-known Katech waterfall being one of its spots. The republic also plans to organize geoparks, also in places where mud volcanos are located.

Transboundary cooperation. The 51st meeting of the Azerbaijani-Iranian Permanent Joint Commission on use of water and energy resources of the Araz River was held in Tabriz, Iran. The parties agreed on the operating mode of the Araz reservoir, developed schedules of water distribution between the two countries, and signed a protocol on the joint use of water and energy resources on the Araz River.

Georgia

Water supply. The German state development bank KfW has allocated €55 million to support modern water infrastructure in Georgia's Black Sea city of Batumi. An old drinking water treatment plant will be rehabilitated and adapted to the modern standards and the wastewater treatment plant will be expanded and equipped with sludge treatment and nutrient elimination systems. €138 million had been spent over more than 16 years on modern water infrastructure in Batumi. More than 200,000 people who previously had access to drinking water only for a couple of hours a day, are now continuously supplied with hygienically safe drinking water.

According to the National Statistical Service of Georgia, half of the population living in the regions of Georgia does not have drinking water. 65% of the rural population produces drinking water on its own, mainly groundwater through wells and springs. However, the level of groundwater has dropped significantly, and non-professional drilling for personal purposes increases the risk of groundwater pollution.

Agriculture. The Georgian government has approved amendments to the Preferential Agricultural Loan Project. For procurement of agricultural drones and weather stations the government will finance a farmer through a 48-month loan at 11% per annum.

Within the framework of the state program "Support for agricultural land owners", small landowners have received support since May 10. This included issuance of special agro-cards, on which farmers who legally own registered land plots ranging from 0.25 to 1.25 ha were credited with agro-points. Farmers could use them to buy fertilizers and plant protection chemicals, seeds or seedlings, agricultural tools, etc.

The vertical farm High Gardens started operating in the industrial district of Tbilisi in April 2022. The vertical farm can produce monthly up to 1.5 t of rare greens and vegetables on an area of 280 m^2. The product line of the farm includes more than 10 plant types, the growing phase of which ranges from 20 to 45 days. The farm works on 2.9-m aeroponic towers. Each tower feeds 144 plants, with stems fixed by sponges in small containers and roots deepening down in the towers to get nutrients. Based on the results of the first commercial cycle, the farm's operating costs did not exceed $2,500, of which 20% was for electricity and about 40% for plant nutrients.

Energy. In 2022, 14.8 billion kWh of electricity were consumed (3.8% more than in 2021) and 14.2 billion kWh were generated (12.7% more than in 2021). Hydropower accounted for the largest share of generation – 10.8 billion kWh. Thermal power generated about 3.4 billion kWh and wind generated 87.49 billion kWh.

The Governments of Azerbaijan, Georgia, Romania and Hungary signed an "Agreement on strategic partnership in the field of green energy development and transmission" on 17 December. By this Agreement, the 1.2-km transmission line to be laid through the Black Sea will connect Georgia, Azerbaijan and Romania. The European Union will allocate €2.3 billion for this project. Electricity generated in Georgia and Azerbaijan will be traded to Europe.

Environment. Georgia's natural protected territories cover 13% of the total country area and are expanding further. In 2022, several new protected zones were established on 120,000 ha. The national fauna is comprised of more than 100 mammal species, 330 bird species and 160 fish species. The protected territories are home to 90 species of rare and endangered animals, accounting for 67% of animals on Georgia's Red List.

International cooperation. Mukhtar Babayev, the Minister of Ecology and Natural Resources of Azerbaijan met with Prime Minister Irakli Garibashvili and Otar Samugia, the Minister of Environmental Protection and Agriculture of Georgia. They discussed the areas of strategic cooperation, emphasized the functioning of regionally important infrastructural projects, and the importance of Georgia-Turkey-Azerbaijan cooperation. The two sides signed a memorandum of cooperation, which provides for management of protected areas in accordance with international practices, as well as protection and conservation of national heritage (November 28).

Belarus

Water resources. The 2030 National Water Strategy has been approved[285] in Belarus. It is aimed at improving

[285] Resolution of the Cabinet of Ministers 91 of 22.02.2022

the water use efficiency to ensure sustainable economic growth and creating conditions for preservation of aquatic ecosystems. The Strategy sets the following targets: (1) provision of the population with centralized water supply and sanitation systems – at least 95% and 85%, respectively; (2) surface water bodies of good and higher environmental status – at least 85%; (3) index of poorly treated wastewater discharge (relative to 2015) – 0%; (4) implementation of integrated water resources management – 100%; (5) the share of transboundary river basins with effective international cooperation agreements – 100%.

The task to improve the quality of water supply in Minsk was set in late 2018. In this context, it was decided to accelerate and facilitate implementation of an investment project for transferring Minsk to water supply from underground sources.

Agriculture. A new version of the Land Code was approved[286]. The document: has provisions for allotting land plots up to 1 ha to citizens for construction of houses in rural settlements; establishes the right to acquire, in the course of 5 years, land plots held by land users as of September 1, 2022, in private ownership or lease for 99 years, with preferential payment terms; strengthens the role of local authorities in regulation of land relations, restoration of order and resolution of disputes relative to land.

Decree of the President of Belarus No.443 "On insurance of crop yields, livestock and poultry" was adopted on 28 December. The Decree approves the list of crops, livestock and poultry and insurance tariffs for compulsory insurance for 2023.

As part of revision of the State Agrarian Business Program, financing of agriculture was increased by $100 million. Such revision will help to settle the matters related to implementation of 13 new investment projects in crop production, poultry farming, dairy and beef cattle breeding.

Energy. The Law regulating relations in the sphere of renewables was adopted on 20 May. The document authorizes the use of RES installations for regulation of daily electricity load in the Belarusian energy system. Renewable energy prices are set at the level of tariffs for industrial consumers with connected capacity of up to 750 kV-A. Minimum incentive coefficients will be applied regardless of the period of RES operation.

Belarus has fifty two 96.2-MW HPPs. In 2022, more than 370 million kWh were generated. The largest hydropower plants – Vitebsk and Polotsk – generated 236 million kWh in total. This saved over 75 thousand tons of oil equivalent.

Environment. Belarus decided to withdraw from the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) due to "biased and discriminatory attitudes of the governing bodies of the Convention and evidence of pressure". It is emphasized that withdrawal of Belarus from the Aarhus Convention will not entail subsequent termination of activities on the improvement of the Belarusian system of interaction between the authorities and the population in environmental matters.

Transboundary cooperation. The Joint Belarusian-Russian Commission for Transboundary Water Protection and Rational Use held its XIII meeting on June 7 in St. Petersburg. The members signed the joint program for monitoring transboundary water bodies in the Dnieper and Western Dvina river basins and approved the Resolution of the First Scientific and Practical Conference "On Further Development of Russian-Belarusian Cooperation on the Protection and Rational Use of Transboundary Waters." In the course of 20 years, the countries have developed and approved 15 major policy documents and undertaken multiple efforts for efficient water management and protection.

Moldova

Water resources. A number of laws on water use and ownership have been amended. According to amendments to the Law "On Fish Fund, Fishing and Fish Farming", the owners of hydraulic structures shall have a permit for special water uses and will be responsible for maintenance of the water body. Amendments to the Law "On Public Property Management and Denationalization" provide for granting administrative-territorial units the right to control sections of the rivers that cross their intra- or extra-settlement territory.

The Ministry of Environment has developed a plan for the rational use of water in the context of severe drought hitting the country. In summer, precipitation did not exceed 25-75 mm, which was observed for the first time in records in larger part of the territory, while soil moisture ranged from 2 to 60% of the norm. Water levels in artesian wells, the only source of drinking water for rural inhabitants or 65% of the country's population have dropped critically. During this period of time, the water level fell to 15-30% of the norm in the Prut River and to 30-40% in the Dniester River, and small rivers have gone low to 20% of the norm, with some of them drying up. In this context, it was recommended to save water as much as possible, use alternative methods of storing and recycling water in economic sectors, including in industry and agriculture.

The Rural Competitiveness and Resilience Project in Moldova (PCRR/USAID, $84 thousand) announced the opening of a financing line for irrigation modernization through installation of the facilities using "green" (renewable) energy to deliver and distribute water to farmland. Water User Associations were invited to the project[287]. As estimated, the share of energy costs in WUAs' irrigation water tariffs reaches 60% in Moldova. In 2022, due to a rise in the cost of electricity and other energy resources, tariffs of WUA services increased by about 20-30%.

[286] Law on amending the codes of 18.07.2022

[287] in total, 35 WUAs are officially registered in Moldova. They administer 30 centralized irrigation systems capable of delivering water to more than 10 000 ha

Agriculture. The Concept of the Information System "Soil Register of the Republic of Moldova" was amended to include some changes in the data inputted into the system. Currently, the Concept provides geospatial and text information on soil profile, solvency, code and name. Farmers and businesses will be able to more quickly view and analyze data on land condition and quality to make sound agricultural investment or lending decisions. The information system can also be used by central and local authorities to identify degraded agricultural land for appropriate measures.

Energy. The Moldovan government disclosed the 2050 Energy Strategy. The Strategy is based on five goals: (1) improving energy security; (2) developing competitive energy markets and regional integration; (3) promoting energy efficiency; (4) developing sustainable RES; and (5) protecting consumers. According to the Strategy, new power plants should be built in the country territories under full control of the government; the energy budget will be revisited and RES and full technical, infrastructural and market integration into the European grid will be promoted.

Environment. A draft law on industrial emissions has been approved in the first reading. This document establishes rules designed not only to reduce and mitigate harmful industrial emissions to air, water and soil, but also to prevent waste generation. Industrial plants will be required to have permissions for operation. A comprehensive environmental permitting system for emissions to water, air and soil will be established for each source of pollution, rather than for economic agents as is currently the case.

The Agreement on the participation of the Republic of Moldova in the European Union Programme for the Environment and Climate Policies "LIFE" was signed[288]. By participating in the LIFE Programme, Moldova will be able to access financing for several projects, which refer to biodiversity, circular economy, transition to clean energy, as well as climate mitigation and adaptation.

Russia

Water resources. In 2022, as part of the Rosvodresursy's project "Reproduction and use of natural resources", for the construction and reconstruction of check dams the government allocates 6.2 billion rubles, of which 70% will be directed to the regions of the Far East. The action is to be completed by 2025. Reconstruction of the dam in Ulan-Ude on the Selenga and Uda rivers was started in Buryatia; the banks of the Vilyui River started to be strengthened in Yakutia; etc. The best results in 2022 were shown by the regions of the North Caucasus: two dams on the Khulkhulau River were built in Chechnya during the year, and bank reinforcement measures on the Urup River were completed ahead of schedule in Karachay-Cherkessia.

Water has dropped to a dangerous level in a number of rivers due to the abnormal heat wave. A state of emergency was announced in the Nenets Autonomous District. In Eastern Siberia, the Yenisei River began drying up rapidly. As a result, storage in the Krasnoyarsk and Sayano-Shushensk reservoirs is below the levels recorded in the last 30 years. All hydroschemes are operated in conservation mode. A lot of dead fish was found on the banks of the Dvina River that can be related to the abnormal heat in expert opinion.

The Basin Council of the Nizhnevolzhsky Basin District discussed the development of the Lower Volga basin within the framework of the National Project "Ecology" (2022-2023). As a result of implementation, the water area of the Kuibyshev reservoir has become cleaner and bank enhancement activities are underway. The Council paid special attention to fulfillment of the work schedule on delineation of flooding and waterlogging zones, provision of reliable water supply to the population and economic sectors, and improvement of water monitoring.

Water supply. Amendments to Federal Law No.5-F3 of 28 January 2022 "On water supply and sanitation" vested the Ministry of Construction with authority to calculate norms of hot, potable and service water losses in centralized water supply systems during production and transportation of water. The law gives to the executive authorities of the RF constituent entities the right to set norms of water losses. Since March 1, 2023, it will be mandatory to take into account the norms of water losses during production and transportation of water. These data will be included in calculating water supply and sanitation tariffs.

Fees for the use of water bodies have been reduced for industrial enterprises: in 2022 and 2023, the payment for the use of water from large Russian rivers will increase by only 10%, instead of the previously planned 15%. By preliminary estimates, industrial companies using water from major Russian rivers, including the Amur, Volga, Yenisei, Don, Ob, and Lake Baikal, will save about 1.7 billion rubles.

Agriculture. The Law "On agricultural produce, raw materials and food with improved characteristics" was put in force (No.159-FZ of 11.06.2021). This law sets the basic requirements for production of improved agricultural produce, food, industrial and other products. One of them is to apply agro-industrial and other production technologies that meet environmental, sanitary-epidemiological, veterinary and other requirements and have a minimal negative impact on the environment; use recyclable and biodegradable packaging. The use of cloning and methods of genetic engineering and ionizing radiation is prohibited.

The Ministry of Agriculture has started to map agricultural land in the dimension of the constituent entities of the Russian Federation. The Kaliningrad, Moscow, Belgorod Regions and the Republic of Tatarstan are the pilot regions in this mapping exercise. This will provide complete and up-to-date data on the state of all agricultural land: producers will see information on land plots they can put into turnover and develop their production.

Energy. Europe's largest hydropower plant – Volzhskaya HPP – generated a record amount of electricity per

[288] the total budget of the LIFE program for 2021-2027 is €5.4 billion

day – 65,370 thousand kWh. This is the maximum for more than 63 years of operation. Higher generation became possible through large-scale modernization of the plant. 22 hydro turbines and 17 hydro generators have been upgraded. The modernization is to be completed by 2026. The capacity of Volzhskaya HPP increased from 2,541 to 2,671 MW and will be brought to 2,744.5 MW.

By December 1, the total RES capacity in Russia reached 5.68 GW. Here wind and solar energy prevail with 2.2 GW and 2.1 GW, respectively. The total capacity of small hydro (up to 50 MW) is 1.2 GW. Renewable energy generation amounted to 6,940 million kWh for 11 months of 2022. The average installed capacity utilization factor was 14.7% for solar projects, 31.1% for wind projects, and 42.2% for small hydro.

Environment. The Government approved an innovative project "Unified National Monitoring System of Climate Active Substances" (2 stages). The monitoring system will produce independent climate forecasts and information on the causes of climate change. The scientific evidence data and environmental monitoring will support decisions on limiting greenhouse gas emissions and adapting the Russian economy to global climate change. At the first stage until the end of 2024, conditions for functioning of the new system will be created and a methodological basis for ecological transformation of economic sectors will be formed. At the second stage, the system is to become fully operational.

The Severstal's Yakovlevskiy Mining and Refining Plant is installing 800 artificial floating islands to grow over 10,000 plants that will create an innovative experimental phytoremediation system in the Plant's waste pond. It is planned to arrange four lines of artificial islands. Each line will have 200 islands and 2,600 plants.

International cooperation. A cooperation agreement was signed between Russia and Mongolia in the course of the conference on protection of Lake Khubsugul (Mongolian Baikal) adjacent to the Republic of Buryatia (RF). The parties decided to establish a specialized research center for protection of Lake Baikal and its coastal zone and include other water bodies in the north-west of Mongolia, neighboring and transboundary Ubsu-Nur, Ureg-Nur, Erzin lakes, and the Tes-Khem River in this project in the near future.

Ukraine

Water resources. The ongoing war in Ukraine is having multiple impacts on the country's water sector. This causes a wide range of damage, including flooding of large areas due to dam breaches, pollution from untreated waste water spills, dumped ammunition, an increase in mine water levels, and a significant decline in the quantity and quality of water for drinking and agricultural purposes. Approximately 16 million people in Ukraine needed water, sanitation and hygiene assistance in 2022. The energy crisis exacerbated the challenges, with power outages impacting water pumping stations and leading to cuts on water supplies across Ukraine. UN WASH Cluster provided nearly 7.4 million people in Ukraine with water, sanitation and hygiene services and supplies, reaching almost 65 per cent of the targeted 11.2 million in 2022.

Irish Water provided two containerized water treatment plants (WTPs) to Ukraine. The self-contained units are capable of treating up to 40,000 litres per hour each, which will supply 6,200 people with the equivalent of 1.6 million one litre bottles of clean water per day.

The Ukrainian drinking water and waste water association Ukrvodokanal[289] was welcomed as an associate EurEau member at the General Assembly meeting in Vienna (20 May).

The Project "Small River Ecosystem Restoration – Way to Promising Community Development and Local Welfare" was launched in Lviv oblast. The Project is aimed at increasing capacities of local communities for implementation of nature-based solutions for adaptation to climate change and helping these communities to start the complex process of river restoration. The project on restoration of the small Krasnoselka River in Chervonohradsky District, Lviv province will be implemented by the NGO Synergy Center for Democratic Youth Development.

Agriculture. By a FAO's survey, targeting 5,230 rural households across Ukraine, 25% of agricultural producers stopped or reduced production due to war. The crisis affected more than 40% households in the regions relying on agriculture. This trend was found in Sumska, Dnipropetrovska, Odeska, Chernihivska and Mykolaivska oblasts. Agricultural production costs have critically increased: 72% of the respondents involved in crop production and 64% of the respondents involved in livestock production reported increases. More than half of rural households have reported more than 50% decrease in levels of income compared with the same period during the previous year. Against this background, it is critical to monitor the dynamic situation in the agricultural sector to better inform short and long-term actions.

The EU-FAO project on conservation of plant genetic resources was launched: representatives of FAO, the Ukrainian National Academy of Agricultural Science and its research institutes discussed the terms and conditions of movement of perennial plant collection to a safe location. In general, the project also envisages improvement of the information system of plant genetic resources.

Energy. About 50% of the country's energy infrastructure has been destroyed: all TPPs and HPPs were damaged, as well about 40% of high-voltage grid facilities. By the Ministry of Energy, with about 10 GW of installed renewable capacity in Ukraine, 30% of solar and more than 90% of wind generation has been put out of operation. By February 2023, €144.36 million has been allocated to the Energy Support Fund of Ukraine.

Environment. By the State Ecological Inspection of Ukraine, due to the war over 280 thousand m^2 of soil

[289] established 30 years ago and counts about 130 members

were contaminated with hazardous substances, more than 59 thousand ha of forests and other plantations, including the forests of Svyatogorye, were burned off by missiles and shells. The total amount of environmental damage due to pollution and contamination of land, air and water is estimated at approximately UAH1.9 trillion.

In Zakarpattya Oblast, the eco-campaign on cleaning of the Borzhava River from garbage was organized as part of celebrations of the Danube Day. Tisza Basin Council jointly with public authorities, local governments and other organizations collected 58 m³ of plastics, 5 m³ of glass, 10 m³ of wood, and 3 m³ of household waste.

International cooperation. Prospects and potential areas for increasing Ukrainian grain export, as well as the possibility of joint implementation of irrigation projects in the south of the country were the key topics addressed during the meeting between the Minister of Agrarian Policy and Food of Ukraine N. Solskiy and his Turkish counterpart V. Kirishji in Turkey (July).

8th meeting of the Polish-Ukrainian Intergovernmental Commission for Economic Cooperation took place on September 22. The parties noted the increasing value of trade with agri-food products and expressed hope for further development of mutual cooperation in this sector[290].

Ukraine broke off diplomatic relations with the Russian Federation in the sphere of water (December 30). In fact, since 2014, the Ukrainian side has not carried out any joint actions and information exchange with Russia on transboundary water.

11.6. Middle East

Israel and **Jordan** signed an agreement on the rehabilitation and protection of the River Jordan (November). The agreement follows an inter-ministerial decision taken in July in Israel to restore a stretch of the southern Jordan basin from the Sea of Galilee to the Bezek stream, after which the river becomes the border between Israel and Jordan. The decision includes the improved treatment of sewage before being released into the river, as well as the release of substantially more water from the Sea of Galilee from the current 30 million m³ to a maximum of 70 million m³. The agreement builds on the 1994 peace treaty which includes clauses on the protection of the river. The water quality and flow of the river has declined steeply as the result of a number of damming and diversion projects conducted by Israel, Syria and Jordan over the last few decades. This resulted in a flow reduction of 98% and increased concentration of pollutants in the lower section of the river.

Jordan, classified as the world's second-most water-scarce country, secured more than $2.2 billion to finance its water carrier project, the largest infrastructure venture in the kingdom's history. The project will depend on the Red Sea as a sustainable source and it includes a desalination plant based on the southern shore of Aqaba, in addition to pumping stations and tanks, and a 450-kilometre pipeline. The National Water Carrier Project to be ready by 2027 will provide about 300 million m³ of desalinated water annually.

Thousands of war-displaced Yemenis were hit by floods. Rainstorms, floods and landslides have impacted the province of Marib in **Yemen** which just this year resulted in an estimated 10.000 displaced individuals. Overall, it is calculated that the war has displaced 90.000 people who sought refuge in Marin. Thousands of shelters have been destroyed in the aftermath of torrential rains. These floods were exacerbating an already very precarious humanitarian situation after 8 years of war in Yemen.

The **Iraqi government** is intensifying its efforts to complete work on the Makhoul Dam. The construction of the dam on the Tigris River is expected to create a reservoir to hold a storage capacity of 3 billion m³. Water storage will be used for generating electricity, irrigation purposes, as well as for preventing flooding. However, the project will put underwater the Ashur Historic heritage site upstream and cause major damage to Mesopotamia Marshes nature heritage site downstream. River-protection NGOs prepared a report, which says if the government continues with the construction of the Makhoul Dam, it will put the ecosystems and environment around the Makhoul Dam out of balance. By flooding upstream areas and decreasing the water flow downstream, it will negatively affect the water quality. The report also points to risks and suggests alternatives.

Egypt faces an acute water crisis. In May, the Minister of Local Development announced that the country had entered a stage of "water poverty". In July, Egypt's submission to the UN Framework on Climate Change revealed that its water resources only amount to about 60 billion m³ annually, nearly all of which comes from the Nile. But with the population increasing by one person every 19 seconds, Egypt needs an estimated 114 billion m³ of water per year, forcing the country to bridge the gap with groundwater, rainfall and treated wastewater. Despite warning of water scarcity, the government continues building a "Green River" in the desert. The artificial body of water is meant to mimic the Nile and become a key centerpiece of the New Capital project (designed for a population of 6.5 million). The giant system of lakes, canals and gardens connecting the New Capital's different neighborhoods is designed to be 35 km long. But it is not clear how the government plans to source the vast amounts of water for the project.

[290] Ukraine is the most important recipient of Polish agri-food products among the non-EU countries. In the seven months of 2022, there was an increase in mutual trade, with exports amounting to around €536 mln, while imports from Ukraine amounted to €1.1 bln

SECTION 12

Thematic Reviews

12.1. Climate Change

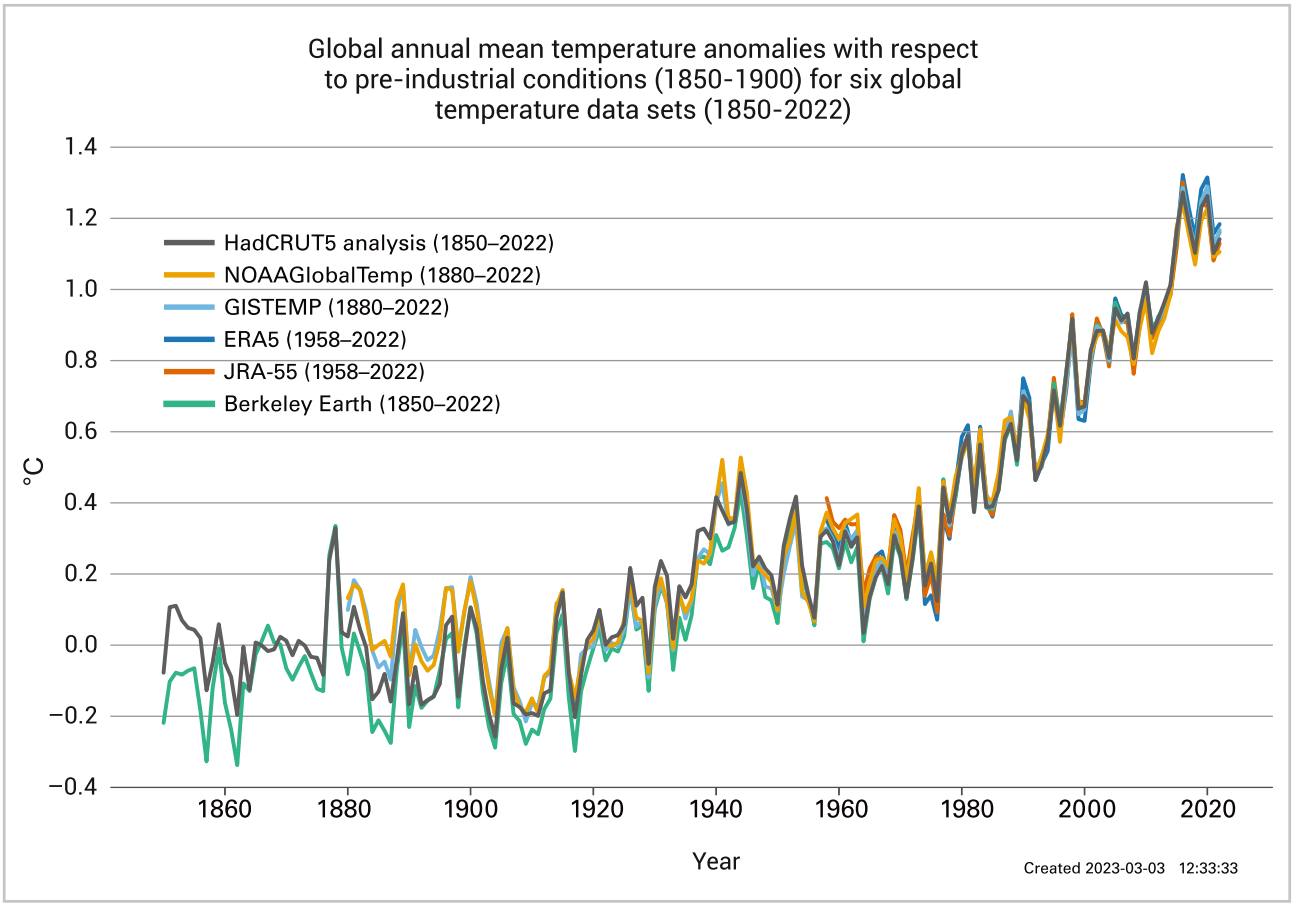
State of Climate in 2022

According to WMO annual report, from mountain peaks to ocean depths, climate change continued its advance in 2022. Droughts, floods and heatwaves affected communities on every continent and cost many billions of dollars. Antarctic sea ice fell to its lowest extent on record and the melting of some European glaciers was, literally, off the charts.

The new WMO report is accompanied by a story map, which provides information for policy makers on how the climate change indicators are playing out, and which also shows how improved technology makes the transition to renewable energy cheaper and more accessible than ever.

Key messages

Temperature. The global mean temperature in 2022 was 1.15 [1.02-1.28] °C above the 1850-1900 average. The years 2015 to 2022 were the eight warmest in the 173-year instrumental record. The year 2022 was the fifth or sixth warmest year on record, despite ongoing La Niña conditions.



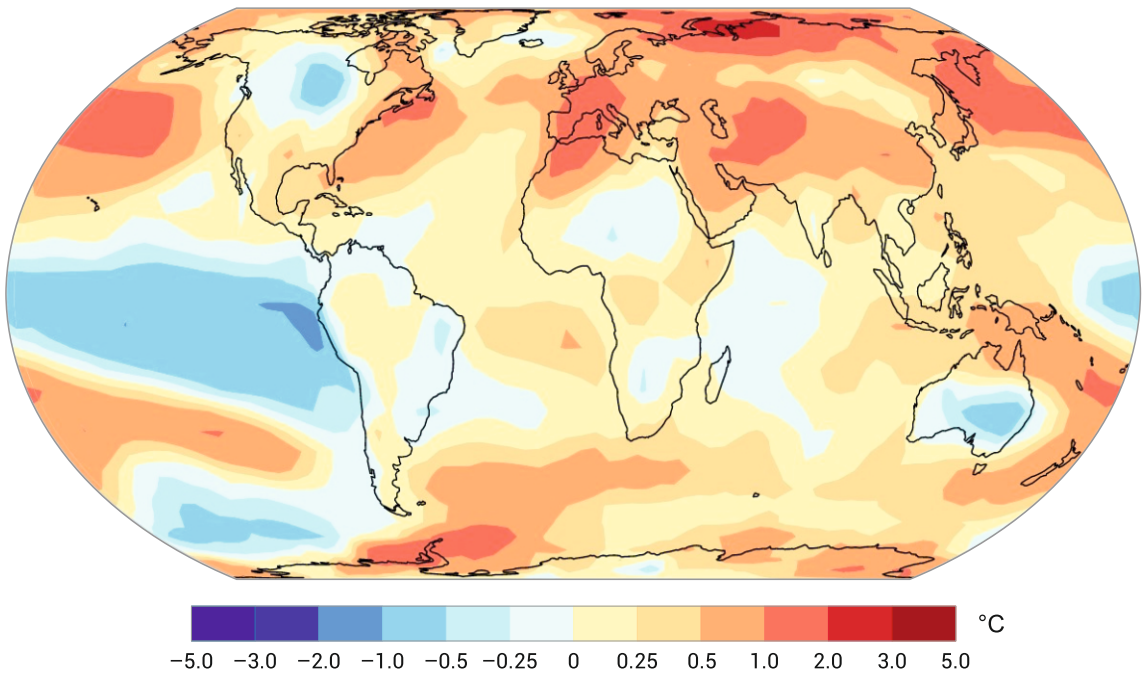
Greenhouse gases. Concentrations of the three main greenhouse gases – carbon dioxide, methane and nitrous oxide – reached record highs in 2021, the latest year for which consolidated global values are available (1984-2021). The annual increase in methane concentration from 2020 to 2021 was the highest on record. Real-time data from specific locations show that levels of the three greenhouse gases continued to increase in 2022.

Glaciers. In the hydrological year 2021/2022, a set of reference glaciers with long-term observations experienced an average mass balance of −1.18 metres water equivalent (m w.e.). This loss is much larger than the average over the last decade. Six of the ten most negative mass balance years on record (1950-2022) occurred since 2015. The cumulative mass balance since 1970 amounts to more than −26 m w.e.

The European Alps smashed records for glacier melt due to a combination of little winter snow, an intrusion of Saharan dust in March 2022 and heatwaves between May and early September.

In Switzerland, 6% of the glacier ice volume was lost between 2021 and 2022 – and one third between 2001 and 2022. For the first time in history, no snow survived the summer melt season even at the very

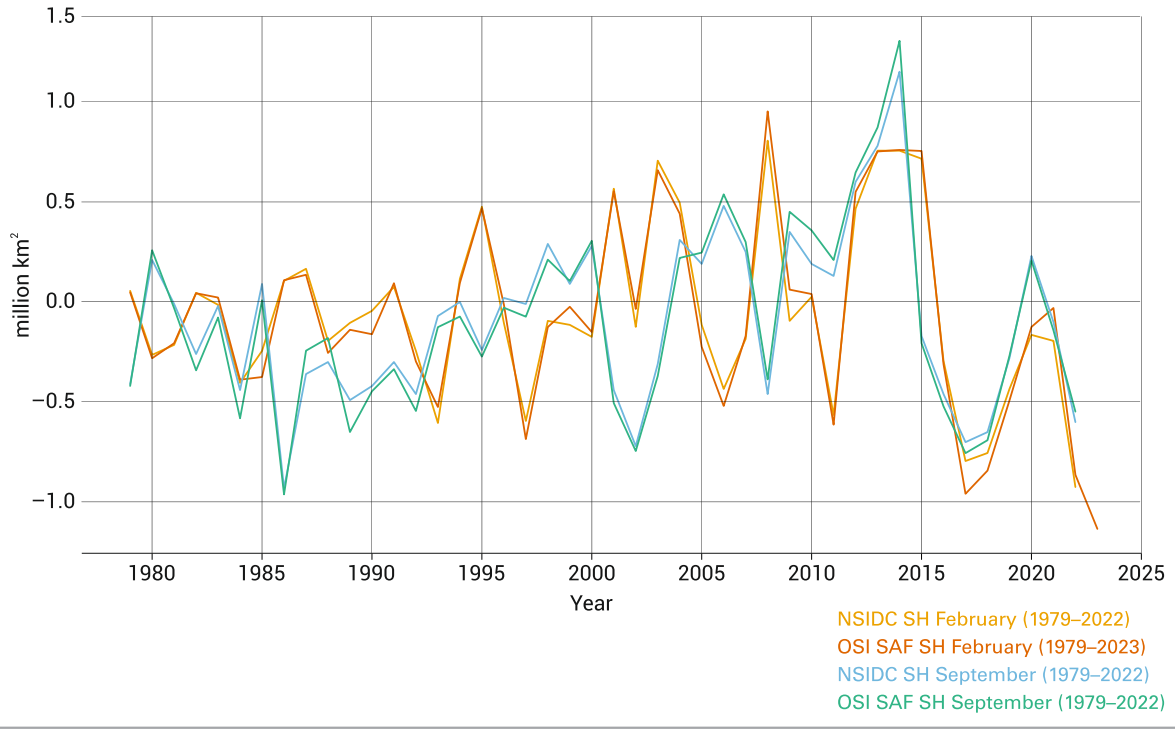
Near-surface temperature differences between 2022 and the 1991-2020 average. The map shows the median anomaly calculated from six data sets



highest measurement sites and thus no accumulation of fresh ice occurred. Measurements on glaciers in High Mountain Asia, western North America, South America and parts of the Arctic also reveal substantial glacier mass losses. There were some mass gains in Iceland and Northern Norway associated with higher-than-average precipitation and a relatively cool summer.

According to the IPCC, globally the glaciers lost more than 6000 Gt of ice over the period 1993-2019. This represents an equivalent water volume of 75 lakes

Antarctic sea-ice extent *(million km²)*
Difference from 1991-2020 average



the size of Lac Leman (also known as Lake Geneva), the largest lake in Western Europe.

The Greenland Ice Sheet ended with a negative total mass balance for the 26th year in a row.

Sea ice in Antarctica dropped to 1.92 million km^2 on February 25, 2022, the lowest level on record and almost 1 million km^2 below the long-term (1991-2020) mean. For the rest of the year, it was continuously below average, with record lows in June and July.

Arctic sea ice in September at the end of the summer melt tied for the 11th lowest monthly minimum ice extent in the satellite record.

Ocean. Ocean heat content reached a new observed record high in 2022. Around 90% of the energy trapped in the climate system by greenhouse gases goes into the ocean, somewhat ameliorating even higher temperature increases but posing risks to marine ecosystems. Ocean warming rates have been particularly high in the past two decades. Despite continuing La Niña conditions, 58% of the ocean surface experienced at least one marine heatwave during 2022.

Sea level. Global mean sea level (GMSL) continued to rise in 2022, reaching a new record high for the satellite altimeter record (1993-2022). The rate of global mean sea level rise has doubled between the first decade of the satellite record (1993-2002, 2.27 mm/yr) and the last (2013-2022, 4.62 mm/yr).

For the period 2005-2019, total land ice loss from glaciers, Greenland, and Antarctica contributed 36% to the GMSL rise, and ocean warming (through thermal expansion) contributed 55%. Variations in land water storage contributed less than 10%.

Ocean acidification. CO_2 reacts with seawater resulting in a decrease of pH referred to as 'ocean acidification'. Ocean acidification threatens organisms and ecosystem services. The IPCC Sixth Assessment Report concluded that "There is very high confidence that open ocean surface pH is now the lowest it has been for at least 26 [thousand years] and current rates of pH change are unprecedented since at least that time."

Socio-economic and environmental impacts

Drought. Drought gripped East Africa. Rainfall has been below-average in five consecutive wet seasons, the longest such sequence in 40 years. As of January 2023, it was estimated that over 20 million people faced acute food insecurity across the region, under the effects of the drought and other shocks.

Precipitation. Record breaking rain in July and August led to extensive flooding in Pakistan. There were over 1,700 deaths, and 33 million people were affected, while almost 8 million people were displaced. Total damage and economic losses were assessed at US$30 billion. July (181% above normal) and August (243% above normal) were each the wettest on record nationally.

Heatwaves. Record breaking heatwaves affected Europe during the summer. In some areas, extreme heat was coupled with exceptionally dry conditions. Deaths associated with the heat in Europe exceeded 15,000 in total across Spain, Germany, the UK, France, and Portugal.

China had its most extensive and long-lasting heatwave since national records began, extending from mid-June to the end of August and resulting in the hottest summer on record by a margin of more than 0.5°C. It was also the second-driest summer on record.

Food insecurity. As of 2021, 2.3 billion people faced food insecurity, of which 924 million people faced severe food insecurity. As of October 2022, several countries in Africa and Asia (such as Ethiopia, Nigeria, South Sudan, Somalia, Yemen, and Afghanistan) and the Caribbean (Haiti) experienced starvation or death and required urgent humanitarian action. In these countries, the key drivers and aggravating factors for acute food insecurity were conflict/insecurity, economic shocks, political instability, displacement, dry conditions and cyclones.

Displacement. In Somalia, almost 1.2 million people became internally displaced by the catastrophic impacts of drought on pastoral and farming livelihoods and hunger during the year, of whom more than 60,000 people crossed into Ethiopia and Kenya during the same period. Concurrently, Somalia was hosting almost 35,000 refugees and asylum seekers in drought-affected areas. A further 512,000 internal displacements associated with drought were recorded in Ethiopia.

The flooding in Pakistan affected some 33 million people, including about 800,000 Afghan refugees hosted in affected districts. By October, around 8 million people have been internally displaced by the floods with some 585,000 sheltering in relief sites.

Environment. Climate change has important consequences for ecosystems and the environment. For example, a recent assessment focusing on the unique high-elevation area around the Tibetan Plateau, the largest storehouse of snow and ice outside the Arctic and Antarctic, found that global warming is causing the temperate zone to expand.

Climate change is also affecting recurring events in nature, such as when trees blossom, or birds migrate. For example, flowering of cherry blossom in Japan has been documented since AD 801 and has shifted to earlier dates since the late nineteenth century due to the effects of climate change and urban development. In 2021, the full flowering date was 26 March, the earliest recorded in over 1200 years. In 2022, the flowering date was 1 April.

Not all species in an ecosystem respond to the same climate influences or at the same rates. For example,

spring arrival times of 117 European migratory bird species over five decades show increasing levels of mismatch to other spring events, such as leaf out and insect flight, which are important for bird survival. Such mismatches are likely to have contributed to population decline in some migrant species, particularly those wintering in sub-Saharan Africa.

Source: WMO, https://library.wmo.int/doc_num.php?explnum_id=11593

Climate Change Agreement

All five Central Asian countries ratified the Paris Agreement to address the climate change threats and take appropriate measures. As of February 2023, 195 members of UNFCCC are parties to the agreement. One of important aspects of the Paris Agreement is that developing countries also have to cut emissions along with developed countries.

A massive shift away from fossil fuels and towards renewable sources will be needed for countries to comply with their obligations under the Paris Agreement and shift to a low-carbon and sustainable energy system. Today, fossil fuels account for 95% of total energy supply in the 5 countries of Central Asia. Analysis published by UNECE as part of its Carbon Neutrality Toolkit shows that under a business-as-usual scenario aiming at strengthening energy resilience to prevent blackouts and ensure reliable supply, the region would need to invest some $1.407 trillion between 2020 and 2050.

Climate Change Conference COP27[291]

The United Nations Climate Change Conference COP27 brought together more than 45 000 delegates in Shark El Sheikh from 6 to 18 November.

COP27 resulted in countries delivering a package of decisions that reaffirmed their commitment to **limit global temperature rise to 1.5 degrees Celsius** above pre-industrial levels. The package also strengthened action by countries to cut greenhouse gas emissions and adapt to the inevitable impacts of climate change, as well as boosting the support of finance, technology and capacity building needed by developing countries.

Governments took the decision to establish **new funding arrangements**, as well as a dedicated fund, to assist developing countries in responding to loss and damage. Governments also agreed to establish a 'transitional committee' to make recommendations on how to operationalize both the new funding arrangements and the fund at COP28 next year. The first meeting of the transitional committee is expected to take place before the end of March 2023. Parties also agreed on the institutional arrangements to operationalize the Santiago Network for Loss and Damage, to catalyze technical assistance to developing countries that are particularly vulnerable to the adverse effects of climate change.

COP27 saw **significant progress on adaptation**, with governments agreeing on the way to move forward on the Global Goal on Adaptation, which will conclude at COP28 and inform the first Global Stocktake, improving resilience amongst the most vulnerable. New pledges, totaling more than $230 million, were made to the Adaptation Fund at COP27. These pledges will help many more vulnerable communities adapt to climate change through concrete adaptation solutions. COP27 President Sameh Shoukry announced the Sharm el-Sheikh Adaptation Agenda, enhancing resilience for people living in the most climate-vulnerable communities by 2030. UN Climate Change's Standing Committee on Finance was requested to prepare a report on doubling adaptation finance for consideration at COP28 next year.

The cover decision, known as the Sharm el-Sheikh Implementation Plan, highlights that a global transformation to a low-carbon economy is expected to require investments of at least $4-6 trillion a year. Delivering such funding will require a swift and comprehensive transformation of the financial system and its structures and processes, engaging governments, central banks, commercial banks, institutional investors and other financial actors. Serious concern was expressed that the goal of developed country Parties to mobilize jointly $100 billion per year by 2020 has not yet been met, with developed countries urged to meet the goal, and multilateral development banks and international financial institutions called on to mobilize climate finance.

At COP27, deliberations continued on setting a **'new collective quantified goal on climate finance'** in 2024, taking into account the needs and priorities of developing countries.

The World Leaders Summit, held over two days during the first week of the conference, convened six high-level roundtable discussions. The discussions highlighted solutions – on themes including food security, vulnerable communities and just transition – to chart a path to overcome climate challenges and how to provide the finance, resources and tools to effectively deliver climate action at scale.

[291] Source: https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries; https://news.un.org/ru/story/2022/11/1434977

Young people in particular were given greater prominence at COP27, with UN Climate Change's Executive Secretary promising to urge governments to not just listen to the solutions put forward by young people, but to incorporate those solutions in decision and policy making. Young people made their voices heard through the first-of-its-kind pavilion for children and youth, as well as the first-ever youth-led Climate Forum.

In parallel with the formal negotiations, the **Global Climate Action space** at COP27 provided a platform for governments, businesses and civil society to collaborate and showcase their real-world climate solutions. The UN Climate Change High-Level Champions held a two-week programme of more than 50 events. This included a number of major African-led initiatives to cut emissions and build climate resilience, and significant work on the mobilization of finance.

The highlights of the meeting included, among others, the launch of the **first report of the High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities**. The report slammed greenwashing – misleading the public to believe that a company or entity is doing more to protect the environment than it is – and provided roadmap to bring integrity to net-zero commitments by industry, financial institutions, cities and regions and to support a global, equitable transition to a sustainable future.

Other announcements at COP27:

- Countries launched a package of 25 new collaborative actions in five key areas: power, road transport, steel, hydrogen and agriculture.

- The Egyptian leadership also announced the **Food and Agriculture for Sustainable Transformation** initiative or FAST, to improve the quantity and quality of climate finance contributions to transform agriculture and food systems by 2030. This was the first COP to have a dedicated day for Agriculture, which contributes to a third of greenhouse emissions and should be a crucial part of the solution.

- UN Secretary-General António Guterres announced a $3.1 billion plan to ensure everyone on the planet is protected by early warning systems within the next five years.

- The UN Secretary-General's High-Level Expert Group on Net-Zero Commitments published a report at COP27, serving as a how-to guide to ensure credible, accountable net-zero pledges by industry, financial institutions, cities and regions.

- The G7 and the V20 ('the Vulnerable Twenty') launched the Global Shield against Climate Risks, with new commitments of over $200 million as initial funding. Implementation is to start immediately.

- Announcing a total of $105.6 million in new funding, Denmark, Finland, Germany, Ireland, Slovenia, Sweden, Switzerland, and the Walloon Region of Belgium, stressed the need for even more support for the Global Environment Facility funds targeting the immediate climate adaptation needs of low-lying and low-income states.

- Meanwhile, former US Vice-President and climate activist Al Gore, with the support of the UN Secretary-General, presented a new independent inventory of greenhouse gas emissions created by the Climate TRACE Coalition. The tool combines satellite data and artificial intelligence to show the facility-level emissions of over 70,000 sites around the world, including companies in China, the United States and India. This will allow leaders to identify the location and scope of carbon and methane emissions being released into the atmosphere.

- The new Indonesia Just Energy Transition Partnership, announced at the G20 Summit held in parallel with COP27, will mobilize $20 billion over the next three to five years to accelerate a just energy transition.

- Important progress was made on forest protection with the launch of the Forest and Climate Leaders' Partnership, which aims to unite action by governments, businesses and community leaders to halt forest loss and land degradation by 2030.

Central Asian countries at COP27

Regional statement of the CA countries. During the 8th meeting of representatives of the ministries of foreign affairs and parliamentarians of Central Asian countries "Towards a regional coherence and cooperation of the countries of Central Asia in the field of climate policy, finance and implementation of Nationally Determined Contributions (NDCs)" at COP27, they announced a regional statement "Voice of Central Asia" on behalf of the governments of the Central Asian countries. The regional statement is to call the attention of the world community and international financing institutions to vulnerability of the region to climate change, emphasize the readiness of the Central Asian countries to strengthen international cooperation on the measures taken by the countries to adapt to and mitigate climate change and to strengthen regional cooperation on transboundary issues, as well as to attract climate financing in the region.

Position of NGOs and youth of the CA countries. Central Asian NGOs urged the governments of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, the UN, the EU, and the international and business communities to revise and significantly strengthen national and regional climate commitments. To prevent the climate crisis and negative consequences in Central Asia, emissions must be reduced by at least 30% by 2030 and reach zero balance by 2050. However, the commitments proposed by the CA countries are not sufficient. Arguments about the difficulties of achieving carbon neutrality, when examined in detail, turn out to be not so significant, but at the same time, the social and economic benefits of reducing emissions and adaptation for human health, employment and national economies are obvious! Representatives of youth networks in Central Asia – young climate and water experts, CALP graduates and members of the Working Group of the First in Central Asia RCOY CA made a separate statement.

Climate Change Reports

IPCC has completed two parts of its Sixth Assessment Report[292]

The second part of the report entitled "Climate Change 2022: Impacts, Adaptation & Vulnerability"[293] identifies and describes the risks associated with global climate change: these relate to changes in global ecosystems and to concrete effects on people in multiple spheres, from agriculture and health care to demography. One of the main conclusions is that adaptation still lags behind climate change. The overshoot of the 1.5°C limit will lead to irreversible transformations in Earth ecosystems, with the currently available adaptation tools turning out to be ineffective. In this context, the main task before humanity is to cut greenhouse gas emissions drastically.

The third part entitled[294] "Climate Change 2022: Mitigation of Climate Change" included detailed assessments of GHG emissions, pathways of their short-, middle- and long-term reduction, and detailed assessment of contributions by economic sectors to climate change. The report also addresses COVID-19, climate policies, sustainable development and international cooperation in the context of responses to climate change. By expert assessments, growth in anthropogenic emissions has persisted across all major groups of GHGs from 2010 to 2019, albeit at different rates. The annual growth was 1.3% and reached 59 ± 6.6 GtCO2-eq in 2019.

The authors note that the COVID-19 pandemic could impede the achievement of SDGs, while taking away political and financial capacities from climate actions. Nevertheless, studies of previous post-shock periods have shown that these are crisis periods that can encourage new behaviors, weaken existing systems, and initiate rapid reforms. Limiting warming to 2°C relative to the pre-industrial level by the end of the century is possible by authors' opinion only if enough stringent restrictive measures are observed. To this end, for instance, energy generation from oil must be reduced by 2030 by 10% relative to 2019 and by 2050 by 40%; that from gas, by 15% and 30%, respectively. Around the 2070s it is expected to reach global net zero CO_2 emissions.

This will require deep decarbonization of all economic sectors that will be facilitated by a wide circle of decision makers. Governments and public institutions may contribute to climate mitigation through a legal framework for recommended climate policy measures and economic support of these measures and diversification of their implementers. The legal framework should include establishment of land rights, state support to new technologies, adoption of standards for transport vehicles and emission regulation, and assessment of ecosystem services.

10 New Insights in Climate Science 2022 are based on the assessment of more than 60 leading world experts. This year the authors reveal the complexities of the interactions between climate change and other risks, such as conflicts, pandemics, food crises and underlying development challenges.

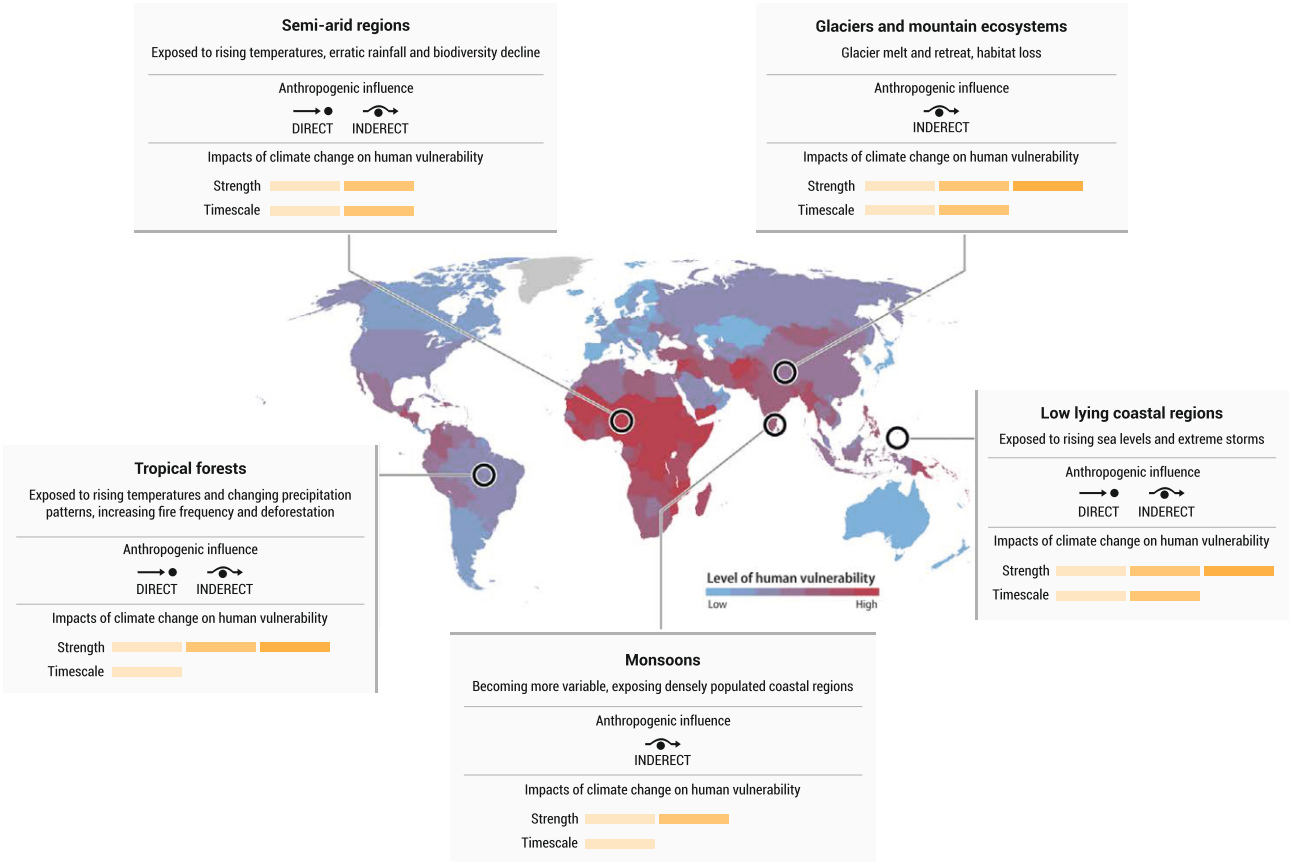
1. **Questioning the myth of endless adaptation: Limits to adaptation are being breached already in different places across the world.** Climate adaptation will become increasingly difficult as we approach 1.5°C or 2°C above pre-industrial temperatures. Existing adaptation efforts are falling short of adequately reducing risks from past, current and future climate change, leaving the most vulnerable particularly exposed to climate impacts. Adaptation cannot substitute for ambitious mitigation efforts. Even effective adaptation will not avoid all losses and damages, and new limits to adaptation can emerge in the shape of conflicts, pandemics and pre-existing development challenges. Deep and swift mitigation is critical to avoid widespread breaching of adaptation limits.

2. **Vulnerability hotspots cluster in 'regions at risk'**: Approximately 1.6 billion people live in vulnerability hotspots, a number projected to double by 2050. Climate-driven hazard mortality is 15 times higher in hotspot countries than in the least-vulnerable countries. Vulnerability – the susceptibility to be adversely affected by climate-driven hazards – is a product of structural inequality in human-environmental systems. It clusters in major "regions at risk": in parts of Central America, Asia and the Middle East, and in Africa across the Sahel, Central and East Africa. Communities in these regions at risk are increasingly exposed to climate change and climate-related hazards, where resilience (physical, ecological and socioeconomic) decreases with worsening levels of inequality, state fragility and poverty. Habitat degradation is putting many ecosystems in Arabian Peninsula and CA at high risk of structural and dynamic change, reducing their climate mitigation capability. It also decreases the ecosystem services and resources those habitats can provide, threatening the adaptive capacity of marginalized groups.

Schematic diagram illustrating systematic human vulnerability on a scale of seven vulnerability categories (adapted from Birkmann et al., 2021) is shown below.

It also highlights climate system components and ecosystems most relevant to human vulnerability from direct (e.g. deforestation) and indirect (e.g. global warming due to greenhouse gas emissions) anthropogenic influence.

[292] the first part was published in 2021 Water Yearbook
[293] issued on February 28
[294] issued on April 4



3. New threats on the horizon from climate-health interactions: Compounding and cascading risks due to climate change are adversely impacting human, animal and environmental health. Heat-related deaths, wildfires bringing physical and mental health impacts, and increasing risks of outbreaks of infectious diseases are all related to climate change.

4. Climate mobility: from evidence to anticipatory action. Involuntary migration and displacement will increasingly occur due to climate change-related slow-onset impacts and the rising frequency and intensity of extreme weather events. Climate change and related impacts can also result in many people losing their capacity to adapt by moving away. Thus, anticipatory humanitarian actions to assist climate-related mobility and minimize displacement are critical.

5. Human security requires climate security: Climate change exacerbates existing vulnerabilities in human security (caused by governance and socioeconomic conditions), which can lead to violent conflict. Effective and timely mitigation and adaptation strategies are required to strengthen human security and, by extension, national security. These must be pursued in parallel with concerted efforts to provide for human security to reduce the risks of increasing violent conflict and promote peace.

6. Sustainable land use is essential to meeting climate targets: Agricultural intensification that is long-term sustainable is preferable to further expansion into natural areas, when proper policies are in place to limit increased land conversion. Efforts to increase food production through enhanced yields and system integration while minimizing adverse ecological impacts can likewise do much to further food security. However, the higher the degree of warming, the less likely the current assumptions about the capacity of land systems to deliver these co-benefits will apply.

7. Private sustainable finance practices are failing to catalyze deep transitions needed to meet climate targets. The large majority of today's sustainable finance practices are designed to fit into the financial sector's existing business models rather than to allocate capital in ways that would provide the most impact on combating climate change.

8. Loss and Damage: the urgent planetary imperative. Losses and damages are already happening and will increase significantly on current trajectories, but rapid mitigation and effective adaptation can still prevent many of these. A coordinated, global policy response to losses and damages is urgently needed.

9. Inclusive decision-making for climate-resilient development: Being inclusive and empowering in all forms of decision-making has been shown to lead to better and more just climate outcomes.

10. Breaking down structural barriers: multidimensional structural barriers arising from the current resource-intensive economy and its vested interests in maintaining the status quo are inhibiting transformational change. Integration of justice and equality aspects in global agreements, decision making processes, and production and consumption mecha-

nisms, de-risking of decarbonisation investments and radical revision of how we track progress will strengthen climate actions and remove the deep-rooted inequalities.

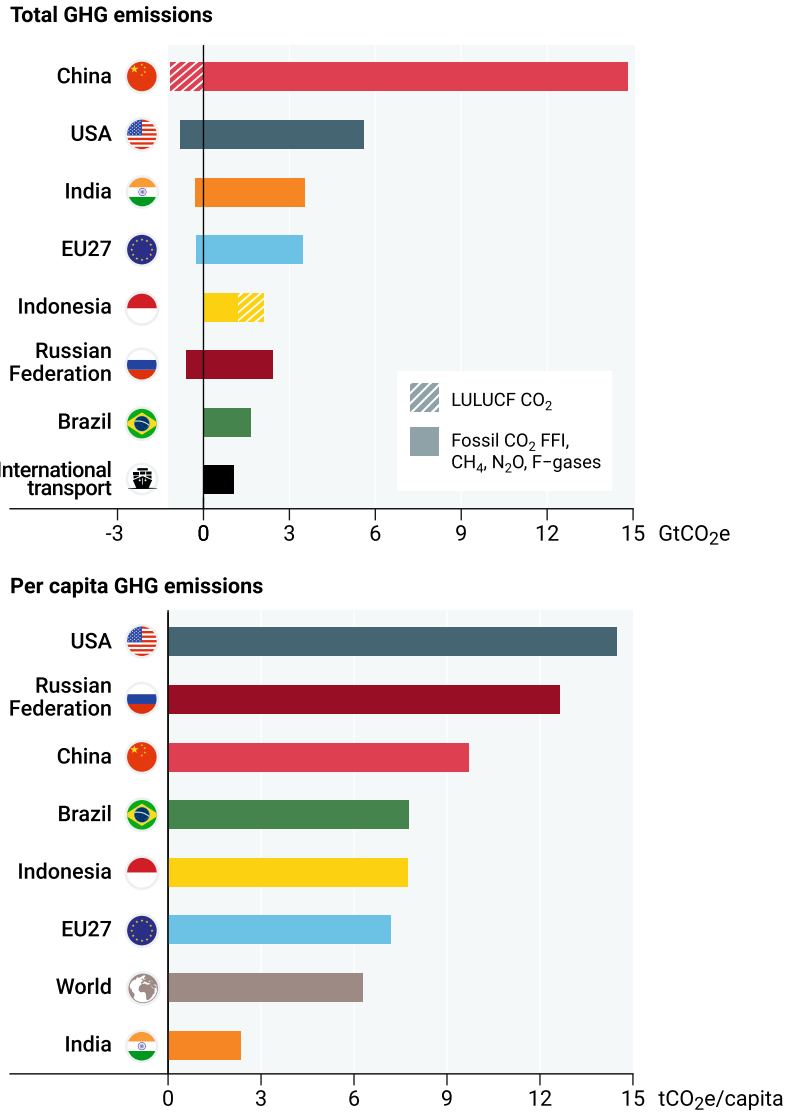
UNEP published the 13th edition of the Emissions Gap Report for 2022 entitled "The Closing Window – Climate crisis calls for rapid transformation of societies". The Report finds that the international community is falling far short of the Paris goals, with no credible pathway to 1.5°C in place. Only an urgent system-wide transformation can avoid climate disaster.

1. Testimony to inadequate action on the climate crisis and the need for transformation. Countries' new and updated NDCs submitted since COP26 reduce projected GHG emissions in 2030 by only 0.5 gigatons of CO_2 equivalent ($GtCO_2e$), compared with emissions projections based on mitigation pledges at the time of COP26. To get on track for limiting global warming to 1.5°C, global annual GHG emissions must be reduced by 45 per cent compared with emissions projections under policies currently in place in just eight years, and they must continue to decline rapidly after 2030, to avoid exhausting the limited remaining atmospheric carbon budget.

2. Global GHG emissions could set a new record in 2021. Global GHG emissions for 2021, excluding LULUCF[295], are preliminarily estimated at 52.8 $GtCO_2e$, a slight increase compared to 2019, suggesting that total global GHG emissions in 2021 will be similar to or even break the record 2019 levels.

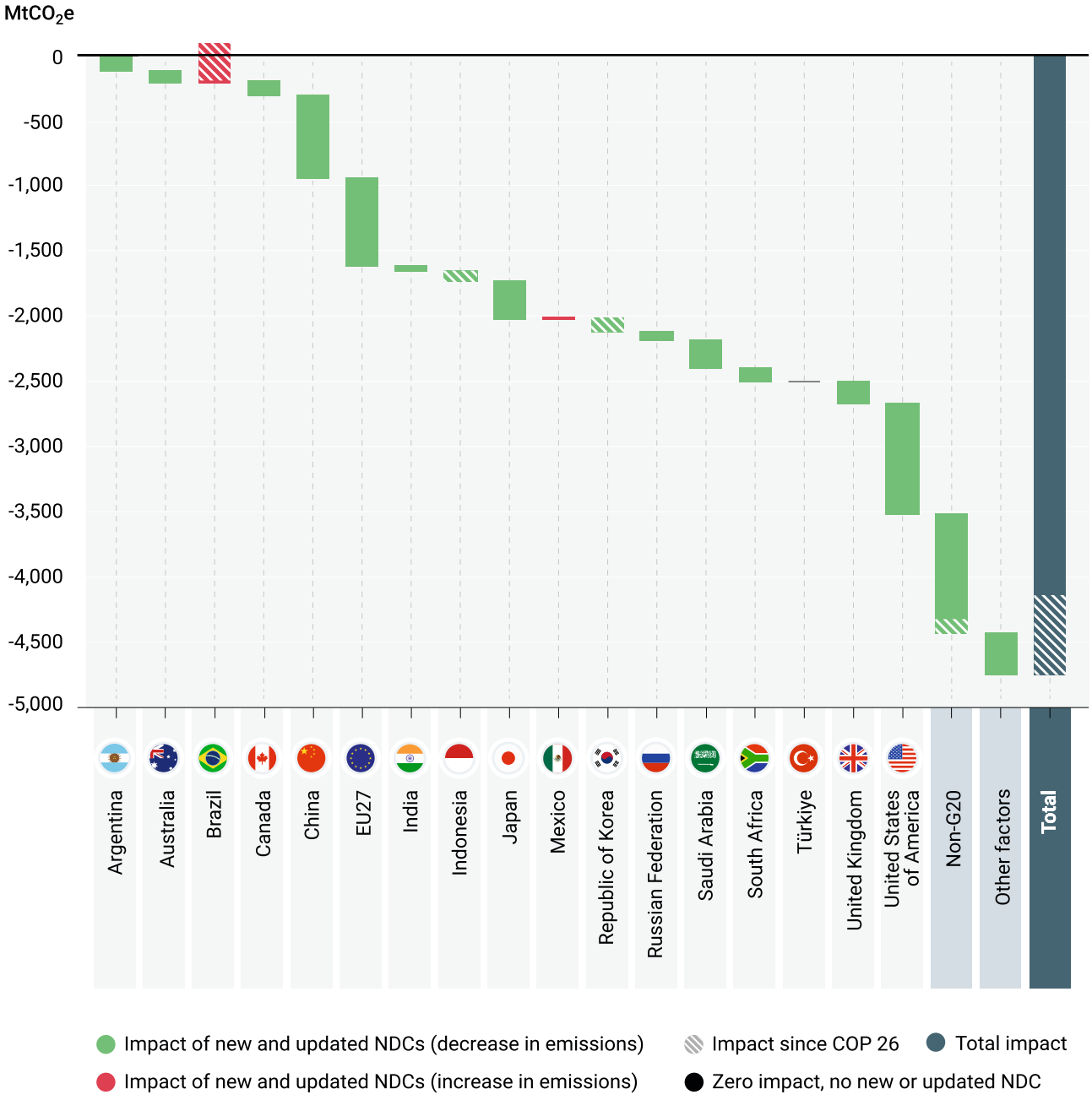
3. GHG emissions are highly uneven across regions, countries and households. Per capita emissions vary greatly across countries. World average per capita GHG emissions (including LULUCF) were 6.3 tCO_2e in 2020. India remains far below the world average at 2.4 tCO_2e.

Total and per capita GHG emissions of major emitters in 2020, including inventory-based LULUCF



[295] estimates of land use, land-use change and forestry (LULUCF) are currently only available up to 2020, limiting the analysis of total global GHG emissions for 2021

Impact on global GHG emissions in 2030
of new and updated unconditional NDCs relative to initial NDCs



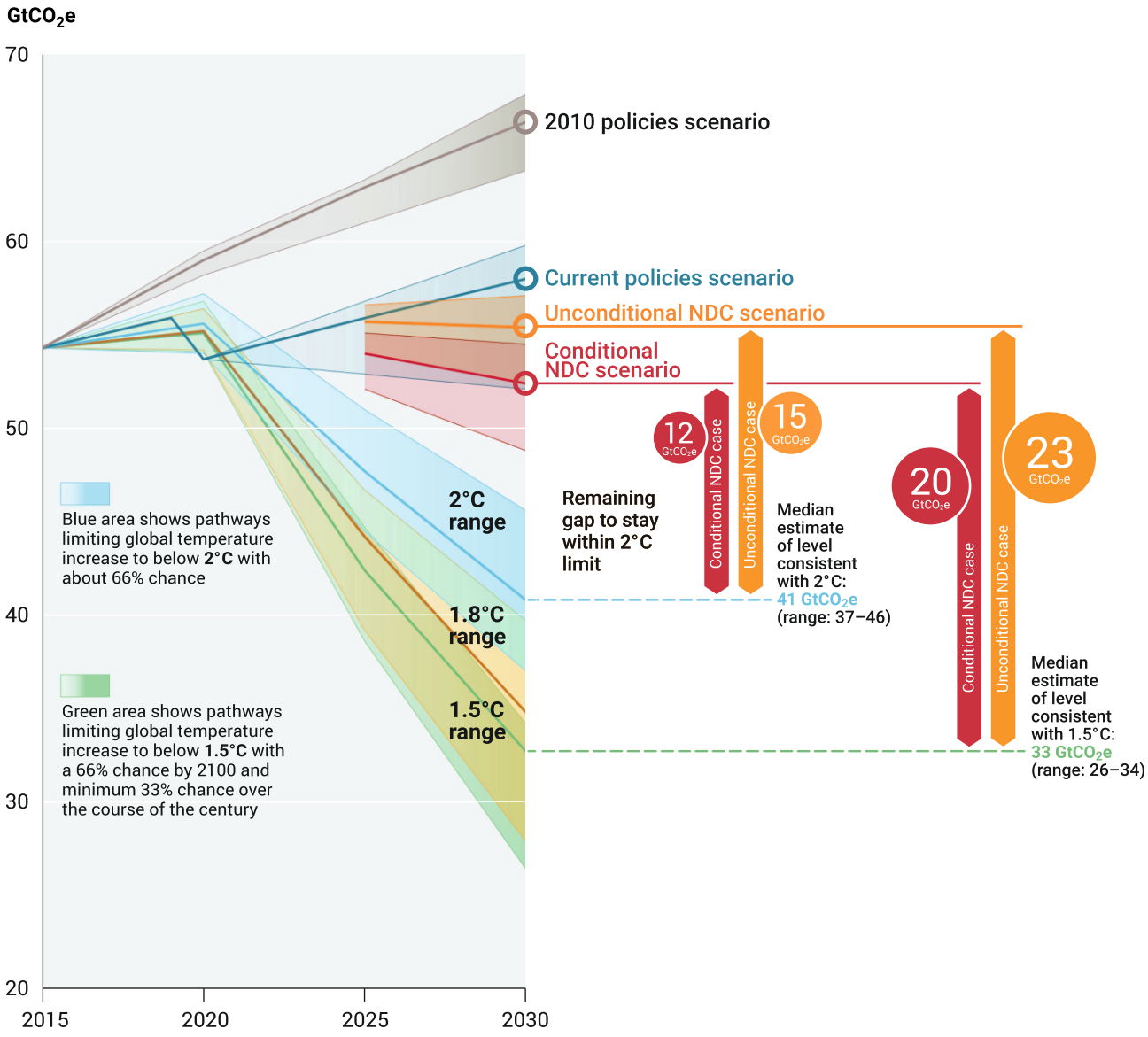
4. Despite the call for countries to "revisit and strengthen" their 2030 targets, progress since COP26 is highly inadequate.

NDCs submitted since COP26 take only 0.5 $GtCO_2e$, less than one per cent, off projected global emissions in 2030. Between 1 January 2020 and 23 September 2022, 166 parties representing around 91 per cent of global GHG emissions had submitted new or updated NDCs, up from 152 parties as of COP26.

5. G20 members are far behind in delivering on their mitigation commitments for 2030, causing an implementation gap. Most of the G20 members have just started the implementation of policies and actions to meet their new targets. The G20 members would collectively fall short of achieving their NDCs by 2030 if stronger measures are not taken.

6. Globally, the NDCs are highly insufficient, and the emissions gap remains high. Current commitments by countries as expressed in their unconditional and conditional NDCs for 2030 are estimated to reduce global emissions by 5 and 10 per cent respectively, compared with current policies and assuming that they are fully implemented. To get on track for limiting global warming to below 2.0°C and 1.5°C, global GHG emissions must be reduced by 30 and 45 per cent respectively, compared with current policy projections.

Global GHG emissions under different scenarios and the emissions gap in 2030 (median estimate and tenth to ninetieth percentile range)



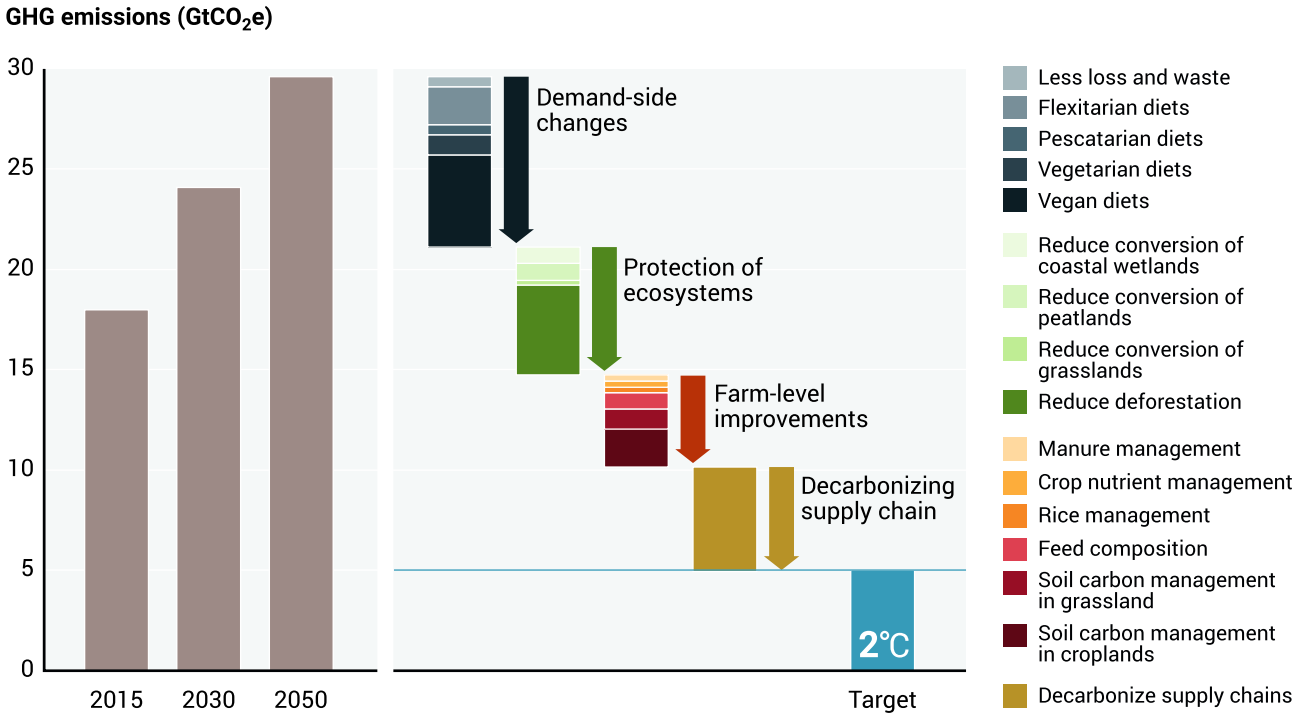
7. Without additional action, current policies lead to global warming of 2.8°C. Implementation of unconditional and conditional NDC scenarios reduces this to 2.6°C and 2.4°C, respectively. A continuation of the level of climate change mitigation effort implied by current unconditional NDCs is estimated to limit warming over the twenty-first century to about 2.6°C (range: 1.9-3.1°C) with a 66 per cent chance, and warming is expected to increase further after 2100 as CO_2 emissions are not yet projected to reach net-zero levels.

8. The credibility and feasibility of the net-zero emission pledges remains very uncertain.

9. Wide-ranging, large-scale, rapid and systemic transformation is now essential to achieve the temperature goal of the Paris Agreement. The following broad portfolio of key actions to initiate and advance the transformation must be undertaken, tailored to the specific context of each of the four sectors: (1) avoiding lock-in of new fossil fuel intensive infrastructure; (2) enabling the transition by further advancing zerocarbon technologies, market structures and plans for a just transformation; (3) applying zero-emissions technologies and promoting behavioural change to sustain and deepen reductions to reach zero emissions.

10. The food system accounts for one third of all emissions, and must make a large reduction. The largest contribution stems from agricultural production (7.1$GtCO_2e$, 39%) including the production of inputs such as fertilizers, followed by changes in land use (5.7 $GtCO_2e$, 32%), and supply chain activities (5.2 $GtCO_2e$, 29%). The latter includes retail, transport, consumption, fuel production, waste management, industrial processes and packaging. Projections indicate that food system emissions could reach ca 30 $GtCO_2e$/year by 2050.

Food systems emissions trajectory and mitigation potentials by transformation domain



11. Realignment of the financial system is a critical enabler of the transformations needed. A global transformation to a low-carbon economy is expected to require investments of at least $4-6 trillion a year, a relatively small (1.5-2%) share of total financial assets managed, but significant (20-28%) in terms of the additional annual resources to be allocated. Delivering such funding will require a transformation of the financial system and its structures and processes, engaging governments, central banks, commercial banks, institutional investors and other financial actors.

The 6th Yearbook of Global Climate Action was published in 2022. It outlines what is needed to accelerate sectoral systems transformation, features case studies of real-world climate action projects, highlights some key global climate action topics – particularly regionalization and accountability. It also highlights what needs to be achieved in 2023, particularly with regard to the Global Stocktake and the work being done on implementing the improved Marrakech Partnership.

Significant and Major Events

The UN Security Council held two "Arria-formula" meetings: (1) at ministerial level on climate finance as a means to build and sustain peace in conflict, post-conflict and crisis situations (9 March, UAE); (2) on the theme "Climate, Peace and Security: Opportunities for the UN Peace and Security Architecture" (29 November, New York) (see Security Council).

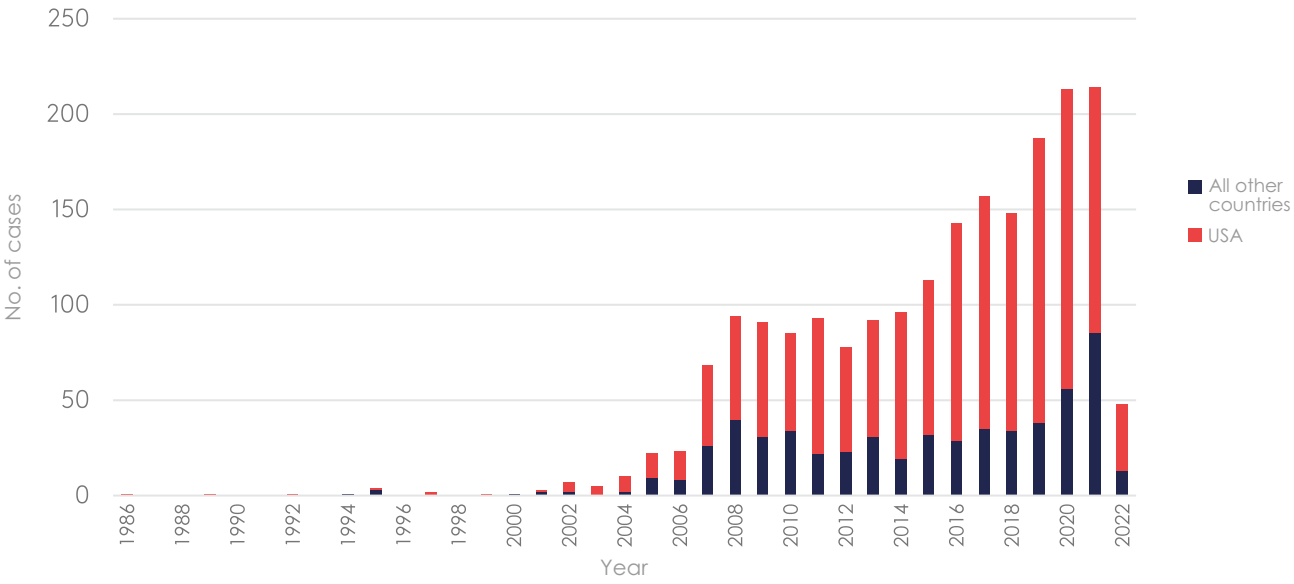
Third UN Climate and SDG Synergies Conference brought together more than 2,000 participants (July 20-21, Tokyo, hybrid format). It generated an impressive range of potential solutions and proposals for how to better integrate efforts to tackle these interlinked global crises and accelerate action to address the climate emergency and recent reversals in achieving the Sustainable Development Goals.

Global trends in climate change litigation in 2022. 2,002 cases of climate change litigation were identified from around the world, as of May 2022 (see Figure below). Of these, 1,426 were filed before courts in the United States, while the remaining 576 were filed before courts in 43 other countries and 15 international or regional courts and tribunals. Outside the US, Australia (124 cases), the UK (83) and the EU (60) remain the jurisdictions with the highest volume of cases.

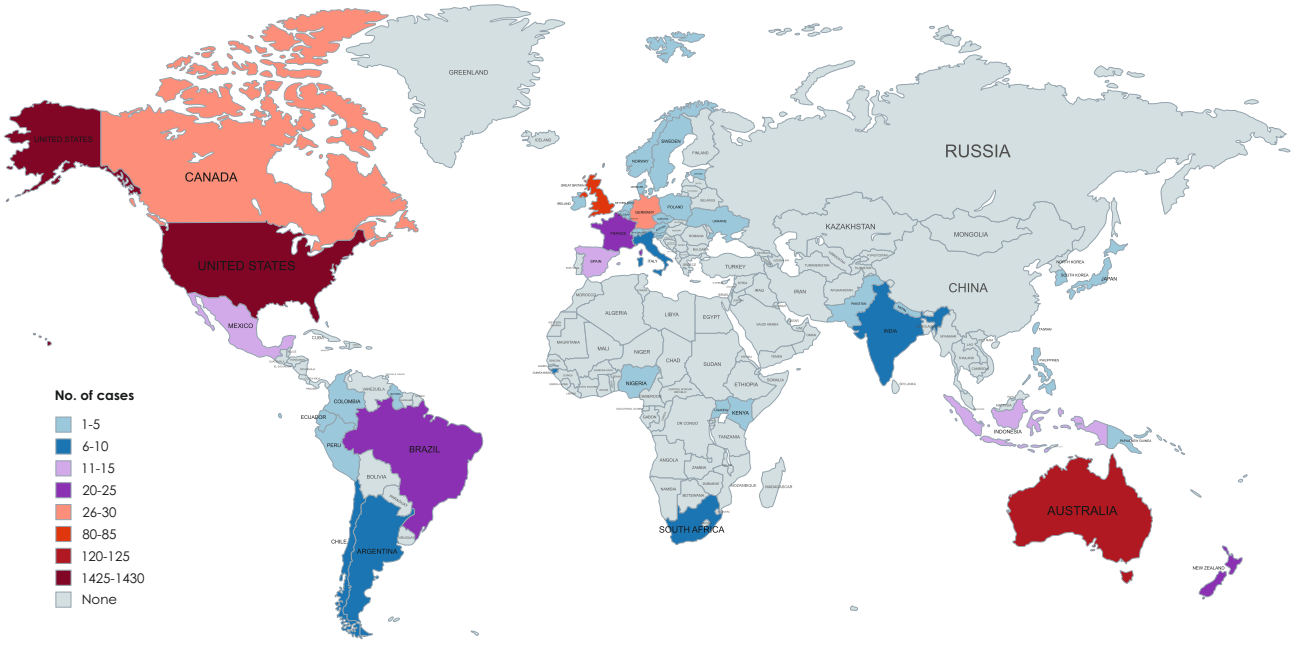
Data from the past 12 months confirms that litigation continues to expand as an avenue for action on climate change. While the number of cases in the US was lower than in previous years – likely down to the change in federal government – 2021 saw the highest number of recorded cases outside the US.

Globally, the cumulative number of climate change-related litigation cases has more than doubled since 2015. Just over 800 cases were filed between 1986 and 2014, and over 1,200 cases have been filed in the last eight years, bringing the total in the databases to 2,002. Roughly one-quarter of these were filed between 2020 and 2022.

Total climate change cases over time, US and non-US (up to 31 May 2022)



Number of climate litigation cases around the world, per jurisdiction (up to 31 May 2022)



Source: Setzer J. and Higham C. (2022) Global trends in climate change litigation: 2022 snapshot. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, Sabin Center for Climate Change Law, https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2022/08/Global-trends-in-climate-change-litigation-2022-snapshot.pdf

Remarkable climate change litigation cases in 2022

In Australia a court moved to block an $8.4bn coal mine development in Queensland on human rights grounds in a landmark case that highlights the mounting legal challenges to fossil fuel extraction around the world. The court said that the project would have infringed on the rights of First Nations people in Queensland because of its climate impact.

On November 16, the first hearing took place in Germany to force carmaker BMW to "drastically reduce" the CO_2 emissions of its vehicles, and that by October 31, 2030, BMW must build new passenger cars that emit a maximum of 604 million tons of CO_2, or prove greenhouse gas neutrality for any CO_2 emissions beyond this.

Greta Thunberg jointly with more than 600 children and young adults in Aurora eco-movement has filed

a lawsuit against the Swedish state for climate inaction. The activists claim the Swedish state to acknowledge its climate policy be flawed.

Greenpeace filed a case before the court against the UK Government for potential disruption of climate goals. The green lobbyists try to stop issuing more than 100 new licenses for oil and gas exploration in the North Sea. They believe that licensing of fuel mining companies will be a real catastrophe that undercuts any hope for the achievement of the Paris Agreement. This will make it impossible to limit the global temperature growth to 1.5°C. British authorities refused to comment the legal challenge, insisting on the need to increase national energy security through development of local energy sources.

The Fridays for Future movement activists filed a climate change litigation case against the Government of Russia for the first time. The litigants claimed the Government to annul the statement in the Presidential decree on cutting of greenhouse gas emissions that says by 2030 the GHG emissions shall be reduced to 70% relative to 1990. While the activists claim for the emissions reductions down to 31%.

American teenagers v. United States climate change lawsuit. The Juliana v. the United States continued in 2022. Twenty one American teenagers filed a class action lawsuit against the US Government. Their complaint asserts that, through the government's affirmative actions that cause climate change, it has violated the youngest generation's constitutional rights to life, liberty, and property, as well as failed to protect essential public trust resource. *State of things:* the youth plaintiffs continue awaiting a ruling on their Motion for Leave to File a Second Amended Complaint, the favorable decision on which would enable them to proceed to trial.[297]

12.2. Progress in Integrated Water Resources Management and Transboundary Water Cooperation in Central Asia (SDG 6.5)

Prepared by D.R. Ziganshina (SIC ICWC)

This survey as a regular part of the Thematic Review tracks progress in achieving the Sustainable Development Goals in Central Asia. Here we review the progress made by the CA countries in integrated water resources management (IWRM) and transboundary water cooperation under SDG 6.5.

SDG 6.5 is formulated as follows: by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

To monitor progress in achieving this goal, SDG 6.5.1 tracks the degree of IWRM implementation, while SDG 6.5.2 considers the percentage of transboundary basin area within a country that has an operational arrangement for water cooperation.

Globally, the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6) coordinates reporting on SDG6 (IMI-SDG6). As the custodian of SDG indicator 6.5.1, the United Nations Environment Programme (UNEP) established a specialized IWRM technical support service, which developed the 2023 Monitoring guide.

The United Nations Economic Commission for Europe (UNECE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) are the custodians of SDG indicator 6.5.2. They developed the Step-by-step monitoring methodology for SDG indicator 6.5.2[298] (2020 version) and the Guide to reporting under this indicator[299].

This summary report is based on formal country reporting verified by the UN custodian organizations (UNECE, UNESCO, and UNEP) within the reporting rounds 2017 and 2020[300].

Globally, the degree of IWRM implementation is 54% (SDG indicator 6.5.1, 2020)

Hopefully this summary will help the countries prepare their reports under the third reporting round 2023 and allow identifying issues that need assistance of development partners.

[297] https://www.ourchildrenstrust.org/juliana-v-us

[298] https://unece.org/DAM/env/water/activities/Reporting_convention/SDG_652_Step-by-step_methodology_2020_ENG.pdf

[299] https://unece.org/sites/default/files/2021-02/ece_mp.wat_60_eng_web.pdf

[300] UNEP – indicator 6.5.1 custodian via the UNEP-DHI IWRM data portal; UNECE and UNESCO – indicator 6.5.2 custodians, https://sdg6data.org/en/indicator/6.5.2; national country reports on SDG indicator 6.5.2 are available on https://unece.org/national-country-reports-sdg-indicator-652

Progress in IWRM at all levels (SDG indicator 6.5.1)

186 countries submitted their national reports on indicator 6.5.1 in 2017 and 2020. All the CA countries also submitted their reports on this indicator in 2020. The degree of IWRM implementation is assessed through the **four key components**: (1) enabling environment; (2) institutions and participation; (3) management instruments; and, (4) financing.[301]

In 2020, given the maximum score of 100, Kazakhstan (46), Tajikistan (46) and Uzbekistan (48) showed **medium-low** degree of IWRM implementation, while Kyrgyzstan was close to **low** degree (31) and Turkmenistan (64) reported on **medium-high** degree. Two countries that submitted national reports in 2017 demonstrated progress: Kazakhstan improved the overall indicator from low to medium-low, whereas Uzbekistan added three scores to its medium-low status (Table 1). Overall, the CA countries, except for Turkmenistan, show the lower than global (54) degree of IWRM implementation.

Table 1. Degree of IWRM implementation in CA countries, 2017 and 2020
(SDG indicator 6.5.1)

	KZ		KG		TJ		TM		UZ		Global
	2017	2020	2017	2020	2017	2020	2017	2020	2017	2020	2020
1. Enabling environment	29	37		27		49		63	38	41	57
2. Institutions and participation	24	51		30		43		48	53	53	58
3. Management instruments	40	51		43		48		63	56	60	55
4. Financing	28	43		23		42		80	34	37	43
Average score	30	46		31		46		64	45	48	54

Note: **Degree of implementation (scores):** very high (91-100); high (71-90); medium-high (51-70); medium low (31-50); low (11-30); very low (0-10); no data

Source: Country reports in 2017 and 2020, http://iwrmdataportal.unepdhi.org/country-reports

Table 2. Rating of enabling environment for IWRM by CA countries
(SDG indicator 6.5.1)

	KZ	KG	TJ	TM	UZ
1.1. What is the status of policies, laws and plans to support IWRM at the national level?					
a. National water resources policy	40	40	60	60	60
b. National water resources law(s)	20	50	50	60	30
c. National (IWRM) plans	20	20	50	60	30
1.2. What is the status of policies, laws and plans to support IWRM at other levels?					
a. Sub-national water resources policies	40	10	40	60	40
b. Basin/aquifer management plans based on IWRM	20	20	50	60	30
c. Arrangements for transboundary water management	80	30	60	80	70
d. Sub-national water resources regulations (laws, degrees, resolutions, etc.)	40	20	30	60	30
Average Enabling environment score	37	27	49	63	41

Note: **Degree of implementation (scores):** very high (91-100); high (71-90); medium-high (51-70); medium low (31-50); low (11-30); very low (0-10)

Source: Country reports, 2020, http://iwrmdataportal.unepdhi.org/country-reports

[301] http://iwrmdataportal.unepdhi.org/, https://sdg6data.org/country-or-area/

Under component 1, the countries assess their efforts in creating enabling environment for IWRM as low (Kyrgyzstan), **medium-low** (Kazakhstan, Tajikistan and Uzbekistan) and **medium-high** (Turkmenistan). Tajikistan and Turkmenistan rate their national water policies, laws and plans as medium-high (50-60). In turn, Uzbekistan gives medium-high score to its national water policy (60) but is not satisfied with laws and plans to support IWRM (30). Kazakhstan is even more dissatisfied with the status of laws and plans (20). Kyrgyzstan considers it achieved medium-low results (40-50) in policies and laws, and much more needs to be done in planning (20 of 100). Responses on subnational strategies and regulations demonstrate the importance of focusing on this level in all CA countries, except for Turkmenistan. Arrangements for transboundary water management (1.2.c) have got high or medium scores in all the countries, except for Kyrgyzstan (30), which considers them unsatisfactory (Table 2).

Under component 2, capacities and participation of **institutions and other stakeholder groups** that help to support implementation, including institutional capacity and effectiveness, inter-sectoral coordination, stakeholder participation and gender equality in the CA countries, are assessed as low (Kyrgyzstan), **medium-low** (Tajikistan and Turkmenistan), **and medium-high** (Kazakhstan and Uzbekistan) (Table 3).

Business participation in water resources development and management and organizational framework for transboundary water management were assessed as **very high** by Kazakhstan and **high** by Turkmenistan. Kazakhstan also gives high rating to public participation at national and sub-national levels, while Turkmenistan assesses as high its basin organizations and sub-national authorities. Kyrgyzstan gives medium-low rating to its institutions at national level and is not satisfied with progress at the sub-national level. Tajikistan gave high scores to national government authorities' capacity for leading implementation of IWRM (60) and organizational framework for transboundary water management (60). Overall, Uzbekistan assesses the status of institutions for IWRM implementation at the national and other levels as medium-low or medium-high.

Kazakhstan is highly dissatisfied with **absence** of gender-specific aspects in water laws and plans. Judging from low scores, this is an issue in all the countries.

Participation of business and sub-national authorities in planning processes in Kyrgyzstan, the public at the local level in Turkmenistan, and vulnerable groups in Tajikistan and Turkmenistan are rated as **critically low**.

Table 3. Rating of institutions and participation for IWRM implementation by CA countries
(SDG indicator 6.5.1)

	KZ	KG	TJ	TM	UZ
2.1. What is the status of institutions for IWRM implementation at the national level?					
a. National government authorities' capacity for leading implementation of IWRM plans	20	40	60	60	60
b. Coordination between national government authorities representing different sectors on water resources, policy, planning and management	40	40	50	40	60
c. Public participation in water resources policy, planning and management at national level	80	40	40	20	50
d. Business participation in water resources development, management and use	100	10	40	80	40
e. Developing IWRM capacity	40	30	50	50	60
2.2. What is the status of institutions for IWRM implementation at other levels?					
a. Basin/aquifer level organizations for leading implementation of IWRM plans	20	20	50	80	60
b. Public participation in water resources policy, planning and management at the local level	80	50	30	10	60
c. Participation of vulnerable groups of population in water planning and management	60	20	10	10	40
d. Gender-specific objectives in water laws/plans, etc.	0	30	30	20	40
e. Organizational framework for transboundary water management	100	40	60	80	70
f. Sub-national authorities for leading implementation of IWRM	20	10	50	80	40
Average Institutions and participation score	51	30	43	48	53

Note: **Degree of implementation (scores):** very high (91-100); high (71-90); medium-high (51-70); medium low (31-50); low (11-30); very low (0-10)

Source: Country reports, 2020, http://iwrmdataportal.unepdhi.org/country-reports

Assessment of management instruments that enable decision makers and users to make rational and informed choices between alternative actions (**Component 3**) generally is **medium-high** (Kazakhstan, Turkmenistan and Uzbekistan) or **medium-low** (Kyrgyzstan and Tajikistan). Such instruments include management programs, water resources and their load monitoring, knowledge sharing and capacity building (Table 4).

Only Kyrgyzstan expressed deep concern about management instruments at basin level. High scores (80) again were given by Kazakhstan and Turkmenistan to transboundary data and information sharing between countries. Turkmenistan is also satisfied with data and information sharing within the country at all levels.

Under component 4, the status of financing for water resources development and management is asses-

Table 4. Rating of IWRM management tools by CA countries
(SDG indicator 6.5.1)

	KZ	KG	TJ	TM	UZ
3.1. What is the status of management instruments to support IWRM implementation at the national level?					
a. National monitoring of water availability (includes surface and/or groundwater, as relevant to the country)	40	30	50	70	70
b. Sustainable and efficient water use management from the national level, (includes surface and/or groundwater, as relevant to the country)	60	60	60	50	60
c. Pollution control at the national level	40	60	40	50	50
d. Management of water-related ecosystems at the national level	40	60	40	60	60
e. Management instruments to reduce impacts of water-related disasters at the national level	60	40	50	60	70
3.2. What is the status of management instruments to support IWRM implementation at other levels?					
a. Basin management instruments	60	20	50	60	60
b. Aquifer management instruments	40	40	50	60	60
c. Data and information sharing within countries at all levels	40	40	40	80	60
d. Transboundary data and information sharing between countries	80	40	50	80	50
Average Management instruments score	51	43	48	63	60

Table 5. Rating of financing for water resources development and management by CA countries
(SDG indicator 6.5.1)

	KZ	KG	TJ	TM	UZ
4.1. What is the status of financing for water resources development and management at the national level?					
a. National budget for water resources infrastructure (investment and recurrent cost)	40	20	50	80	50
b. National budget for the IWRM elements (investment and recurrent costs)	40	20	50	70	30
4.2. What is the status of financing for water resources development and management at other levels?					
a. Sub-national or basin budgets for water resources infrastructure (investment and recurrent costs)	20	20	30	80	40
b. Revenues raised for financing IWRM elements	40	30	40	70	30
c. Financing for transboundary cooperation	100	30	40	100	50
d. Sub-national or basin budgets for the IWRM elements (investment and recurrent costs)	20	20	40	80	20
Average Financing score	43	23	42	80	37

Note: **Degree of implementation (scores):** very high (91-100); high (71-90); medium-high (51-70); medium low (31-50); low (11-30); very low (0-10)

Source: Country reports, 2020, http://iwrmdataportal.unepdhi.org/country-reports

sed as **low** (Kyrgyzstan), **medium-low** (Kazakhstan, Tajikistan and Uzbekistan) and **high** (Turkmenistan). Kazakhstan and Turkmenistan gave the highest score to their efforts for financing transboundary cooperation. Virtually all the countries, except for Turkmenistan, express particular concerns about the status of financing for water resources development and management at sub-national or basin level (Table 5).

Progress in transboundary water cooperation (SDG indicator 6.5.2)

Indicator 6.5.2 looks at the area of a country within transboundary basins and assesses the extent to which that area is covered by operational cooperation arrangements. "Arrangement" refers to a bilateral or multilateral treaty, convention, agreement or other arrangement between riparian States that provides a framework for cooperation on transboundary water management. For an arrangement for cooperation between the riparian States to be considered operational, the following **four criteria** need to be in place: (1) there is a joint body or mechanism in place; (2) there are regular (at least once per year) meetings between riparian countries; (3) a joint or coordinated water management plan or joint objectives have been established; and, (4) regular exchanges (at least once per year) of data and information take place.

There are 286 transboundary river and lake basins and 592 transboundary aquifer systems in the world. According to data of the 2023 reporting round, only 24 countries of 153 countries comprising transboundary rivers, lakes and/or aquifers have 100% of their transboundary basin area covered by operational arrangements.[302] From the 2020 reporting results, the global indicator of the percentage of transboundary basin area in a country covered by an operational arrangement of transboundary cooperation is 58%. The average value for this indicator is 65% in relation to transboundary river and lake basins (data from 115 countries) and 42% in relation to transboundary aquifers (for available 94 countries).[303]

On average, 58% of transboundary basin area within a country is covered by operational arrangements for water cooperation (SDG indicator 6.5.2, 2022)

Table 6. Percentage of transboundary basin area within CA countries that has an operational arrangement for water cooperation *(SDG indicator 6.5.2)*

Country	6.5.2 Percentage of transboundary basin area covered by operational arrangement for water cooperation (%)					
	Total		Transboundary river and lake		Transboundary aquifer	
	2017	2020	2017	2020	2017	2020
Kazakhstan	72	63.22	100	100	0	0
Kyrgyzstan	–[304]	27.2	–	29.91	–	0
Tajikistan	–	–	–	–	–	–
Turkmenistan	NaN[305]	NaN	NaN	66.02	NaN	NaN
Uzbekistan	NaN	69.59	59.3	100	NaN	0
Global	59.16	58[306]	63.28	64[307]	48.52	42[308]

Source: UNECE and UNESCO, 2017 and 2020, https://www.sdg6data.org/indicator/6.5.2

[302] UN-Water, UNECE, UNESCO, 2021. Progress on Transboundary Water Cooperation: Global status of SDG indicator 6.5.2 and acceleration needs, 2021. https://unece.org/sites/default/files/2021-12/SDG652_2021_2nd_Progress_Report_ENG_web.pdf

[303] UN-Water, UNECE, UNESCO, 2021. Progress on Transboundary Water Cooperation: Global status of SDG indicator 6.5.2 and acceleration needs, 2021. https://unece.org/sites/default/files/2021-12/SDG652_2021_2nd_Progress_Report_ENG_web.pdf

[304] report was not submitted

[305] NaN: indicates that the indicator value is not available

[306] by combining data from 2017 and 2020, 101 countries that share transboundary rivers, lakes and aquifers now have a full value for the SDG indicator 6.5.2, compared with 67 countries in 2017. Therefore this does not mean the decrease in the value of the indicator as compared to 2017

[307] the transboundary river and lake basin component is available for 115 countries in 2020, compared with only 89 in 2017. Therefore this does not indicate to a lack of progress

[308] the transboundary aquifer component of the indicator was available for 94 countries in 2020 compared with 65 in 2017. Lowering of the indicator value reflects the fact that the additional 29 countries with an aquifer component value report in general a lower value than the initial 65 countries

Meanwhile, **100% of tranboundary river or lake basin area in Kazakhstan and Uzbekistan, 66%, in Turkmenistan, and 30% in the Kyrgyz Republic are covered by operational arrangements for cooperation**, i.e. there is a joint body, mechanism or commission for transboundary cooperation; riparian states meet regularly (at least once per year) at political or technical levels; joint objectives, strategy, joint or coordinated management or action plan are established by riparian states; and, there is regular exchange (at least once per year) of data and information (Table 6).

These results are consistent with those on transboundary cooperation under SDG indicator 6.5.1.

As mentioned earlier, arrangements for transboundary water management (1.2.c.) and organizational framework for transboundary water management (2.2.e.) had very high or medium-high rating in all the countries, except for Kyrgyzstan. Kazakhstan and Turkmenistan are satisfied with transboundary data and information sharing, while other countries consider the latter as medium-low (Table 7).

Table 7. Rating of transboundary cooperation for IWRM implementation by the countries
(SDG indicator 6.5.1)

	KZ	KG	TJ	TM	UZ
Enabling environment: 1.2. What is the status of policies, laws and plans to support IWRM at other levels?					
c. Arrangements for transboundary water management	80	30	60	80	70
Institutions and participation: 2.2. What is the status of institutions for IWRM implementation at other levels?					
e. Organizational framework for transboundary water management	100	40	60	80	70
Management instruments: 3.2. What is the status of management instruments to support IWRM implementation at other levels?					
d. Transboundary data and information sharing between countries	80	40	50	80	50
Financing: 4.2. What is the status of financing for water resources development and management at other levels?					
c. Financing for transboundary cooperation	100	30	40	100	50

Note: **Degree of implementation (scores):** very high (91-100); high (71-90); medium-high (51-70); medium low (31-50); low (11-30); very low (0-10)

Source: Country reports, 2020, http://iwrmdataportal.unepdhi.org/country-reports

The status of financing for transboundary cooperation is assessed as very high by Kazakhstan and Turkmenistan, medium-low by Tajikistan and Uzbekistan and low by Kyrgyzstan. Generally, two downstream countries – Kazakhstan and Turkmenistan – are more satisfied with the status of transboundary cooperation. One should note that this assessment refers to cooperation not only within the Aral Sea basin but also within other basins to which these countries are riparian.

The global value for the aquifer component of the indicator is 42% as of 2020 (Table 6) that is lower than the overall value of this indicator (58%). The data on aquifers was reported by lower countries. This reflects that there is lack of knowledge and understanding of physical characteristics of transboundary aquifers in riparian states and the cooperation arrangements for aquifers are limited.

Kazakhstan, Kyrgyzstan, and Uzbekistan reported the data on aquifers in 2020, while Kazakhstan submitted such data in 2017 also. The aquifer component value of the indicator is '0' in all the cases that means that no groundwater is covered by operational arrangements.

Conclusion and next steps

The CA countries and the world in general shall make much more efforts to achieve SDG 6.5, namely by 2030, implement IWRM at all levels, including through transboundary cooperation as appropriate. As of 2020, the value of indicator 6.5.1 is lower than 50 in all CA countries, except for Turkmenistan. It is necessary to accelerate progress twice and even more in some cases.

Ensure timely and better quality reporting. In the first reporting round, country reports on SDG indicator 6.5.2 were submitted by Kazakhstan, Turkmenistan and Uzbekistan but the indicator value was verified for Kazakhstan and Uzbekistan only. In the second reporting round, Kyrgyzstan also submitted its report and reporting was improved by Kazakhstan, Turkmenistan and Uzbekistan.

Country engagement in workshops organized by UNECE and UNESCO, as well as supporting guidance material, strengthened the quality of reporting. Submission of country report by Tajikistan in the third reporting round would help to have a more comprehensive picture of the status of cooperation in Central Asia.

As to indicator 6.5.1, all CA countries submitted their reports in the second monitoring round as compared to the first round, when only Kazakhstan and Uzbekistan submitted reports.

Revise priority areas. Monitoring through good quality and regular reporting informs countries and development partners of where to focus efforts. In particular, ***monitoring of SDG indicator 6.5.1*** in CA countries demonstrates the need to focus on the following areas:

(a) planning processes at all levels;

(b) IWRM implementation at sub-national and/or basin levels;

(c) building capacities in gender mainstreaming;

(d) enhanced engagement of stakeholders, including the public and vulnerable groups in IWRM processes;

(e) national monitoring of water availability and data sharing at all levels within a country;

(f) management instruments at aquifer level;

(g) financing for all levels.

Globally, in addition to tracking implementation of individual components, development of national IWRM Action Plans is encouraged.

The SDG 6 IWRM Support Programme offers technical and financial support in developing such a plan (sdg6iwrmsp@gwp.org). The available IWRM Action Plans can be checked on the Results Map.

Monitoring of transboundary water cooperation indicators revealed general positive trend and satisfaction of the countries in this area, except for Kyrgyzstan. As to river or lake basins, the fuller coverage by operational arrangements is demonstrated by Kazakhstan and Uzbekistan.

According to the second monitoring round, Uzbekistan increased the indicator from 59.3 to 100% by viewing cooperation under umbrella of the ICWC, which *fully* covers the territories of Syr Darya and Amu Darya basins in Uzbekistan under its jurisdiction.

Nevertheless, significant data gaps still exist, especially in relation to transboundary aquifers in all the countries. The average value for indicator 6.5.2 could not be derived for Turkmenistan as the latter did not provided information on transboundary aquifers.

Although Kazakhstan, Kyrgyzstan and Uzbekistan submitted data on transboundary aquifers, neither country reported on availability of any arrangement for transboundary aquifer.

This indicates to a need to fill gaps in the data, especially on extent and dynamics of transboundary aquifers, and increase efforts to adopt arrangements for transboundary aquifers and ensure that all transboundary water bodies are covered by operational arrangements by 2030. These efforts should be backed by capacity building in transboundary water assessment.

Enhance cooperation between the countries in the process of national reporting in relation to transboundary aspects. While SDG indicator 6.5.2 invites countries to submit national reports, first and second reporting rounds in 2017/2018 and 2020/2021 showed benefits of coordination between countries when completing these reports.

Coordination allows countries to improve the overall quality of data, reach a common understanding of the challenges, opportunities and priorities for a water body, and provides an opportunity for countries to set common targets, such as the development of a new or revised agreement, the establishment or reinvigoration of a joint institutional body, or the adoption of a basin management plan.[309]

UNECE and UNESCO made recommendations to consider the possibility of such coordination in the third reporting exercise, 2023, on SDG indicator 6.5.2. Enhanced cooperation between the CA countries in the recent years allowed the countries speak with one voice at COP conferences in Glasgow (2021) and Sharm El Sheikh (2022) and during the UN Water Conference in New York (2023).

ICWC as the mechanism of water cooperation operating for over 30 years could be a coordination platform on SDG indicator 6.5.2 for the CA countries.

National coordinators of indicators play a critical role. In most countries, coordinators are related to ministries which are responsible for water management.

The coordinator bears overall responsibility for organization of monitoring, including stakeholder consultations and reporting.

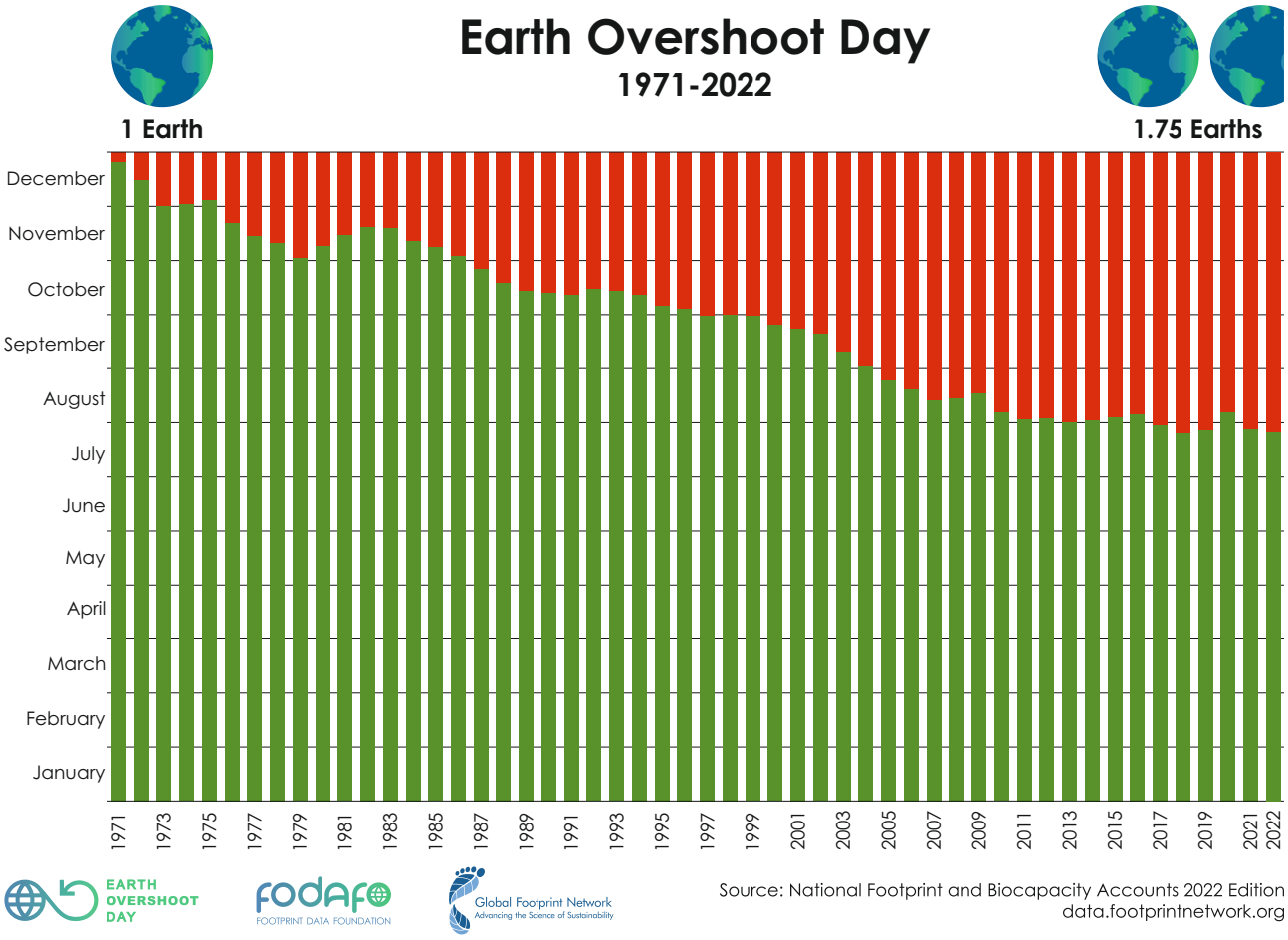
If necessary, they may apply to technical support services: UNEP (iwrmsdg651@un.org) on SDG indicator 6.5.1 and UNECE (transboundary_water_cooperation_reporting@un.org) and UNESCO (transboundary_water_cooperation_reporting@unesco.org) on SDG indicator 6.5.2.

[309] https://unece.org/third-reporting-exercise-2023-sdg-indicator-652

12.3. Earth Overshoot Day 2022

Earth Overshoot Day 2022 falls on 28 July. This day marks the date when we have used all the biological resources that the Earth can renew during the entire year.

In 1970, the population consumed just as much resources as our planet could renew during the year. In 2021, humanity needed 1.7 such planets for comfortable life.



Source: National Footprint and Biocapacity Accounts 2022 Edition
data.footprintnetwork.org

The Earth Overshoot Day can be calculated for each country. A Country Overshoot Day reflects the ecological footprint of a country by comparing the population's demand and the nation's biocapacity.

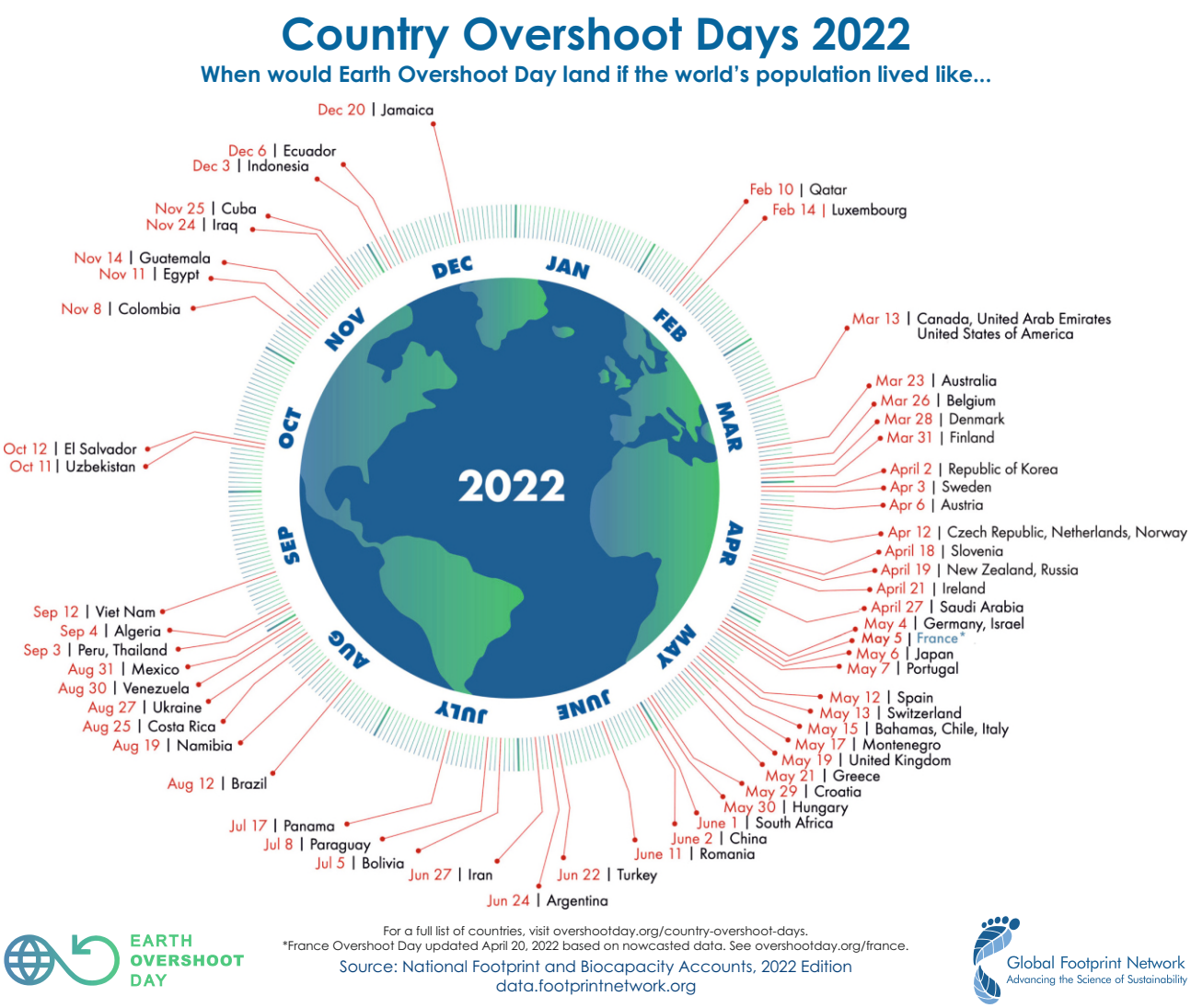
On a planetary scale, reducing the ecological footprint is linked to preserving and restoring ecosystems. If we restore 350 ha of forest that has disappeared in recent years, this would **move the date 8 days**.

The global campaign for sustainable development will be decided in cities. 80% of all people is expected to live in urban areas by 2050. Smart city planning and urban development strategies are instrumental to making sure there is enough biological regeneration to avoid excessive human demand that would erode it. 17% of the total carbon footprint left by humans comes from car emissions. Cutting emissions by as little as 50% would **move the date 13 days back**.

The **carbon emissions** make up 57% of humanity's ecological footprint. Over 150 years ago, the carbon footprint of humanity was close to zero. If we want to limit the global temperature increase to below 2°C, the carbon footprint would have to be zero again before 2050. Existing off-the-shelf, commercial energy-efficiency technologies for buildings, industrial processes, and electricity production could move **Overshoot Day at least 21 days**, without any loss in productivity or comfort. Reducing the carbon component of humanity's Ecological Footprint by 50% would **move Earth Overshoot Day by 93 days**, or more than three months.

Half of Earth's biocapacity is used to feed humanity. About one third of the food produced in the world for human consumption gets lost or wasted. 40% of all food gets wasted in the US. This is comparable to the ecological footprint of Sweden and Colombia cumulatively. If we cut food waste in half worldwide, we would **move Overshoot Day 13 days**.

Food production is a very energy-intensive process, especially as concerns the animal husbandry. China has started a program aimed to reduce meat consumption by 50%. If successful, this will move the date **5 days back**. If we reduce global meat consumption by 50%, we would **move Overshoot Day 17 days**.



12.4. Biodiversity: Highlights of 2022 and Related Activities in Central Asia

Prepared by Z.R. Yarullina, D.R. Ziganshina (SIC ICWC)

Great things are accomplished with huge resources. However, the nature gives great gifts for free.

(A.I. Herzen)

The 2019 Water Yearbook provided an overview of major trends in global biodiversity based on the assessments by IPBES, OECD and FAO.[310] Here we summarize key findings of the 15th Conference of the Parties to the Convention on Biological Diversity (COP15) held in 2022, as well as the priorities and activities of the Central Asian countries on biodiversity protection.

Introduction

Biodiversity is the diversity of all different kinds of life and a measure of complexity of biological system and heterogeneity of its elements. Biodiversity is all the

[310] PBES (2019) The global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services; FAO (2019) The State of the World's Biodiversity for Food and Agriculture, J. Bélanger & D. Pilling (eds.); OECD (2019) Biodiversity: Finance and the Economic and Business Case for Action, report prepared for the G7 Environment Ministers' Meeting, 5-6 May, 2019

different kinds of life you'll find in one area – the variety of animals, plants, fungi, and even microorganisms like bacteria and their interactions within and between species and their habitats.

While there is a growing recognition that biological diversity is a global asset of tremendous value to present and future generations, the number of flora and fauna species continues rapidly declining. The loss of biodiversity results from destruction of natural habitats, overexploitation of natural resources, water and soil pollution, and the invasive alien species.

The main causes of biodiversity damage and disturbance are as follows:

- **degradation or complete destruction of natural habitats** due to urbanization, tourism development, farming expansion, and growing transport, fisheries, mining and forestry infrastructures;
- **intensive and inconsistent use** of wild plants, timber, animals and resulting products (excess fishing or hunting, deforestation, etc.) for local or international trade combined with illegal trade;
- **water, soil and air pollution** by industrial, agricultural and household wastes;
- **introduction of invasive exotic species**;
- **climate change** disturbing habitats of species, forcing them to relocate or adapt to new conditions.

FACTS AND FIGURES

- *Current negative trends in biodiversity will undermine progress towards 80% of the assessed targets of 8 Sustainable Development Goals.*
- *Three-quarters of the land-based environment and about 66% of the marine environment have been significantly altered by human actions.*
- *1 million animal and plant species are now threatened with extinction.*

Convention on Biological Diversity and Outcomes of COP15

The global agreement for biodiversity is the Convention on Biological Diversity[311]. The three **main objectives** of the Convention are: (1) the conservation of biological diversity; (2) the sustainable use of its components; (3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding. 196 countries, including the CA countries, are the parties of the Convention, as of January 2023.

The parties to the Convention took on the **core obligations** in part of implementation of measures for: conservation and sustainable use of biodiversity by developing and implementing national strategies, plans or programs (Article 6); identification and monitoring of components of biological diversity and organization of this data (Article 7); in-situ conservation by establishing a system of protected areas and a regulatory-legal framework for management of the areas to maintain and restore viable populations of species in natural surroundings (Article 8); ex-situ conservation by implementing measures for the recovery and rehabilitation of components of biological diversity outside their natural habitats (Article 9); sustainable use of components of biological diversity by integrating consideration of the conservation and sustainable use of biological resources into decision-making and regulation (Article 10); impact assessment and minimizing adverse impacts by introducing appropriate procedures requiring environmental impact assessment and implementing actions for prevention of threats to biological diversity (Article 14).

COP15 and key messages

The 15th Conference of the Parties to the Convention on Biological Diversity was held in Montreal, Canada on 7-19 December[312]. The Parties to the Convention expressed their concern that "while there has been encouraging progress towards achievement of the Aichi Biodiversity Targets, national targets set by Parties through their national biodiversity strategies and action plans were collectively not commensurate with the level of ambition set out in the Aichi Biodiversity Targets and implementation has been limited".[313]

Decisions. To accelerate efforts in this direction, a package of documents was adopted by the Conference, including the Kunming-Montreal Global

[311] adopted at the UN Conference on Environment and Development (1992, Rio de Janeiro). Entered into force on 29 December 1993

[312] first stage of COP15 was held in Kunming, China in 2021

[313] CBD/COP/DEC/15/3 **Decision 15/3** Review of progress in the implementation of the Convention and the Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Biodiversity Targets

Biodiversity Framework and the related monitoring framework; mechanisms for planning, monitoring, reporting and review; resource mobilization strategy; capacity-building and development and technical and scientific cooperation actions; and, arrangements on digital sequence information on genetic resources. Also, the Parties have agreed upon the Gender Plan of actions, the long-term strategic approach to mainstreaming biodiversity within and across sectors, the recommendations from the United Nations Permanent Forum on Indigenous Issues to the Convention on Biological Diversity, and actions relative to sustainable wildlife management, biodiversity and health, biodiversity and climate change, and synthetic biology.

One of big achievements of the Conference is the 30x30 commitment to protect 30% of the planet and 30% of degraded ecosystems by 2030. Among other goals and tasks, it is outlined in the Kunming-Montreal Global Biodiversity Framework. This Framework builds on the Strategic Plan for Biodiversity 2011-2020, its achievements, gaps, and lessons learned, and the experience and achievements of other relevant multilateral environmental agreements. The Framework is an ambitious plan to implement broad-based action to bring about a transformation in our societies' relationship with biodiversity by 2030, in line with the 2030 Agenda for Sustainable Development and its Sustainable Development Goals, and ensure that, by 2050, the shared vision of living in harmony with nature is fulfilled.

The Kunming-Montreal Global Biodiversity Framework has **four long-term goals** for 2050 and **23 action-oriented global targets** for urgent action over the decade to 2030. These are summarized below.

1. Reducing threats to biodiversity

- bring the loss of areas of high biodiversity importance close to zero *(Target 1)*;
- restore at least 30% of areas of degraded terrestrial, inland water, and marine and coastal ecosystems *(Target 2)*;
- create conditions for effective conservation and management of at least 30% of terrestrial and inland water areas, and of marine and coastal areas *(Target 3)*;
- halt human induced extinction of known threatened species and recover and conserve species, in particular threatened species *(Target 4)*;
- ensure that the use, harvesting and trade of wild species is sustainable, safe and legal *(Target 5)*;
- eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services *(Target 6)*;
- reduce excess nutrients lost to the environment by at least half and the overall risk from pesticides and highly hazardous chemicals *(Target 7)*;
- minimize the impact of climate change *(Target 8)*;

2. Meeting people's needs through sustainable use and benefit-sharing

- ensure that the management and use of wild species are sustainable, thereby providing benefits for people, especially those in vulnerable situations *(Target 9)*;
- ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably *(Target 10)*;
- restore, maintain and enhance nature's contributions to people *(Target 11)*;
- increase the area and quality of green and blue spaces in urban and densely populated areas *(Target 12)*;
- take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits *(Target 13)*;

3. Tools and solutions for implementation and mainstreaming

- full integration of biodiversity and its multiple values into policies, regulations, planning, strategies, assessments and national reports *(Target 14)*;
- take measures to encourage and enable business for regular monitoring, assessment and transparent disclosure of their risks, dependencies and impacts on biodiversity *(Target 15)*;
- ensure that people are encouraged and enabled to make sustainable consumption choices, reduce the global footprint of consumption in an equitable manner *(Target 16)*;
- establish, strengthen capacity for, and implement in all countries, biosafety measures *(Target 17)*;
- progressively reduce by at least $500 billion subsidies harmful for biodiversity *(Target 18)*;
- mobilize at least $200 billion per year to implement national biodiversity strategies and action plans *(Target 19)*;
- strengthen capacity-building and development, access to and transfer of technology, and promote development of and access to innovation and technical and scientific cooperation *(Target 20)*;
- ensure that the best available data, information and knowledge are accessible *(Target 21)*;
- ensure the full, equitable, inclusive, and effective representation and participation of indigenous peoples and local communities in decision making *(Target 22)*;
- ensure gender equality in the implementation of the Framework through a gender-responsive approach, where all women and girls have equal opportunity and capacity to contribute to the three objectives of the Convention *(Target 23)*.

As a whole, the Framework aims to restore degraded ecosystems, prevent the introduction of invasive alien species, reduce ecosystem pollution, including by pesticides, hazardous chemicals and plastics, improve management of areas under fisheries, agriculture and forestry, conduct regular monitoring and assessment of impact on biodiversity from large transnational companies and financial institutions and ensure transparency of this data. It also identifies the role of indigenous people and local communities in conservation, restoration and sustainable use of biodiversity. Besides, it makes provision for annual allocation of $200 billion for financing biodiversity related projects.

Each of the Framework's targets will be supported by effective mechanisms for planning, monitoring, reporting and review.

Reflection of activists on the Conference outcomes

Decisions adopted at the Conference were viewed as a historical deal to stop destruction of the Earth's ecosystems and preserve global biodiversity largely because of the adopted '30x30' goal and the agreement to allocate $200 billion per year for environmental initiatives. The recognition of the indigenous people and women' rights, the local environmental initiatives, the effective area protection, and the security and rights of nature activists were applauded.

At the same time, the outcomes were also criticized. There is not a strong scientific argument behind 30% as the threshold for staving off species loss, experts said. Additionally, it is not clear from the agreement, what should count as protection. For instance, some countries might allow people to live within protected areas or promote indigenous stewardship of these lands. Some might even allow for extractive industries to operate under permits and regulation. In other cases, conservation areas are off limits to everyone. Representatives of African countries, home to tropical rainforests, are concerned that developing countries have no funds for financing conservation effects and need support from developed countries to implement the agreed targets.

Executive Director of the Global Forest Coalition, Simone Lovera is concerned with a number of lost opportunities in the package of adopted decisions. *First*, she noted the absence of comprehensive technology horizon scanning. Activists hoped for strong texts on, for example, a horizon scanning mechanism for new technologies, or measures to reduce the risks of synthetic biology, genetically modified organisms, false climate solutions like bioenergy and carbon capture and sequestration, or the privatization and commercialization of genetic information through digital sequence information systems. *Second*, important proposals that would hold corporations legally accountable for damage caused to biodiversity were removed from the final Global Biodiversity Framework (GBF) text, while the targets dealing with the role and accountability of the private sector and consumers were watered down to weak phrases. *Third*, deleted from the text were references to the need to change diets and/or food systems in general to reduce the impact of, in particular, unsustainable livestock farming, which is a primary cause of biodiversity loss and climate change. *Fourth*, she worries about weak implementation mechanisms that provide no guarantee that the lofty recommendations in the GBF will actually lead to concrete action on the ground.

Simone Lovera considered it ugly that the GBF risks corporate capture through private sector financing since, per se, the Framework opens the door for greenwashing (and potentially even whitewashing, as even illegally acquired money seems to be welcome) practices. Even uglier was the inclusion of "biodiversity offsets and credits" because one cannot simply replace a destroyed ecosystem with another ecosystem. Many NGOs and rightsholder groups were against the inclusion of the term "nature-based solutions" in the GBF since the so-called "nature-based solutions" tend to reinforce existing gender injustices by ignoring the rights, needs and livelihoods of rural women, girls and other underrepresented groups and frequently represent fraud schemes covering up projects that actually have a negative effect on the nature and climate.

The way forward

The success of the Framework and other Conference decisions will depend on how urgently countries, the private sector and civil society implement and mobilize resources. First, this means early revisiting and strengthening of existing national biodiversity strategies and action plans.

It is important to remember that the global community as a whole, including the CA countries, has failed on biodiversity conservation targets. Almost all targets set by the international community for 2020 have not been achieved.

Biodiversity priorities and activities of the Central Asian countries

This subsection discusses efforts made by the CA countries for fulfillment of their obligations under the Convention on Biological Diversity.

Regulatory and framework program

Based on obligations under the Convention on Biodiversity, the CA countries have adopted a number of legal documents in part of management and protection of the natural environment, including water and land, air, flora and fauna. A separate law regulating the matters related to the *use and protection of natural areas* is effective in all the CA countries.[314]

[314] laws on specially protected natural areas in Kazakhstan (175-III of 07.07.2006), Kyrgyzstan (18 of 03.05.2011), Tajikistan (788 of 26.12.2011), Turkmenistan (286-IV of 31.03.2012), and Uzbekistan (710-II of 03.12.2004)

The countries also have regulations concerning:

- *Control and monitoring of natural environment*. For instance, the law on state monitoring of natural environment is under development in Turkmenistan. Provisions of the draft law are developed in line with international conventions and agreements and the Turkmenistan strategic priorities, such as conservation of biodiversity, sound use of natural resources, and protection of ecosystems. The Regulation on national environmental monitoring[315] was accepted for bringing into effect in Uzbekistan. The document provides for monitoring of flora and fauna.

- *Control of bio-resources use, exportation and importation* which is valid for all users of fauna. All the CA countries trade animals and plants, with some of these countries also serving as transit points. All the countries, except for Turkmenistan, are Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and have been implementing the Convention and related enforcement activities for many years.

- *Environmental impact assessment* and measures for prevention or elimination of biodiversity risks (environmental expertise). Such regulations set key guidelines for documentary justification of actions that potentially affect the natural environment in given area.

Since *environmental control* is the key enforcement mechanism of environmental regulations, government bodies have powers to exercise control over compliance with the regulations, to stop or suspend illegal nature use or other harmful impact on the natural environment, as well as the right to give instructions which are binding for elimination of the causes and the consequences of offenses.

The CA countries have adopted its own **strategies and national plans** for biodiversity conservation (see key documents in the Table below).

Concepts and strategies	Main goals and priorities
Republic of Kazakhstan	
Concept for transition of the Republic of Kazakhstan to green economy[316]	▫ preservation and efficient management of ecosystems; ▫ forestry management; ▫ fishery management; ▫ wild life management; ▫ eco-tourism.
Concept for conservation and sustainable use of biodiversity in the Republic of Kazakhstan until 2030[317]	▫ formation of a representative environmental network; ▫ conservation of rare and endangered species; ▫ conservation of genetic resources, ensuring access to them and their fair and equitable utilization; development of a system of biodiversity monitoring based on the ecosystem approach; ▫ improvement of the system and mechanisms for management of specially protected natural areas in line with the biodiversity conservation goals; ▫ conservation and sustainable use of forest ecosystems and resources; ▫ conservation, reproduction and sound use of wild life resources; ▫ conservation, reproduction and sound use of fish resources and sustainable development of fishery; ▫ conservation and restoration of agro-biodiversity; ▫ strengthening and improvement of natural environment and conservation of soil.
Kyrgyz Republic	
Green Economy Development Programme for 2019-2023 in the Kyrgyz Republic	▫ regulation of load on natural ecosystems; ▫ conservation and restoration of natural environment; ▫ sustainable use of ecosystem services; ▫ integration of ecosystem valuation into development planning; ▫ building environmental culture among population.

[315] approved by the Cabinet of Ministers of Uzbekistan on 05.09.2019

[316] approved by Presidential Decree No.577 of 30.05.2013

[317] developed as part of the GEF/UNDP/MEWR RK project "Planning biodiversity conservation at the national level to support the implementation of the CBD 2011-2020 Strategic Plan in the Republic of Kazakhstan"

Concepts and strategies	Main goals and priorities
Concept of Kyrgyzstan as a green economy country[318]	▫ adopt a unified ecosystem classification system, define standards for the relevant ecosystems for future monitoring of their state; ▫ integrate ecosystem approach into sector-specific development plans and local management plans; ▫ account for the value of ecosystems and biodiversity in industrial and municipal planning, use of pastures and other agricultural lands; ▫ account for seasonal migration zones, quiet zones and wildlife corridors in pasture management plans and linear infrastructure projects ▫ develop programs for restoration of particularly valuable ecosystems for conservation of globally significant biodiversity; ▫ implement a system of biodiversity offsets by entities causing inevitable harm to biodiversity; support local initiatives promoting participation in biodiversity damage compensation schemes; ▫ expand protected areas (PA) up to 10% of the country land area; ▫ involve local communities in promotion of local tourism products associated with protected areas (eco-, agro- and ethnic tourism, extreme tourism, mountaineering, agriculture certified with a PA label); ▫ facilitate development of sustainable tourism (eco-, agro- and ethnic tourism) with due regard to the tourist capacity of natural areas; ▫ introduce incentives for biodiversity-friendly economic activities; support biodiversity focused PPPs.
On priorities for conservation of biodiversity in the Kyrgyz Republic until 2024 and the Action Plan for implementation of these priorities in 2014-2020[319]	▫ mainstream biodiversity conservation in the activities of government bodies and public organizations; reducing the pressure on biodiversity and facilitating its sustainable use; ▫ improve protection and monitoring of ecosystems and species diversity; ▫ increase social significance of biodiversity and ecosystem services, the benefits of sustainable provision of ecosystem services and traditional technologies.
Republic of Tajikistan	
National strategy and action plan on conservation of biodiversity until 2020[320]	▫ modernization of the system of protected areas; ▫ sustainable use of biodiversity of natural ecosystems and agro-ecosystems; ▫ rational use of biotechnology; ▫ development and strengthening of political, institutional, legislative frameworks, and capacity building of human resources; ▫ equal sharing of benefits from the use of biological resources; ▫ NGO involvement in biodiversity conservation; ▫ improvement of policies, legislation and institutional framework; ▫ spatial planning and biodiversity conservation programs; ▫ biodiversity research and biodiversity monitoring; ▫ training and education of the population; ▫ strengthening of the financial support mechanisms for biodiversity conservation activities; ▫ information, coordination and cooperation; ▫ establishment of mediation mechanism; ▫ international cooperation; ▫ development of a special legislative act to regulate activities in the habitats of migratory species of animals within low-mountain semi-savanna (savanna-like) ecosystems.

[318] approved by Resolution of the Parliament 2532-VI of 28.06.2018

[319] approved by PPKR 131 of 17.03. 2014

[320] developed as part of the project "Supporting Tajikistan in updating the National strategy for biodiversity and development of the Fifth national report on biodiversity", with the financial support of GEF and UNEP

Concepts and strategies	Main goals and priorities
Turkmenistan	
National biodiversity strategy of Turkmenistan for 2018-2023	▫ strengthen control over environmental legislation implementation, including biodiversity-related legislation; ▫ ensure sustainable use of human-influenced ecosystems (pastures, arable lands, reservoirs, forests, hunting grounds); ▫ maintain a balance between the economy and biodiversity while developing extractive industries; ▫ develop protected areas to improve nature conservation and social and economic benefits of biodiversity; ▫ improve understanding and awareness of the importance and benefits of biodiversity and ecosystem services.
Republic of Uzbekistan	
Strategy for the Conservation of Biological Diversity in the Republic of Uzbekistan for 2019-2028[321]	▫ mainstream biological diversity issues in the activities of government authorities, public administration and society as a whole; ▫ reduce direct pressures on biological diversity, ensure sustainable use of its components in productive landscapes; ▫ develop the system of protected areas, enhance the benefits of ecosystem services; ▫ improve the efficiency of conservation and sustainable use of biological diversity through planning, capacity building and development of financing mechanisms; ▫ increase ecosystem representativeness of protected areas; ▫ increase the number of unique natural objects in the PA system; ▫ increase the number of rare and endangered plant species under territorial protection (PA categories I-IV); ▫ develop and regularly update the national database of biological diversity used for food production and agriculture; ▫ determine the main habitats of wild relatives of cultivated plants; ▫ develop and launch implementation of the State Programme of Conservation and Sustainable Use of Biological Diversity Components Used for Food Production and Agriculture.
Concept of environmental protection of the Republic of Uzbekistan until 2030[322]	▫ increase the area and density of forest plantations and improve their quality; ▫ expand and develop the PA network; ▫ step up measures to bring the area of PA categories I-V to 7% of the country land area by December 1, 2021; ▫ implement measures to ensure biological safety; ▫ study international experience; ▫ draft the Law of the Republic of Uzbekistan "On biological safety"; ▫ improve the legislative framework for the conservation of biological diversity.
Strategy for transition of the Republic of Uzbekistan to green economy for 2019-2030[323]	▫ improve water use, prevent further salinization and deterioration of land quality; ▫ restore degraded pastures and introduce mechanisms for sustainable pasture management; ▫ introduce organic farming methods; ▫ diversify crops (expansion of perennial tree plantings and perennial grasses); ▫ create soil-protective forest plantations and afforest degraded land (agricultural afforestation); ▫ introduce in the process of forest development and tree planting local plant species that are resistant to salinity, drought and other hazardous phenomena and risks; ▫ maintain the system of natural lakes within the area of the Aral Sea; ▫ implement large-scale measures for afforestation on the exposed bed of the Aral Sea and prevent desertification.

[321] approved by the Cabinet of Ministers of Uzbekistan (Resolution 484 of 11.06.2019)
[322] approved by Presidential Decree UP-5863 of 30.10.2019
[323] approved by Government Resolution PP-4477 of 04.10.2019

Concepts and strategies	Main goals and priorities
"Green space" project aimed to increase tree plantations[324]	▫ improve the management system in the area of tree planting and care; ▫ carry out research and analysis for determination of soil-climatic and other characteristics of regions, based on scientific approaches, and subsequent regional mapping; ▫ increase the number of nurseries, localize imported ornamental trees fit to climate of country regions, proceeding from soil fertility; ▫ create 'green parks' and 'public green parks' in country regions; ▫ revisit the system of tree watering and ensure its efficient performance; ▫ assign persons, who will be responsible for every tree and introduce relevant incentive mechanisms; ▫ strengthen responsibility for damaging or destruction of trees and further enhancement of public control in this area.

National country reports on the Convention

In due time, the CA countries prepare and submit their reports to the Secretariat of the Convention on Biological Diversity. As of 01.01.2023, each of the countries has prepared six national reports[325] in line with reporting guidelines. The reports cover the period from 2013 to 2017, contain final reviews of results achieved through implementation of the Strategic Plan for the Conservation and Sustainable Use of Biodiversity for 2011-2020 and targets for conservation and sustainable use of biodiversity adopted in Aichi, including relevant national targets. Country reports are the important tool for the Conference of the Parties to track implementation and also the tool for planning biodiversity conservation activities at national level by providing analysis and monitoring needed for making timely decisions.

Future tasks

UNECE Environmental Performance Review identified a number of issues related to biodiversity conservation in CA. In particular, these are the declining trends in populations of several threatened species; all main representatives of natural and semi-natural ecosystems, providing important ecosystem services and habitats for the diversity of species increasingly threatened by anthropogenic pressures and adverse effects of ongoing global climate changes; countries particularly affected by adverse effects of climate changes, resulting in desertification, land degradation, and large-scale environmental disasters, e.g., in the Aral Sea region. Based on the assessment results, experts identified as a priority the need for undertaking urgent ecosystem restoration measures and enhancing spatial ecological connectivity (also, in transboundary scale) of ecosystems, which is particularly important during the 2021-2030 UN Decade on Ecosystem Restoration.

Also, the Analytical review of biodiversity and significant ecosystems conservation priorities in Central Asia[326] highlights that the countries of Central Asia have gained a unique biodiversity but natural areas are under great pressure since a substantial part of population in Central Asia still lives in rural areas relying heavily on natural resources as means of existence.

Despite all efforts, forest cover in Central Asia has recently been declining for many reasons, including urbanization, agricultural development, climate change, growing demand for timber, and expansion of plantations for species not typical for the region.

The economic, political, social, cultural challenges the region faces are often at variance with the goals of ecosystem conservation, and therefore new, sustainable approaches to dealing with issues of the day are required, since biodiversity degradation will lead to an increase in poverty, inequality, conflict, migration flows and reduce the ability of local communities to resist the impact of climate change.

The analysis identified key areas of activity, prospects for effective cooperation and provided recommendations for the achievement of concrete results on biodiversity protection and conservation in the CA countries, including the following:

- align the national biodiversity targets with the UN SDG15 adopted by all CA countries;
- harmonize national biodiversity terminology in the region with the Multilateral Environmental Conventions glossaries;
- set the targets and time frames for all national biodiversity goals;
- improve the legal framework on transboundary protected areas and biosphere reserves;

[324] launched by Presidential Decree UP-46 of 30.12.2021

[325] see 6th national report on: Kazakhstan, https://www.cbd.int/doc/nr/nr-06/kz-nr-06-en.pdf; Kyrgyzstan, https://chm.cbd.int/database/record?documentID=243111; Tajikistan, https://chm.cbd.int/database/record?documentID=247273; Turkmenistan, www.cbd.int/doc/nr/nr-06/tm-nr-06-ru.pdf; Uzbekistan, https://www.cbd.int/doc/nr/nr-06/uz-nr-06-en.pdf

[326] produced within the framework of the EU-funded project "European Union – Central Asia Water, Environment and Climate Change Cooperation (WECOOP)"

- develop a mechanism for the assessment of the economic value of biodiversity and ecosystem services;
- identify areas that have to be preserved and have a high conservation value, but have no conservation status or special regime of use;
- strengthen financial support mechanisms for biodiversity conservation activities;
- build the capacity of personnel of government bodies in charge of biodiversity management;
- widen engagement of local communities and the public concerned in environmental activities, empower social movements and groups;
- impose a moratorium on the development and use of pristine/primary forests in Central Asia, establish protection regimes for this type of ecosystems;
- develop and maintain cross-border cooperation between the countries of Central Asia;
- exchange genetic resources through international institutions and gene banks;
- interact with international development agencies and financial organizations to attract international experience and resources for biodiversity conservation;
- develop the Red List of Ecosystems of Central Asia.

12.5. Construction of the Qosh-Tepa Canal in northern Afghanistan (March 2022-March 2023)

On 10 December 2018, a **feasibility study** for the Qosh-Tepa Irrigation Scheme and Power Generation was launched at the Office of the President in Kabul, Afghanistan. The feasibility study was completed in 2018-2019 by AACS Consulting and BETS Consulting Services Ltd as part of the USAID Strengthening Watershed and Irrigation Management (SWIM) project implemented by AECOM International Development, Inc./DT Global. The request for expression of interest was announced by AECOM on 20 March 2018. The feasibility study worth of $3.6 million was conducted in coordination with the Ministry of Agriculture, Irrigation and Livestock, Ministry of Energy and Water, and National Environmental Protection Agency of Afghanistan. The feasibility study has not been published finally.

The construction of the Qosh-Tepa irrigation canal was inaugurated on 30 March 2022. The canal will originate on the left bank of the Amu Darya in Balkh province. The canal will pass from Kaldar through Dawlat Abad *(Balkh)*, Faizabad, Aqcha *(Jowzjan)* to And-Khoy *(Faryab)* for irrigation of land in these provinces.

General information. The total length of the Qosh-Tepa canal will be 290.5 km, with the width of 100 m and the depth of 8.5 m. The main canal is 208.307 km and the two branches are 37.369 km and 44.909 long, respectively. The system will include 27 secondary canals stretching to 502 km in total.

The total command area of the canal is 550,000 ha, and the gross irrigated area is 331,500 ha, while irrigable area is 276,500 ha in Balk, Jowzjan, and Faryab provinces. About 230.3 thousand ha of land is planned to be irrigated by gravity and 46.2 thousand ha by lift irrigation. In general, up to 6 billion m^3 of Amu Darya flow will be abstracted annually to meet the project's irrigation demand.

Implementation. The project is to be implemented in 6 years in three phases. The first phase is 108 km, which is expected to be completed by June 2023. The second and third phases, which combined make up 177 km, are expected to be completed within five years by 2028.

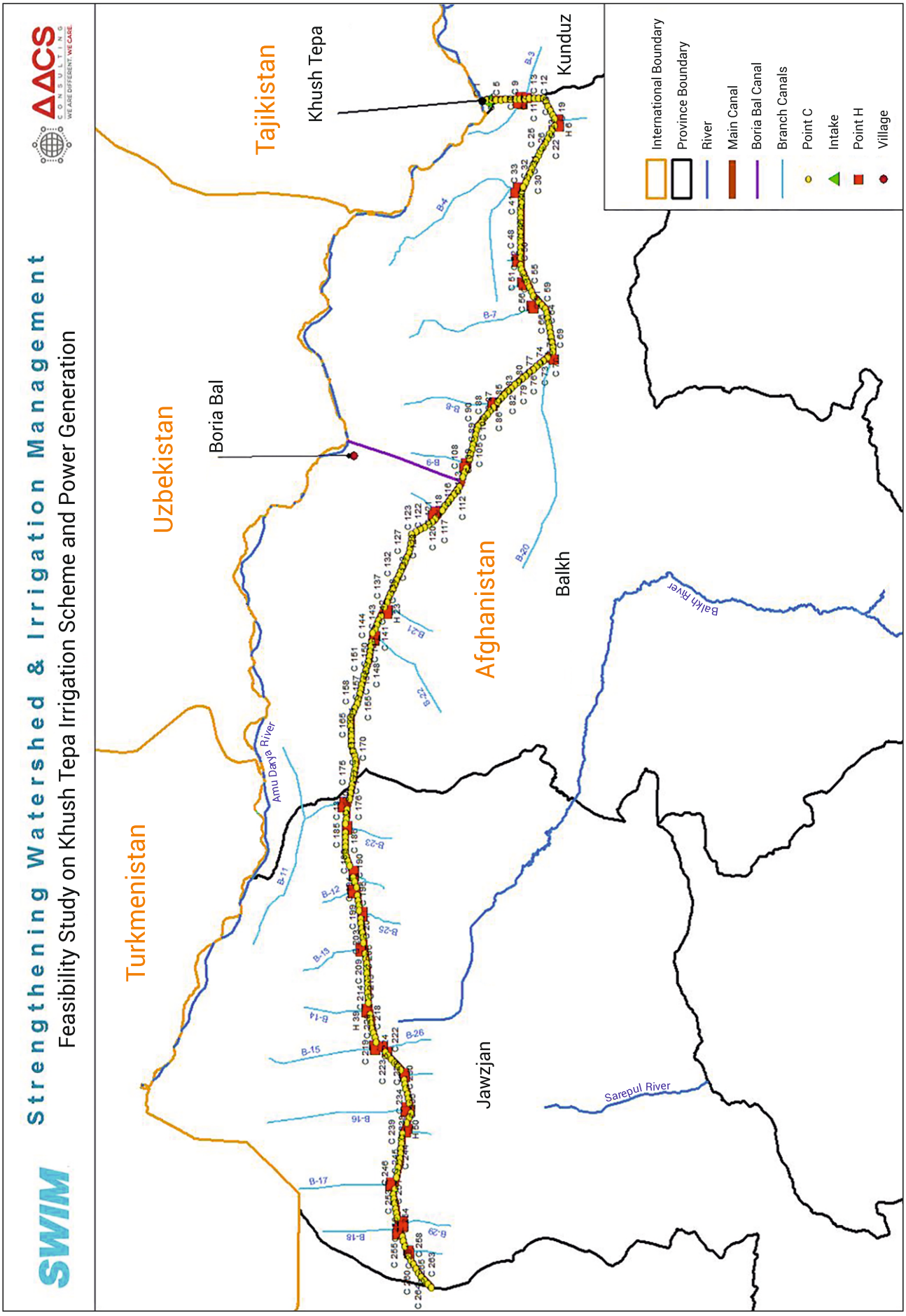
The project is implemented by the national development company of Afghanistan. The Melli company under the Ministry of Finance have got a contract for construction from the former government. On 22 February 2023, it was announced that a joint committee would be formed of the Administrative Office of the Islamic Emirate, Ministry of Agriculture, Irrigation and Livestock, and National Development Company for further coordination of activities on the Qosh-Tepa Canal.

Financing. The total project cost will depend on the design chosen and may vary from $676 million to $1.951 billion. The financing was stated to get funding from national budget. According to the Ministry of Finance (MoF), the government allocated 7 billion Afs (approx. $79 million) for the Qosh-Tepa canal in 2022 budget.

Pace of construction since March 2022 till March 2023. 45 km of the Qosh Tepa canal have been completed by November 2022 and over 100 km by March 2023. A water filled section of the canal stretched to 33.3 km in March 2023.

By 20 November 2022, up to 4,000 people were engaged and 2.6 thousand pieces of heavy equipment were used in the construction. Local authorities stated that construction work was speeded up at the end of 2022 and, thus, the project was expected to be completed ahead of its due date. As of January 2023, the construction work was underway in 120 locations and nearly 6,000 people were working in the project. The first phase of 108 km long is to be completed in the next six months (June 2023).

The National Development Corporation said on 2 January 2023 that it will **change the route of the Qosh Tepa Canal** in northern Balkh province in order to



Source: AACS Consulting request for proposal for "Geotechnical Site Investigation" RFP No.: AACS-KTISPGFS/2019-0002. March 13, 2019

protect historical structures situated between Kaldar and Dawlat Abad districts. Changing the canal's route will cost an additional 3 million Afghanis.

Dialogue with riparian countries. The canal will divert water from the Amu Darya River shared by Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The above feasibility study didn't seem to make an assessment of the potential impacts of planned activities on the riparian countries. No official notifications have been sent to neighboring countries prior to the start of the project.

In December 2022, President of Uzbekistan, Shavkat Mirziyoyev considered it necessary to initiate a dialogue on joint construction of the new canal in the Amu Darya Basin together with the interim government of Afghanistan and the international community in line with international norms and with account of the interests of all countries in the region.

The Deputy Prime Minister for Economic Affairs, Mullah Abdul Ghani Baradar Akhund in his Twitter account wrote on 22 March 2023 that Uzbekistan had expressed readiness to work together with Afghanistan's technical teams to improve the efficiency of the Qosh Tepa Canal project along with other infrastructure projects. The Afghanistan's right to water in the Amu Darya River under international law and with full account of country's privileges and rights was noted. He assured that the completion of the Qosh-Tepa Project would enhance bilateral relations between the two neighboring countries.

Norms of international law. No general water cooperation agreement exists for the Amu Darya riparian countries. The water use relations between the CA countries are governed by the Agreement on Cooperation in the Field of Joint Management of the Use and Conservation of Water Resources in Interstate Sources (1992 Almaty Agreement) that retained the water allocation quotas in the Amu Darya Basin for Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan set in 1987. The presumed water diversion by Afghanistan of 2.1 km^3/year was deducted in the allocations from available usable water resources.

Agreements between the CA countries (as legal successors of USSR regarding boundary areas) and Afghanistan do not cover the issue of water sharing of the Amu Darya but establish the general order of frontier water use. The 1958 Treaty concerning the regime of the Soviet-Afghan state frontier sets that: (1) in the use of frontier waters, and of the waters of rivers which flow to the frontier or into frontier waters, the mutual rights and interest of both Contracting Parties shall be respected (Article 7); (2) matters concerning the use of waters shall be governed by special agreements (Article 16); (3) the diversion of water and other matters associated with the use of frontier waters shall be agreed on (Article 18); (4) any constructions likely to influence the flow of water or cause damage thereto shall not be erected except by agreement between the two Parties (Article 19).

Afghanistan is not a party of the UN Convention on the law of non-navigational uses of international watercourses (New York, 1997) and the UNECE Convention on the protection and use of transboundary watercourses and international lakes (Helsinki, 1992) that contain the most comprehensive list of rights and obligations as concerns transboundary water. Meanwhile, many provisions of the global water conventions are the norms of customary international law that all states are bound to adhere to.[327] These include: (1) utilization of a watercourse in an equitable and reasonable manner; (2) taking all appropriate measures to prevent, control and reduce transboundary impact; (3) provision of minimum river flow for environment; (4) cooperation with riparian states in good faith in order to attain optimal utilization and adequate protection of an international watercourse. Minimum procedural obligations that are recognized as customary law are: (1) regular data and information exchange with riparian countries; (2) consultation with each other on transboundary water; (3) prior notification regarding planned activities; (4) transboundary environmental impact assessment.

12.6. Public Private Partnership in Irrigation: What are the lessons for Central Asia?

The irrigation sector of all Central Asian countries is in serious need for investment to improve water use efficiency and modernize aging infrastructure. Currently, the government bears the main burden for financing water in all Central Asian countries. However, to improve the situation, countries are looking also for other options such as public private partnership (PPP) arrangements.

PPP is one of the sophisticated financing modalities, which is very different from traditional procurement. It allows bigger participation from the private entity by means of financial structure and engineering, technology and innovation, and risk-sharing schemes. PPP performance is based on service quality and delivery, not on inputs; and contract period is defined by the project life cycle. Consequently, it requires comprehensive understanding and sufficient endowment from the public sector. It also introduces the benefits of market incentives for the public sector.

The Central Asia enacted PPP laws demonstrating political commitment to use PPP as a tool to attract foreign and local investments. The countries differ

[327] Customary international law consists of rules that come from "a general practice accepted as law" and exist independent of treaty law

however in the number of PPP projects implemented and in the priority sectors for PPP investments.

In Kazakhstan, out of the $195.6 billion investments tracked between 2000 and 2019, water projects (which include water supply, irrigation, and water resources management projects) are limited to only $471 million; while energy projects account for more than half of Kazakhstan's planned and under construction infrastructure projects at around $112.5 billion (58%).

Between 2006 and 2010, investment in the sector was less than $20 million annually, which was inadequate to maintain millions of hectares of irrigation facilities.

Although investment resumed in 2014 and 2015, reaching $250 million, water demand is rising in Kazakhstan, with projections that by 2030, demand will outstrip all possible water supplies.

In Kyrgyzstan, out of $140 million investments in 6 PPP projects only one is in the water and sewerage sector, with the largest share of ICT projects.

In Tajikistan, 5 PPP projects accounting for $961 million investments in total are reported between 1999 and 2020.

In Uzbekistan, for the period of 2019-2022, the highest number of PPPs projects was recorded in the water management sector (157 out of 423 PPPs projects in different sectors) accounting for $29.82 million.

Based on few examples of PPPs in the irrigation sector, this review will draw some lessons for Central Asian countries informing their endeavours to implement successful PPP projects.

PPP refers to a long-term contractual arrangement between public (national, state, provincial, or local) and private entities through which the skills, assets, and/or financial resources of each of the public and private sectors are allocated in a complementary manner, thereby sharing the risks and rewards, to seek to provide optimal service delivery and good value to citizens. In a PPP, the public sector retains the ultimate responsibility for service delivery, although the private sector provides the service for an extended time. All contracts such as performance-based contracts (management and service contracts), lease-operate-transfer, build-own-operate-transfer, design-build-finance-operate, variants, and concessions are considered as various forms of PPP.

Source: ADB, Public-Private Partnerships. Guidance note on procurement

Examples of PPP in irrigation projects

Olmos irrigation project in Peru

The Olmos Irrigation Project (hereinafter, Proyecto Especial Olmos Tinajones, PEOT) is a set of engineering works, consisting of 3 main components: (i) the transfer of water through a 20 km Trans-Andean Tunnel and the Limón Dam, which started operating in 2012; (ii) the generation of hydroelectric power; and (iii) the implementation of irrigation infrastructure.

A 44 million m^3 capacity dam (Limon Dam) and the trans-Andean tunnel were to be constructed with the purpose of transferring the water from the Huancabamba River, on the Atlantic watershed, to the Pacific watershed for agricultural and power generation purposes in the new Olmos Valley.

In July 2004, the legal framework for the procurement procedure for the PEOT was set and transfer works were awarded by the Regional Government of Lambayeque (GORE Lambayeque) to the Olmos Transfer Concessionaire (Concesionaria Trasvase Olmos, CTO).

In 2004, the GORE Lambayeque, in the framework of Legislative Decrees No.994 and No.1012 and their respective regulations supporting private investment in irrigation projects, awarded the works that allow for the diversion of water from the Atlantic watershed to the Pacific watershed, to the Olmos Transfer Consortium of the Odebrecht Group for a period of 20 years at a cost of $185 million, of which $77 million funded by the Andean Development Corporation (CAF).

In June 2010, another concession contract was signed between GORE Lambayeque and H2Olmos, a private company created in 2009, in order to manage the distribution of water for the irrigation component of the PEOT.

In October 2010, the economic compensation contract was signed between GORE Lambayeque and

the private company SINERSA S.A. (Sindicato Energético) dedicated to the construction of electricity generation plants, their operation and administration, and the trade of energy (as part of the hydropower component).

In 2012, the public tendering process was developed by GORE Lambayeque and H2Olmos for the award of the lands of the "new Olmos valley", as part of the irrigation component.

In November 2014, the irrigation works was inaugurated and the transfer and irrigation works was put into operation. New concession contracts for more hydropower plants to be built in the area are being currently planned and negotiated.

Zambia's Kaleya and Manyonyo schemes

So far, there have not been many examples in sub-Saharian Africa of PPPs involving irrigated agriculture. Some of them are found in Zambia, which has developed models of inclusive PPPs with smallholders. These PPPs have in common that smallholders have established farmer-owned liability companies to run profitable commercial businesses.

The farmers are organized in water user associations, which are represented on the management board of irrigation projects along with representatives of the government and the farmers' union. While the farmers hire irrigation professionals to run the irrigation scheme profitably, the management units organize agricultural production in parallel, assuring professional cultivation.

The Kaleya irrigation scheme has 161 farmers cultivating 2,165 ha in Southern Zambia's Kafue River basin. Irrigation infrastructure was publicly financed,

but operation and maintenance has always been the responsibility of the Kaleya Smallholders Company Ltd. (KASCOL), a private company owned by independent individual and institutional investors. Smallholder farmers collectively hold 19% of the company's shares.

KASCOL owns the land and recruits farmers by offering them land on a four-year lease base. It holds a water-use permit but receives additional bulk water in drought periods supplied by Zambia Sugar Plc. at an advantageous fee. On-farm irrigation and farming operations are carried out by farmers on their individual (leased) plots. Benefits from this arrangement have been manifold, but farmers particularly complain about the short-term land lease arrangement.

The Manyonyo smallholder irrigation scheme is located in the same river basin. It was initiated by the Zambian Ministry of Agriculture, who assisted farmers in forming a liability company and running the irrigation scheme. Each of the 145 households contributed four hectares of their land which are clustered into and managed as one single farm. The farmers maintain their property as well as individual land titles, thus guaranteeing membership to the scheme but also reversibility of membership.

The company holds a group permit for water abstraction from the river. The water infrastructure is constructed by using public funds and is leased out to the farmer-company through a suitable PPP arrangement. The company is a stand-alone firm, but its production is sold to nearby Zambia Sugar Plc.

The model provides security for smallholders vis-a-vis the (farmer-owned) company and its management. These farmer-owned companies are often linked to large enterprises (e.g. Zambia Sugar) as contract farmers (Kaleya Smallholders Company Ltd.), but some, such as the Manyonyo smallholder irrigation scheme, are also stand-alone firms.

In one or the other way, smallholders contribute to debt financing (cash or land contributions) and share operation and maintenance costs of providing irrigation services. Individual farmers can benefit from improved income, job opportunities and the dividends generated by their equity stake in the collective company. Finally, involving local communities in PPPs is in many cases also a means to integrate them in larger value creation and rural development by improving e.g. access to electricity, health services and transportation.

The projects in Zambia successfully address two other common challenges of irrigation schemes: inequitable water distribution and frequently unclear water and land ownership and use rights.

Concerning water distribution, farmers at the head of a canal are often privileged compared to "downstream" users at the tail end. In cases where water provided by the PPP does not cover all water needs,

financially strong farmers are privileged as they can invest in deep drilling to complement this, while poorer farmers cannot do so and are in addition faced with rapidly sinking water tables due to the boreholes of their rich neighbours. Such situations arise where farmers are very heterogeneous, as in the Moroccan El Guerdane case.

Morocco's El Guerdane project

The El Guerdane project, operational since 2009, is considered as the first public-private partnership in irrigation in which the private partner participates not only in the financing and construction, but also in the operation and maintenance of the system. In contrast to the Zambian cases, the private partner is not involved in agricultural development.

A complex of two dams feeds a 90 km irrigation canal to carry 45 million m^3 of water per year to the 300 km distribution network that makes up the El Guerdane scheme situated in a highly water-scarce valley. The project is designed to supply 597 citrus farms, covering 9,600 out of the 30,000 irrigable hectares.


Photo: Annabelle Houdret

The $80 million of investment costs was covered by the Moroccan State (48%), the National Investment Company (SNI, 44%) and the farmers involved (8%).

However, the project has contributed to increasing inequalities between family farming and agro-investors: the investment costs required, the type of crop targeted (citrus fruits), the quality requirements for export and the political choice to initially restricted call for tenders to pre-selected farmers have marginalized smallholders.

The average size of project farmers' plots is one indicator of this trend: they cultivate an average of 16 ha – more than five times the average size of farms in the project's immediate surroundings in Taroudant. Moreover, the project provides water to only a small proportion of the farmers in the region (597 farms, equivalent to about 11% of the total number of farms in the area).

The collective ownership chosen for the PPPs in Zambia instead provides for an innovative solution to these two distribution challenges; at least until now, inequitable water distribution has not been reported. The collective model also helps to address the challenging issue of unclear water and land use rights, which is particularly complex in settings with many smallholders.

Hybrid and sometimes contradictory forms of collective and individual land, water and other resource ownership and user rights coexist in a continuum from customary tenure systems to formal ownership systems, often with the state as final custodian and owner. Mostly, these tensions are not clarified and formalized.

The resulting uncertainty is detrimental to investments, regardless of who invests, not only in irrigation but also in all kinds of machinery, equipment and long-term land improvement. The way land can or cannot be used as collateral has implications for the ability of individual actors to engage in PPPs.

In the Manyonyo PPP, for instance, where farmers hold individual land-use rights, it is prohibited to use land as collateral for loans so as to avoid the danger of farmers losing the land to "bogus investors" offering "slave loans". Banks seem to be ready to provide credits relying on the soundness of business models.

Lessons Learned

The most commonly used contractual forms of PPP in the irrigation sector include:

- *Operation, Management and Maintenance (OMM) contract*, under which the private sector is engaged to undertake operation, management and maintenance of infrastructure services for defined recipients. The private sector provides a service for which it receives a fee (either from the government or from users). Where rehabilitation or construction works are required, they can also be part of the contract. Assets are publicly financed, and this is an appropriate form of contract where there is limited scope to raise private capital.

- *Infrastructure concession*, under which the private sector is engaged to raise commercial finance for infrastructure development and then construct, operate, manage and maintain the infrastructure. Investment and financing costs must be recovered through fees (either from the government or from users). End user risk is significant in irrigation projects where often the users are not fully defined at the beginning of the project (it depends on how many farmers take up the water from the system). It might be possible to share end user risk between the public and private parties, for instance with a guarantee on minimum revenue. The investment may be undertaken in whole or in part by the private sector where for instance there is grant funding available to bear some of the investment cost.

- *Farm service agreement*, under which the private sector can also partner with smallholder farmers and communities for the provision of farm-level services. Services might be on-farm, such as planting, harvesting and water application; or off-farm, such as storing, processing and marketing (e.g. outgrower services). Such farm services, by improving the agricultural performance of water users, are likely to improve the viability of irrigation infrastructure. The level of investment private finance required depends on the services provided. Farm services can be integral or separate from infrastructure OMM contract.

- *Hub farm agreement*, under which the private sector can be engaged to undertake commercial agricultural production through a land concession or lease. This might be on unoccupied land owned by the government or third parties, or community land held under collective title (or especially consolidated) and leased in return for a fee of share in commercial operations. The hub farm has purely commercial aims, and will require a certain scale in order to offer commercial opportunities (especially for food crops). Private capital is required for on-farm investments, while irrigation fees can reflect any or all infrastructure related costs (e.g. OMM, investment and finance).

Key legal issues that arise in irrigation PPPs include (while some of the legal issues are not confined to irrigation PPPs they can take on a new dimension and complexity when applied to irrigation):

- *Land ownership* – all irrigation projects are dependent on land ownership – both in relation to the land that is needed for the project, and also in relation to the customers for the project, the farmers, and their legal interest in the land. Some countries limit land ownership to locals or may prohibit ownership in private hands. There may also be restrictions on land use, irrigation or types of irrigation may be restricted – and the rules may vary within a country from state to state or county to county.

- *Water extraction* – there may be limitations on levels of water extraction, both at national and international level. If extraction from a river or other water source is subject to international waterways, then there may be restrictions on the amount of water that can be extracted. The regimes for charges for water extraction may be complex and/ or vague. These will be key issues in a PPP as the private provider will want to ensure a steady revenue stream and so will want to be sure of the price that it is buying raw water, the price that it can on sell irrigation water and the quantities that it can extract and sell.

- *Public Sector Counterpart* – in irrigation PPPs it can be difficult to ascertain which public institution will be responsible for developing the project and the signatory to the project agreement – in most emerging markets where PPPs have been used for developing irrigation systems, the national entity in charge of irrigation services would be the counterparty to the PPP contract.

Although PPP policies and projects are at various stages of maturity, **some lessons**[328] can be drawn from

[328] Sources used: The International Journal for Rural Development "Rural 21", Issue 01/20 ; OECD Studies on Water, Water Governance in Peru, 2021; UNECE National PPP Readiness Assessment Report: Tajikistan, November 2013

irrigation PPPs implemented in different parts of the world:

- PPP arrangements require *country- and site-specific solutions* and must address the risks of the various parties involved, including nature, to ensure that such projects are development-friendly and economically viable while protecting natural resources.

- *Look beyond the irrigation scheme* as such since potential socioeconomic and environmental benefits and threats extend way beyond the geographical area of the scheme. Primarily targeting financially strong farmers or not actively supporting the smaller ones creates an unequal race for access to potentially irrigable land and sometimes scarce water resources. Neither does it necessarily assure an optimal return on investment since smaller farmers can be very efficient in value and employment creation, also compared to larger entities. Finally, the public sector must ensure the long-term ecological viability of a project as well.

- PPPs in irrigation need to be embedded in *comprehensive development plans* and include specific support measures to ensure sustainable and equitable development. This may include access to extension services and financial products, input supply, and – above all – access to stable markets. The PPPs we reviewed in Zambia and Morocco have in common that smallholders have established farmer-owned liability companies to run commercial businesses. These companies have entered into contracts with private sector companies for irrigation management, service provision and market access. Farmers are represented on the management boards of their companies. For such arrangements, smallholders need long-term support along with assistance in designing contracts and acquiring management skills. If one compares the Zambian schemes with the Moroccan El Guerdane, these PPPs are better characterized as PPPs in irrigated agriculture, i.e. investments in agricultural production that include irrigation components.

- PPPs, when properly implemented, can help reduce a nation's *infrastructure deficit*. With a strong enabling environment, PPPs can help to fulfil the vision for the nation's infrastructure needs by setting goals to align departmental policies, attracting private sector investment and expertise, ensuring best value from government investments, and optimizing project risk allocation. The PPP model has in-built mechanisms which reduce the potential for schedule slippage and cost overruns in delivering major projects, and can accelerate availability of service improvements.

- Taking *smallholders concerns, but also local government and administrations capacities*, into account when developing PPPs in irrigation is a key prerequisite for achieving mutual benefits. Successful irrigation PPPs which are not only able to mobilize investment but also provide long-term perspectives for local smallholders require sound design and monitoring of networks and contracts with respect to equitable cost-benefit sharing and environmental impacts. However, many smallholders as well as local administrations currently lack the capacities to fully oversee potential impacts of such projects and related contracts.

- Encourage *dialogue between stakeholders* for more integrated and resilient water governance. In the Olmos Irrigation Project case, for example, it was suggested to create the River Basin Council as a multi-stakeholder platform that could help improve plans and dialogues across players in the old and new parts of the Olmos Valley, as well as between the peasant communities established upstream and the water users downstream. Also, the distribution arrangement established in the concession contract between GORE Lambayeque and H2Olmos could be modified in order to accommodate demands from the small and medium-sized farmers in the "old" valley, where appropriate, in order to stimulate economic development across this area of the basin. This represents an opportunity for local, regional and national governments to work together to ensure the legal framework surrounding the PEOT adapts to present and future demands.

- Local, regional and national governments should join forces to ensure *greater data collection and monitoring*. Collecting, using and disseminating more data will not only reinforce the technical solutions but they will also encourage greater transparency and stakeholder engagement. However, this measure would require a clear allocation of responsibilities across authorities and agreement on what should be prioritised in terms of data collection, as well as the target groups.

- *Good planning and timely execution*. It is better to come up with a few selected prioritized and well-prepared projects that the government has carefully defined than a long list of several projects intended to attract any type of investor that the government does not actually have the capacity to deal with. Management of deal flow is equally important to make investors know what to expect, and to attract the most ready and matching bidders.

SECTION 13

Publications in 2022


Изменение климата:
что происходило
в 2022 году
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Ташкент 2022
Водный кризис
приближается...
Часть 2
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Эффективность водопользования в орошаемом земледелии стран бассейна Аральского моря: современное состояние и перспективы
Совершенствование
орошаемого земледелия:
мировой опыт
НИЦ МКВК
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4
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БЮЛЛЕТЕНЬ
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Центральной Азии
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9 Всемирный водный форум
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Стимулирование действий в области водоснабжения,
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SECTION 14

Central Asia Awards in Water and Related Fields

Awards on the occasion of 30th ICWC anniversary

Events on the occasion of the 30th anniversary of the Interstate Commission for Water Coordination of Central Asia took place in Turkistan, Kazakhstan on April 26-27, 2022. In this context, **medals "For contribution to saving the Aral Sea"** of ED IFAS in Kazakhstan and **ICWC Certificates of appreciation** were awarded.

Awards to water workers in Kazakhstan

The Director General of TOO "KazNIIVH" (Kazakh Water Research Institute), N. Balgabayev received the badge of veteran worker of the water sector on 12 April.

Source: https://www.gov.kz/memleket/entities/ecogeo/press/news/details/355213?lang=ru *(in Russian)*

By Presidential Decree No.1031 of 4 October, a number of citizens were nominated for national awards, of which the advisor to Director of the water operator RGP "Kanysh Satpaev Canal" was awarded the **Order of Honor**.

Source: https://adilet.zan.kz/rus/docs/U2200001031 *(in Russian)*

Awards to agricultural workers in Kyrgyzstan

By Presidential Decree on awarding state decorations of the Kyrgyz Republic, distinguished citizens were awarded **"Honored researcher of the Kyrgyz Republic"**, **"Honored environmentalist of the Kyrgyz Republic"**, and "**Honored agricultural worker of the Kyrgyz Republic"** for significant contribution to socio-economic, intellectual and cultural potential of the country, as well as for great achievements in their professional activities.

Source: https://ru.sputnik.kg/20220901/kyrgyzstan-vruchenie-gosnagrada-sadyr-zhaparov-ukaz-1067441773.html *(in Russian)*

Government awards on occasion of 31st Independence Day of Tajikistan

On occasion of the 31st anniversary of State Independence, the President of Tajikistan awarded professionals in different sectors for outstanding results. Agricultural workers also were in the list of awardees.

Source: https://avesta.tj/2022/08/25/emomali-rahmon-vruchil-gosnagrady-po-sluchayu-31-j-godovshhiny-gosudarstvennoj-nezavisimosti-tadzhikistana/

Government awards in Turkmenistan

By Presidential Decree "On awarding on the occasion of the 31st anniversary of independent Turkmenistan", representatives of the Regional Committee for Development, Environmental Protection and Agro-Industrial Policy

at the Upper Chamber of Parliament, the Committee for Environmental Protection, Nature Management and Agro-Industrial Complex at the Parliament, the State Committee for Water Management, and the Ministry of Agriculture were awarded medals **"Gaýrat"** (for diligence) and **"Watana bolan söýgüsi üçin"** (for the love of the Motherland).

Source: https://tdh.gov.tm/ru/post/32979/ukaz-prezidenta-turkmenistana-o-nagrazhdenii-gosudarstvennymi-nagradami-v-oznamenovanie-31-j-godovshchiny-nezavisimosti-turkmenistana (in Russian)

Awards to agricultural and water workers in Uzbekistan

By Presidential Decree "On awarding a group of civil servants and industrial and socio-economic workers on occasion of the thirtieth anniversary of independent Uzbekistan" distinguished citizens were awarded honorary titles and medals for the long-term fruitful work.

Source: https://nova24.uz/uzbekistan/shavkat-mirzijoev-nagradil-rabotnikov-i-sluzhashhih-razlichnyh-sfer/ *(in Russian)*

On the occasion of the Agricultural Worker Day, a group of representatives of the agricultural sector was awarded for their valuable contribution to agricultural development.

Source: https://www.agro.uz/ru/11-0453564/ *(in Russian)*

New awards

By Resolution of the Uzbek Cabinet of Ministers No.443 of 10.08.2022, a new badge **"Tabiat himoyachisi"** (nature activist) is to be awarded to encourage citizens, who have achieved significant results in the area of ecology, nature protection and resource conservation, disseminated scientific achievements in agriculture, and taken initiative to green expansion through application of up-to-date technologies.

The State Committee for Ecology and Nature Conservation will award the badge annually on the occasion of the World Environment Day (5 June).

Source: http://www.uzdaily.uz/ru/post/70934 *(in Russian)*

SECTION 1.5

Global Risks 2023

This Section presents key global risks and foreign policy trends according to the versions of several analytical centers, namely the analysts of the World Economic Forum, the consulting company Eurasia Group, and the Russian Economic News Agency PRIME.

15.1. Risks 2023 (WEF version)

The risk ranking in the WEF's Global Risks Report 2023 draws on insights from experts across academia, civil society, government, and business all over the world.

The world has faced a set of risks that feel both wholly new and eerily familiar. First, it is a return of "older" risks – inflation, cost-of-living crises, trade wars, widespread social unrest, geopolitical confrontation and the spectre of nuclear warfare. Second, these are being amplified by comparatively new developments in the global risks landscape, including unsustainable levels of debt, a new era of low growth, low global investment and de-globalization, a decline in human development after decades of progress, rapid and unconstrained development of dual-use (civilian and military) technologies, and the growing pressure of climate change impacts and ambitions in an evershrinking window for mitigation.

The authors conclude that together, these are converging to shape a unique, uncertain and turbulent decade to come.

Cost of living dominates global risks in 2023-2025. Almost all respondents anticipated consistent volatility over the next two years due to aggravating crises destabilizing economies and causing harm to societies; more than half respondents predict persistent crises in the next decade leading to catastrophic consequences. The top risks – energy crisis, inflation and food supply crisis – represent the cost-of-living crisis dominating in the list of global threats over the next two years.

A global Cost-of-living crisis is already being felt. Even before the COVID-19 pandemic, the price of basic necessities – non-expendable items such as food and housing – were on the rise. Costs further increased in 2022, with inflationary pressures disproportionately hitting those that can least afford it. To curb domestic prices, around 30 countries introduced restrictions, including export bans, in food and energy last year, further driving up global inflation. Although global supply chains have partly adapted, with pressures significantly lower than the peak experienced in spring 2022, the FAO Price Index hit the highest level since the 1960s.

Risks map. Half in the top 10 risks over the next two years are environment-related risks from natural disasters and natural resource crises to failure to mitigate climate change and failure of climate-change adaptation. Another three risks are viewed as social ones – besides the cost-of-living crisis, these are the risks of societal polarization and large-scale involuntary migration.

Global risks ranked by severity over the short- and long-term

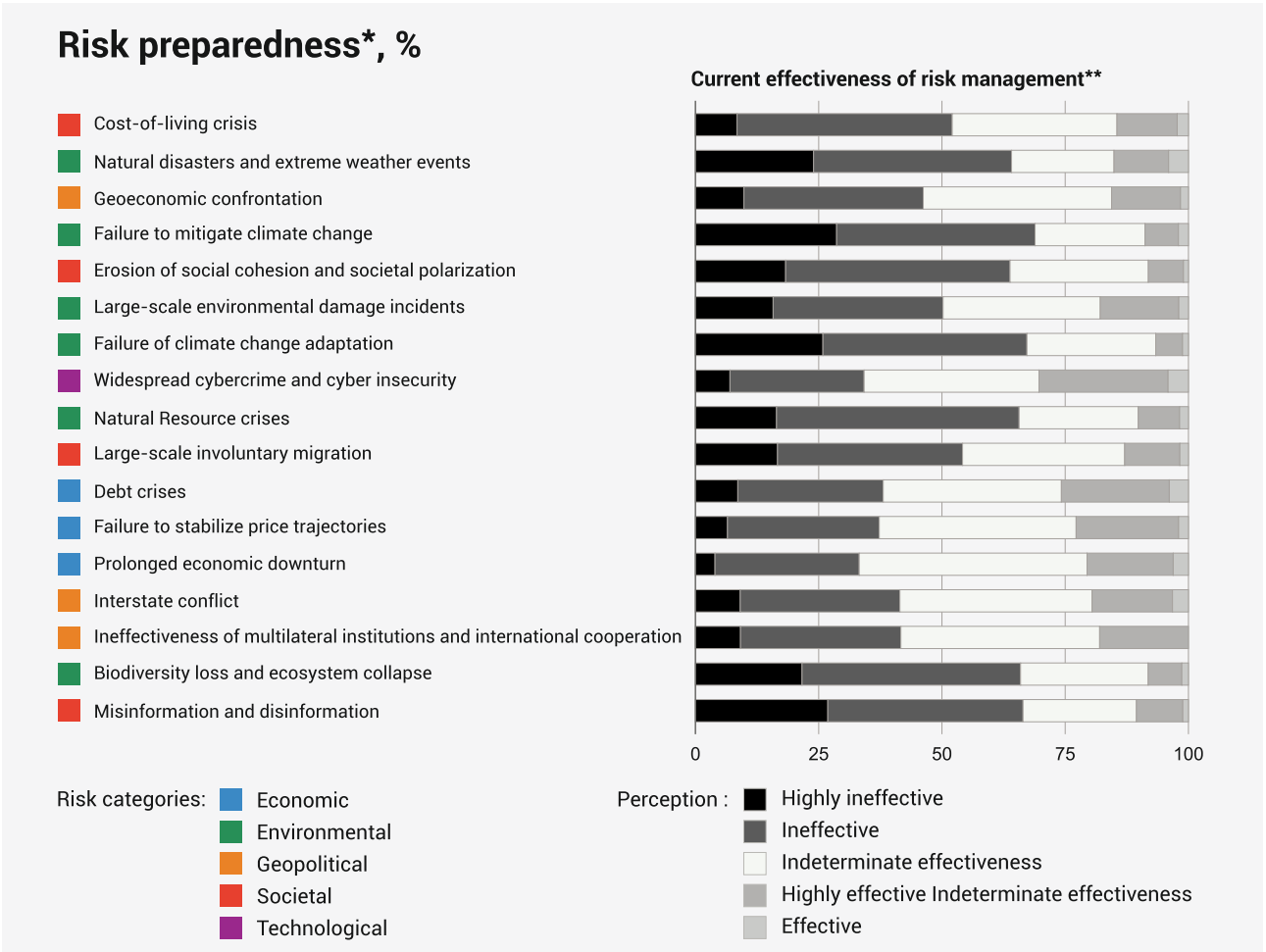
Geoeconomic confrontation. Geoeconomic confrontation, including sanctions and trade wars, was ranked the third-most severe risk over the next two years. A number of Asian countries, including China, Kazakhstan, and Japan considered it as the top risk (US as the third one). Economic policy is increasingly directed towards geopolitical goals: countries are seeking to build "self-sufficiency", defending through tighter investment screening, data localization policies, visa bans and exclusion of companies from key markets.

Societal polarization. Polarization increases both between countries and people: societal polarization is among top 10 global risks over the short- (fifth rank) and long-term (seventh rank). Defined as the loss of social capital and fracturing of communities leading to declining social stability, individual and collective wellbeing and economic productivity, it is triggered by many other risks – including debt crises, inflation, a prolonged economic downturn and climate migration. A widening gap in values and equality is posing an existential challenge to both autocratic and democratic systems, as economic and social divides are translated into political ones.

"Climate action hiatus". Severe polarization on key issues leads to deadlocked situations in governments hampering long-term decision making. This would contribute to stronger disagreements, especially in light of economic complexities and uncertainties in the next years.

It is characteristic that environmental risks account for half in top 10 short-term risks and take six positions, including first four rankings in top 10 risks over the next decade. Counteractions on global warming has stagnated: the combination of current economic, societal and geopolitical crises diverts attention and resources from the long-term risks and, eventually, the world may face the rising burden on natural and human ecosystems.

A failure to mitigate climate change is ranked as one of the most severe threats in the short term but is the global risk we are seen to be the least prepared for, with 70% of respondents rating existing measures to prevent or prepare for climate change as "ineffective" or "highly ineffective".



* List of top 15 risks over a 2-year and 10-year period
** Mechanisms in place to prevent the risk from occurring or prepare to mitigate its impact

ECONS

Source: World Economic Forum, 2023

Current energy crisis on the background of geopolitical conflicts should result in a turning point, encouraging energy-importing countries to invest in renewable energy sources. Yet the current situation have already limited – and in some cases reversed – progress on climate change mitigation, at least over the short term. For example, the EU spent at least €50 billion on new and expanded fossil-fuel infrastructure and supplies, and some countries restarted coal power stations.

Negotiations at the last climate conference failed, laying bare the difficulty of balancing short-term needs with longer-term ambitions. The stark reality of 600 million people in Africa without access to electricity illustrates the failure to deliver change to those who need it and the continued attraction of quick fossil-fuel powered solutions. A just transition that supports those set to lose from decarbonization is increasingly invoked by countries heavily dependent on fossil-fuel industries as a reason to slow down efforts.

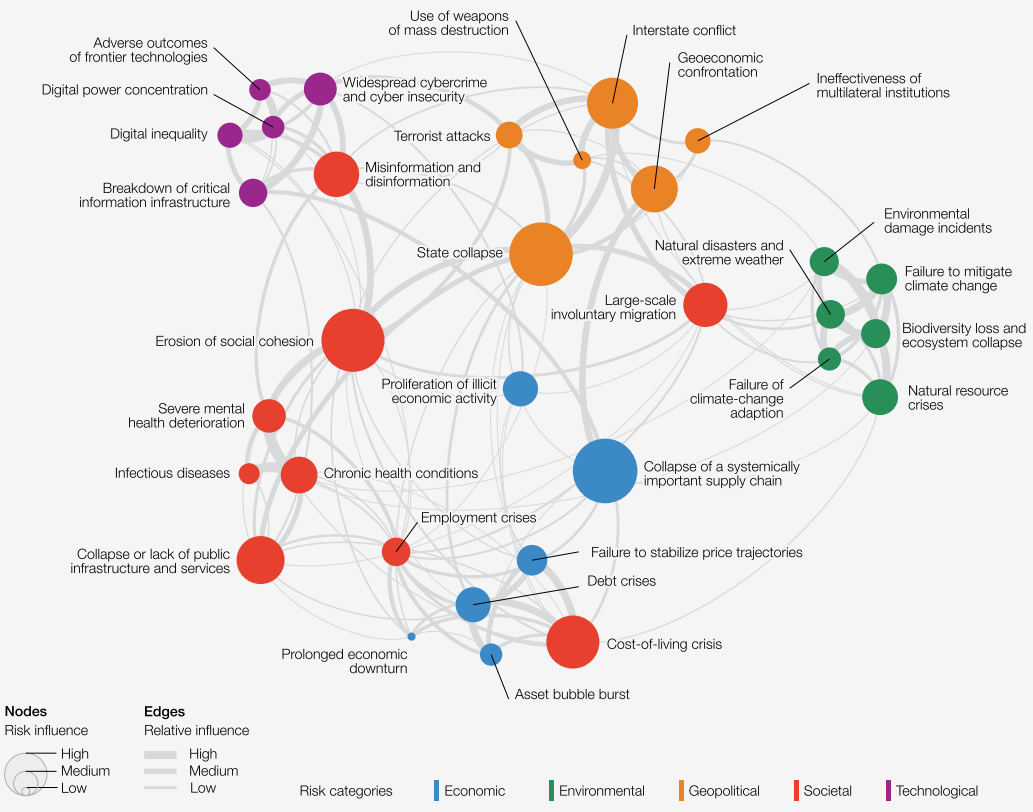
This implies that the risks of a slower and more disorderly transition have now turned into reality. Climate change will also increasingly become a key migration driver and there are indications that it has already contributed to the emergence of terrorist groups and conflicts in Asia, the Middle East and Africa. As floods, heatwaves, droughts and other extreme weather events become more severe and frequent, a wider set of populations will be affected.

Global risks 2033: Tomorrow's catastrophes. Shocks of recent years have reflected and accelerated an epochal change to the global order. Risks that are more severe in the short term are embedding structural changes to the economic and geopolitical landscape that will accelerate other global threats faced over the next 10 years.

Comparing the two-year and 10-year time frames provides a picture of areas of decreasing and increasing concerns. The last ones refer to environmental risks that have worsening scores over the course of the 10-year time frame. Large-scale involuntary migration caused mainly by climate change rises to fifth place.

The scores of multiple social risks are also worsening, including "Severe mental health deterioration", "Collapse or lack of public infrastructure and services", and "Chronic diseases and health conditions". In contrast, economic risks such as "Failure to stabilize price trajectories", "A prolonged economic downturn", "Collapse of a systemically important industry or supply chain", and "Asset bubble burst" are perceived to fall slightly in expected severity over the 10-year time frame. Respondents perceive the geopolitical risk of interstate conflict as decreasing in severity, with the risk of state collapse worsening.

Global risks landscape: an interconnections map



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

The authors identify five emerging risks clusters that that may become tomorrow's catastrophes:

1. Natural ecosystems: past the point of no return. Biodiversity is already declining faster than at any other point during human history. Over the next 10 years, the interplay between biodiversity loss, pollution, natural resource consumption, climate change and socio-economic drivers will make for a dangerous mix. con-sequences. The consequences may include increa-sed occurrence of zoonotic diseases, a fall in crop yields, growing water stress exacerbating potentially violent conflict, loss of livelihoods dependent on food systems, and ever more dramatic natural disasters.

2. Human health. Expanding sources of disease will combine with persistent disease burdens to entrench a growing health burden. A key implication is the resul-ting rise in disabilities, rather than deaths: people are living more years in poor health – medical advances have made it possible for people to live with multiple co-morbidities, but these remain complex and expen-sive to manage.

3. Human security. Growing mistrust and suspicion between global and regional powers has already led to the reprioritization of military expenditure and stag-nation of non-proliferation mechanisms. Diffusion of military power to multiple countries and actors is dri-ving the latest iteration of a global arms race.

4. Digital rights. The proliferation of data-collecting de-vices and datadependent AI technologies could open pathways to new forms of control over individual auto-nomy. As more data is collected and the power of emerging technologies increases over the next deca-de, individuals will be targeted and monitored by the public and private sector to an unprecedented de-gree, often without adequate anonymity or consent.

5. Economic stability. The rapid and widespread nor-malization of monetary policies, accompanied by a stronger US dollar and weaker risk sentiment, has already increased debt vulnerabilities that are likely to remain heightened for years. Larger emerging markets exhibiting a heightened risk of default include Argen-tina, Egypt, Ghana, Kenya, Tunisia, Pakistan and Tur-key. Extended supply-driven inflation could drive more painful interest rate rises, even amidst a slowdown in growth, leading to a harder landing and more wide-spread debt distress. Even comparatively orderly fiscal consolidation is likely to impact spending on human capital and development, ultimately threatening the resilience of economies and societies in the face of the next global shock, whatever form it might take.

While ongoing polycrisis unfolds, the world stands at a crossroads, WEF concludes. The actions taken today will dictate our future risk landscape. In this context, defensive, fragmented and crisisoriented approaches are short-sighted and often perpetuate vicious cycles. Lack of preparedness for longer-term risks will desta-bilize the global risks landscape further, bringing ever tougher trade-offs for policy-makers and business lea-ders. Four principles for preparedness in this new era of polycrises can be outlined: (1) strengthening risk iden-tification and foresight, (2) recalibrating the present value of "future" risks, (3) investing in multi-domain risk preparedness, and (4) strengthening preparedness and response cooperation.

15.2. Risks 2023 (Eurasia Group version)

The Eurasia Group consulting company launched its rating of ten global risks 2023. The world is through the pandemic. Renewables are becoming dirt cheap. The headwinds for human development will grow in 2023.

1. Rogue Russia. Russia will turn from global player into the world's most dangerous rogue state, posing a serious security threat to Europe, the United States, and beyond.

2. Xi Jinping followed Mao: Xi emerged from China's 20th Party Congress[329] with a grip on power unrivaled since Mao Zedong .

3. Weapons of mass disruption. New technologies will be a gift to autocrats bent on undermining democra-cy abroad and stifling dissent at home.

4. Inflation shockwaves. Rising interest rates and glo-bal recession will raise the risk of emerging-market crises.

5. Iran in a corner. The chance of regime collapse is low, but it's higher than at any point in the past four decades.

6. Energy crunch. Higher oil prices will also increase frictions between OPEC+ and the United States.

7. Arrested global development. Women and girls will suffer the most, losing hard-earned rights, opportuni-ties, and security.

8. Divided states of America. The United States re-mains one of the most politically polarized and dys-functional of the world's advanced industrial demo-cracies. Red-blue animosity creates the environment, which will become increasingly challenging for com-panies used to thinking of the United States as a co-herent market with a predictable regulatory regime. There is also the continuing risk of political violence.

9. TikTok boom. Born between the mid-1990s and the early 2010s, Generation Z is the first with no expe-

[329] October 2022

rience of life without the internet. Digital devices and social media have connected its members across borders to create the first truly global generation. That makes them a new political and geopolitical force, especially in the United States and Europe.

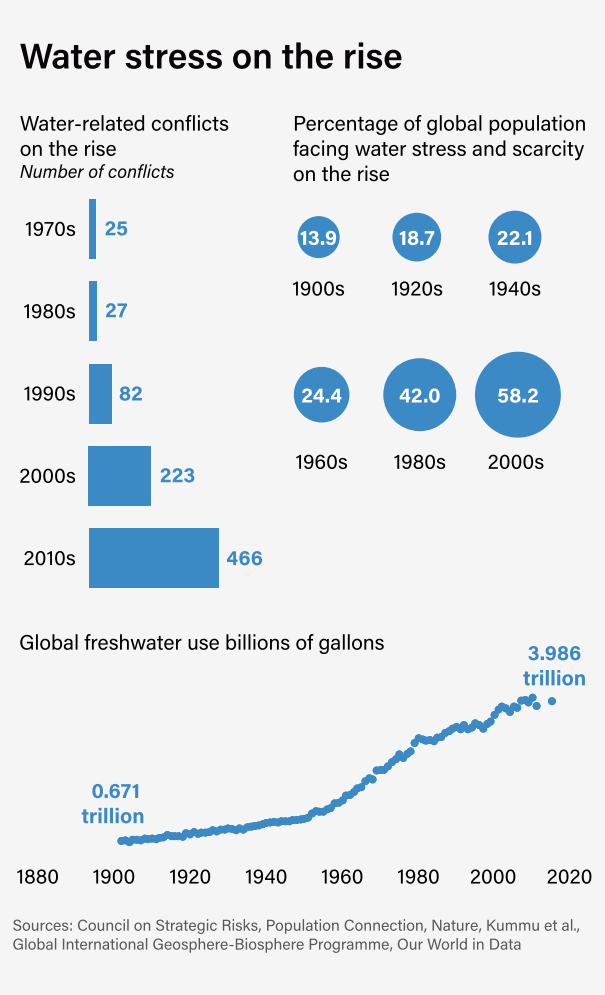
10. Water stress. In 2022, receding water levels exacerbated the food crisis in Africa, halted shipping and nuclear output in Europe, and led to factory shutdowns in China. Water scarcity also forced the United States to limit water releases in western states and triggered social unrest in Latin America, heightening tensions between corporations and communities. Forecasts for 2023 are worse. Water stress will become the new normal: River levels will fall to new lows, and two-thirds of companies globally will face substantial water risks to their operations or supply chains.

Within countries, the number of water-related conflicts, already up sharply since the 1980s, will reach new heights in 2023. The impact will be greatest in the Middle East and Africa, where water will act as a "trigger" in places where militias fight over the scarce resource, and as a "casualty" in places where militants destroy water pumps, tanks, and pipes. Water scarcity will also trigger refugee flows in the Middle East (Syria, Iraq, and Yemen), threaten economic prospects in North Africa (Algeria, Morocco, and Tunisia), and heighten food insecurity in the horn of Africa (Ethiopia, Kenya, Somalia) by driving food prices higher and forcing farmers to migrate.

US policymakers will have to choose between electricity generation, water releases, industrial production, and food production on the one hand, and water conservation on the other. More US farmers, who will suffer the most from water restrictions taking effect in 2023[330], will be asked to forgo harvesting to help tackle water scarcity.

Europe will face different challenges. Norway may have to limit electricity exports to preserve hydropower for domestic use, exposing itself to legal challenges from the Netherlands and Germany. And sinking water levels in the Rhine and Po rivers will disrupt inland shipping and hamper broader economic activity in western Europe.

In Latin America, political decisions will push water-intensive industries such as beverage companies to move facilities from dry to water-rich regions. Local policymakers will follow Santiago de Chile's lead by rotating water cuts among customers, affecting the retail and hospitality industries.



15.3. Economic News Agency "PRIME"

Based on an expert survey, the Russian economic news agency "PRIME" presented eight potential risks that the world will likely face in 2023. The global economic system is so ineffective now that it is difficult to predict when it crashes. This uncertainty will be the major risk to global economic stability in 2023.

Geopolitical conflicts. The armed conflict between Russia and Ukraine could reverse decades of economic gains. Other geopolitical tension points where new military conflicts could erupt and escalate into a global confrontation include China v. Taiwan, Israel v. Syria, the United States v. Mexico, Turkey v. Greece, South Korea v. North Korea, Serbia v. Kosovo, Azerbaijan v. Armenia, Moldova v. Transnistria, Africa countries (Somalia, Congo, South Sudan), South Asia (Afghanistan, Pakistan).

For example, if confrontation around Taiwan turns into open military clashes, the global economy may risk collapse. The US would inevitably be involved in such conflict, and economic ties between the US and China (as well as China and the EU) would certainly be broken.

[330] an up to 21% reduction in Colorado River water supplies for some states

Political institutions crisis. The crisis of existing political institutions will worsen the global situation. And while Brexit was perceived by everyone as something extraordinary, today an increasing number of countries are declaring their strive for autonomy and, consequently, their desire to leave alliances that somehow restrict them.

For example, the Organization of Turkic States, initially created as a trade union, is gradually beginning to talk about its own military doctrine. This is not yet a counterweight to global military alliances like NATO, but "they made a start".

Inflation and global recession. Most economists conclude that the global economy will enter the hardest year. Today, economic growth in the leading industrial countries (primarily the US and Europe) has slowed down noticeably. However, it is believed that a large-scale recession could still be avoided through accelerated economic growth in China and India. But the latest data on China are also disappointing: a new round of coronavirus pandemic is on rise. Additionally, demand for Chinese and Indian goods has largely been driven by Western countries. Today, however, rising inflation in these countries is reducing demand, while internal demand and that from developing countries cannot compensate the resulting losses. This, in particular, has caused China's budget gaps (currently, the budget deficit is about $1.1 trillion).

One of scenarios in WB's forecasts assumes an inflation rate up to 5%, which may result in recession and also in financial crises. Probably, defaults can be expected, first corporate defaults, and then sovereign ones (and here the Eurozone countries are particularly at risk).

Ultimately, this will cause further stratification of the population, shrinking middle class, rising unemployment and poverty. Bankruptcies of both enterprises and individuals will be inevitable. Alas, bankruptcy may become a characteristic of 2023.

Markets. In December, the US Federal Reserve System (FRS) raised its median forecast for the federal funds rate from 4.6% to 5.1% by the end of 2023. However, the rate futures market still does not believe in such determination of the FRS and supposes that the US regulator will soften its position in 2023 to avoid 'hard landing' for the US economy. If this happens, a reassessment of rate expectations could trigger a strong decline in the equity market in the US and the world as a whole. This is another risk that could exacerbate the negative effects of recession.

Oil. Potentially large-scale rise in commodity prices as a result of reduced stock of energy and metals could put additional pressures on the global economy. This may cause stagflation.

The main risk the oil market could face is a combination of recession in the EU, tight restrictions in China and stable situation in the US, where FRC will keep tight monetary policy to fight inflation. If the US makes some concessions to Iran and Venezuela, pressure on oil quotations both on Brent and on the Urals to Brent differential could increase sharply and would bring some exports close to operating margin.

For Russia, analysts consider it as the additional devaluation factor and a reason to expand borrowings on the domestic debt market. Such situation probably persisting for more than two quarters will rise concerns about financial stability.

The gap of economic ties. The breach of economic ties will also contribute to worsened situation. And it is not just the situation between Russia and Western countries.

The emerging tendency is that states prefer to build their own economic policy based on their own interests, often at the expense of cooperation and existing arrangements. As is well-known from political economy, those countries that actively trade with each other, as a rule, do not fight. Now this principle is not followed.

The war is not necessarily takes the form of an armed conflict, but can be also in the form of economic warfare and not less destructive. It is likely that in 2023 the confrontation between the largest exporting countries and the largest consuming countries will intensify – it will be a war of sanctions and embargoes, a price and currency war.

Climate. Climate variations, i.e. when summer drought alternates with extreme winter frosts may reduce grain yields and cause rise in prices/deficits. This will pose a threat to food security.

Humanitarian catastrophe. All the above mentioned could lead to humanitarian catastrophe. Thus, the failure to cooperate globally in the field of public health may result in a repeated pandemic like COVID-19, but a more serious one. A general decline in living standards will entail demographic problems. The glut of weapons will undoubtedly push up crime.

Source: Economic News Agency PRIME

SECTION 16

2023 Calendar of Events

January

- **January 15-19** – The 13th IWA International Conference on Water Reclamation and Reuse, Chennai, India
- **January 16-18** – World future energy summit, Abu Dhabi, UAE
- **January 17-19** – UNESCO-IWRA Online Conference "Emerging Pollutants: Protecting Water Quality for the Health of People and the Environment"
- **January 19-28** – International Green Week 2023, Berlin, Germany
- **January 25-26** – WWT wastewater (conference and exhibition), Birmingham, Great Britain
- **January 25-27** – 10th International Micro-irrigation Conference of ICID, Dakhla, Morocco

February

- **February 2** – World Wetlands Day
- **February 7-10** – 2nd WASAG International Forum on Water Scarcity in Agriculture, Praia, Cape Verde
- **February 9-10** – 7th International Conference on Climate Change, Colombo, Sri Lanka
- **February 14** – International Scientific-Practical Conference on Environmental Resources and Sustainable Water Use - EnREM 2023, online
- **February 15-16** – 10th World Water Forum Kick-Off Meeting, Jakarta, Indonesia
- **February 16-17** – 15th meeting of Implementation Committee of the Water Convention, Geneva, Switzerland
- **February 17-18** – 82nd WWC Board of Governors meeting, Denpasar, Indonesia
- **February 22-24** – Silk Road of Knowledge: Science meets Green Policy, Almaty, Kazakhstan, online
- **February 23-24** – 7th EU-Central Asia High-Level Conference, Rome, Italy

March

- **March 3** – World Wildlife Day
- **March 8-9** – 2023 Earth Summit, Doha, Qatar
- **March 9-10** – International Conference "Cooperation on Food Security in the context of Climate Change", Ashgabat, Turkmenistan
- **March 14** – World Rivers Day
- **March 14-16** – ASIA 2023: Water Resources and Renewable Energy Development in Asia, Kuala Lumpur, Malaysia
- **March 16-17** – 2nd International Conference on Dam Safety Management and Engineering, Kuala Lumpur, Malaysia
- **March 18** – Conference "Water Resources of Central Asia: Challenges and Prospects", Bishkek, Kyrgyzstan
- **March 21** – International Day of Forests
- **March 21-23** – Water Korea 2023, Seoul, South Korea
- **March 22** – World Water Day
- **March 22-24** – UN Water Conference, New York, USA
- **March 23** – World Meteorological Day

- **March 26** – Day of the Aral Sea
- **March 27-30** – Asia-Pacific Forum on Sustainable Development (APFSD) 2023, Bangkok, Thailand
- **March 29-30** – Regional Forum on Sustainable Development, Geneva, Switzerland

April

- **April 7** – 15th International Student Conference "Modern Global Trends: Challenges and Risks before Central Asia", Almaty, Kazakhstan
- **April 15-16** – G7 Ministers' Meeting on Climate, Energy and Environment, Sapporo, Japan
- **April 16-22** – 4th World Irrigation Forum (WIF4), Beijing, China
- **April 19-21** – IE expo China 2023, Shanghai, China
- **April 19-21** – International Conference on Climate Risk, Vulnerability and Resilience Building, Paris, France
- **April 22** – International Mother Earth Day

May

- **May 8-10** – Global Water Summit 2023, Berlin, Germany
- **May 15-16** – 2nd World Conference on Environmental and Earth Sciences, Paris, France
- **May 15-17** – Exhibition on Green Energy Technologies Central Asia GETCA, Tashkent, Uzbekistan
- **May 16-17** – Central Asian Conference on Climate Change (CACCC 2023), Dushanbe, Tajikistan
- **May 17-19** – Energy Forum of Uzbekistan, Tashkent, Uzbekistan
- **May 23-25** – E-World Energy & Water 2023, international conference and exhibition, Essen, Germany
- **May 24-26** – International Energy and Environment Fair & Conference (ICCI), Istanbul, Turkey
- **May 25-26** – X Neva International Environmental Congress, St. Petersburg, Russia
- **May 28-June 6** – 18th IWA Leading Edge Conference on Water and Wastewater Technologies, Daegu, South Korea

June

- **June 1-2** – Regional roundtable "Aarhus Convention: Effective Public Participation for Efficient Governance, Healthy Environment and Sustainable Development", Tashkent, Uzbekistan
- **June 4-6** – Singapore International Water Week, Singapore
- **June 5** – World Environment Day
- **June 5-7** – Conference dedicated to the 30th Anniversary of IFAS, Dushanbe, Tajikistan
- **June 5-7** – Aquatech China 2023, Shanghai, China
- **June 5-15** – Bonn Climate Change Conference, Bonn, Germany
- **June 6-8** – Ecosperity Week 2023, Singapore
- **June 7-8** – 7th Annual International Congress and Exhibition: Hydropower Central Asia and Caspian, Astana, Kazakhstan

- **June 8** – World Oceans Day
- **June 7-9** – 44th International Exhibition of Environmental Technology and Green Energy (ENVEX 2023), Seoul, South Korea
- **June 8-9** – Eurasian Congress'23 "Future Eurasia: from challenges to solutions", Sochi, Russia
- **June 13-16** – Asia Clean Energy Forum 2023, Manila, Philippines
- **June 17** – Desertification and Drought Day
- **June 20** – International Conference "Financial and Investment Support of Rational Water Use Efforts", Ashgabat, Turkmenistan
- **June 20-21** – 7th All-Russian Water Congress, Moscow, Russia
- **June 27-29** – 7th International Conference "Energy and Meteorology", Padova, Veneto, Italy
- **June 27-29** – High-Level Summit and International Scientific Symposium "Fundamental Life Science Meets Climate, Environment and Sustainability: new bridges, new partnerships, new opportunities", Paris, France

July

- **July 1-7** – FAO Conference on water management, Rome, Italy
- **July 3-8** – 17th International Scientific-Practical Conference of the Russian Environmental Economy Society "Global Challenges and National Environmental Interests: Environmental and Social Aspects", Novosibirsk, Russia
- **July 6-7** – 3rd International Conference on Water and Climate, Fez, Morocco
- **July 10-15** – World Congress of the International Association for Landscape Ecology, Nairobi, Kenya
- **July 10-20** – High-Level Political Forum on Sustainable Development, New York, USA

August

- **August 12** – Day of the Caspian Sea
- **August 16-17** – Zanzibar Water Conference, Zanzibar, Tanzania
- **August 20-24** – World Water Week, Stockholm, Sweden
- **August 22-24** – Ecology Expo 2023, Minsk, Belarus
- **August 28-September 1** – 8th Asia-Pacific Climate Change Adaptation Forum, Incheon, Republic of Korea

September

- **September 5-7** – The Green Expo 2023, Mexico, Mexico
- **September 7-8** – International Conference on Food Security, Samarkand, Uzbekistan
- **September 11-15** – 18th IWRA World Water Congress, Beijing, China
- **September 12-14** – ECWATECH 2023, Moscow, Russia
- **September 12-15** – 20th Technical Dam Control International Conference, Chorzow, Poland

- **September 14-15** – Summit of the Heads of IFAS Founder-States
- **September 15** – WWC Board of Governors meeting, Beijing, China
- **September 18** – Climate Ambition Summit, New York, USA
- **September 18-19** – 2nd Stakeholders Consultation Meeting for the 10th World Water Forum, Bali, Indonesia
- **September 19** – World Cleanup Day
- **September 19-20** – SDG Summit, New York, USA
- **September 28** – World Maritime Day

October

- **October 2-3** – OECD Forum on Green Finance and Investment, Paris, France
- **October 9-13** – 21st meeting of the UNCCD Committee for the Review of the Implementation of the Convention CRIC21, Samarkand, Uzbekistan
- **October 12-13** – International Forum "Sustainable Mountain Development", St. Petersburg, Russia
- **October 15** – International Day of Rural Women
- **October 16-18** – HYDRO 2023 International Conference and Exhibition, Edinburgh, Great Britain
- **October 16-19** – 20th Europe-INBO International Conference, Valencia, Spain
- **October 23-27** – Global Green Growth Week
- **October 23-27** – 14th Meeting of the Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals, Samarkand, Uzbekistan

November

- **November 1-8** – 25th International Irrigation and Drainage Congress, Visapakhatnam, India
- **November 6-8** – 3rd Almaty Energy Forum, Kazakhstan
- **November 7-9** – 19th World Lake Conference, Balaton, Hungary
- **November 7-13** – International Week of Science and Peace
- **November 10** – World Science Day for Peace and Development
- **November 15-17** – Water, Energy, Technology, and Environment Exhibition (WETEX) 2023, Dubai, UAE
- **November 30-December 12** – Climate Conference COP 28, Dubai, UAE

December

- **December 5** – World Soil Day
- **December 10-14** – IWA Water and Development Congress & Exhibition, Kigali, Rwanda
- **December 11** – International Mountain Day
- **December 11-12** – 16th meeting of the Implementation Committee of the Water Convention, Geneva, online

SECTION 17

In Memoriam

Time and tide wait for no man and, unfortunately, our veterans pass away...
but they remain in our memories forever.

The head of the Professional Development and Training division of SIC ICWC, **Yusup Kh. Rysbekov** passed away on January 26.

After having graduated from Tashkent State University in Engineering Hydrology in 1977, Yu. Rysbekov worked at the Central Asian Irrigation Research Institute (SANIIRI) from engineer to senior researcher.

He successfully defended his thesis in 1986 and received the degree of Candidate of Technical Sciences.

Eight years (1995-2003) of active military service as a senior officer was an important milestone in his life.

He had been working at SIC ICWC as Assistant Director since 2004 and as the head of the Professional Development and Training division since 2010.

Mr. Rysbekov wrote 100 research and information-analytical papers on the issues related to sustainable development and regional cooperation on water and energy, published over 220 works on topical aspects of water management at national and regional levels, including more than 80 works issued in international journals (German, Iran, Spain, Italy, Russia, US, Turkey, France and others).

Source: SIC ICWC

On February 20, the corresponding member of Tajikistan National Academy of Sciences (NAN RT), Ir. Dr., Prof. **Zainalobuddin V. Kobuliev** died suddenly at the age of just 60.

Prof. Kobuliev worked as the Director of the Institute of Water Problems, Hydropower and Ecology at the NAN RT since June 2009 till August 2020.

Source: SIC ICWC

On November 10, **Akylbek T. Sulaymanov** passed away at the age of 66.

A graduate of the Hydromelioration Faculty at the Kyrgyz Agricultural Institute named after K. I. Skryabin, Mr. Sulaymanov has worked in the field of water resources for more than 40 years.

Awardee for excellence in water management of the Kyrgyz Republic, he has been awarded with the certificates of appreciation from the Government, the Ministry of Water Management and Land Reclamation, the Ministry of Agriculture, and the Department of Water Management and Land Reclamation of the Kyrgyz Republic.

He worked since 2012 until his death as the Head of the Water Management Department at the Water Resources Service of the Kyrgyz Republic.

Source: Water Resources Service of the Kyrgyz Republic

On October 10, **Abdulla Abirov**, a prominent Uzbek scientist, passed away.

He graduated from the Tashkent Institute of Irrigation Engineers and Agricultural Mechanization, Hydromelioration Faculty in 1962.

After the institute, Abdulla Abirov worked as a head of land reclamation brigade in Syrdarya region, chief engineer for irrigation of "Golodnostepstroy" trust, a group head of the "Sredazgiprovodkhlopok" Institute.

Since 1967, he joined the "SANIIRI" Institute, where he worked his way from junior researcher to the head of department, defended (1980) his PhD thesis.

Mr. Abirov trained many young researchers, published a number of research papers on drainage and hydromelioration and several methodological guidelines.

Source: Research Institute of Irrigation and Water Problems